Staff Report to the Zoning Administrator

Application Number: 04-0258

Applicant: Pajaro Valley Water Management Agency: Attn. Mary Bannister/Tech. Div. Mgr.
Owners: various
APN's: 046-151-06/16/19/20/26/28/29/30/31/32/36/37, 046-201-05/07/09/15/16/17/18/19/20/21/25/26/28, 046-371-01/02, 052-081-34/35, 052-181-19, 052-211-22/25/26/27, 052-221-04/19, 052-222-25, 052-311-01/05,06 052-551-01/02/03/04/05/06/07/08, 052-561-01, 052-571-01/04, 052-581-07,08,10.

Date: August 20,2004

Agenda Item # : 1
Time: After 11:00 a.m.

Project Description: Proposal to construct an Integrated Coastal Water Distribution System and Import Pipeline as part of the Pajaro Valley Water Management Agency Basin Management Plan. Requires an Amendment to Coastal Development Permit #99-0335, and Preliminary Grading Approval.

Location: Project located approximately 700 feet west **of** Highway One on the **north** side of the Pajaro River in Watsonville.

Permits Required: Amendment to Coastal Development Permit 99-0335, Riparian Exception, Preliminary Grading Approval.

Staff Recommendation:

- Approval of Application 04-0258, based on the attached findings and conditions.
- Acknowledgement that the Environmental Impact Report and Addendum and Environmental Impact Statement have been reviewed by the Pajaro Valley Water Management Agency and the documents certified in compliance with the California Environmental Quality Act and shall receive a **Federal** Consistency Statement from the California Coastal Commission.

Exhibits

A.	Project plans	C.	Conditions
B.	Findings	D.	PVWMA EIR 1999, Addendum

2003, EIS 2004 (CD on file)
E. Mitigation Measures for EIR & EIS
F. Location map, APN maps
G. Zoning map, General Plan map
H. Comments & Correspondence
I. Coastal Zone Permit #99-0335 with Conditions of Approval
J. Coastal Zone Permit #02-0596 with Conditions of Approval
K. P W M A Basin Management Project, Environmental Science Associates, Submittal 6/02/04
L. NOAA Biological Opinion, August 15,2003
M. US Dept Interior Fish & Wildlife Service Biological & Conference Opinion, March 19,2004.

Parcel Information

Parcel Size:	various
Existing Land Use - Parcel:	Commercial Agriculture
Existing Land Use - Surrounding:	Commercial Agriculture
Project Access:	Beach Road, San Andreas Road
Planning Area:	San Andreas
Land Use Designation:	A (Agriculture), Type 3 viable coastal zone ag. land
Zone District:	CA (Commercial Agriculture)
Supervisorial District:	Second (District Supervisor: Pine)
Within Coastal Zone:	X Inside __ Outside
Appealable to Calif. Coastal Comm.	X Yes __ No

Environmental Information

Geologic Hazards:	Not mapped/no physical evidence on site
Soils:	Baywood loamy sand, Elder sandy loam
Fire Hazard:	Not a mapped constraint
Slopes:	2 – 15 percent slopes
Env. Sen. Habitat:	Mapped/Biological Opinion by NOAA & USFWS issued (Ex. L, M)
Grading:	No grading proposed
Tree Removal:	No trees proposed to be removed
Scenic:	Mapped resource – pipelines will be underground, site restored
Drainage:	Existing drainage adequate
Traffic:	No significant impact
Roads:	Existing roads adequate
Parks:	Existing park facilities adequate
Archeology:	Mapped/Programmatic Agreement USACOE & CA SHPO

Services Information

Inside Urban/Rural Services Line:	__ Yes X No
Water Supply:	Pajaro Valley Water Management Agency
Sewage Disposal:	N/A
Fire District:	Pajaro Valley Fire Protection District
Drainage District:	Non-zone

History

The Pajaro Valley Water Management Agency received approval for Coastal Development Permit #99-0335 on March 13,2000 to construct facilities and infrastructure to implement the Pajaro Valley Water Management Agency's Harkins Slough Recharge and Water Redistribution Project. Coastal Zone Permit Amendment #02-0596 was issued on June 20,2003 to construct a new well and retrofit an existing well and install connections for the Integrated Coastal Distribution System (ICDS). This proposal for the installation of the ICDS and Import Pipeline was accepted on June 4,2004. The PVWMA is concurrently pursuing necessary approvals from other appropriate Federal, State and County agencies for the implementation of the pipeline project in the areas of the Pajaro River under the jurisdiction of the California Coastal Commission (CCC). After review of post-certification maps, the CCC has determined that it retains permitting jurisdiction for a portion of the proposed Import Pipeline in the coastal zone of Santa Cruz County located from the County border in the center of the Pajaro River to the edge of the existing levee.

Project **Setting**

The Pajaro Valley Water Management Agency (PVWMA) administers standards for the use and regulation of groundwater resources in the Pajaro Valley. Approximately 80,000 acres of imgated agricultural lands fall under the jurisdiction of the PVWMA. The greatest challenge for the agency is to address the imbalance between water use and maintaining sustainable water supplies.

The PVWMA intends to use Central Valley Project (CVP) water to supplement water supplies in the Pajaro Valley Basin and deliver approximately 14,000 acre-feet of water per year for agricultural irrigation. Approximately 7,000 afy of the CVP water will be blended with 3,000 afy of inland groundwater and 4,000 afy **of** tertiary treated water from the City of Watsonville's wastewater treatment facility. The PVWMA will utilize CVP water to bring its water supply into balance with existing agricultural demand in conjunction with improved water conservation practices to prevent continued overdraft of the groundwater basin, and to prevent continued seawater intrusion into the aquifer. All imported water will be transported through enclosed pipelines either for direct application to agricultural fields or for blending with recycled water prior to application and will not directly enter the Pajaro River or its tributaries.

The Integrated Coastal Distribution System (ICDS) pipeline in Santa Cruz County would begin approximately 700 feet west of State Highway One north of the Pajaro River. It parallels the Pajaro River along the outside of the north levee and proceeds north past the wastewater treatment plant on West Beach Road. Two main laterals branch off the Beach Road Lateral. The Northeast Addition Lateral travels north along a farm road about I .25 miles. The North Plateau Lateral branches off the Beach Road alignment and follows San Andreas Road to the north about **1.5** miles. Approximately 54,000 LF of pipeline would be constructed in Santa Cruz County. The Import Pipeline will connect the ICDS on the north side of the Pajaro River levee about 1,900 feet west of State Highway One. The pipeline will link the Pajaro Valley Basin with the Santa Clara Conduit of the San Felipe Unit facilities to allow the PVWMA to take delivery of Central Valley Project water and water fiom other sources.

Zoning & General Plan Consistency

The subject properties are located in the CA (Commercial Agriculture) zone district, a designation which allows agricultural uses. The proposed water import and distribution pipelines for agricultural irrigation are a principal permitted use within the zone district and the project is consistent with the site's (A) Agriculture General Plan designation. The project sites are designated as Type 3 Agricultural Lands, as per General Plan policy 5.13.2, which categorizes viable agricultural land within the Coastal Zone.

Local Coastal Program Consistency

The proposed water import and distribution pipeline is in conformance with the County's certified Local Coastal Program, in that the ICDS is sited and designed to be compatible with the character of the surrounding agricultural lands. The project is consistent with Groundwater Protection policies of Chapter 5.8 of the General Plan in that careful water quality monitoring and management of extractions is consistent with long-term sustainable water supply yields. The project is also consistent with Chapter 5.13, Commercial Agricultural Land, **of** the General Plan in that an adequate water supply is required for sustainable agricultural production. The project site is located between the shoreline and the first public road but is not identified as a priority acquisition site in the County's Local Coastal Program. Consequently, the proposed underground agricultural irrigation pipeline import and distribution system with any required pumping stations will not interfere with public access to the beach, ocean, or other nearby body **of** water. Public coastal access is available at Sunset and Palm State Beaches in the project vicinity.

Design Review

The proposed water distribution pipeline system complies with the requirements **of** the County Design Review Ordinance, in that the proposed agricultural irrigation pipelines will be buried underground and the sites will continue to be farmed. There will be minimal visual impact of the proposed development on surrounding land uses and the natural landscape because crops in production will shield irrigation apparatus from view.

Environmental Review

California Environmental Quality Act (CEQA) certification has been completed for the project as follows:

PVWMA Local Water Supply and Distribution EIR 1999. The Board **of** Directors **of** the PVWMA on May 19,1999 by Resolution 99-05 certified the Final Environmental Impact Report (State Clearinghouse#97021006).

PVWMA Local Water Supply EIR Addendum – Supplemental Wells and Connecting Pipeline at Harkins Slough, November 2001. The PVWMA Board of Directors on November 7,2001 by Resolution 2001-18. Addendum adopted by PVWMA Board of Directors June 5,2002 by Resolution 2002-13 to address minor changes to the Harkins Slough and Coastal Distribution

System. Addendum adopted by the PVWMA Board of Directors on August 20,2003 by Resolution 2003-19 to modify the Integrated Coastal Distribution System.

PVWMA Revised Basin Management Plan Project EIS 2004. Bureau of Reclamation Record of Decision August, 2004. The revised BMP Projects EIS focuses on the impacts of project construction and operation, including impacts on land use, water resources, geology and soils, threatened and endangered species, cultural resources, air quality, and socioeconomics. The EIS fulfills the requirements of Executive Orders 11988 (floodplain management), 11990 (protection of wetlands), and 12898 (Environmental Justice).

The environmental review process generated mitigation measures that will reduce potential impacts from the proposed development that will adequately address these issues.

Conclusion

As proposed and conditioned, the project is consistent with all applicable codes and policies of the Zoning Ordinance and General Plan/LCP. Please see Exhibit "B" ("Findings") for a complete listing of findings and evidence related to the above discussion.

Staff Recommendation

- **APPROVAL** of Application Number **04-0258,** based on the attached fmdings and conditions.

- Acknowledgement that the Environmental Impact Report and Addendum and Environmental Impact Statement have been reviewed by the Pajaro Valley Water Management Agency and the documents certified in compliance with the California Environmental Quality Act and shall receive a Federal Consistency Statement from the California Coastal Commission.

Supplementary reports and information referred to in this report are on file and available for viewing at the Santa Cruz County Planning Department, and are hereby made a part of the administrative record for the proposed project.

The County Code and General Plan, as well as hearing agendas and additional information are available online at: www.co.santa-cruz.ca.us

Report Prepared By: Joan Van der Hoeven
Santa Cruz County Planning Department
701 Ocean Street, 4th Floor
Santa Cruz CA 95060
Phone Number: (831) 454-5174
E-mail: pln140@co.santa-cruz.ca.us

APN: 046-151-06, 046-151-16, 046-151-19, 046-151-26, 046-151-28, 046-151-29, 046-151-30, 046-151-32, 046-151-36, 046-151-37, 046-161-06, 046-201-05, 0462-201-07, 046-201-09, 046-201-15, 046-201-16, 046-201-17, 046-201-18, 046-201-19, 046-201-20, 046-201-21, 04

Owner: various

Coastal Development Permit Findings

1. That the project is a use allowed in one of the basic zone districts, other than the Special Use (SU) district, listed in section 13.10.170(d) as consistent with the General Plan and Local Coastal Program LUP designation.

This finding can be made, in that the property is zoned CA (Commercial Agriculture), a designation which allows agricultural uses. The proposed water import and distribution pipeline system is a principal permitted use within the zone district, consistent with the site's (A) Agriculture General Plan designation. The proposed agricultural irrigation system is consistent with Type **3,** viable agricultural lands within the coastal zone designation, in that the imported and recycled water, coupled with improved water conservation methods, will provide sufficient water for irrigation to sustain crop production without contributing to further depletion of groundwater reserves, consistent with General Plan objective 5.8.

2. That the project does not conflict with any existing easement or development restrictions such as public access, utility, or open space easements.

This finding can be made, in that the proposal does not conflict with any existing easement or development restriction such as public access, utility, or open space easements in that no such easements or restrictions are known to encumber the project sites. Public coastal access is available at Sunset and Palm State Beaches in the project vicinity.

3. That the project is consistent with the design criteria and special use standards and conditions of this chapter pursuant to section 13.20.130 **et** seq.

This finding can be made, in that the development is consistent with the surrounding agricultural farmlands in that the pipeline distribution system will be placed underground with minimal above ground equipment whose visibility will be mitigated by growing field crops. The development sites are not on a prominent ridge, beach, or bluff top.

4. That the project conforms with the public access, recreation, and visitor-serving policies, standards and maps of the General Plan and Local Coastal Program land use plan, specifically Chapter 2: figure 2.5 and Chapter **7,** and, as to any development between and nearest public road and the sea or the shoreline of any body of water located within the coastal zone, such development is in conformity with the public access and public recreation policies of Chapter 3 of the Coastal Act commencing with section 30200.

This finding can be made, in that although the project site is located between the shoreline and the first public road, the water distribution pipeline will not interfere with public access to the beach, ocean, or any nearby body **of** water. Public access to the ocean is available at Palm and Sunset State Beaches in the project vicinity. **Further,** the project site is not identified as a priority acquisition site in the County Local Coastal Program.

5. That the proposed development is in conformity with the certified local coastal program.

This finding can be made, in that the proposed Integrated Coastal Distribution System (ICDS) is sited and designed to provide supplemental water supplies imported to the area, mixed with reclaimed wastewater and used with improved water conservation methods, to promote sustainable agriculture and maintain the character *of* the surrounding agricultural lands. Additionally, agricultural uses are allowed uses in the CA (Commercial Agriculture) zone district of the area, as well as the General Plan and Local Coastal Program land use designation, consistent with General Plan Chapter 5.13. The proposed development is also consistent with General Plan Chapter 5.8, Groundwater Protection, in that implementation of the ICDS will help to inhibit further overdraft conditions that have caused the groundwater levels to drop below sea level causing salt water intrusion into coastal water supplies. The project is located within the Appeal Jurisdiction of the California Coastal Commission and remains subject to CCC consistency review.

Development Permit Findings

1. That the proposed location of the project and the conditions under which it would be operated or maintained will not be detrimental to the health, safety, or welfare of persons residing or working in the neighborhood or the general public, and will not result in inefficient or wasteful use of energy, and will not be materially injurious to properties or improvements in the vicinity.

This finding can be made, in that the project is located in an area designated for agricultural uses and is not encumbered by physical constraints to development. Construction will comply with prevailing building technology, the Uniform Building Code, and the County Building ordinance to insure the optimum in safety and the conservation of energy and resources. The proposed water distribution pipeline will be substantially located underground with the exception of any required pumping stations, and will not deprive adjacent properties or the neighborhood of light, air, or open space, in that the structure meets all current setbacks that ensure access to light, air, and open space in the neighborhood.

2. That the proposed location of the project and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the zone district in which the site is located.

This finding can be made, in that the proposed location of the water import and distribution pipeline system and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the CA (Commercial Agriculture) zone district in that the primary use of the property remains commercial agricultural production and the proposed water distribution pipeline, when coupled with improved water conservation and recycling methods, will promote sustainable agriculture in the Pajaro Valley.

3. That the proposed use is consistent with all elements of the County General Plan and with any specific plan which has been adopted for the area.

This finding can be made, in that the proposed pipeline distribution system for agricultural use is consistent with the use and density requirements specified for the Agriculture (A) land use designation in the County General Plan.

The proposed water import and distribution pipeline system will not adversely impact the light, solar opportunities, air, and/or open space available to other structures or properties, and meets all current site and development standards for the zone district in that the water distribution system will not adversely shade adjacent properties, and will meet current setbacks for the zone district that ensure access to light, air, and open space in the neighborhood.

The proposed water import and distribution pipeline will not be improperly proportioned to the parcel size or the character of the neighborhood as specified in General Plan Policy **8.6.1** (Maintaining a Relationship Between Structure and Parcel Sizes), in that the proposed water distribution pipeline will comply with the site standards for the CA zone district (including

setbacks) and will be primarily located underground.

A specific plan has not been adopted for this portion of the County.

4. That the proposed use will not overload utilities and will not generate more than the acceptable level of traffic on the streets in the vicinity.

This finding can be made, in that the proposed water distribution pipeline is to be constructed on existing parcels utilized for agricultural production. The expected level of traffic generated by the proposed project is anticipated to remain the same as the existing level and will not adversely impact existing roads and intersections in the surrounding areas of Beach Road and San Andreas Road. Public Works Encroachment Permits are required for any work within the County road right-of-way.

5. That the proposed project will complement and harmonize with the existing and proposed land uses in the vicinity and will be compatible with the physical design aspects, land use intensities, and dwelling unit densities of the neighborhood.

This finding can be made, in that the proposed water distribution system is primarily located underground, beneath the agricultural fields that it will serve. Growing field crops should mitigate any visual impact of those portions of the system which are above ground.

6. The proposed development project is consistent with the Design Standards and Guidelines (sections **13.1** 1.070 through 13.11.076), and any other applicable requirements of this chapter.

This finding can be made, in that the proposed water import and distribution pipeline will be of an appropriate scale and type of design that will enhance the aesthetic qualities of the surrounding properties and will not reduce or visually impact available open space in the surrounding area in that the pipes will primarily be located underground and any above ground apparatus will be visually mitigated by crops in production.

Conditions of Approval

Exhibit A Key Plan Coastal Distribution System, Figures 1-19, CH2MHILL dated June 11, 2004.
Pajaro Valley Water Management Agency (PVWMA) Coastal Distribution System,CH2MHILL Vol 2, 30% Design Drawings July 5,2004 pp 1-27.

I. This permit authorizes the construction of a water import and distribution pipeline. Prior to exercising any rights granted by this permit including, without limitation, any construction or site disturbance, the applicant/owner shall:

A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.

B. Obtain a Building Permit from the Santa Cruz County Building Official.

C. Obtain a Grading Permit from the Santa Cruz County Building Official.

D. Obtain an Encroachment Permit from the Department of Public Works for all off-site work performed in the County road right-of-way. Engineered plans shall be required.

E. Environmental Planning staff shall review and approve final plans in writing prior to exercise of the permit.

F. Obtain a Riparian Exception from Environmental Planning

G. All conditions of approval from prior project permits associated with the water redistribution project (Coastal Development Permits #99-0335 and #02-0596, Exhibits I & J) remain in effect.

H. Comply with all required Mitigation Measures of the EIR and EIS (Exhibit E).

II. Prior to issuance of a Building Permit the applicant/owner shall:

A. Submit Final Architectural Plans for review and approval by the Planning Department. The final plans shall be in substantial compliance with the plans marked Exhibit **"A"** on file with the Planning Department. The final plans shall include the following additional information:

1. Identify finish of exterior materials for Planning Department approval. Any color boards must be in 8.5" x 11" format.

2. Grading, drainage, and erosion control plans. PVWMA shall identify the responsible party for inspections of the installation. The erosion control plan should specifically address areas shown on Sheets PP-23, PP-25 & PP-26.

3. A detailed erosion control plan, including spoils management, location of staging areas, diversion of flows as necessary, timing of the construction activities, details of sediment control structures, designated site to receive spoils, and all other elements required by the applicable Mitigation Measures and Biological and Conference Opinion must be reviewed and approved in writing by Environmental Planning staff prior to exercise of the permit. Work shall occur between August 1 and October 15. Staging areas shall be located at least 50 feet from waterways and shall be confined to the southwest side of the railroad track. Project plans shall be revised to show detail of the boring entry and exit pits adequate to verify that the design is consistent with standards called for in the Biological Opinion.

4. Final plans shall indicate areas of Freshwater Emergent Wetland or Valley Foothill Riparian (as designated in the EIR). No construction shall occur between March 1 and July 30 within 500 feet of these areas unless work is preceded by surveys, carried out as described in the EIR and BO, that show an absence of protected bird species. Survey results shall be submitted to Santa Cruz County Environmental Planning staff prior to disturbance in these areas.

5. Revise plans to show fencing at the 25-foot riparian corridor setback where work will occur within 30 feet of the corridor.

6. Submit an approved storm water pollution prevention plan that specifically addresses areas shown on Sheets PP-23, PP-25 & PP-26.

7. If any wetland or riparian vegetation is disturbed, a detailed re-vegetation plan including replacement with locally collected plants at a 3:1 ratio, success goals, three year maintenance and monitoring plan, weed control, and all other elements required by the applicable Mitigation Measures must be reviewed and approved in writing by Environmental Planning staff prior to the exercise of the permit.

B. Obtain an Environmental Health Clearance for this project from the County Department of Environmental Health Services. Provide required documentation that well abandonment requirements have been completed to the satisfaction of the Environmental Health Service.

C. Submit 3 copies of a soils report prepared and stamped by a licensed Geotechnical

Engineer. Areas of liquefaction and weak soils shall be identified.

D. A biological monitor shall conduct surveys for special status species covering the slough crossing and the staging areas within two weeks of beginning that portion of the work, as called for in the Biological Opinion (Exhibit M). Results of the surveys shall be submitted to Environmental Planning staff. A biological monitor shall be on site during all drilling and construction of the crossing. Final plans shall show the location of exclusionary fencing. Recommendations of the Biological opinion, including follow up monitoring of relocated individuals, shall be followed.

III. All construction shall be performed according to the approved plans for the Building Permit. Prior to final building inspection, the applicant/owner must meet the following conditions:

A. All site improvements shown on the final approved Building Permit plans shall be installed.

B. All inspections required by the building permit shall be completed to the satisfaction of the County Building Official and Santa Cruz County Environmental Planning.

C. The project must comply with all recommendations of the approved soils reports.

D. Pursuant to Sections 16.40.040 and 16.42.100 of the County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this development, any artifact or other evidence of an historic archaeological resource or a Native American cultural site is discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the Sheriff-Coroner if the discovery contains human remains, or the Planning Director if the discovery contains no human remains. The procedures established in Sections 16.40.040 and 16.42.100, shall be observed.

IV. Operational Conditions

A. In the event that future County inspections of the subject property disclose noncompliance with any Conditions of this approval or any violation of the County Code, the owner shall pay to the County the full cost of such County inspections, including any follow-up inspections and/or necessary enforcement actions, up to and including permit revocation.

V. As a condition of this development approval, the holder of this development approval ("Development Approval Holder"), is required to defend, indemnify, and hold harmless the COUNTY, its officers, employees, and agents, from and against any claim (including attorneys' fees), against the COUNTY, it officers, employees, and agents to attack, set

aside, void, or annul this development approval of the COUNTY or any subsequent amendment of this development approval which is requested by the Development Approval Holder.

A. COUNTY shall promptly notify the Development Approval Holder of any claim, action, or proceeding against which the COUNTY **seeks** to be defended, indemnified, or held harmless. COUNTY shall cooperate fully in such defense. If COUNTY fails to notify the Development Approval Holder within sixty **(60)** days of any such claim, action, or proceeding, or fails to cooperate fully in the defense thereof, the Development Approval Holder shall not thereafter be responsible to defend, indemnify, or hold harmless the COUNTY if such failure to notify or cooperate was significantly prejudicial to the Development Approval Holder.

B. Nothing contained herein shall prohibit the COUNTY from participating in the defense of any claim, action, or proceeding if both of the following occur:

1. COUNTY bears its own attorney's fees and costs; and

2. COUNTY defends the action in good faith.

C. Settlement. The Development Approval Holder shall not be required to pay or perform any settlement unless such Development Approval Holder has approved the settlement. When representing the County, the Development Approval Holder shall not enter into any stipulation or settlement modifying or affecting the interpretation or validity of any of the terms or conditions of the development approval without the prior written consent of the County.

D. Successors Bound. "Development Approval Holder" shall include the applicant and the successor'(s) in interest, transferee(s), and assign(s) of the applicant.

Minor variations to this permit which do not affect the overall concept or density may be approved by the Planning Director at the request of the applicant or staff in accordance with Chapter 18.10 of the County Code.

Please note: This permit expires two years from the effective date unless you obtain the required permits and commence construction.

Approval Date: _____

Effective Date: _____

Expiration Date: _____

Don Bussey
Deputy Zoning Administrator

Joan Van der Hoeven
Project Planner

Appeals: Any property owner, or other person aggrieved, or any other person whose interests are adversely affected by any act or determination of the Zoning Administrator, may appeal the act or determination to the Planning Commission in accordance with chapter 18.10 of the Santa Cruz County Code.

APPENDIX D

PVWMA MITIGATION COMMITMENTS

EXHIBIT E

Environmental commitments are written statements of intent made by Reclamation to monitor and mitigate for potential adverse environmental impacts associated with any phase of planning, construction, and operation and maintenance (O&M) activities. Environmental commitments are actions that:

- Restore or enhance environmental quality
- Are directly controlled by Reclamation
- Are indirectly controlled via a written agreement with another party to carry out the action – in this case, PVWMA and/or the City of Watsonville.

NEPA guidelines state that environmental commitments may be required by Reclamation and/or the project sponsor if the project is implemented. With respect to the Revised BMP Projects, PVWMA has already adopted mitigation commitments through certification of the Environmental Impact Report and adoption of Mitigation Monitoring and Report Programs (MMRP) pursuant to the California Environmental Quality Act. The mitigation commitments for the proposed project are from the MMRPs. MMRPs for the Import Water Project, Recycled Water Project and supplemental wells were adopted as conditions of project approval for the Revised Basin Management Plan EIR on February 6,2002 (see Tables D.1, D.2, and D.5). The MMRF' for the Integrated Coastal Distribution System was adopted a condition of project approval for the Local Projects EIR on May 19, 1999 (see Table D.3). Mitigation measures for biological resources for all of the Revised BMP projects are grouped in a separate table (Table D.4) and will be superseded and updated as the U.S. Fish and Wildlife Service, National Oceanic Atmospheric Administration Fisheries, U.S. Army Corps of Engineers, and California Department of Fish and Game establish permit conditions for the proposed action.

The mitigation commitments are organized in a table format, keyed to each significant impact and each adopted EIR mitigation measure. The mitigation measures are presented in the tables and are coded by number to the appropriate EIR (not EIS) section. The column headings in the tables are defined as follows:

- Mitigation Measure: This column contains mitigation measures to be implemented
- Monitoring and Reporting Actions: This column contains an outline of the appropriate steps to verify compliance with the mitigation measure.
- Monitoring / Reporting Responsibility: This column contains an assignment of responsibility for the monitoring and reporting tasks.
- Monitoring / Reporting Schedule: The general schedule for conducting each monitoring and reporting task, identifying where appropriate both the timing and the frequency of the action.

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EXHIBIT

TABLE D.1
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Land Use and Planning			
Measure 4.B.1-1 (Recommended): Implement **Measure 4.A.1-1.** **Measure 4.A.1-1 (Recommended):** Advance notification of construction activities should be provided to all property owners, residents, and businesses in the vicinity of construction areas. See also mitigation measures in Sections 4.A.6, Traffic and Circulation, 4.A.7, Air Quality, and 4.A.8, Noise, of this EIR.	1) Send notices to all property owners, residents, and businesses in the project area vicinity at least one week in advance of construction. Publish notices in local newspapers at least one week in advance of construction. Place large signs along roads in the project vicinity at least one week in advance of construction. Submit copies of public notices to the project file to document compliance.	PVWMA	Prior to project construction
Geology and Soils			
Measure 4.B.2-1a: For pipeline segments that traverse the Sargent Hills in the foothills of the Santa Cruz Mountains or portions of the Cayetano Hills, a design-level geotechnical report that includes a slope stability evaluation shall be completed prior to construction. Pipeline installation specifications should incorporate all slope stability recommendations contained in the geotechnical evaluation. Slope stabilization measures may include drainage, slope benching, buttresses, and vegetation restoration.	1) Review construction specifications to ensure that design recommendations for pipeline installation were included. 2) Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA's consulting engineering geologist	Prior to project construction During and immediately following project construction
Measure 4.B.2-1b: For pipeline segments at stream crossings, a detailed hydraulic and scour analysis shall be conducted to ensure that pipelines and tunnels are installed at an adequate depth to prevent scour during flood flows. Bank erosion and channel stability should also be evaluated in the vicinity of Station 590+00 (Pajaro River and UPRR crossing). Recommendations of the hydraulic and scour analysis shall be incorporated into the project design and specifications.	1) Review construction specifications to ensure that design recommendations for pipeline installation were included. 2) Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA's consulting engineering geologist	Prior to project construction During and immediately following project construction

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.2-2: For pipeline segments that cross the San Andreas and Sargent faults, incorporate the following elements into the design and construction of the proposed pipeline: ▪ Use ductile-grade steel pipe in conjunction with increased pipe wall thickness throughout the fault zones as depicted in **Maps A1, A2, and A3** in the Map Appendix. These materials are more flexible and can tolerate some deformation caused by ground failure. ▪ Install welded joints at the joints through the fault zones. ▪ Where possible, install pipelines across faults in a perpendicular direction. ▪ Install water-pressure-sensitive or pipe-movement-sensitive instruments linked to the isolation valves to shut down the system in the event of failure. The isolation valves could be automatically closed during a large earthquake. ▪ Construct a contingency route for pipe flow drainage in case of failure. Drainage of pipe flows to a culvert under the railroad track to the river or a detention basin should be considered. ▪ Design the water conveyance system to facilitate rapid or emergency repair.	1) Review construction specifications to ensure that design recommendations listed in **Measure 4.B.2-2** are included. 2) Monitor project construction activities to verify compliance with construction specifications. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA or PVWMA's consulting engineer	Prior to project construction During and immediately following project construction

EXHIBIT E 1 of 8

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.2-3: For pipeline segments located in low-lying areas (Stations 0+00 to about 450+00 and Stations 650+00 to 1127+00) a design-level geotechnical investigation, including collection of subsurface data shall be completed prior to construction of facilities. The geotechnical evaluation should include identification of density profiles, determination of maximum shallow groundwater levels, and characterization of the vertical and lateral extent of saturated sand/silt layers that could undergo liquefaction during strong ground shaking. When facility-specific testing indicates that conditions are present that could result in liquefaction and damage to project facilities, appropriate, feasible measures should be included in the site-specific soil analysis and incorporated into the project design. These measures could include the following, unless the site-specific soils analysis dictates otherwise: ▪ Densification or dewatering of surface or subsurface soils. ▪ Construction of concrete foundations to support pipelines or pile foundations to support buildings. ▪ Removal of material that could undergo liquefaction in the event of an earthquake and replacement with stable material.	1) Review construction specifications to ensure that design recommendations for pipeline installation are included. 2) Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA's consulting engineering geologist	Prior to project construction During and immediately following project construction
Measure 4.B.2-4: PVWMA shall develop and implement an earthquake preparedness and emergency response program. The program should be detailed and should include, at a minimum, the following elements: ▪ Identify specific pipeline locations, through site-specific geologic studies, that would be vulnerable to damage in an earthquake and define priorities for system repairs. ▪ Provide appropriate PVWMA facilities staff, sheriff and fire departments with emergency response training. ▪ Conduct practice drills, using simulated earthquake scenarios, of emergency response procedures annually.	1) Prepare contract specifications for the construction contractor that require implementation of an earthquake preparedness and emergency response program. 2) Monitor project construction activities to verify earthquake preparedness and emergency response program implementation. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA or PVWMA's consulting engineer	Prior to project construction During project construction

EXHIBIT E 19

TABLE D.1 *(Continued)*
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.2-5a: A site-specific investigation shall be conducted by a *geotechnical engineer to determine the presence and characteristic of* potentially compressible and/or expansive soils, the depth and thickness of soil layers, and the depth to groundwater. Soils shall be sampled and laboratory tested to determine the expansion potential. The results of the investigation shall include mitigation measures that would reduce settlement to a less-than-significant level. Feasible mitigation measures could include removal and replacement of soil or deep mixing of compressible soils with stabilizing agents, as identified below: ▪ Expansive soils can be excavated and replaced with non-expansive materials. The required depth of excavation should be specified by a registered civil engineer based on actual soil conditions. ▪ Expansive soils may be treated in place by mixing them with lime. Lime-treatment alters the chemical composition of the expansive clay minerals such that the soil becomes non-expansive.	1) Review construction specifications to ensure that the *geotechnical engineer's design recommendations for* pipeline installation are included. 2) Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA's consulting engineering geologist	Prior to project construction During project construction
Measure 4.B.2-5b: Any native or imported backfill shall be selected, placed, compacted, and inspected in accordance with plans and specifications prepared by a licensed civil engineer.	1) Monitor project construction activities to verify compliance with the construction specifications. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist	During project construction
Measure 4.B.2-6a: A site-specific soil corrosion survey shall be conducted by an engineer certified to evaluate soils conditions along the pipeline. The investigation shall define the need for, and the location of, insulating couplings, electrolysis test stations, and hot spot areas where there should be either galvanic or impressed current cathodic protection. This will assure a high degree of corrosion suppression to cement and uncoated steel or ductile iron pipes. All buried structures should be designed and constructed to withstand corrosive subsurface conditions.	1) Review construction specifications to ensure that design recommendations for pipeline installation were included. 2) Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist PVWMA's consulting engineering geologist	Prior to construction Periodically during project construction

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.2-6b: To maintain and extend the life of the pipeline, bonding jumpers shall be provided at all joints to facilitate periodic corrosion testing.	1) Monitor project construction activities to verify compliance with the recommendations of the soils report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist	Periodically during project construction
Measure 4.B.2-7: The PVWMA shall design and implement a Temporary Erosion and Sediment Control Plan for the excavation and construction phase of the project that would, at a minimum, meet the following objectives, consistent with the Final Program EIR for the Pajaro Valley Water Basin Management Plan (PVWMA, 1993): ▪ The Temporary Erosion and Sediment Control Plan would be prepared by a registered civil engineer or a certified erosion and sediment control specialist using the concepts such as those developed by the Association of Bay Area Governments' Manual of Standards for Erosion and Sediment Control Measures (1995). ▪ The Plan would be based on the specific erosion and sediment transport control needs of each pipeline segment. ▪ The Plan would specify the means to reduce the velocity of water leaving the pipeline alignment. ▪ The elements of the Plan would be maintained in working condition during the excavation, grading, and construction phases. ▪ The Plan would be required, submitted, reviewed, implemented, and inspected as part of a general grading plan for the project.	1) Prepare contract specifications for the construction contractor that require implementation of a Temporary Erosion and Sediment Control Plan. 2) Monitor project construction activities to verify Temporary Erosion and Sediment Control Plan implementation. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA's consulting engineering geologist	Prior to construction Periodically during project construction

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE

Measure 4.B.2-7: (cont.)

Other erosion and sediment control measures include:

- Confine grading and excavation to the dry season (April 15 through October 15), whenever possible. If grading is scheduled for the wet season, ensure that erosion and sediment control structures are in place prior to the onset of the first major storm of the season.
- Keep disturbed areas (from grading and related activities) to the minimum necessary for demolition or construction.
- Direct runoff away from disturbed areas during grading and related activities.
- Locate staging areas and spoil sites outside major stream and drainage ways and such that they do not drain directly into the waterways. If a spoil site drains into the creek, temporary catch basins will be constructed to intercept sediment before it reaches the channels. Spoil sites will be graded to reduce the potential for erosion.
- Place sediment curtains upstream and downstream of the construction zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.
- Prevent runoff from flowing over unprotected slopes. Place sediment traps on downhill slopes whenever construction activities such as trenching, grading, etc. occur on slopes along rivers or streams.
- Following construction, creek banks will be covered with erosion control blankets and replanted with locally indigenous species using locally collected materials (seed, plugs, willow or cottonwood wattles). These will be planted according to a revegetation plan approved by the resource agencies.

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TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE [redacted] WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Hydrology and Water Quality			
Measure 4.B.3-2a: Implement **Measure 4.A.3-1** (Storm Water Pollution Prevention Plan).		Construction contractor	Prior to construction
Measure 4.A.3-1a: The PVWMA shall require contractors to develop a SWPPP for construction of proposed facilities, as required by the RWQCB. The objectives of the SWPPP are to identify pollutant sources that may affect the quality of stormwater discharge and to implement BMPs to reduce pollutants in stormwater discharges. The SWPPP for this proposed action would include the implementation, at a minimum, of the following elements: ▪ Source identification; ▪ Preparation of a site map; ▪ Description of construction materials, practices, and equipment storage and maintenance; ▪ List of pollutants likely to contact stormwater; ▪ Estimate of the construction site area and percent impervious area; ▪ Erosion and sedimentation control practices, including soils stabilization, revegetation, and runoff control to limit increases in sediment in stormwater runoff, such as detention basins, straw bales, silt fences, check dams, geofabrics, drainage swales, and sandbag dikes; ▪ Proposed construction dewatering plans and ▪ List of provisions to eliminate or reduce discharge of materials to stormwater; ▪ Description of waste management practices; and ▪ Maintenance and training practices.	1) Prepare contract specifications for the construction contractor that require implementation of a Storm Water Pollution Prevention Plan. 2) Monitor project construction activities to verify Storm Water Pollution Prevention Plan implementation. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction

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EXHIBIT E

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.3-2b: Implement **Measure 4.A.4-1a** (construction within potentially jurisdictional wetlands/waters of the U.S. and streambeds). **Measure 4.A.4-1a--Wetlands Avoidance:** Wetlands and riparian habitat at the Highway 1 crossing of the Pajaro River may be avoided entirely by using bore and jack construction.	1) Prepare construction specifications that require bore and jack construction techniques be used to cross the Pajaro River. 2) Monitor project construction activities to ensure that the bore and jack construction is used at the Pajaro River crossing. If non-compliance is noted, notify the contractor of required actions and the deadline for compliance.	PVWMA PVWMA or PVWMA's consulting engineer	Prior to project construction During project construction
Measure 4.B.3-3: Obtain a National Pollutant Elimination Discharge System (NPDES) permit for construction dewatering and implement conditions of the permit. An NPDES permit will be required from the RWQCB for all discharges for construction dewatering. Discharges must meet all applicable water quality objectives. The RWQCB may require certain conditions of the permit, such as treatment of the flows prior to discharge.	1) Prepare and submit an application for an NPDES permit to the RWQCB. 2) Monitor construction activities to verify compliance with BMP water quality objectives and any conditions of the NPDES permit. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to project construction Periodically during project construction
Measure 4.B.3-4a: Implement measures to ensure that construction activities do not damage existing wells. Wells shall be capped in an appropriate manner to prevent soil and other contaminants from entering groundwater aquifers.	1) Review construction plans and maps to ensure that the wells are identified. 2) Monitor construction activities to verify that wells in and near the project area are avoided. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to project construction Periodically during project construction
Measure 4.B.3-4b: PVWMA or its contractor shall correct any damage to wells and/or reimburse well owners for any loss of use of the well during construction.	1 Inspect wells in the construction area prior to, and immediately following, project construction. Document any damage to wells resulting from construction activities. Repair any damage to the wells.	PVWMA	Prior to and immediately following construction

EXHIBIT E

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.3-4b: (cont.)	2) If access to existing wells in the construction area will be affected, notify well operators in writing of the loss of use of the well and the dates during which access to the well(s) will not be available. Reimburse well operators for loss of well use based on historical water use.	Construction contractor and PVWMA	Prior to and immediately following construction
Vegetation and Wildlife			
See Table 4.			
Cultural Resources			
Measure 4.B.5-1a: Final pipeline and facility plans shall locate facilities and pipeline alignments away from identified cultural resource sites. A qualified cultural resource specialist shall be retained to assist in identifying the extent of important cultural resource sites to be avoided, which may include the preparation of detailed cultural resource evaluation reports and consultation with local, state, and federal agencies as well as the local Native American community and the Native American Heritage Commission.	1) Determine the areal extent of important cultural resources sites within the project area. Review project plans to verify that project facilities would not be located within these sites.	PVWMA's consulting archaeologist	Prior to final engineering design
Measure 4.B.5-1b: If important cultural resource sites cannot be avoided, PVWMA will coordinate with local, state, and federal agencies in the development of an appropriate mitigation plan for the cultural resource. Possible mitigation measures for important cultural resources may include documentation and recordation of the resource, relocation, or stabilization of the resource.	1) Prepare contract specifications for the construction contractor that require implementation of the cultural resources mitigation plan developed under the Programmatic Agreement.	PVWMA's consulting archaeologist	Prior to requesting construction bids
	2) Monitor construction activities to ensure that the cultural resources mitigation plan is implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting archaeologist	During project construction

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TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.5-2: Implement **Measure 4.A.5-1**.			
Measure 4.A.5-1: Should any as yet undiscovered cultural resources, such as structural features, or unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work will be suspended and PVWMA staff will be contacted. A qualified cultural resource specialist shall be retained and will perform any necessary investigations to determine the significance of the find. PVWMA will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources. In addition, pursuant to Sections 5097.97 and 5097.98 of the State Public Resources Code and Section 7050.5 of the State Health and Safety Code, in the event of the discovery of human remains, all work must be halted and the County Coroner shall be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.	1) Prepare a resource recovery plan for the site including findings and recommendations and submit it to PVWMA, the U.S. Army Corps of Engineers, the State Historic Preservation Officer, the Advisory Council on Historic Preservation and the project file.	PVWMA's consulting archaeologist	During project construction, if potential resources are encountered
	2) Submit a document verifying that evaluation of the materials and their recovery occurred. Prepare a report of findings and submit it to PVWMA, the State Historic Preservation Officer, the Advisory Council on Historic preservation and the project file.	PVWMA's consulting archaeologist	During project construction, if potential resources are encountered
Measure 4.B.5-3a: The resource boundaries should be marked as exclusion zones both on the ground and on construction maps.	1) Review construction maps and monitor construction sites to ensure that resource boundaries are marked as exclusion zones.	PVWMA's consulting archaeologist	Prior to, and during, project construction
Measure 4.B.5-3b: Construction supervisory personnel should be notified of the existence of these resources and be required to keep personnel and equipment away from these areas. During construction and operations, personnel and equipment will be restricted to the surveyed corridor.	1) Prepare contract specifications for the construction contractor that require all construction personnel and equipment remain within the surveyed corridor.	PVWMA	Prior to requesting construction bids
Measure 4.B.5-3c: Monthly monitoring of the cultural resources to be avoided should be completed to insure that no inadvertent damage to the resources occurs as a result of construction or construction-related activities. If damage is detected a guard will be posted to patrol the site and adjacent important resources (such as gravestones and churches).	1) Monitor cultural resources to be avoided on a monthly basis during project construction to verify that no damage occurs.	PVWMA's consulting archaeologist	Monthly during project construction
	2) If damage to a cultural resource is detected, hire a guard to patrol the site and adjacent important resources.	PVWMA	During project construction, if damage is detected

EXHIBIT E

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Traffic and Circulation			
Measure 4.B.6-1 (Recommended): Implement **Measures 4.A.6-1a** and 4.A.6-1b. **Measure 4.A.6-1a (Recommended):** Schedule truck trips outside of peak commute hours. **Measure 4.A.6-1b (Recommended):** Use haul routes that minimize truck traffic on local roadways to the extent possible.	1) Prepare contract specifications for the construction contractor that require construction truck trips be scheduled during off-peak hours and that haul routes be selected to minimize truck traffic on local roadways.	PVWMA	Prior to requesting construction bids
Measure 4.B.6-2a: Limit construction hours to off-peak traffic periods on commute streets.	1) Prepare contract specifications for the construction contractor that limit construction hours to off-peak traffic periods.	PVWMA	Prior to requesting construction bids
Measure 4.B.6-2b: The contractor shall be required to prepare traffic control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plan shall be reviewed for appropriateness, and approved by Caltrans and the governing Public Works Departments.	1) Prepare contract specifications for the construction contractor that require preparation of a traffic control plan.	PVWMA	Prior to requesting construction bids
	2) Review the proposed traffic control plan to ensure that measures to maintain traffic flows are included. Notify the construction contractor if any modifications are required.	PVWMA, Caltrans, Santa Cruz County Public Works Department	Prior to project construction
Measure 4.B.6-3a: To minimize disruption of emergency vehicle access and maintain access to driveways to adjacent land uses, PVWMA would require the contractors to maintain steel trench plates at the construction sites to restore access across open trenches. Construction trenches shall not be left open after work hours.	1) Monitor construction activities to ensure that steel trench plates are placed on construction trenches along driveways. If non-compliance is noted, notify construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction
Measure 4.B.6-3b: To minimize disruption of emergency vehicle access, affected jurisdictions will be asked to identify detours to be posted by contractor.	1) Place a large sign along roadways in the project vicinity at least one week in advance of construction.	PVWMA	Prior to project construction

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.6-3c: The contractor will notify the appropriate police, fire, and emergency services of the timing, location, and duration of construction activities and the locations of detours and lane closures prior to beginning construction in the immediate vicinity of affected roadways.	1) Send notices to police, fire, and emergency service providers at least one week in advance of construction.	PVWMA	Prior to project construction
Measure 4.B.6-4: Implement **Measure 4.A.6-2.**			
Measure 4.A.6-2: Conduct a preconstruction survey of road conditions on key access routes to the project sites (e.g., San Andreas Road). The pavement conditions of local streets judged to be in good condition for use by heavy truck traffic shall be monitored. Roads damaged by construction shall be repaired to a structural condition equal to, or better than, that which existed prior to construction activity.	1) Prepare contract specifications for the construction contractor that require that a preconstruction survey of key routes to the project site be conducted, and that roads damaged by construction be repaired. 2) Inspect access roads to the project site to ensure that roads are repaired following project construction, if necessary. If roads are not repaired, notify the construction contractor of required actions and the deadline for compliance.	WMA ee above	Prior to project construction Following project construction See above
Measure 4.B.6-5: Implement **Measures 4.A.6-3a** and **4.A.6-3b.**	1) Implement the Monitoring and Reporting Action for **Measure 4.B.6-2b**, above.		
Measure 4.A.6-3a: The construction contractor shall prepare traffic safety and control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plans prepared by the contractor shall include recommended detours for bicyclists. The traffic control plan shall be reviewed for appropriateness, and approved by the governing Public Works Department.		See above	See above
Measure 4.A.6-3b: The contractor shall provide advanced public notification of construction activity and roadway/access closures.	1) Implement the Monitoring and Reporting Action f **Measure 4.B.1-1**, above.		

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TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Air Quality			
Measure 4.B.7-1a: Implement dust control program described in **Measure 4.A.7-1** to minimize potential public health impacts associated with exposure to contaminated soil dust.	1) Prepare contract specifications for the construction contractor that require implementation of a dust control program.	PVWMA	Prior to requesting construction bids
Measure 4.A.7-1: The construction contractor shall implement a dust control program that includes the following elements: ▪ Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. ▪ Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. Sweep daily (with water sweepers) all paved access roads, paved parking areas and paved staging areas at construction sites. ▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. Hydroseed or apply (non-toxic) soil binders to inactive construction areas. However, do not apply these measures in operating agricultural fields under cultivation unless requested by the grower. ▪ Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.). ▪ Limit traffic on unpaved roads to 15 mph. ▪ Install sandbags or other erosion control measures to prevent silt runoff to public roadways. ▪ Replant vegetation in disturbed areas as quickly as possible.	2) Monitor construction activities to verify that the measures of the dust control program are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.7-1b: Response Plan. Prepare a project-specific Response Plan that includes a project-specific contingency plan for hazardous materials and waste operations and submit the plan to the agency with jurisdiction before site activities could proceed. The Response Plan, applicable to all excavation activities, shall establish policies and procedures to protect workers and the public from potential hazards posed by hazardous wastes. The plan shall be prepared according to federal and California OSHA regulations. The plan shall also provide for proper storage and/or disposal of any contaminated soils that meet the definition of a hazardous waste. Such a protocol could include off-site treatment of contaminated materials or disposal at an appropriate landfill.	1) Prepare contract specifications for the construction contractor that require implementation of a Response Plan for hazardous materials and waste operations. 2) Monitor project construction activities to verify Response Plan implementation. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to construction project During pr construct Pri to nstructio
Measure 4.B.7-1c: Reduction of Excavation Impacts. The contractor shall monitor for odors and analyze excavated material with a photoionization detector to determine the potential for soil contamination and the need for specialized soil-handling procedures to reduce excavation impacts in areas of suspected contamination.	1) Prepare contract specifications for the construction contractor that require use of a photoionization detector to determine the potential for soil contamination. 2) Monitor project construction activities to determine the potential for soil contamination. If soil contamination is detected, notify PVWMA immediately and remove contaminated soils using appropriate procedures.	Construction contractor Construction contractor	Prior to ing project nstruction Durin const uring project onstruction
Measure 4.B.7-1d: Disposal Characterization. Within high-risk areas identified in Table 4.B.7-1, excavations shall be observed by a trained health and safety professional equipped with an organic vapor analyzer to screen excavated materials and ensure worker safety. If contamination is encountered, excavated soils shall be segregated and sampled relative to the profiling requirements of the accepting landfill.	1) Monitor construction activities in high-risk areas to ensure worker safety and screen excavated materials. 2) If contamination is encountered, conduct soil sampling and submit soil testing results to PVWMA and the accepting landfill.	PVWMA's consulting health and safety professional PVWMA's consulting health and safety professional	Dur During project con construction, if necessary Du co ne

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TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.7-1e: Groundwater and Soil Testing. Conduct groundwater and soil testing for hazardous materials at identified potentially contaminated sites prior to pipeline construction. Treatment would be applied, in consultation with the Regional Water Quality Control Board, Department of Toxic Substances Control, and/or other regulatory agencies, to ensure that all discharges meet applicable regulations.	1) Conduct soil and groundwater testing and submit results to PVWMA and appropriate regulatory agencies. If hazardous materials are encountered, implement treatment measures in consultation with the regulatory agencies.	PVWMA's consulting hazardous materials specialist and PVWMA	
Measure 4.B.7-1f: Hazardous Materials Management/Spill Prevention Plan. A Hazardous Materials Management/Spill Prevention Plan shall be developed and given to all contractors working on the project. At least one copy shall be on-site with the construction manager at all times. The purpose of the plan is to provide on-site construction managers, environmental compliance monitors, and regulatory agencies with a detailed description of hazardous materials management, spill prevention, and spill response/cleanup measures associated with the construction of project elements. The primary objective of the plan is to prevent the spill of hazardous materials. Elements of the plan shall include, but not be limited to, the following: ▪ A discussion of hazardous materials management, including delineation of hazardous material and hazardous waste storage areas, access and egress routes, waterways, emergency assemble areas, temporary hazardous waste storage areas; ▪ Spill control and countermeasures, including employee spill prevention/response training; and ▪ [illegible] and documentation procedures.	1) Prepare contract specifications for the construction contractor that require implementation of a Hazardous Materials Management/Spill Prevention Plan. 2) Monitor project construction activities to verify implementation of the Hazardous Materials Management/Spill Prevention Plan. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to construction During project construction

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Noise			
Measure 4.B.8-1: Implement **Measure 4.A.8-1.** **Measure 4.A.8-1:** PVWMA shall incorporate into contract specifications the following measures: ▪ Comply with all local sound control and noise level rules, regulations, and ordinances. ▪ Equipment and trucks used for project construction shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts. Impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically- or electrically-powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves would be used where feasible, and this could achieve a reduction of 5 dbA. Quieter procedures shall be used (such as drilling rather than impact equipment) whenever feasible. ▪ Stationary noise sources shall be located as far from sensitive receptors as possible. If they must be located near existing receptors, they shall be adequately muffled. ▪ Temporary walls may be erected at some locations to reduce noise impacts to residences adjacent to construction sites.	1) Prepare contract specifications for the construction contractor that require implementation of noise mitigation measures listed in **Measure 4.A.8-1.** 2) Monitor construction activities to verify that the measures of the noise control measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to requesting construction bids Periodically during project construction

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Public Services			
Measure 4.B.9-1a: A detailed study identifying utilities along the proposed alignment will be prepared during the pre-design stages of the project.	1) Conduct a detailed study of utilities along the project alignment and submit a report documenting the results of the study to PVWMA.	PVWMA's consulting engineer	Prior to final engineering design
Measure 4.B.9-1b: The following measures are required for segments identified in final design as having potential conflict with significant utilities: ▪ Utility excavation and encroachment permits would be required from the appropriate agencies, including the Public Works Departments of San Benito, Santa Clara, Santa Cruz and Monterey Counties, Pacific Bell, U.S. Sprint, PG&E, City of Watsonville, and UPRR. These permits include measures to minimize utility disruption. PVWMA and its contractors would comply with permit conditions. Permit requirements would be included in construction contract specifications.	1) Prepare contract specifications for the construction contractor that include measures listed in **Measure 4.B.9-1b**.	PVWMA	Prior to final engineering design
▪ Utility locations would be verified through field survey (potholing) and use of an underground locating service.	2) Monitor construction activities to verify that the measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction
▪ A detailed engineering and construction plan would be prepared as part of the design plans and specifications. This plan should include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services would be notified of PVWMA's construction plans and schedule. Arrangements would be made with these entities regarding protection, relocation, or temporary disconnection of services. In areas where the pipeline would parallel wastewater mains, engineering and construction plans will include trench wall support measures to guard against trench wall failure and possible resulting loss of structural support for the wastewater main. Residents and businesses in the project area would be notified by the contractor in writing of planned utility service disruption two to four days in advance in conformance with County and State standards.			

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.9-2: Implement **Measures 4.B.6-3a** through **4.B.6-3c** in Section 4.B.6, Traffic and Circulation.	1) Implement the Monitoring and Reporting Actions for **Measures 4.B.6-3a** through **4.B.6-3c**, above.		
Measure 4.B.9-3 (Recommended): Implement **Measures 4.B.6-2a** and **4.B.6-2b** in Section 4.B.6, Traffic and Circulation.	1) Implement the Monitoring and Reporting Actions for **Measures 4.B.6-2a** and **4.B.6-2b**, above.		
Visual/Aesthetic and Recreational Resources			
Measure 4.A.10-1a: The PVWMA shall revegetate disturbed natural areas to minimize textural contrasts with the surrounding vegetation using grasses, shrubs and trees typical of the immediately surrounding area.	1) Prepare contract specifications for the construction contractor that require revegetation of disturbed areas.	PVWMA	Prior to requesting construction bids
	2) Inspect construction areas to verify that disturbed natural areas are revegetated following construction. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA or PVWMA's consulting biologist	Following project construction
Measure 4.A.10-1b: The PVWMA shall use design elements to enhance visual integration of the proposed above-ground facilities with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain.	1) Review project plans to ensure that they include design elements such as low-glare earth-tone paint to visually integrated the proposed facilities with their surroundings.	PVWMA	Prior to final engineering design
Measure 4.A.10-1c: The PVWMA shall ensure that its contractors restore disturbed areas along the pipeline alignment to their pre-project condition such that short-term construction disturbance does not result in long-term visual impacts.	1) Prepare contract specifications for the construction contractor that require revegetation of disturbed areas along the pipeline alignment.	PVWMA	Prior to requesting construction bids
	2) Inspect construction areas to verify that disturbed natural areas are revegetated following construction. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Following project construction

EXHIBIT

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

SURE		MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.10-2 (Recommended): Implement **Measure 4.A.10-2.** **Measure 4.A.10-2 (Recommended):** The PVWMA shall ensure that all exterior lighting if used is directed downward and oriented to insure that no light source is directly visible from neighboring residential areas. If necessary, landscaping shall be provided around proposed facilities. This vegetation shall be selected, placed, and maintained to minimize off-site light and glare onto surrounding areas. In addition, highly reflective building materials and/or finishes shall not be used in the designs for proposed structures.	1) Prepare contract specifications for the construction contractor that include exterior lighting mitigation listed in **Measure 4.A.10-2.**	PVWMA	Prior to requesting construction bids
	2) Monitor construction activities to verify that the measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	During and following construction
Measure 4.C-1: CEQA Compliance. Delivery of CVP water for use in areas beyond the 30,200 acres of agricultural lands shown in **Figure 4.C-2** shall be permitted only in accordance with the terms for delivery to Contractor's Service Area pursuant to any contract for the delivery of CVP water between Reclamation and PVWMA, and in accordance with any and all laws, including CEQA and NEPA. The appropriate local land use agency will be the lead agency for preparation of an environmental document for any proposed land use changes; PVWMA will be the lead agency for any actions specific to water system improvements or other PVWMA actions needed to provide CVP water to areas beyond those shown in **Figure 4.C-2.**	1) Complete CEQA documentation for any water system improvements to serve areas beyond the 30,200 acres.	PVWMA	Prior to delivering CVP water beyond the 30,200 acres
Measure 4.C-2: Endangered Species Act Compliance. PVWMA will not deliver water for the purpose of converting any native lands to agriculture uses unless and until the project sponsor has complied with the Endangered Species Act and has determined that such conversion will not likely affect listed species or that appropriate mitigation has been provided. PVWMA intends to provide CVP water to existing irrigated agricultural lands. PVWMA currently is not proposing to provide any CVP water for M&I purposes, nor is it proposing to provide CVP water outside of the approximately 30,200 acres of agricultural lands shown in **Figure 4.C-2.** If PVWMA is the lead agency for development of water system improvements and construction or operation of those improvements or any other PVWMA actions that could adversely affect threatened or endangered species, PVWMA will consult with the appropriate resource agency (California	1) Obtain proof of compliance with the Endangered Species Act prior to providing water to areas beyond the 30,200 acres.	PVWMA	Prior to delivering CVP water beyond the 30,200 acres
	2) Comply with the Endangered Species Act for any water system improvements needed to serve areas beyond the 30,200 acres.	PVWMA	Prior to delivering CVP water beyond the 30,200 acres

TABLE D.1 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE IMPORT WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Department of Fish and Game, US Fish and Wildlife Service, and/or National Marine Fisheries Service) pursuant to all applicable laws, including CEQA and NEPA. PVWMA will implement project-specific mitigation measures and permit conditions as appropriate.			

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TABLE D.2
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Land Use and Planning			
Measure 4.A.1-1 (Recommended): Advance notification of construction activities should be provided to all property owners, residents, and businesses in the vicinity of construction areas. See also mitigation measures in Sections 4.A.6, Traffic and Circulation, 4.A.7, Air Quality, and 4.A.8, Noise, of this EIR.	1) Send notices to all property owners residents, and businesses in the project area vicinity at least one week in advance of construction. Publish notices in local newspapers at least one week in advance of construction. Place large signs along roads in the project vicinity at least one week in advance of construction. Submit copies of public notices to the project file to document compliance.	PVWMA	Prior to project construction
Measure 4.A.1-2: In order to compensate for the loss of prime agricultural land, PVWMA will cause up to 8.5 acres of prime agricultural land that is no longer farmed to be restored or otherwise brought back into production. This can be accomplished through contribution to a fund dedicated to the restoration of agricultural land.	1) Identify 8.5 acres of prime agricultural land that is no longer farmed and return it to production, or alternatively, contribute to a fund dedicated to the restoration of agricultural land. Submit documentation of agricultural land restoration or appropriate contribution to the project file and the Santa Cruz County Planning Department.	PVW	
Geology and Soils			
Measure 4.A.2-1a: Implement **Measures 5.A.2-3a** through **5.A.2-3f**.	1) Review construction specifications to ensure that design recommendations for RWF construction and pipeline installation listed in **Measures 5.A.2-3a** through **5.A.2-3f** are included.	PVWMA PVWMA	Prior to project construction
Measure 5.A.2-3a: All grading and construction will conform to requirements of the Monterey and Santa Cruz Counties Grading Ordinances. **Measure 5.A.2-3b:** Site grading and construction work areas will expose as little new ground surface as possible. Vegetation cover should be left intact to the extent practical.	2) Monitor project construction activities to verify compliance with the construction specifications. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist	During and immediately following project construction

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TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 5.A.2-3c: To the extent possible, grading activities in noncropped areas will be limited to the period between April 15 and October 15. If dry conditions persist after October 15, one-week extensions of grading activities will be obtained from the County Public Works Department. In areas where the soil is tilled, grading activities will be coordinated with the local farmers to ensure consistency between their erosion control and farming practices and construction disturbance.			
Measure 5.A.2-3d: Implement best construction practices at all grading sites, regardless of soil erodibility hazard.			
Measure 5.A.2-3e: Upon completion of construction at all sites, loose soils shall be removed or spread and all areas shall be re-soiled and reseeded to ensure that a stable soil cover will remain.			
Measure 5.A.2-3f: PVWMA will prepare and implement an inspection and maintenance program for the right-of-way and all facility sites. The plan will include routine inspection plans and reporting, and prescriptive methods for correcting erosion or soil instability problems.			

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TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.A.2-1b: Implement **Measure 5.A.2-2.**			
Measure 5.A.2-2: All diversion and pipeline facilities will comply with applicable policies and appropriate engineering investigation practices necessary to reduce the potential detrimental effects of expansive soils, and corrosivity. Appropriate geotechnical studies will be conducted using generally accepted and appropriate engineering techniques for determining the susceptibility of the sites to unstable, weak or corrosive soils. A licensed geotechnical engineer will prepare recommendations applicable to foundation design, earthwork, and site preparation prior to or during the project design phase. Recommendations will address mitigation of site-specific, adverse soil and bedrock conditions that could hinder development. Project engineers will implement the recommendations. Geotechnical design and design criteria will comply with applicable codes and requirements of the 1994 or 1997 UBC with California additions (CCR Title 24), applicable City construction and grading ordinances.	1) Include geotechnical report with recommendations as an appendix to construction specifications.	PVWMA	Prior to requesting construction bids
	2) Review construction specifications to ensure that design recommendations were included.	PVWMA	Prior to project construction
	3) Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist	During and immediately following project construction
Measure 4.A.2-2: Conduct geologic investigations of all project facilities and pipeline alignments prior to the final design, and implement design recommendations. The investigations will specify hazards related to ground movements and co-seismic effects, especially liquefaction. The recommendations of an engineering geologist will be incorporated into the design and specifications and shall be implemented by the construction contractor. The construction manager will conduct inspections and certify that all design criteria have been met. While these measures would not eliminate the potential for damage to the facilities, they would ensure that the hazards have been reduced to an acceptable level of risk and, therefore, the impact would be reduced to a less-than-significant level.	1) Review construction specifications to ensure that the engineering geologist's design recommendations for RWF construction and pipeline installation are included.	PVWMA	Prior to project construction
	2) Monitor project construction activities to verify compliance with the recommendations of the engineering geologist. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist	During and immediately following project construction

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[redacted]

TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Hydrology and Water Quality			
Measure 4.A.3-1a: The PVWMA shall require contractors to develop a SWPPP for construction of proposed facilities, as required by the RWQCB. The objectives of the SWPPP are to identify pollutant sources that may affect the quality of stormwater discharge and to implement BMPs to reduce pollutants in stormwater discharges. The SWPPP for this proposed action would include the implementation, at a minimum, of the following elements: ▪ Source identification; ▪ Preparation of a site map; ▪ Description of construction materials, practices, and equipment storage and maintenance; ▪ List of pollutants likely to contact stormwater; ▪ Estimate of the construction site area and percent impervious area; ▪ Erosion and sedimentation control practices, including soils stabilization, revegetation, and runoff control to limit increases in sediment in stormwater runoff, such as detention basins, straw bales, silt fences, check dams, geofabrics, drainage swales, and sandbag dikes; ▪ Proposed construction dewatering plans and ▪ List of provisions to eliminate or reduce discharge of materials to stormwater; ▪ Description of waste management practices; and ▪ Maintenance and training practices.	1) Prepare contract specifications for the construction contractor that require preparation and implementation of a Storm Water Pollution Prevention Plan. 2) Monitor project construction activities to verify Temporary Erosion and Sediment Control Plan implementation. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to construction Periodically during project construction
Measure 4.A.3-1b: Refer to **Measure 4.A.4-1a** in Section 4.A.4, Vegetation and Wildlife, regarding pipeline construction within potentially jurisdictional wetlands/waters of the U.S. and streambeds and at the Pajaro River.	1) Implement Monitoring and Reporting Actions for **Measure 4.A.4-1a**, below.		

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[redacted]

TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE		MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING REPORTING SCHEDULE
Measure 4.A.3-2a: Above-ground irrigation systems shall be operated in accordance with the requirements of Title 22 of the California Code of Regulations and any reclamation permits issued by the RWQCB, Central Coast Region. Title 22 requires that irrigation rates match the evapotranspiration rates of the plants or crops being irrigated, and that application of reclaimed water be prohibited within 50 feet of any domestic water supply or wells.	1)	Prepare and submit an application for an NPDES permit to the RWQCB.	PVWMA	Prior to project construction
	2)	Monitor operation of irrigation systems to verify compliance with applicable regulations and permits. If non-compliance is noted, notify the operator of required actions and the deadline for compliance.	PVWMA	Periodically following project implementation
Measure 4.A.3-2b: Monitoring of crop productivity should be performed, and if adverse impacts to the yields of sensitive crops (e.g., strawberries) occurs, the blending ratio should be adjusted to decrease the fraction of recycled water in the applied irrigation water.	1)	Monitor crop productivity and submit documentation of crop yields to the project file. Adjust blending ratios if necessary.	PVWMA	Periodically following project implementation
Measure 4.A.3-3: The facilities shall be designed to comply with FEMA and County of Santa Cruz requirements to floodproof the facilities and not increase upstream or downstream flood hazards.	1)	Review project plans to ensure they comply with FEMA and County of Santa Cruz requirements concerning floodproofing. If non-compliance is noted, revise plans as necessary.	PVWMA or PVWMA's consulting engineer	Prior to final engineering design
	2)	Monitor project construction activities to verify compliance with FEMA and County of Santa Cruz requirements. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction
Measure 4.A.3-4a: Implement measures to ensure that construction activities do not damage existing wells. Wells shall be capped in an appropriate manner to prevent soil and other contaminants from entering groundwater aquifers.	1)	Review construction plans and maps to ensure that the wells are identified.	PVWMA	Prior to project construction
	2)	Monitor construction activities to verify that wells in and near the project area are avoided. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction

EXHIBIT E

TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.A.3-4b: PVWMA or its contractor shall correct any damage to wells and/or reimburse well owners for any loss of use of the well during construction.	1) Inspect wells in the construction area prior to, and immediately following, project construction. Document any damage to wells resulting from construction activities. Repair any damage to the wells.	PVWMA	Prior to and immediately following construction
	2) If access to existing wells in the construction area will be affected, notify well operators in writing of the loss of use of the well and the dates during which access to the well(s) will not be available. Reimburse well operators for loss of well use based on historical water use.	Construction contractor and PVWMA	Prior to and immediately following construction
Vegetation and Wildlife			
See Table 4.			
Cultural Resources			
Measure 4.A.5-1: Should any as yet undiscovered cultural resources, such as structural features, or unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work will be suspended and PVWMA staff will be contacted. A qualified cultural resource specialist shall be retained and will perform any necessary investigations to determine the significance of the find. PVWMA will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources. In addition, pursuant to Sections 5097.97 and 5097.98 of the State Public Resources Code and Section 7050.5 of the State Health and Safety Code, in the event of the discovery of human remains, all work must be halted and the County Coroner shall be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.	1) Prepare a resource recovery plan for the site including findings and recommendations and submit it to PVWMA, the U.S. Army Corps of Engineers, the State Historic Preservation Officer, the Advisory Council on Historic Preservation and the project file.	PVWMA's consulting archaeologist	During project construction, if potential resources are encountered
	2) Submit a document verifying that evaluation of the materials and their recovery occurred. Prepare a report of findings and submit it to PVWMA, the State Historic Preservation Officer, the Advisory Council on Historic preservation and the project file.	PVWMA's consulting archaeologist	During project construction, if potential resources are encountered

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TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.A.5-2: As part of the siting study for wells, PVWMA will retain an archaeologist to conduct archival research and surface reconnaissance of potential sites. The findings of the investigations will be incorporated into the selection of specific locations for wells and connecting pipelines such that PVWMA will avoid siting wells and attendant connecting pipelines at or through any significant cultural resources.	1) Determine the areal extent of important cultural resources sites within the project area. Review project plans to verify that project facilities would not be located within these sites.	PVWMA's consulting archaeologist	Prior to final engineering design
Traffic and Circulation			
Measure 4.A.6-1a (Recommended): Schedule truck trips outside of peak commute hours. **Measure 4.A.6-1b (Recommended):** Use haul routes that minimize truck traffic on local roadways to the extent possible.	1) Prepare contract specifications for the construction contractor that require construction truck trips be scheduled during off-peak hours and that haul routes be selected to minimize truck traffic on local roadways.	PVWMA	Prior to requesting construction bids
Measure 4.A.6-2: Conduct a preconstruction survey of road conditions on key access routes to the project sites (e.g., San Andreas Road). The pavement conditions of local streets judged to be in good condition for use by heavy truck traffic shall be monitored. Roads damaged by construction shall be repaired to a structural condition equal to, or better than, that which existed prior to construction activity.	1) Prepare contract specifications for the construction contractor that require that a preconstruction survey of key routes to the project site be conducted, and that roads damaged by construction be repaired.	PVWMA	Prior to project construction
	2) Inspect access roads to the project site to ensure that roads are repaired following project construction, if necessary. If roads are not repaired, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Following project construction
Measure 4.A.6-3a: The construction contractor shall prepare traffic safety and control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plans prepared by the contractor shall include recommended detours for bicyclists. The traffic control plan shall be reviewed for appropriateness, and approved by the governing Public Works Department.	1) Prepare contract specifications for the construction contractor that require preparation of a traffic control plan.	PVWMA	Prior to requesting construction bids
	2) Review the proposed traffic control plan to ensure that measures to maintain traffic flows are included. Notify the construction contractor if any modifications are required.	PVWMA, Caltrans, Santa Cruz County Public Works Department	Prior to project construction

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TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.A.6-3b: The contractor shall provide advanced public notification of construction activity and roadway/access closures.	1) Implement the Monitoring and Reporting Action for **Measure 4.A.1-1**, above.		
Air Quality			
Measure 4.A.7-1: The construction contractor shall implement a dust control program that includes the following elements: ▪ Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. ▪ Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. ▪ Sweep daily (with water sweepers) all paved access roads, paved parking areas and paved staging areas at construction sites. ▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. ▪ Hydroseed or apply (non-toxic) soil binders to inactive construction areas. However, do not apply these measures in operating agricultural fields under cultivation unless requested by the grower. ▪ Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.). ▪ Limit traffic on unpaved roads to 15 mph. ▪ Install sandbags or other erosion control measures to prevent silt runoff to public roadways. ▪ Replant vegetation in disturbed areas as quickly as possible.	1) Prepare contract specifications for the construction contractor that require implementation of a dust control program. 2) Monitor construction activities to verify that the measures of the dust control program are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to requesting construction bids Periodically during project construction

EXHIBIT E

TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Noise			
Measure 4.A.8-1: PVWMA shall incorporate into contract specifications the following measures: ▪ Comply with all local sound control and noise level rules, regulations, and ordinances. ▪ Equipment and trucks used for project construction shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts. ▪ Impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically- or electrically-powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves would be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures shall be used (such as drilling rather than impact equipment) whenever feasible. ▪ Stationary noise sources shall be located as far from sensitive receptors as possible. If they must be located near existing receptors, they shall be adequately muffled. ▪ Temporary walls may be erected at some locations to reduce noise impacts to residences adjacent to construction sites.	1) Prepare contract specifications for the construction contractor that require implementation of noise mitigation measures listed in **Measure 4.A.8-1.** 2) Monitor construction activities to verify that the measures of the noise control measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to requesting construction bids Periodically during project construction

TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.A.8-2: PVWMA shall incorporate into contract specifications the following measures: ▪ The pumping facilities shall be designed with acoustical treatments (building enclosures, louvered vents, noise walls, etc.) that are adequate to maintain potential noise generation to levels at or below ambient levels. ▪ The blending facilities shall be built with enclosures that provide maximum feasible noise attenuation, to ensure that sensitive receptors would not be affected.	1) Prepare contract specifications for the construction contractor that include measures listed in **Measure 4.A.8-2.**	PVWMA	Prior to final engineering design
	2) Monitor construction activities to verify that the measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction
Public Services			
Measure 4.A.9-1: A detailed study identifying utilities along the proposed alignment will be prepared during the pre-design stages of the project. The following measures are required for segments identified in final design as having potential conflict with significant utilities: ▪ Utility excavation and encroachment permits would be required from the appropriate agencies, including the Public Works Departments of San Benito, Santa Clara, Santa Cruz and Monterey Counties, Pacific Bell, U.S. Sprint, PG&E, City of Watsonville, and UPRR. These permits include measures to minimize utility disruption. PVWMA and its contractors would comply with permit conditions. Permit requirements would be included in construction contract specifications. ▪ Utility locations would be verified through field survey (potholing) and use of an underground locating service.	1) Conduct a detailed study of utilities along the project alignment and submit a report documenting the results of the study to PVWMA.	PVWMA's consulting engineer	Prior to final engineering design
	2) Prepare contract specifications for the construction contractor that include measures listed in **Measure 4.A.9-1.**	PVWMA	Prior to final engineering design
	3) Monitor construction activities to verify that the measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction

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TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.A.9-1: (cont.) ▪ A detailed engineering and construction plan would be prepared as part of the design plans and specifications. This plan should include procedures for the excavation, support, and fill of areas around utility cables and pipes. All affected utility services would be notified of PVWMA's construction plans and schedule. Arrangements would be made with these entities regarding protection, relocation, or temporary disconnection of services. ▪ In areas where the pipeline would parallel wastewater mains, engineering and construction plans will include trench wall support measures to guard against trench wall failure and possible resulting loss of structural support for the wastewater main. ▪ Residents and businesses in the project area would be notified by the contractor in writing of planned utility service disruption two to four days in advance in conformance with County and State standards.			
Visual/Aesthetic and Recreational Resources			
Measure 4.A.10-1a: The PVWMA shall revegetate disturbed natural areas to minimize textural contrasts with the surrounding vegetation using grasses, shrubs and trees typical of the immediately surrounding area.	1) Prepare contract specifications for the construction contractor that require revegetation of disturbed areas.	PVWMA	Prior to requesting construction bids
	2) Inspect construction areas to verify that disturbed natural areas are revegetated following construction. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA or PVWMA's consulting biologist	Following project construction

EXHIBIT E

TABLE D.2 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE RECYCLED WATER PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	REPORTING RESPONSIBILITY	REPORTING SCHEDULE
Measure 4.A.10-1b: The PVWMA shall use design elements to enhance visual integration of the proposed above-ground facilities with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain.	1) Review project plans to ensure that they include design elements such as low-glare earth-tone paint to visually integrated the proposed facilities with their surroundings.	PVWMA	Prior to final engineering design
Measure 4.A.10-1c: The PVWMA shall ensure that its contractors restore disturbed areas along the pipeline alignment to their pre-project condition such that short-term construction disturbance does not result in long-term visual impacts.	1) Prepare contract specifications for the construction contractor that require revegetation of disturbed areas along the pipeline alignment.	PVWMA	Prior to requesting construction bids
	2) Inspect construction areas to verify that disturbed natural areas are revegetated following construction. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Following project construction
Mitigation Measure 4.A.10-2 (Recommended): The PVWMA shall ensure that all exterior lighting if used is directed downward and oriented to insure that no light source is directly visible from neighboring residential areas. If necessary, landscaping shall be provided around proposed facilities. This vegetation shall be selected, placed, and maintained to minimize off-site light and glare onto surrounding areas. In addition, highly reflective building materials and/or finishes shall not be used in the designs for proposed structures.	1) Prepare contract specifications for the construction contractor that include exterior lighting mitigation listed in **Measure 4.A.10-2**.	PVWMA	Prior to requesting construction bids
	2) Monitor construction activities to verify that the measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	During and following construction

EXHIBIT E

PVWMA

TABLE D.3
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Land Use and Planning			
Measure 8.1.3-1 (Recommended): The PVWMA will provide advance notification of construction activities to all property owners, residents, and businesses in the vicinity of construction areas.	**8.1.3-1:** Send notices to all property owners residents, and businesses in the project area vicinity at least one week in advance of construction. Publish notices in local newspapers at least one week in advance of construction. Place large signs along San Andreas Road, Beach Road, Trafton Road, and Highway 1 at least one week in advance of construction. Submit copies of public notices to the project file to document compliance.	PVWMA	Prior to project construction.
Geology and Soils			
Measure 8.2.3-1a: All grading and construction shall conform to requirements of the Santa Cruz County Grading Ordinance.	**8.2.3-1a:** Review project plans to verify that grading and construction activities comply with the Santa Cruz County Grading Ordinance and that they expose as little new ground surface as possible. Document compliance or non-compliance and remedial action(s) required and submit this documentation to the Santa Cruz County Public Works Department, the Monterey County Public Works Department, and the project file.	PVWMA	Prior to project construction.
Measure 8.2.3-1b: Site grading and construction work areas shall expose as little new ground surface as possible. Vegetation cover should be left intact to the extent practical.	**8.2.3-1b:** Conduct inspections of the construction site to verify compliance with Mitigation Measures 8.2.3-1b, 8.2.3-1c, 8.2.3-1d, and 8.2.3-1e. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA or PVWMA's consulting engineer	During and immediately following project construction.
Measure 8.2.3-1c: To the extent possible, grading activities in non-cropped areas shall be limited to the period between April 15 and October 31. If dry conditions persist after October 31, one week extensions of grading activities will be obtained from the County Public Works Department. In areas where the soil is tilled, grading activities will be coordinated with the local farmers to ensure consistency between their erosion control and farming practices and construction disturbance.			

EXHIBIT E

TABLE D.3 (Continued)
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 8.2.3-1d: Implement best construction practices at all grading sites, regardless of soil erodibility hazard.			
Measure 8.2.3-1e: Upon completion of construction at all sites, loose soils shall be removed or spread and all areas shall be re-soiled and reseeded to ensure that a stable soil cover will remain.			
Measure 8.2.3-1f: PVWMA will prepare and implement an inspection and maintenance program for the right-of-way and all facility sites. The plan will include routine inspection plans and reporting, and prescriptive methods for correcting erosion or soil instability problems.	**8.2.3-1c:** Prepare a report that presents the inspection and maintenance program that includes routine inspection plans and reporting, and recommendations for correcting erosion or soil instability problems. Submit this report to the project file.	PVWMA	Prior to project construction.
Measure 8.2.3-4: Conduct geologic investigations of the proposed pipeline alignment and pumping facilities prior to the final design, and implement design recommendations. The investigations will specify hazards related to corrosion, weak soils and settlement, including differential settlement. The recommendations of an engineering geologist shall be incorporated into the design and specifications and shall be implemented by the construction contractor. The construction manager shall conduct inspections and certify that all design criteria have been met. While these measures would not ensure that some damage to the facilities would not occur, it would ensure that design standards have been met and the hazards have been reduced to an acceptable level of risk. Therefore, the impact would be reduced to a less than significant level.	**8.2.3-4a:** Prepare a report that presents the results of the geotechnical investigation and includes design recommendations for the project. Submit this report to the project file.	PVWMA's consulting engineering geologist	Prior to completion of final engineering design.
	8.2.3-4b: Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist	Periodically during project construction.

TABLE D.3 (Continued)
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 8.2.3-5: Conduct geologic investigations of the proposed pipeline alignment and pumping, diversion and filtration facilities prior to the final design and implement design recommendations. The investigations will specify hazards related to ground movements and co-seismic effects, especially liquefaction. The recommendations of an engineering geologist shall be incorporated into the design and specifications and shall be implemented by the construction contractor. The construction manager shall conduct inspections and certify that all design criteria have been met. While these measures would not ensure that damage to the facilities would not occur, it would ensure that the hazards have been reduced to an acceptable level of risk and, therefore, the impact would be reduced to a less than significant level.	**8.2.3-5a:** Prepare a report that presents the results of the geotechnical investigation and includes design recommendations for the project. Submit this report to the project file.	PVWMA's consulting engineering geologist	Prior to completion of final engineering design.
	8.2.3-5b: Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist	Periodically during project construction.
Hydrology and Water Quality			
Measure 8.3.3-1: Employ construction storm water quality management practices.	**8.3.3-1:** Monitor project construction activities to ensure that storm water quality management practices are implemented. If non-compliance is noted, notify the contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction.
Measure 8.3.3-2: Obtain NPDES permit for construction dewatering and implement conditions of the permit. An NPDES permit will be required from the RWQCB for all discharges for construction dewatering. Discharges must meet water quality objectives specified in the Basin Management Plan as described in Section 3.3. The RWQCB may require certain conditions of the permit, such as treatment of the flows prior to discharge.	**8.3.3-2a:** Prepare and submit an application for an NPDES permit to the RWQCB.	PVWMA	Prior to project construction.
	8.3.3-2b: Monitor construction activities to verify compliance with BMP water quality objectives and any conditions of the NPDES permit. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction.

EXHIBIT

TABLE D.3 (Continued)
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 8.3.3-4: Avoid construction impacts to the wells. The precise well locations shall be identified in preconstruction surveys. The pipeline construction trench, material stockpile areas and soil excavation stockpiles shall be designated in the construction plans and specifications to specifically avoid impacting the well and access to the wells.	**8.3.3-4a:** Review construction plans and maps to ensure that the wells are identified.	PVWMA	Prior to project construction.
	8.3.3-4b: Monitor construction activities to verify that wells in and near the project area are avoided. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction.
Vegetation and Wildlife			
See Table 4.			
Cultural Resources			
Measure 8.5.3-1a: Final pipeline and facility plans shall locate facilities and pipeline alignments away from these identified important cultural resource sites. A qualified cultural resource specialist shall be retained to assist in identifying the areal extent of important cultural resource sites to be avoided, which may include the preparation of detailed cultural resource evaluation reports and consultation with local, state, and federal agencies as well as the local Native American Commission.	**8.5.3-1a:** Determine the areal extent of important cultural resources sites within the project area. Review project plans to verify that project facilities would not be located within these sites.	PVWMA's consulting archaeologist	Prior to final engineering design.
Measure 8.5.3-1b: If important cultural resource sites cannot be avoided, the Pajaro Water Management Agency will enter into a Programmatic Agreement with the U.S. Army Corps of Engineers, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation to develop an appropriate mitigation plan for the cultural resource. Possible mitigation measures for important cultural resources may include documentation and recordation of the resource, recovery and relocation, or stabilization of the resource.	**8.5.3-1b:** Prepare contract specifications for the construction contractor that require implementation of the cultural resources mitigation plan developed under the Programmatic Agreement.	PVWMA	Prior to requesting construction bids.
	8.5.3-1c: Monitor construction activities to ensure that the cultural resources mitigation plan is implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting archaeologist	Periodically during project construction.

EXHIBIT E

TABLE D.3 (Continued)
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	REPORTING SCHEDULE
Measure 8.5.3-2: Should any as yet undiscovered cultural resources, such as structural features, or unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work will be suspended and PVWMA staff will be contacted. A qualified cultural resource specialist will be retained and will perform any necessary investigations to determine the significance of the find. PVWMA will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources. In addition, pursuant to Sections 5097.107 and 5097.108 of the State Public Resources Code and Section 7050.5 of the State Health and Safety Code, in the event of the discovery of human remains, all work must be halted and the County Coroner shall be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.	**8.5.3-2a:** Submit a resource recovery plan for the site including findings and recommendations and submit it to PVWMA, the U.S. Army Corps of Engineers, the State Historic Preservation Officer, the Advisory Council on Historic Preservation and the project file. **8.5.3-2b:** Submit a document verifying that evaluation of the materials and their recovery occurred. Prepare a report of findings and submit it to PVWMA, the State Historic Preservation Officer, the Advisory Council on Historic Preservation and the project file.	PVWMA's consulting archaeologist PVWMA's consulting archaeologist	During project construction, if potential resources are encountered. During project construction, if potential resources are encountered.
Measure 8.5.3-3a: The resource boundaries shall be marked as exclusion zones both on the ground and on construction maps. **Measure 8.5.3-3b:** Construction supervisory personnel shall be notified of the existence of these resources and required to keep personnel and equipment away from these areas. During construction and operations, personnel and equipment will be restricted to the surveyed corridor.	**8.5.3-3a:** Review construction maps and monitor construction sites to ensure that resource boundaries are marked as exclusion zones. **8.5.3-3b:** Prepare contract specifications for the construction contractor that require all construction personnel and equipment remain within the surveyed corridor.	PVWMA's consulting archaeologist PVWMA	Prior to, and during, project construction. Prior to requesting construction bids.

TABLE D.3 (Continued)
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 8.5.3-3c: Monthly monitoring of cultural resources to be avoided shall be completed to insure that no inadvertent damage to the resources occurs as a result of construction or construction-related activities. If damage is detected, a guard will be posted to patrol the site and adjacent important resources (such as gravestones and churches).	**8.5.3-3c:** Monitor cultural resources to be avoided on a monthly basis during project construction to verify that no damage occurs.	PVWMA's consulting archaeologist	Monthly during project construction.
	8.5.3-3d: If damage to a cultural resource is detected, hire a guard to patrol the site and adjacent important resources.	PVWMA	During project construction, if damage is detected.
Traffic and Circulation			
Measure 8.6.3-1a (Recommended): Schedule truck trips outside of peak commute hours. **Measure 8.6.3-1b (Recommended):** Use haul routes that minimize truck traffic on local roadways to the extent possible.	**8.6.3-1a:** Prepare contract specifications for the construction contractor that require construction truck trips be scheduled during off-peak hours and that haul routes be selected to minimize truck traffic on local roadways.	PVWMA	Prior to requesting construction bids.
Measure 8.6.3-2a: Limit construction hours to off-peak traffic periods on commute streets.	**8.6.3-2a:** Prepare contract specifications for the construction contractor that limit construction hours to off-peak traffic periods.	PVWMA	Prior to requesting construction bids.
Measure 8.6.3-2b: The construction contractor shall prepare traffic safety and control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plan shall be reviewed for appropriateness, and approved by Caltrans and the governing Public Works Departments.	**8.6.3-2b:** Prepare contract specifications for the construction contractor that require preparation of a traffic control plan.	PVWMA	Prior to requesting construction bids.
	8.6.3-2c: Review the proposed traffic control plan to ensure that measures to maintain traffic flows are included. Notify the construction contractor if any modifications are required.	PVWMA, Caltrans, Santa Cruz County Public Works Department	Prior to project construction.
Measure 8.6.3-3a: Construction trenches shall be covered by steel trench plates to allow access to driveways.	**8.6.3-3a:** Monitor construction activities to ensure that steel trench plates are placed on construction trenches along driveways. If non-compliance is noted, notify construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction.

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EXHIBIT 11

TABLE D.3 (Continued)
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 8.6.3-3b: To minimize disruption of emergency vehicle access, contractors will work with affected jurisdictions (Santa Cruz or Monterey County or City of Watsonville) to identify detours during construction.	**8.6.3-3b:** Prepare contract specifications for the construction contractor that require the contractor contact the Santa Cruz County Public Works Department to determine detours.	PVWMA	Prior to project construction.
Measure 8.6.3-3c: Police, fire, and emergency services shall be notified of the timing, location, and duration of construction activities and the locations of detours and lane closures.	**8.6.3-3c:** Send notices to police, fire, and emergency service providers at least one week in advance of construction. Publish notices in local newspapers at least one week in advance of construction. Place a large sign along San Andreas Road at least one week in advance of construction. Submit copies of public notices to the project file to document compliance.	PVWMA	Prior to project construction.
Measure 8.6.3-4: Conduct a preconstruction survey of road conditions on key access routes to the project site. The pavement conditions of local streets and designate roads judged to be in good condition for use by heavy truck traffic will be monitored. Roads damaged by construction shall be repaired to a condition equal to, or better than, that which existed prior to construction activity.	**8.6.3-4a:** Prepare contract specifications for the construction contractor that require that a preconstruction survey of key routes to the project site be conducted, and that roads damaged by construction be repaired.	PVWMA	Prior to project construction.
	8.6.3-4b: Inspect access roads to the project site to ensure that roads are repaired following project construction, if necessary. If roads are not repaired, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Following project construction.
Measure 8.6.3-5a: The traffic control plans prepared by the contractor (see Mitigation Measure 8.6.3-2b) shall include detours for bicyclists.	**8.6.3-5a:** Review the traffic control plans to ensure that detours for bicyclists are included. If they are not included, notify the construction contractor of required revisions to the traffic control plan and the deadline for submitting the revised plan.	PVWMA	Prior to project construction.
Measure 8.6.3-5b: The contractor shall provide advanced public notification of construction activity and roadway/access closures.	**8.6.3-5b:** Implement Monitoring and Reporting Action 8.1.3-1, above.	PVWMA	Prior to project construction.

EXHIBIT E

TABLE D.3 (Continued)
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Air Quality			
Measure 8.7.3-1: The construction contractor shall implement a dust control program.	**8.7.3-1a:** Prepare contract specifications for the construction contractor that require implementation of a dust control program.	PVWMA	Prior to requesting construction bids.
	8.7.3-1b: Monitor construction activities to verify that the measures of the dust control program are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction.
Socioeconomics and Public Utilities			
Measure 8.8.2-1: A detailed study identifying utilities along the proposed alignment will be done during the pre-design stages of the project.	**8.8.2-1:** Conduct a detailed study of utilities along the project alignment and submit a report documenting the results of the study to PVWMA.	PVWMA's consulting engineer	Prior to final engineering design.
Measure 8.8.2-2: Refer to Mitigation Measures 8.6.3-3a, b, c.	**8.8.2-2:** See Monitoring and Reporting Actions 8.6.3-3a, b, c.		
Measure 8.8.2-5: The PVWMA will establish a procedure to compensate growers for the financial losses that they incur as a result of the impacts caused by the excavation and construction activities that occur in the easements for the placement of the local distribution system. The growers will receive compensation based upon the total amount of farmland disrupted, the amount of time of the disruption, the historical type of crop planted on the land and the current year unit market price for the unplanted crop.	**8.8.2-5:** Develop a procedure for compensating growers with financial losses resulting from project construction activities. Prepare a report outlining this procedure and submit it to the project file.	PVWMA	Prior to project construction.
Visual/Aesthetic and Recreational Resources			
Measure 8.9.3-1a: The PVWMA will revegetate disturbed natural areas to minimize textural contrasts with the surrounding vegetation using grasses, shrubs and trees typical of the immediately surrounding area.	**8.9.3-1a:** Prepare contract specifications for the construction contractor that require revegetation of disturbed areas, restoration of the topography, and repair of any damaged roads within the project area.	PVWMA	Prior to requesting construction bids.

EXHIBIT E

TABLE D.3 (Continued)
ENVIRONMENTAL COMMITMENTS FOR THE INTEGRATED COASTAL DISTRIBUTION SYSTEM

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 8.9.3-1b: The PVWMA will ensure that its contractors restore the topography of disturbed areas along the pipeline alignment to their pre-project condition such that short-term construction disturbance does not result in long-term visual impacts.	**8.9.3-1b:** Inspect the project area to verify that disturbed areas are revegetated, the topography is restored, and roads are repaired, if necessary. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Following project construction.
Measure 8.9.3-2: Implementation of Measures 8.6.3-4, 8.6.3-5a and 8.6.3-5b would ensure that damaged roads would be repaired to pre-construction conditions, and that detours would be provided for bicyclists and motorists during the construction period.	**8.9.3-2:** See Monitoring and Reporting Actions 8.6.3-4, 8.6.3-5a and 8.6.3-5b, above.		

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EXHIBIT E

TABLE D.4
ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform Commitment	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
PVWMA	Irrigation ditch open trench crossings		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	
	`illers Canal crossing: Data oint 19		Construction will be underground (horizontal directional drilling, microtunneling, or bore-and-jack); no construction activity within riparian area.	During construction	
			Exclusionary construction fencing (orange netting) to be placed at around construction areas.		
			All construction will be completed between June 15 and November 1 to minimize direct impacts to SCCS (if the channel is dry, construction can occur prior to June 15).		
			A qualified biological monitor will be on site during underground stream crossing activities.		
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Construction adjacent to vernal pool: Data point 26		Construction activities will avoid vernal pool. Install exclusionary construction fencing (orange netting) and silt fencing around construction activities within 100 feet of vernal pool.	During construction	
			Preconstruction surveys for California tiger salamander according to CDFG protocol (1998) and burrow excavation and relocation (see page 6-25).	Two years prior to construction During construction	

EXHIBIT E

TABLE D.4 (Continued)
ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform Commitment	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
PVWMA	Pipeline crossing of culvert within Betabel Road: Data point 7		Exclusionary fencing (orange netting) will be placed between riparian zone and construction areas. Confine construction activities to Betabel Road.	During construction	
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Pajaro River crossing west of HWY 101: Data point 14		Construction will be underground (horizontal directional drilling, microtunneling, or bore-and-jack).	During construction	
			Exclusionary fencing (orange netting) will be placed between riparian zone and construction areas.		
			All construction will be completed between June 15 and November to minimize direct impacts to SCCS (if the channel is dry, construction can occur prior to June 15).		
			A qualified biological monitor will be on site during underground stream crossing activities.		
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zone will be established around active bird nest until young have fledged.	15 days prior to construction, During construction	
PVWMA	Open trench crossing of two unnamed drainages near Pescadero Creek: Data points 25 and 27		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	

EXHIBIT E

ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform Commitment	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVωMA	pen trench crossing of two ıamed drainages near escadero Creek: Data points 5 and 27 (cont.)		Project disturbance corridor width will be confined to 40 feet or less in riparian areas. Corridor will be located in area of drainage with previous disturbance (i.e. tractor road) or least riparian cover. Revegetation of wetland and riparian habitat at a ratio acceptable to CDFG and USFWS and implementation of a monitoring and reporting plan.	After construction	
PVWMA	Sargent Creek open trench crossing: Data point 24		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	
			All construction will be completed between June 15 and November 1 to minimize direct impacts to SCCS (if the channel is dry, construction can occur prior to June 15).	During construction	
			Capture and relocation of steelhead, water diversion, screened pumping, sediment curtains, spill prevention plan, biological monitor, and site restoration.		
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	

EXHIBIT

TABLE D.4 (Continued)
ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform Commitment	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
PVWMA	Sargent Creek open trench crossing: Data point 24 (cont.)		Project disturbance corridor width will be confined to 40 feet or less in riparian areas. Corridor will be located in area of drainage with previous disturbance (i.e. tractor road) or least riparian cover. Revegetation of wetland and riparian habitat at a ratio acceptable to CDFG and USFWS and implementation of a monitoring and reporting plan.	After construction	
PVWMA	Open trench crossing of Pescadero Creek: Data point 23		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	
			Conduct preconstruction surveys for WPT eggs and nests.	15 days prior to construction	
			All construction will be completed between June 15 and November 1 to minimize direct impacts to SCCS (if the channel is dry, construction can occur prior to June 15).	During construction	
			Capture and relocation of steelhead, water diversion, screened pumping, sediment curtains, spill prevention plan, biological monitor, and site restoration.		
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Open trench crossing of Pescadero Creek: Data point 23 (cont.)		Project disturbance corridor width will be confined to 40 feet or less in riparian areas. Corridor will be located in area of drainage with previous disturbance (i.e. tractor road) or least riparian cover. Revegetation of wetland and riparian habitat at a ratio acceptable to CDFG and USFWS and implementation of a monitoring and reporting plan.	After construction	

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EXHIBIT E

TABLE D.4 (Continued)
ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform Commitment	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
PVWMA	Open mneb crossing or drainage east of Soda Lake: Data point 9		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	
			Preconstruction surveys for California tiger salamander according to CDFG protocol (1998) and burrow excavation and relocation (see page 6-25).	Two years prior to construction During construction	
PVWMA	Open trench pipeline crossing of Pajaro River on Graniterock property: Data point 48		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	
			Conduct preconstruction surveys for WPT eggs and nests.	15 days prior to construction	
PVWMA	Open trench pipeline crossing of Pajaro River on Graniterock property: Data point 48 (cont.)		All construction will be completed between June 15 and November 1 to minimize direct impacts to SCCS (if the channel is dry, construction can occur prior to June 15).	During construction	
			Capture and relocation of steelhead, water diversion, screened pumping, sediment curtains, spill prevention plan, biological monitor, and site restoration.		
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	

EXHIBIT M

TABLE D.4 (Continued)
ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform Commitment	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
			Project disturbance corridor width will be confined to 40 feet or less in riparian areas. Corridor will be located in area of drainage with previous disturbance (i.e. tractor road) or least riparian cover. Revegetation of wetland and riparian habitat at a ratio acceptable to CDFG and USFWS and implementation of a monitoring and reporting plan.	After construction	
PVWMA	Open trench crossing of drainage west of Aromas: Data point 22		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	
PVWMA	Pajaro River pipeline crossing west of HWY 1: Data point 1		Construction will be underground (horizontal directional drilling, microtunneling, or bore-and-jack); no construction activity within riparian area.	During construction	
			Exclusionary construction fencing (orange netting) to be placed at around construction areas.		
			All construction will be completed between June 15 and November 1 to minimize direct impacts to SCCS (if the channel is dry, construction can occur prior to June 15).		
			A qualified biological monitor will be on site during underground stream crossing activities.		
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Open trench pipeline crossings of Watsonville Slough: Data points 30 and 37		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	

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EXHIBIT E

TABLE D.4 (Continued)
ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform Commitment	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
PVWMA	Pipeline construction adjacent to irrigation ponds		Exclusionary fencing (silt fencing) will be placed between pond and construction areas. Confine construction activities to farm roads and agricultural fields.	During construction	
PVWMA	Pipeline construction adjacent to irrigation ponds (cont.)		If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Pipeline crossing of Hanson Slough: Data point 38		Construction will be underground (horizontal directional drilling, microtunneling, or bore-and-jack); no construction activity within riparian area.	During construction	
			Exclusionary construction fencing (orange netting) to be placed at around construction areas.		
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Pipeline construction adjacent to Harkins Slough: Data point 39		Exclusionary fencing (silt fencing) will be placed between slough and construction areas. Confine construction activities to farm roads and agricultural fields.	During construction	
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	

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EXHIBIT E

TABLE D.4 (Continued)
ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform Commitment	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
PVWMA	Pipeline crossing at road culvert of drainage south of Trafton Road: Data point 44		Standard protection measures for California red-legged frog from programmatic Biological Opinion	15 days prior to construction During construction, After construction	
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Pipeline construction adjacent to Bennett Slough: Data point 56		Exclusionary fencing (silt fencing) will be placed between slough and construction areas. Confine construction activities to Struve Road and agricultural fields.	During construction	
			If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Pipeline crossing of McClusky Slough: Data point 57		Construction will be underground (horizontal directional drilling, microtunneling, or bore-and-jack); no construction activity within riparian area.	During construction	
			Exclusionary fencing (silt fencing) will be placed between slough and construction areas. Confine construction activities to Struve Road and agricultural fields.		
PVWMA	Pipeline crossing of McClusky Slough: Data point 57 (cont.)		If construction activities are scheduled during the breeding season (March 1 through August 15), preconstruction surveys and no-disturbance buffer zones will be established around active bird nests until young have fledged.	15 days prior to construction, During construction	
PVWMA	Potential San Joaquin kit fox habitat		Preconstruction surveys of potential dens	15 to 30 days prior to construction	

EXHIBIT E

TABLE D.4 (Continued)
ENVIRONMENTAL COMMITMENTS FOR BIOLOGICAL RESOURCES FOR THE REVISED BMP PROJECT

Agency to Perform	Location[1]	ED #	Brief Description of Mitigation	Deadline	Status
			Implement additional measures from *USFWS Standardized Recommendations for Protection of the San Joaquin Kit Fox*	During construction	
PVWMA	Potential burrowing owl habitat		Preconstruction surveys for occupied burrows	15 days prior to construction	
			Passive relocation or seasonal avoidance of occupied burrows according to the California Burrowing Owl Consortium guidelines	During construction	

[1] Data points refer to Figures B1 through

EXHIBIT E

TABLE D.5
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE		MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Land Use and Planning				
Measure 5.D.1-1 (Recommended): Implement **Measure 4.A.1-1**. **Measure 4.A.1-1 (Recommended):** Advance notification of construction activities should be provided to all property owners, residents, and businesses in the vicinity of construction areas. See also mitigation measures in Sections 4.A.6, Traffic and Circulation, 4.A.7, Air Quality, and 4.A.8, Noise, of this EIR.	1)	Send notices to all property owners residents, and businesses in the project area vicinity at least one week in advance of construction. Publish notices in local newspapers at least one week in advance of construction. Place large signs along roads in the project vicinity at least one week in advance of construction. Submit copies of public notices to the project file to document compliance.	PVWMA	Prior to project construction
Geology and Soils				
Measure ASR-1: Implement **Measure 5.A.2-2**. **Measure 5.A.2-2:** All diversion and pipeline facilities will comply with applicable policies and appropriate engineering investigation practices necessary to reduce the potential detrimental effects of expansive soils, and corrosivity. Appropriate geotechnical studies will be conducted using generally accepted and appropriate engineering techniques for determining the susceptibility of the sites to unstable, weak or corrosive soils. A licensed geotechnical engineer will prepare recommendations applicable to foundation design, earthwork, and site preparation prior to or during the project design phase. Recommendations will address mitigation of site-specific, adverse soil and bedrock conditions that could hinder development. Project engineers will implement the recommendations. Geotechnical design and design criteria will comply with applicable codes and requirements of the 1994 or 1997 UBC with California additions (CCR Title 24), applicable City construction and grading ordinances.	1)	Include geotechnical report with recommendations as an appendix to construction specifications.	PVWMA	Prior to requesting construction bids
	2)	Review construction specifications to ensure that design recommendations were included.	PVWMA	Prior to project construction
	3)	Monitor project construction activities to verify compliance with the recommendations of the geotechnical report. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting engineering geologist	During and immediately following project construction

TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure ASR-2: Implement **Measures 5.A.2-3a** through **5.A.2-3f.** **Measure 5.A.2-3a:** All grading and construction will conform to requirements of the Monterey and Santa Cruz Counties Grading Ordinances. **Measure 5.A.2-3b:** Site grading and construction work areas will expose as little new ground surface as possible. Vegetation cover should be left intact to the extent practical. **Measure 5.A.2-3c:** To the extent possible, grading activities in noncropped areas will be limited to the period between April 15 and October 15. If dry conditions persist after October 15, one-week extensions of grading activities will be obtained from the County Public Works Department. In areas where the soil is tilled, grading activities will be coordinated with the local farmers to ensure consistency between their erosion control and farming practices and construction disturbance. **Measure 5.A.2-3d:** Implement best construction practices at all grading sites, regardless of soil erodibility hazard. **Measure 5.A.2-3f:** PVWMA will prepare and implement an inspection and maintenance program for the right-of-way and all facility sites. The plan will include routine inspection plans and reporting, and prescriptive methods for correcting erosion or soil instability problems.	1) Obtain Monterey and Santa Cruz County Grading Permits. 2) Review construction specifications to ensure that design recommendations for ASR construction and pipeline installation were included. 3) Monitor project construction activities to verify compliance with the construction specifications. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA PVWMA's consulting engineering geologist	Prior to project construction Prior to project construction During and immediately following project construction
Hydrology and Water Quality **Measure ASR-3:** All groundwater discharges associated with injection/extraction well development, initial pumping, and backwashing as well as long-term operational maintenance shall be conducted in accordance with NPDES permit issued through the RWQCB to ensure that degradation of surface water does not occur.	1) Monitor project construction activities to verify compliance with NPDES permit requirements. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	During project construction

EXHIBIT E

TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure ASR-4a: The PVWMA will operate the proposed project in compliance with the Surface Water Treatment Rule, Safe Drinking Water Act, where applicable, the SWRCB's Antidegradation Policy, and applicable DHS regulations regarding drinking water quality. Water injected into the groundwater aquifers from surface sources would be required to comply with federal and state water quality standards for drinking water and those set forth by SWRCB's Antidegradation Policy. The RWQCB has regulatory authority over injection and will require that groundwater degradation not occur and that injectate water meet both primary and secondary Title 22 standards. Federal and state drinking water standards, developed by EPA and DHS, dictate acceptable concentrations for many constituents, including fecal coliform, heavy metals, TDS, and nitrates.	1) Review engineering design to ensure that design meets regulations listed in **Measure 5.D.3-4a.** 2) Monitor project operation to verify compliance with regulations listed in **Measure 5.D.3-4a.** If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to final engineering design During, and following, project construction
Measure ASR-4b: The PVWMA will prepare and implement a treatment and monitoring program to ensure that surface water intended for injection is monitored and adequately treated so that applicable federal and state drinking water standards are not exceeded. Proposed injectate will require treatment to meet Surface Water Treatment Rule provisions and to remove, among other potential constituents, nitrate, iron, manganese, and potentially aluminum and arsenic. Treatment of the water to meet regulatory requirements could require multiple treatment technologies. Given the variable and sometimes high levels of turbidity in the College Lake injectate, compliance with the Surface Water Treatment Rule could require conventional treatment, consisting of coagulation, flocculation, sedimentation, filtration, and disinfection. Removal of dissolved constituents, including metals that exceed primary and secondary Title 22 standards, will require additional treatment technologies, such as reverse osmosis and ion exchange. The PVWMA will prepare and implement a plan that addresses regular monitoring of surface water sources and defines adequate treatment methods to reduce concentrations of contaminant, if present, to levels below the federal and state drinking water standards.	1) Monitor surface water intended for injection to determine compliance with applicable federal and state regulations. If non-compliance is noted, notify regulatory agencies and, in consultation with the agencies, adjust water treatment methods to reduce contaminants to levels below the federal and state drinking water standards.	PVWMA or PVWMA's consulting engineer	Following project completion

EXHIBIT E

TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure ASR-5: PVWMA will complete a hydrogeologic feasibility study and testing for the proposed injection/extraction well field prior to design. PVWMA will develop a groundwater monitoring plan to monitor the groundwater elevations in the vicinity of the injection/extraction wells. The program will include procedures to adjust, if necessary, the injection/extraction rates to avoid adverse aquifer response such as mounding or drawdown.	1) Prepare hydrogeologic feasibility study.	PVWMA	Following conceptual well field delineation
	2) Review the groundwater monitoring plan to ensure that it includes procedures to adjust, if necessary, injection/extraction rates to avoid mounding and drawdown.	PVWMA	Prior to final engineering design
<u>Cultural Resources</u>			
Measure ASR-6a: As part of the siting study for wells, PVWMA will retain an archaeologist to conduct archival research and surface reconnaissance of potential sites. The findings of the investigations will be incorporated into the selection of specific locations for wells and connecting pipelines such that PVWMA will avoid siting wells and attendant connecting pipelines at or through any significant cultural resources.	1) Determine the areal extent of important cultural resources sites within the project area. Review project plans to verify that project facilities would not be located within these sites.	PVWMA's consulting archaeologist	Prior to final engineering design
Measure ASR-6b: Implement **Measures 4.B.5-1a** and **4.B.5-1b**.			
Measure 4.B.5-1a: Final pipeline and facility plans shall locate facilities and pipeline alignments away from identified cultural resource sites. A qualified cultural resource specialist shall be retained to assist in identifying the extent of important cultural resource sites to be avoided, which may include the preparation of detailed cultural resource evaluation reports and consultation with local, state, and federal agencies as well as the local Native American community and the Native American Heritage Commission.	**4.B.5-1a:** Determine the areal extent of important cultural resources sites within the project area. Review project plans to verify that project facilities would not be located within these sites.	PVWMA's consulting archaeologist	Prior to final engineering design
	4.B.5-1b: 1) Prepare contract specifications for the construction contractor that require implementation of the cultural resources mitigation plan developed under the Programmatic Agreement.	PVWMA's consulting archaeologist	Prior to requesting construction bids
Measure 4.B.5-1b: If important cultural resource sites cannot be avoided, PVWMA will coordinate with local, state, and federal agencies in the development of an appropriate mitigation plan for the cultural resource. Possible mitigation measures for important cultural resources may include documentation and recordation of the resource, relocation, or stabilization of the resource.	2) Monitor construction activities to ensure that the cultural resources mitigation plan is implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA's consulting archaeologist	During project construction

TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure ASR-7: Implement **Measure 4.A.5-1.**			
Measure 4.A.5-1: Should any as yet undiscovered cultural resources, such as structural features, or unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work will be suspended and PVWMA staff will be contacted. A qualified cultural resource specialist shall be retained and will perform any necessary investigations to determine the significance of the find. PVWMA will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources. In addition, pursuant to Sections 5097.97 and 5097.98 of the State Public Resources Code and Section 7050.5 of the State Health and Safety Code, in the event of the discovery of human remains, all work must be halted and the County Coroner shall be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.	1) Prepare a resource recovery plan for the site including findings and recommendations and submit it to PVWMA, the U.S. Army Corps of Engineers, the State Historic Preservation Officer, the Advisory Council on Historic Preservation and the project file.	PVWMA's consulting archaeologist	During project construction, if potential resources are encountered
	2) Submit a document verifying that evaluation of the materials and their recovery occurred. Prepare a report of findings and submit it to PVWMA, the State Historic Preservation Officer, the Advisory Council on Historic preservation and the project file.	PVWMA's consulting archaeologist	During project construction, if potential resources are encountered
Measure ASR-8: Implement **Measures 4.B.5-3a** through **4.B.5-3c.**	**4.B.5-3a:** Review construction maps and monitor construction sites to ensure that resource boundaries are marked as exclusion zones.	PVWMA's consulting archaeologist	Prior to, and during, project construction
Measure 4.B.5-3a: The resource boundaries should be marked as exclusion zones both on the ground and on construction maps.			
Measure 4.B.5-3b: Construction supervisory personnel should be notified of the existence of these resources and be required to keep personnel and equipment away from these areas. During construction and operations, personnel and equipment will be restricted to the surveyed corridor.	**4.B.5-3b:** Prepare contract specifications for the construction contractor that require all construction personnel and equipment remain within the surveyed corridor.	PVWMA	Prior to requesting construction bids

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TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.B.5-3c: Monthly monitoring of the cultural resources to be avoided should be completed to insure that no inadvertent damage to the resources occurs as a result of construction or construction-related activities. If damage is detected a guard will be posted to patrol the site and adjacent important resources (such as gravestones and churches).	1) Monitor cultural resources to be avoided on a monthly basis during project construction to verify that no damage occurs. 2) If damage to a cultural resource is detected, hire a guard to patrol the site and adjacent important resources.	PVWMA's consulting archaeologist PVWMA	damage is detected
Traffic and Circulation			
Measure 5.D.6-1 (Recommended): Implement **Measures 4.A.6-1a** and **4.A.6-1b.**	1) Prepare contract specifications for the construction contractor that require construction truck trips be scheduled during off-peak hours and that haul routes be selected to minimize truck traffic on local roadways.	PVWMA	Prior to requesting construction bids
Measure 4.A.6-1a (Recommended): Schedule truck trips outside of peak commute hours.			
Measure 4.A.6-1b (Recommended): Use haul routes that minimize truck traffic on local roadways to the extent possible.			
Measure ASR-9: Implement **Measures 4.B.6-2a** and **4.B.6-2b.**			
Measure 4.B.6-2a: Limit construction hours to off-peak traffic periods on commute streets.	1) Prepare contract specifications for the construction contractor that limit construction hours to off-peak traffic periods.	PVWMA	Prior to requesting construction bids
Measure 4.B.6-2b: The contractor shall be required to prepare traffic control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plan shall be reviewed for appropriateness, and approved by Caltrans and the governing Public Works Departments.	1) Prepare contract specifications for the construction contractor that require preparation of a traffic control plan. 2) Review the proposed traffic control plan to ensure that measures to maintain traffic flows are included. Notify the construction contractor if any modifications are required.	PVWMA PVWMA, Caltrans, Santa Cruz County Public Works Department	Prior to requesting construction bids Prior to project construction

EXHIBIT E

TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure ASR-10: Implement **Measures 4.B.6-3a** through **4.B.6-3c**.			
Measure 4.B.6-3a: To minimize disruption of emergency vehicle access and maintain access to driveways to adjacent land uses, PVWMA would require the contractors to maintain steel trench plates at the construction sites to restore access across open trenches. Construction trenches shall not be left open after work hours.	1) Monitor construction activities to ensure that steel trench plates are placed on construction trenches along driveways. If non-compliance is noted, notify construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction
Measure 4.B.6-3b: To minimize disruption of emergency vehicle access, affected jurisdictions will be asked to identify detours to be posted by contractor.	1) Place a large sign along roadways in the project vicinity at least one week in advance of construction.	PVWMA	Prior to project construction
Measure 4.B.6-3c: The contractor will notify the appropriate police, fire, and emergency services of the timing, location, and duration of construction activities and the locations of detours and lane closures prior to beginning construction in the immediate vicinity of affected roadways.	1) Send notices to police, fire, and emergency service providers at least one week in advance of construction.	PVWMA	Prior to project construction
Measure ASR-11: Implement **Measure 4.A.6-2**.			
Measure 4.A.6-2: Conduct a preconstruction survey of road conditions on key access routes to the project sites (e.g., San Andreas Road). The pavement conditions of local streets judged to be in good condition for use by heavy truck traffic shall be monitored. Roads damaged by construction shall be repaired to a structural condition equal to, or better than, that which existed prior to construction activity.	1) Prepare contract specifications for the construction contractor that require that a preconstruction survey of key routes to the project site be conducted, and that roads damaged by construction be repaired.	PVWMA	Prior to project construction
	2) Inspect access roads to the project site to ensure that roads are repaired following project construction, if necessary. If roads are not repaired, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Following project construction

TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure ASR-12: Implement **Measures 4.A.6-3a** and **4.A.6-3b**.			
Measure 4.A.6-3a: The construction contractor shall prepare traffic safety and control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plans prepared by the contractor shall include recommended detours for bicyclists. The traffic control plan shall be reviewed for appropriateness, and approved by the governing Public Works Department.	1) Prepare contract specifications for the construction contractor that require preparation of a traffic safety and control plan.	PVWMA	Prior to requesting construction bids
	2) Review the proposed traffic control plan to ensure that measures to maintain traffic flows are included. Notify the construction contractor if any modifications are required.	PVWMA	Prior to construction
Measure 4.A.6-3b: The contractor shall provide advanced public notification of construction activity and roadway/access closures.	1) Send notices to all property owners, residents, and businesses in the project area vicinity at least one week in advance of construction. Publish notices in local newspapers at least one week in advance of construction. Place a large sign along each affected roadway at least one week in advance of construction. Submit copies of public notices to the project file to document compliance.	Construction contractor	Prior to project construction
Measure ASR-13: Implement **Measure 5.A.6-7**.			
Measure 5.A.6-7: The traffic control plan shall include consideration of any other planned traffic detours related to nearby and concurrent construction projects.	1) Review the traffic control plan to ensure that it considers other planned traffic detours related to concurrent construction projects. If the plan does not consider other planned detours, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Prior to project construction
<u>Air Quality</u>			
Measure 5.D.7-1: Implement dust control program described in **Measure 4.A.7-1**.			
Measure 4.A.7-1: The construction contractor shall implement a dust control program that includes the following elements:	1) Prepare contract specifications for the construction contractor that require implementation of a dust	PVWMA	Prior to requesting construction bids

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TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
▪ Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. ▪ Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. ▪ Sweep daily (with water sweepers) all paved access roads, paved parking areas and paved staging areas at construction sites. **easure 4.A.7-1: (cont.)** ▪ Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. Hydroseed or apply (non-toxic) soil binders to inactive construction areas. However, do not apply these measures in operating agricultural fields under cultivation unless requested by the grower. Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.). ▪ Limit traffic on unpaved roads to 15 mph. ▪ Install sandbags or other erosion control measures to prevent silt runoff to public roadways. ▪ Replant vegetation in disturbed areas as quickly as possible.	control program. 2) Monitor construction activities to verify that the measures of the dust control program are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Periodically during project construction

EXHIBIT E

TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Noise			
Measure 5.D.8-1: Implement **Measure 4.A.8-1.**			
Measure 4.A.8-1: PVWMA shall incorporate into contract *specifications the following measures:* ▪ Comply with all local sound control and noise level rules, regulations, and ordinances. ▪ Equipment and trucks used for project construction shall utilize the best available noise control techniques (including mufflers, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) in order to minimize construction noise impacts. **Measure 4.D.8-1: (cont.)** ▪ Impact equipment (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically- or electrically-powered wherever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used; this muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves would be used where feasible, and this could achieve a reduction of 5 dBA. Quieter procedures shall be used (such as drilling rather than impact equipment) whenever feasible. ▪ Stationary noise sources shall be located as far from sensitive receptors as possible. If they must be located near existing receptors, they shall be adequately muffled. ▪ Temporary walls may be erected at some locations to reduce noise impacts to residences adjacent to construction sites.	1) Prepare contract specifications for the construction contractor that require implementation of noise mitigation measures listed in **Measure 4.A.8-1.** 2) Monitor construction activities to verify that the measures of the noise control measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA PVWMA	Prior to requesting construction bids Periodically during project construction

EXHIBIT E

MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEME

TABLE D.5 (Continued)

AL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 5.D.8-2: Implement ***Measure 5.B.8-2.***			
Measure 5.B.8-2: *PVWMA shall incorporate into contract specifications the following measures:*	1) Prepare contract specifications for the construction contractor that include measures listed in **Measure 5.B.8-2.**	PVWMA	Prior to final engineering design
The pumping facilities shall be designed with acoustical treatments (building enclosures, louvered vents, noise walls, etc.) that are adequate to maintain potential noise generation to levels at or below ambient levels.	2) Monitor construction activities to verify that the measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	VWMA	Periodically during project construction
Public Services			
Measure 5.D.9-3: The design of all pump facilities with a potential to exceed the capacity of existing PG&E systems will be coordinated with PG&E to ensure adequate capacity is available.	1) Submit documentation of consultation with PG&E to the project file to ensure that adequate capacity is available.		
Visual/Aesthetic and Recreational Resources			
Measure 5.D.10-1: Implement **Measure 4.A.10-1a** through **4.A.10-1c.**		PVWMA	to final eering design
Measure 4.A.10-1a: The PVWMA shall revegetate disturbed natural areas to minimize textural contrasts with the surrounding vegetation using grasses, shrubs and trees typical of the immediately surrounding area.	1) Prepare contract specifications for the construction contractor that require revegetation of disturbed areas.	PV	
	2) Inspect construction areas to verify that disturbed natural areas are revegetated following construction. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	MA PV con MA or PVWMA's ting biologist	Prior to requesting construction bids Following project construction

EXHIBIT 3

TABLE D.5 (Continued)
MITIGATION MONITORING AND REPORTING PROGRAM FOR THE SUPPLEMENTAL WELLS PROJECT

MITIGATION MEASURE	MONITORING AND REPORTING ACTIONS	MONITORING / REPORTING RESPONSIBILITY	MONITORING / REPORTING SCHEDULE
Measure 4.A.10-1b: The PVWMA shall use design elements to enhance visual integration of the proposed above-ground facilities with their surroundings. Proposed facilities shall be painted low-glare earth-tone colors that blend with the surrounding terrain.	1) Review project plans to ensure that they include design elements such as low-glare earth-tone paint to visually integrated the proposed facilities with their surroundings.	PVWMA	Prior to final engineering design
Measure 4.A.10-1c: The PVWMA shall ensure that its contractors restore disturbed areas along the pipeline alignment to their pre-project condition such that short-term construction disturbance does not result in long-term visual impacts.	1) Prepare contract specifications for the construction contractor that require revegetation of disturbed areas along the pipeline alignment.	PVWMA	Prior to requesting construction bids
	2) Inspect construction areas to verify that disturbed natural areas are revegetated following construction. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	Following project construction
Mitigation Measure 5.D.10-2 (Recommended): Implement **Measure 4.A.10-2.**			
Mitigation Measure 4.A.10-2 (Recommended): The PVWMA shall ensure that all exterior lighting if used is directed downward and oriented to insure that no light source is directly visible from neighboring residential areas. If necessary, landscaping shall be provided around proposed facilities. This vegetation shall be selected, placed, and maintained to minimize off-site light and glare onto surrounding areas. In addition, highly reflective building materials and/or finishes shall not be used in the designs for proposed structures.	1) Prepare contract specifications for the construction contractor that include exterior lighting mitigation listed in **Measure 4.A.10-2.**	PVWMA	ior to requesting nstruction bids
	2) Monitor construction activities to verify that the measures are implemented. If non-compliance is noted, notify the construction contractor of required actions and the deadline for compliance.	PVWMA	ring and following struction

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EXHIBIT E

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EXHIBIT E

APPENDIX B
SUMMARY OF IMPACTS AND MITIGATION MEASURES OF THE ICDS PROJECT

ENVI VMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
8.1 Le		
Impac Use and Planning – Coastal Distribution distribu adjacen 3-1: Construction of the proposed coastal system would result in short-term disturbance of d uses.	**Mitigation Measure 8.1 3-1:** The PVWMA will provide advance notification of construction activities to all property owners, residents, and businesses in the vicinity of construction areas. Additionally, measures identified in Sections 8.6.3, Traffic, and 8.7.3, Air Quality, will be implemented	Less than significant.
Impact be gener General 3-2: The proposed coastal distribution system would County consistent with policies of the Santa Cruz County LCP and the Monterey County General Plan, North 8.2 Geol Plan, and North County LUP/LCP.	None required.	Less than significant.
Impact 8 and Soils – Coastal Distribution System result in a and effect 1: Construction of the proposed pipelines would would be grated erosion and attendant loss of soil resources soils havin sediment discharges in water courses. The impact the entire ficant on slopes over 2 percent and in areas with derate or greater erosion hazard, which includes of the coastal distribution system.	**Mitigation Measure 8.2.3-1a:** All grading and construction shall conform to requirements of the Santa Cruz County Grading Ordinance and Monterey County Grading Ordinance. **Mitigation Measure 8.2.3-1b:** Site grading and construction work areas shall expose as little new ground surface as possible. Vegetation cover should be left intact to the extent practical. **Mitigation Measure 8.2.3-1c:** To the extent possible, grading activities in non-cropped areas shall be limited to the period between April 1 and October 31. If dry conditions persist after October 31, one week extensions of grading activities should be obtained from the County Public Works Department. In areas where the soil is tilled, grading activities should be coordinated with the local farmers to ensure consistency between their erosion control and farming practices and construction disturbance.	Less than significant.

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Mitigation Measure 8.2.3-1d: Implement best construction practices at all grading sites, regardless of soil erodibility.	
	Mitigation Measure 8.2.3-1e: Upon completion of construction at all sites, loose soils shall be removed or spread and all areas shall be re-soiled and reseeded to ensure that a stable soil cover will remain.	
Impact 8.2.3-3: The prc significant loss of prime a	**Mitigation Measure 8.2.3-1f:** PVWMA should prepare and implement an inspection and maintenance program for the right-of-way and all facility sites. The plan should include routine inspection plans and reporting, and prescriptive methods for correcting erosion or soil instability problems.	
Impact 8.2.3-4: Propose pass through areas with C subject to settlement, expa soils that could damage the	ld result in a less than al soils. None required.	
	s on the Pajaro floodplain clay soils that are weak soils ls and potentially corrosive d facilities. **Mitigation Measure 8.2.3-4:** Conduct soil engineering investigations of the proposed pipeline alignments prior to the final design and implement design recommendations. The investigations should specify hazards related to weak soils and settlement, including differential settlement. The recommendations of an engineering geologist shall be incorporated into the design and specifications and shall be implemented by the construction contractor. The construction manager shall conduct inspections and certify that all design criteria have been met. While these measures would not ensure that some damage to the facilities would not occur, it would ensure that design standards have been met and the hazards have been reduced to an acceptable level of risk. Therefore, the impact would be reduced to a less than significant level.	Less than significant. Less than significant.

EXHIBIT

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.2.3-5: Large earthquakes would be expected to damage the proposed facilities, impairing and/or disrupting their intended operations.	**Mitigation Measure 8.2.3-5:** Conduct geologic investigations of the proposed pipeline alignment and pumping facilities prior to the final design and implement design recommendations. The investigations should specify hazards related to ground movements and co-seismic effects, especially liquefaction. The recommendations of an engineering geologist shall be incorporated into the design and specifications and shall be implemented by the construction contractor. The construction manager shall conduct inspections and certify that all design criteria have been met. While these measures would not ensure that damage to the facilities would not occur, it would ensure that the hazards have been reduced to an acceptable level of risk and, therefore, the impact would be reduced to a less than significant level.	Less than significant
8.3 <u>Hydrology and Water Quality – Coastal Distribution</u>		
Impact 8.3.3-1: Construction activities would increase soil erosion and may transport other contaminants to downstream receiving waters.	**Mitigation Measure 8.3 3-1**The PVWMA will provide advance notification of construction activities to all property owners, residents, and businesses in the vicinity of construction areas.	Less than significant.
Impact 8.3.3-2: Construction activities at the proposed project site could result in dewatering of shallow groundwater resources and contamination of surface water.	**Mitigation Measure 4.3.3-2:** Employ construction storm water quality management practices.	Less than significant.
Impact 8.3.3-3: Development at the project site may expose structures to flood hazards. However, after construction, all of the project pipeline will be underground and will not cause a flood hazard.	None required.	Less than significant.

EXHIBIT

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMEN	IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.3.3-4: adjacent to a num damage the wells	roposed pipeline would be constructed wells. Construction activities could ck access to the wells.	**Mitigation Measure 8.3.345:** *Avoid construction impacts to well. The precise well location shall be identified in preconstruction surveys. The pipeline construction trench, material stockpile areas and soil excavation stockpiles shall be designated in the construction plans and specifications to specifically avoid impacting the well and access to the well.*	Less than significant.
Impact 8.3.3-5: Tl convey water to agr decreasing the need	stal distribution system project would ral lands for irrigation, thereby mp groundwater.	None required.	
8.4 Vegetation and			
Impact 8.4.3-1—*We*life – Coastal Distribution project could result i potential jurisdictiona streambeds and banks sedimentation of the c during trenching activ stream function as wil	**:** Construction of the proposed orary impacts of up to 2.4 acres of ands/waters of the U.S. and ential impacts could occur due to ls outside of the construction area nd loss of riparian vegetation and nd fishery habitat.	**Mitigation Measure 8.4.3-1a—*Avoidance of Wetlands:*** *All crossings of jurisdictional areas at the Pajaro River, McClusky Slough, Watsonville Slough and the unnamed ephemeral drainage above Trafton Road shall be avoided to the extent feasible by project construction, maintaining all facilities outside the jurisdictional area defined by riparian or emergent vegetation. Re-routing the pipeline to avoid McClusky Slough and the lower crossing of Watsonville Slough by extending and possibly enlarging nearby laterals shall be incorporated into the final design. Bore and jack methods shall be used to install the pipeline under creek channels, pipes, and culverts. This measure would also avoid impacts to special status species potentially occurring in the waterways (see Impact 8.4.3-2). If complete avoidance is infeasible, implement Measure 8.4.3-1b.*	Beneficial Less than significan

EXHIBIT E
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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Mitigation Measure 8.4.3-1b—*Implement Standard Protective Measures to Maintain Water Quality and Control Erosion and Sedimentation*: Standard measures to maintain water quality and to control erosion and sedimentation are recommended. This includes trenching across wetlands during low flow periods, excluding water from construction by diversions as feasible, use of sediment curtains, placing spoil sites outside waterways, preparing and implementing a spill prevention plan, storing equipment and materials outside the wetlands, and revegetating impacted wetland vegetation according to a detailed revegetation plan approved by the Corps and/or CDFG.	
	Mitigation Measure 8.4.3-1c--*Restore Pajaro River riparian forest, McClusky Slough wetlands and Watsonville Slough wetlands*: The revegetation plan for the project shall include restoration of riparian forest and wetlands that may have been impacted by construction (i.e. bore and jack staging). Revegetation shall include installation of trees and shrubs in a ratio of 3:1 to replace lost vegetation, specifications for after-installation care, weed control, and monitoring for a three year period following installation. Wetland restoration shall include salvage of sod and soil, maintenance during construction, reinstallation following the completion of construction, weed control, and monitoring, performance criteria and replacement measures, as needed. Revegetation materials shall consist of locally obtained, locally indigenous species.	

EXHIBIT E

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

		MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.4.3-2: Constr could result in temporar special status animal spe increased sedimentation loss through vegetation r and construction disturba	ities in and near wetlands 2.4 acres of habitat for could occur due to vatering of pools, habitat ction of nests and burrows	**Mitigation Measure 8.4.3-2a--***Avoid Loss of Riparian and Wetland Habitat*: Avoid removal or damage to all riparian and wetland vegetation within the project corridor using bore and jack and/or directional drilling techniques to avoid all impacts to McClusky Slough and to the lower crossing of Watsonville Slough, resulting in a potential reduction of 0.8 acres of sensitive wildlife habitat. **Mitigation Measure 8.4.3-2b--***Protect Riparian and Wetland Habitat*: Erect exclusion fencing during construction along the edge of riparian and wetland vegetation where the construction area is within 25 feet of the riparian zone. **Mitigation Measure 8.4.3-2c--***Survey, Consultation and Protection Measures for special status wildlife species:* As part of the habitat assessment, potential habitat for the California red-legged frog was found to be present at Watsonville Slough. Potential habitat may also be present for Santa Cruz long-toed salamander. Central Coast steelhead, and tidewater goby are present at the Pajaro River, and potential habitat for California red-legged frog was identified here as well. As a result, PVWMA will initiate formal consultation with USFWS and CDFG if these areas will be impacted. **Mitigation Measure 8.4.3-2d--***Protection of Nesting Special Status Birds*: To avoid conflicts with nesting raptors, yellow warblers and tricolored blackbirds, construction activities within 500 feet of Valley Foothill Riparian or Fresh Emergent Wetland habitat shall begin prior to or after the nesting season (March to July).	Less than significant.

EXHIBIT 4

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Mitigation Measure 8.4.3-2e Protection of Steelhead Migration Habitat: Impacts to steelhead smolt passage shall be reduced by avoiding construction in the Pajaro River until after June 1, when smolt are assumed to have completed their migration.	
Impact 8.4.3-3: Construction of facilities in coastal scrub habitat above the Watsonville Slough could result in temporary or permanent impacts to special status plant species.	**Mitigation Measure 8.4.3-3—*Protection of Special Status Plants*:** Prior to construction of the lower Watsonville Slough crossing, preconstruction surveys for the robust spineflower shall be carried out during the flowering period of this species, May-September. If any populations are found, they will be flagged and avoided during construction.	Less than significant

EXHIBIT E

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
8.5 Cultural Resources – Coastal Distribution		
Impact 8.5.3-1: Construction activities associated with the proposed coastal distribution system may result in the alteration or destruction of identified cultural resources.	**Mitigation Measure 8.5.3-1a:** Final pipeline and facility plans shall locate facilities and pipeline alignments away from these identified important cultural resource sites. A qualified cultural resource specialist shall be retained to assist in identifying the areal extent of important cultural resource sites to be avoided, which may include the preparation of detailed cultural resource evaluation reports and consultation with local, state, and federal agencies as well as the local Native American Commission. **Mitigation Measure 8.5.3-1b:** If important cultural resource sites cannot be avoided, the Parajo Water Management Agency will coordinate with local, state, and federal agencies in the development of an appropriate mitigation plan for the cultural resource. Possible mitigation measures for important cultural resources may include documentation and recordation of the resource, recovery and relocation, or stabilization of the resource. Mitigation Measures 8.5.3-1a and 8.5.3-1b presented under Impact 8.5.3-1 applied to these sites would reduce this impact to a Less than significant level.	Less than significant.
Impact 8.5.3-2: Ground-disturbing activities associated with the proposed coastal distribution system could reveal previously unknown buried or otherwise obscured significant prehistoric and historic cultural resources.	Mitigation Measure 8.5.3-3 presented under Impact 8.5.3-3 applied to these sites, if present, would reduce this impact to a Less than significant level.	Less than significant.

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.5.3-3: Potential indirect impacts to cultural resources, primarily vandalism, could result from the increased access to and use of the general area during construction. Such disturbance could result in the loss of integrity of important cultural resources.	***Mitigation Measure 8.5.3-3:*** Should any as yet undiscovered cultural resources, such as structural features, or unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work will be suspended and PVWMA staff will be contacted. A qualified cultural resource specialist will be retained and will perform any necessary investigations to determine the significance of the find. PVWMA will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources.	Less than significant.
8.6 Traffic and Circulation – Coastal Distribution		
Impact 8.6.3-1: Traffic on area roadways would increase as a result of project-generated vehicle trips by construction workers and construction vehicular activities.	Although this impact would be less than significant, the mitigation measures presented under Impact 8.6.3-1 are recommended to further reduce the less than significant impact. **Mitigation Measure 8.6.3-1a (Recommended):** Schedule truck trips outside of peak commute hours. ***Mitigation Measure 8.6.3-1b* (Recommended):** Use haul routes that minimize truck traffic on local roadways to the extent possible.	Less than significant.

EXHIBIT E

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.6.3-2: Project construction would increase traffic delays for vehicles traveling past the construction zone.	Mitigation Measures presented under Impact 8.6.3-2 would reduce this impact to less than significant levels. **Mitigation Measure 8.6.3-2a:** Limit construction hours *to* off-peak traffic periods on commute streets. **Mitigation Measure 8.6.3-2b:** The construction contractor shall prepare traffic safety and control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plan shall be reviewed for appropriateness, and approved by Caltrans and the governing Public Works Departments.	Less than significant.
Impact 8.6.3-3: Project construction would affect access to adjacent land uses for both general and emergency access.	Mitigation Measures presented under Impact 4.6.3-3 would reduce this impact to less than significant levels. **Mitigation Measure 8.6.3-3a:** Construction trenches would be covered by steel trench plates to allow access to driveways. **Mitigation Measure 8.6.3-3b:** To minimize disruption of emergency vehicle access, contractors will work with affected jurisdictions (Santa Cruz or Monterey County or City of Watsonville) to identify detours during construction. **Mitigation Measure 8.6.3-3c:** Police, fire, and emergency services should be notified of the timing, location, and duration of construction activities and the locations of detours and lane closures.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

EXHIBIT E

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.6.3-4: Project construction would increase wear-and-tear on area roadways used by construction vehicles.	Mitigation Measures presented under Impact 8.6.3-4 would reduce this impact to less than significant levels. Mitigation Measure 8.6.3-4: Conduct a preconstruction survey of road conditions on key access routes to the project site. The pavement conditions of local streets and designate roads judged to be in good condition for use by heavy truck traffic should be monitored. Roads damaged by construction should be repaired to a condition equal to, or better than, that which existed prior to construction activity.	Less than significant.
Impact 8.6.3-5: Project construction would increase potential traffic safety hazards for vehicles and pedestrians in the construction area.	Mitigation Measures presented under Impact 8.6.3-5 would reduce this impact to less than significant levels. Mitigation Measure 8.6.3-5a: The traffic control plans prepared by the contractor (see Mitigation Measure 8.6.3-2b) shall include detours for bicyclists. Mitigation Measure 8.6.3-5b: The contractor shall provide advanced public notification of construction activity and roadway/access closures.	Less than significant
Impact 8.6.3-6: Project construction would generate a demand for parking spaces **for** construction worker vehicles.	Non Required	Less than significant.
8.7 **Air** Quality - Coastal Distribution		
Impact 8.7.3-1: Construction of the Coastal Distribution components would temporarily generate criteria air pollutants, particularly PM_{10}, over the duration of the construction period.	Mitigation Measure **8.7.3-1:** The construction contractor shall implement a dust control program that includes the following elements: • Water all active construction sites at least twice daily.	Less than significant.

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (with water sweepers) all paved access roads, paved parking areas and paved staging areas at construction sites. • Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets. • Hydroseed or apply (non-toxic) soil binders to inactive construction areas. However, do not apply these measures in operating agricultural fields under cultivation unless requested by the grower. • Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic on unpaved roads to 15 mph • Install sandbags or other erosion control measures to prevent silt runoff to public roadways. • Replant vegetation in disturbed areas as quickly as possible	
Impact 8.7.3-2: Lane closures and detours necessitated by construction of the project could temporarily increase vehicular emissions.		Less than significant.
Impact 8.7.3-3: Vehicle trips resulting from operation and maintenance of the various components of the project would generate emissions of criteria air pollutants.		Less than significant.

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

EXHIBIT E

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
8.8 Socioeconomic and Public Utilities – Coastal Distribution		
Impact **8.8.2-1:** Pipeline and/or facility construction could result in temporary, planned or accidental disruption to utility services provided by underground lines.	Mitigation Measure **84.8.2-1:** A detailed study identifying utilities along the proposed alignment will be done during the pre-design stages of the project.	Less than significant.
Impact **8.8.2-2:** Pipeline construction could temporarily impede vehicle access to emergency services as well as to collection and delivery services. This impact could affect Counties' Sheriffs Departments, fire departments, emergency services (e.g. ambulance companies), delivery and collection services.	Mitigation Measure **8.8.2-2:** Refer to Mitigation Measures 8.6.3-3a, b, c.	Less than significant.

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL **IMPACT**	**MITIGATION**	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.8.2-3: Construction activities for all facilities could require short-term police and tire protection services to assist in traffic management or respond to construction accidents and other service requests.	None required	Less than significant.
Impact 8.8.2-4: The proposed project would increase water augmentation fees required to support the costs of the project and will cause Pajaro Valley growers' crop production costs to rise and increase production costs would lower their net return per unit of production. This could result in substantial adverse economic impacts on some small, economically marginal farming operations and force them out of business. However, cost increases attributable to the project would be less than two percent to net returns. In addition the increase in irrigation water fees will tend to be mitigated by better management practices and increased conservation and for the market forces to lower land rents to reflect the lower net returns for growers.	None required.	Less than significant
Impact 8.8.2-5: During the construction phase of the proposed project, the farmlands within construction access easements, the required distribution system easements would not be in production for one growing season.	**Mitigation** Measure **8.8.2-5:** The PVWMA will establish a procedure to compensate growers for the financial losses that they incur as a result of the impacts caused by the excavation and construction activities that occur in the easements for the placement of the local distribution system. The growers will receive compensation based upon the total amount of farmland disrupted, the amount of time of the disruption, the historical type of crop planted on the land and the current year unit market price for the unplanted crop.	Less than significant

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
8 ≥ <u>Visual/Aesthetic and Recreational Resources – Coastal Distribution</u>	**Mitigation Measure 8.9.3-1b:** The PVWMA will revegetate disturbed natural areas to minimize textural contrasts with the surrounding vegetation using grasses, shrubs and trees typical of the immediately surrounding area. **Mitigation Measure 8.9.3-1c:** The PVWMA will ensure that its contractors restore the topography of disturbed areas along the pipeline alignment to their pre-project condition such that short-term construction disturbance does not result in long-term visual impacts.	Less than significant.

EXHIBIT E

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.9.3-1: Installation of the coastal distribution system lateral lines would disturb roadways and remove crops and vegetation, which would temporarily alter the visual landscape.	**Mitigation Measure 8.9.3-2:** Implementation of Measures 8.6.3-4, 8.6.3-5a and 8.6.3-5b would ensure that damaged roads would be repaired to pre-construction conditions, and that detours would be provided for bicyclists and motorists during the construction period. **Mitigation Measure 8.6.3-4:** Conduct a preconstruction survey of road conditions on key access routes to the project site. The pavement conditions of local streets and designate roads judged to be in good condition for use by heavy truck traffic should be monitored. Roads damaged by construction should be repaired to a condition equal to, or better than, that which existed prior to construction activity. **Mitigation Measure 8.6.3-5a:** The traffic control plans prepared by the contractor, which will consist of specific methods for maintaining traffic flows, shall include detours for bicyclists. This control plan shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plan shall be reviewed for appropriateness, and approved by Caltrans and the governing Public Works Departments. **Mitigation Measure 8.6.3-5b:** The contractor shall provide advanced public notification of construction activity and roadway/access closures.	Less than significant.
Impact 8.9.3-2: Development of the coastal distribution system component would temporarily disrupt recreational uses along designated recreational bicycle trails in Santa Cruz and Monterey Counties.		

EXHIBIT E

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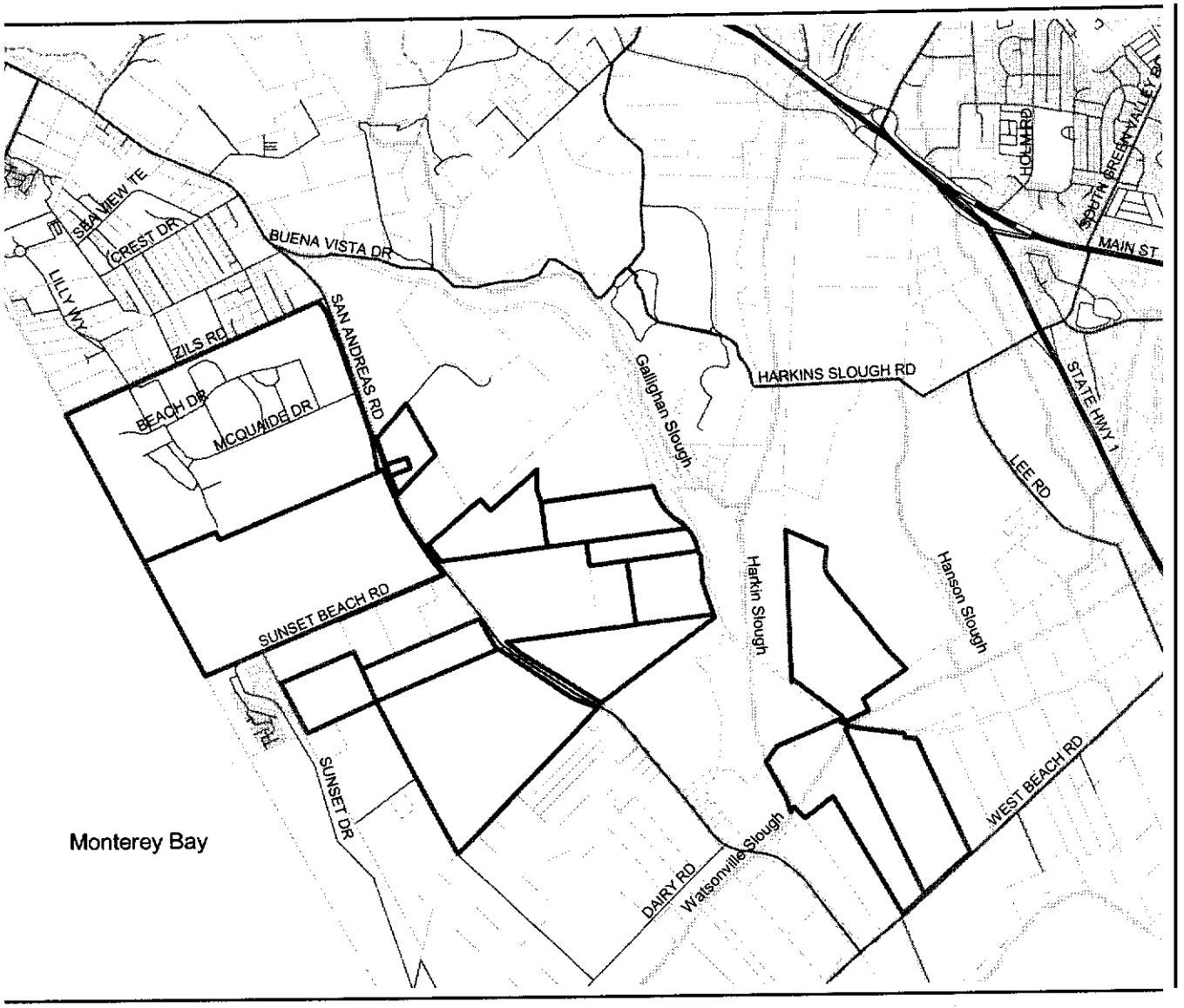
Location **Map**



1 0 1 2 Miles

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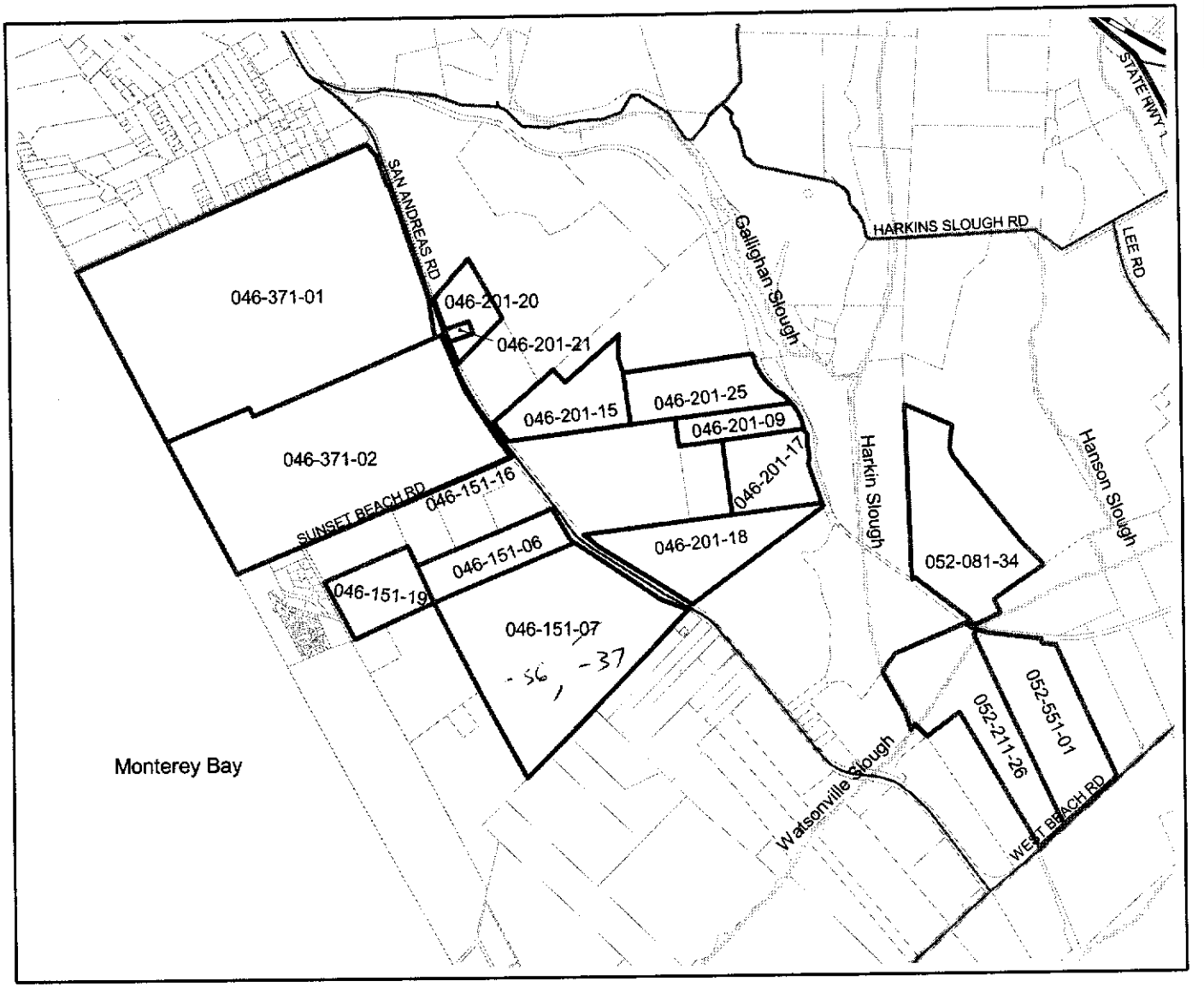
Map created by Santa Cruz County Planning Department: June 2004

EXHIBIT F

EXHIBIT F

Parcels Along ICDS Alignment



Map created by Santa Cruz County
Planning Department:
June 2004

EXHIBIT F

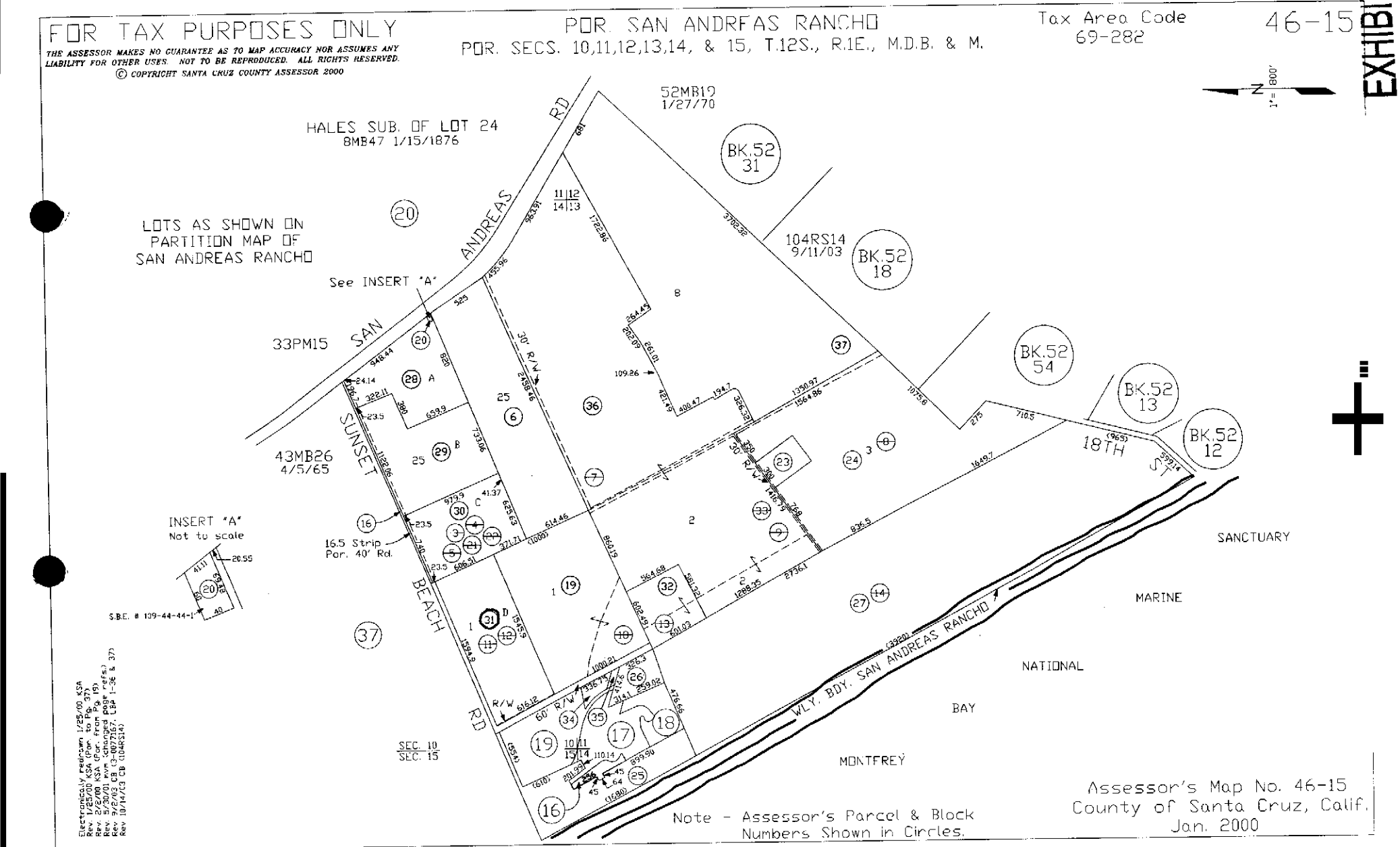
EXHIBIT F

FOR TAX PURPOSES ONLY

POR. SAN ANDRFAS RANCHO
POR. SECS. 10,11,12,13,14, & 15, T.12S., R.1E., M.D.B. & M.

Tax Area Code
69-282

46-15



Assessor's Map No. 46-15
County of Santa Cruz, Calif.
Jan. 2000

Electronically redrawn 1/25/00 KSA
Rev. 1/25/00 KSA (Por. to Pg. 37)
Rev. 2/2/00 KSA (Por. from Pg. 19)
Rev. 5/30/01 mm (changed page refs.)
Rev. 9/2/02 CB (104RS14, LM 1-36 & 37)
Rev 10/14/03 CB (104RS14)

EXHIBIT F

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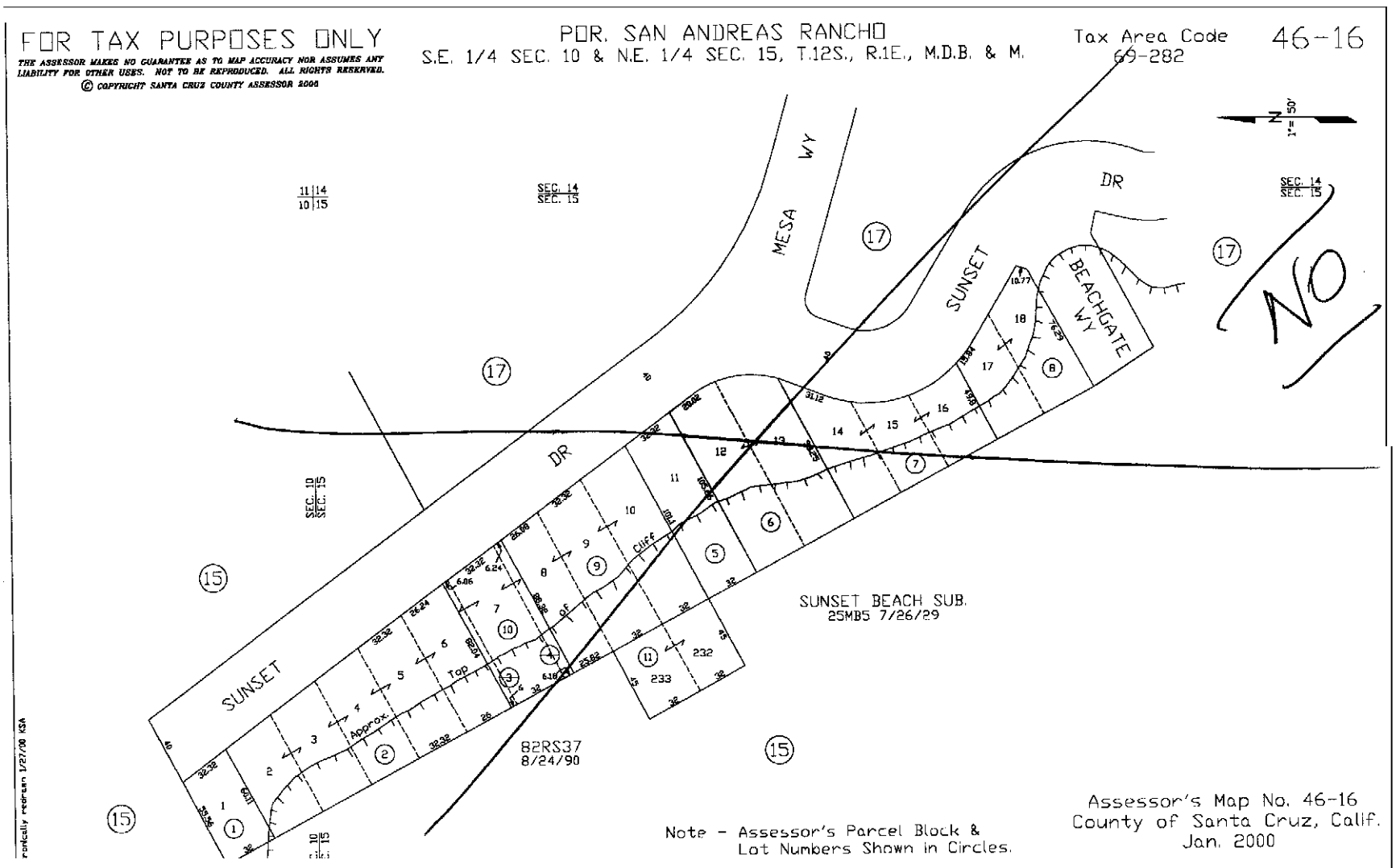
FOR TAX PURPOSES ONLY

POR. SAN ANDREAS RANCHO
S.E. 1/4 SEC. 10 & N.E. 1/4 SEC. 15, T.12S., R.1E., M.D.B. & M.

Tax Area Code 69-282

46-16



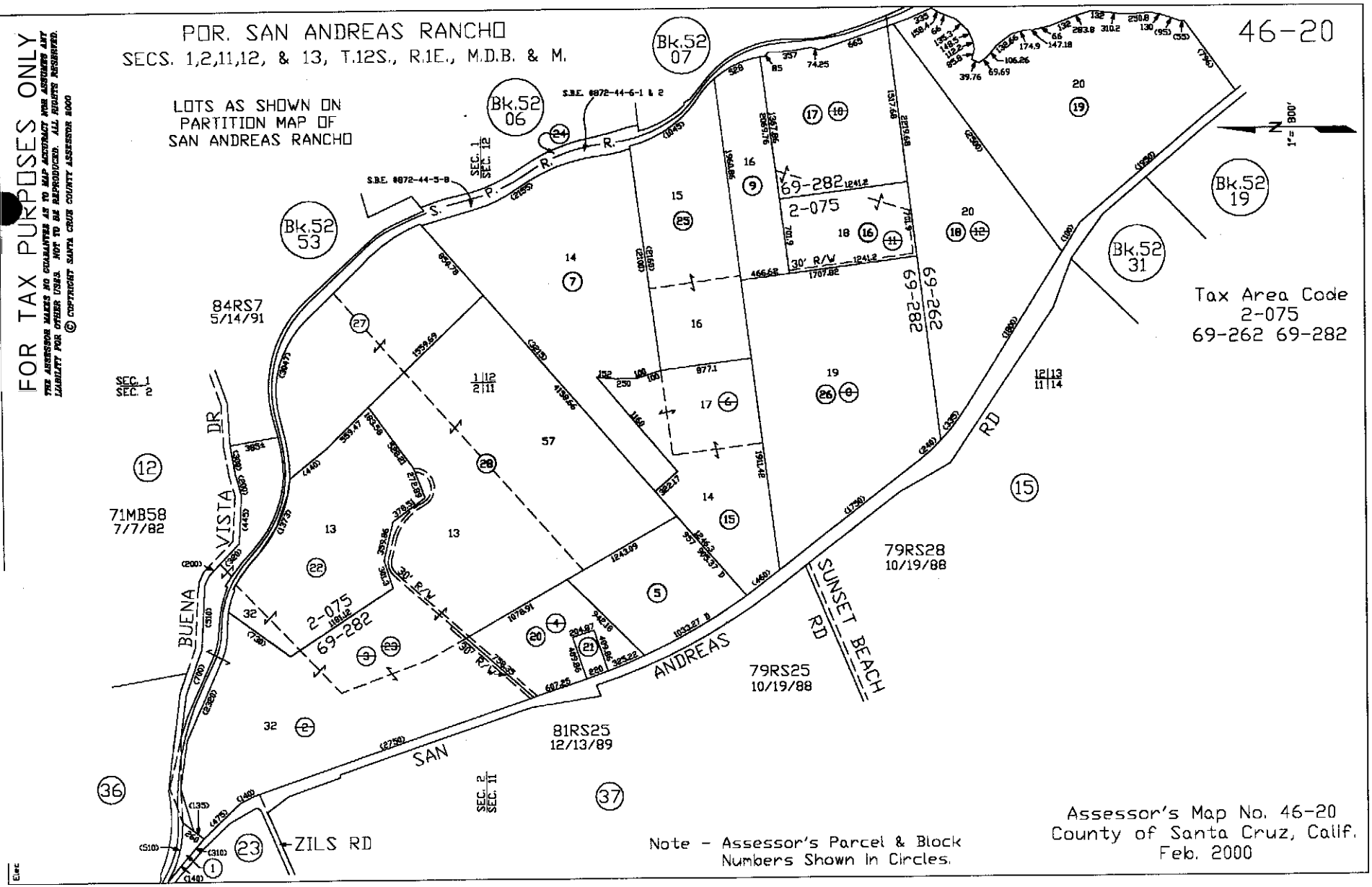
NO

Note - Assessor's Parcel Block & Lot Numbers Shown in Circles.

Assessor's Map No. 46-16
County of Santa Cruz, Calif.
Jan. 2000

radically redrawn 1/27/00 KSA

EXHIBIT F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SECS. 1,2,11,12, & 13, T.12S., R.1E., M.D.B. & M.
LOTS AS SHOWN ON PARTITION MAP OF SAN ANDREAS RANCHO
46-20
Bk.52 07
Bk.52 06
Bk.52 53
Bk.52 19
Bk.52 31
S.B.E. 8872-44-5-8
S.B.E. 8872-44-6-1 & 2
84RS7 5/14/91
71MB58 7/7/82
79RS28 10/19/88
79RS25 10/19/88
81RS25 12/13/89
69-282
69-262
2-075
30' R/W
BUENA VISTA DR
SUNSET BEACH RD
SAN ANDREAS RD
ZILS RD
SEC. 1 SEC. 2
SEC. 1 SEC. 12
SEC. 2 SEC. 11
Tax Area Code
2-075
69-262 69-282
Note - Assessor's Parcel & Block Numbers Shown In Circles.
Assessor's Map No. 46-20
County of Santa Cruz, Calif.
Feb. 2000

EXHIBIT F

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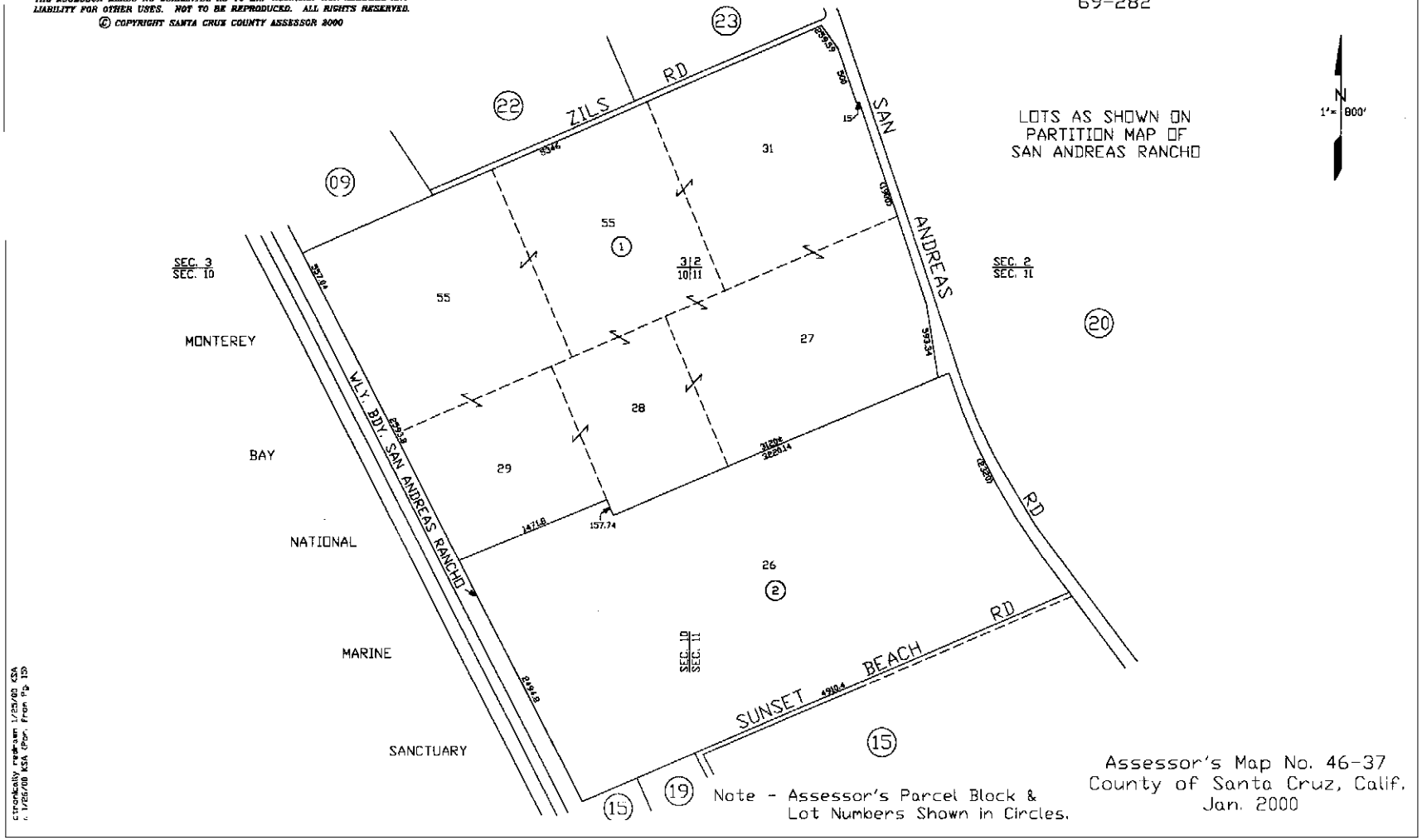
FOR TAX PURPOSES ONLY

POR. SAN ANDREAS RANCHO

POR. SECS. 2,3,10 & 11, T.12S., R.1E., M.D.B. & M.

Tax Area Code
69-282

46-37



Assessor's Map No. 46-37
County of Santa Cruz, Calif.
Jan. 2000

Note - Assessor's Parcel Block & Lot Numbers Shown in Circles.

Cronically replaces 1/25/00 KSA
& 1/26/00 KSA (Por. From Pg 15)

EXHIBIT F

101

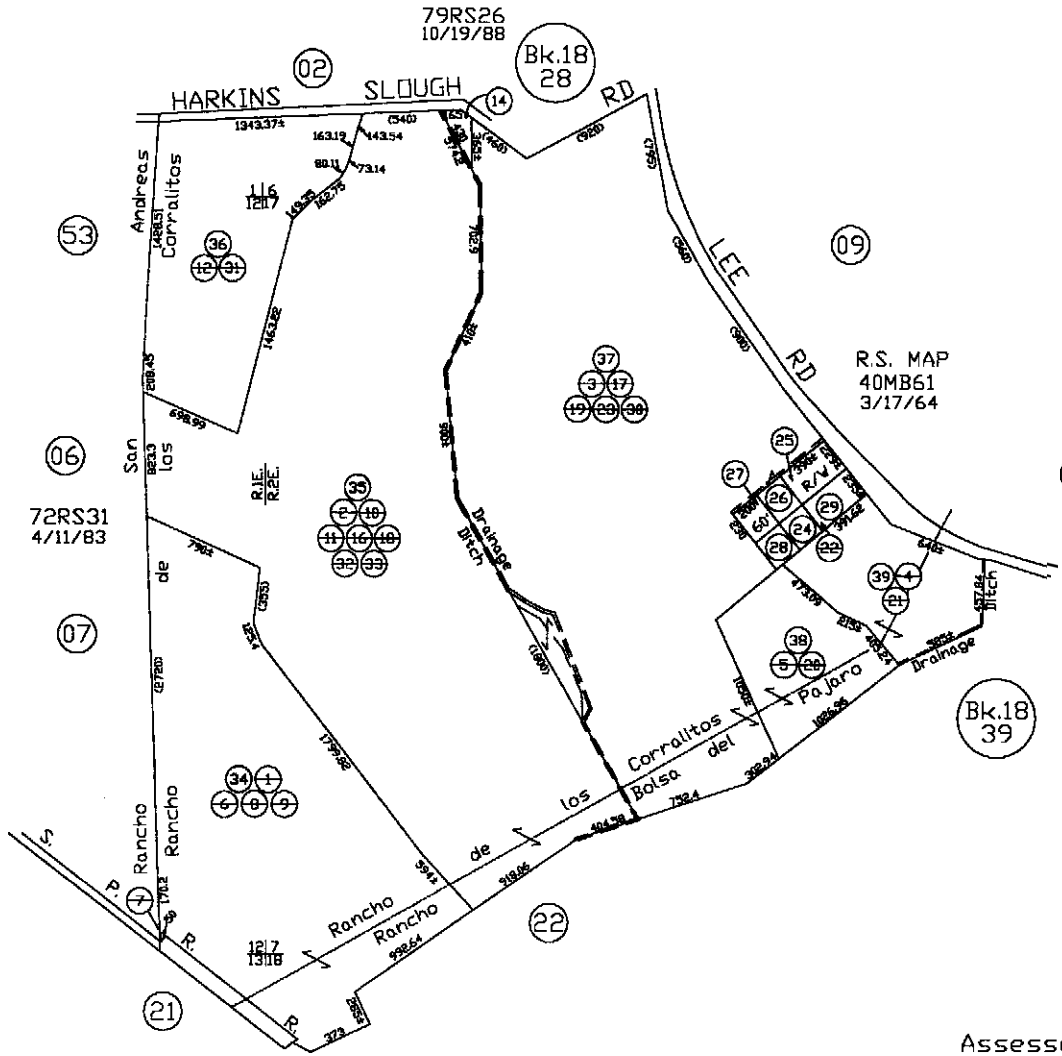
FOR TAX PURPOSES ONLY

POR. PAJARO & CORRALITOS RANCHOS

SECS. 1 & 12, T.12S., R.1E.,
SECS, 6,7 & 18, T.12S., R.2E., M.D.B. & M

Tax Area Code
69-262

52-08



Note - Assessor's Parcel & Block Numbers Shown in Circles

Assessor's Map No. 52-08
County of Santa Cruz, Calif
Aug. 1951

EXHIBIT F

FOR TAX PURPOSES ONLY

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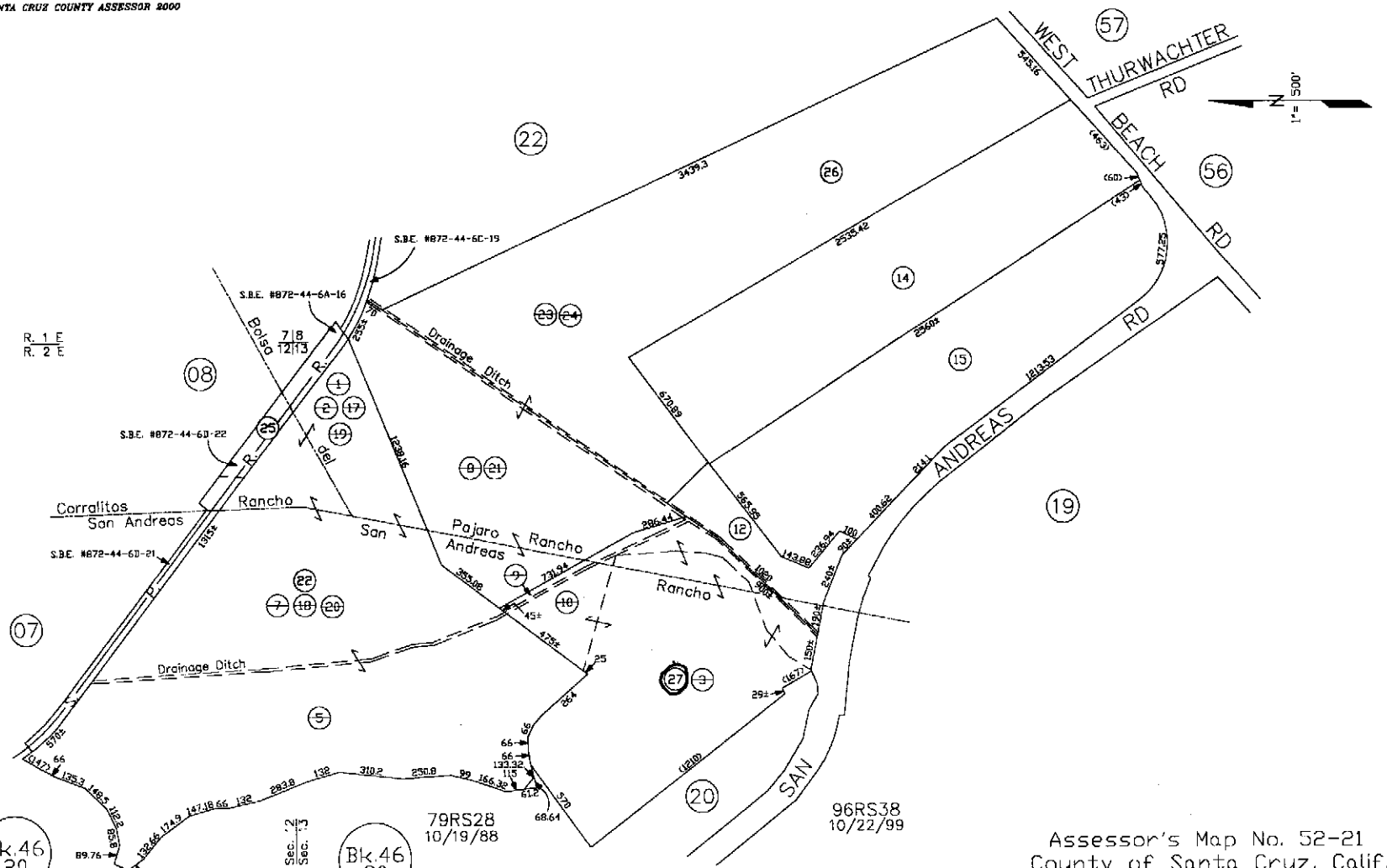
POR. SAN ANDREAS & PAJARO RANCHO'S

SECS. 12 & 13, T.12S., R.1E., & SEC. 8 T.12S., R.2E., M.D.B. & M.

Tax Area Code 69-262

52-21



Note - Assessor's Parcel & Block Numbers are Shown in Circles.

Assessor's Map No. 52-21
County of Santa Cruz, Calif.
Aug. 2000

Electronically rendered 8/5/00 KSA

1/2

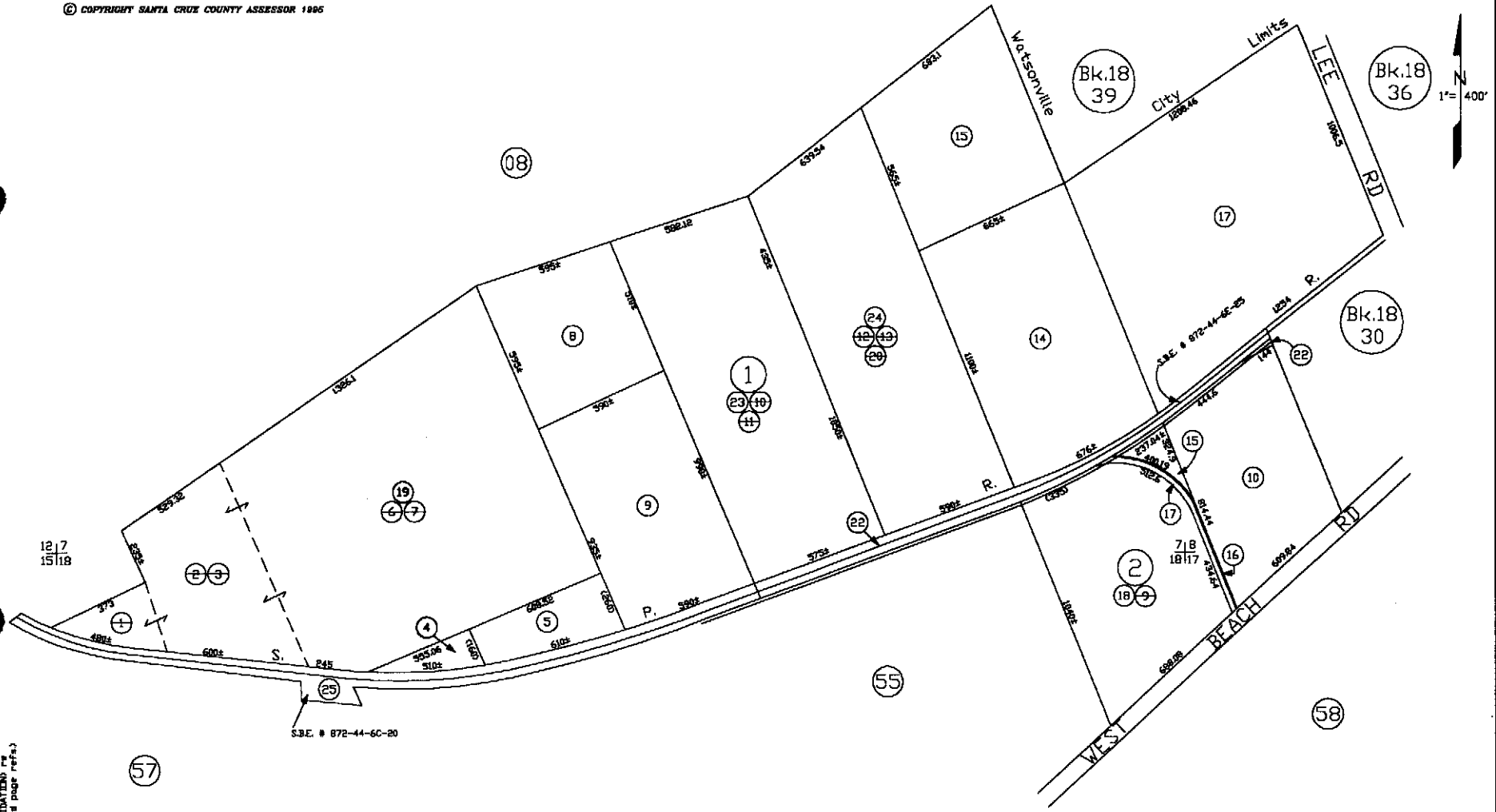
FOR TAX PURPOSES ONLY

POR. RANCHO BOLSA DEL PAJARO

SEC.S 7,8, & 18, T.12S., R.2E., M.D.B.&M

Tax Area Code
69-262

52-22



Note - Assessor's Parcel & Block Numbers Shown in Circles.

Assessor's Map No. 52-22
County of Santa Cruz, Calif.
Sept. 1951

Electronically drawn 11/9/95 KSA
Rev. 6/2/98 (TCA CONSOLIDATION) rw
Rev. 6/12/01 nvm (changed page refs.)

EXHIBIT F

103

EXHIBIT F

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POR. RANCHO BOLSA DEL PAJARO
SECS. 7,8, & 18, T.12S., R.2E., M.D.B. & M

Tax Area Code
69-262

52-55

Note - Assessor's Parcel & Block Numbers Shown in Circles

Assessor's Map No. 52-55
County of Santa Cruz, Calif.
Nov. 1995

electronically drawn 12/13/95 KSA
rv. 6/12/98 CTCA CONSOLIDATION rv
rv. 6/13/01 mvn (changed page refs)

10Y

EXHIBIT F

105

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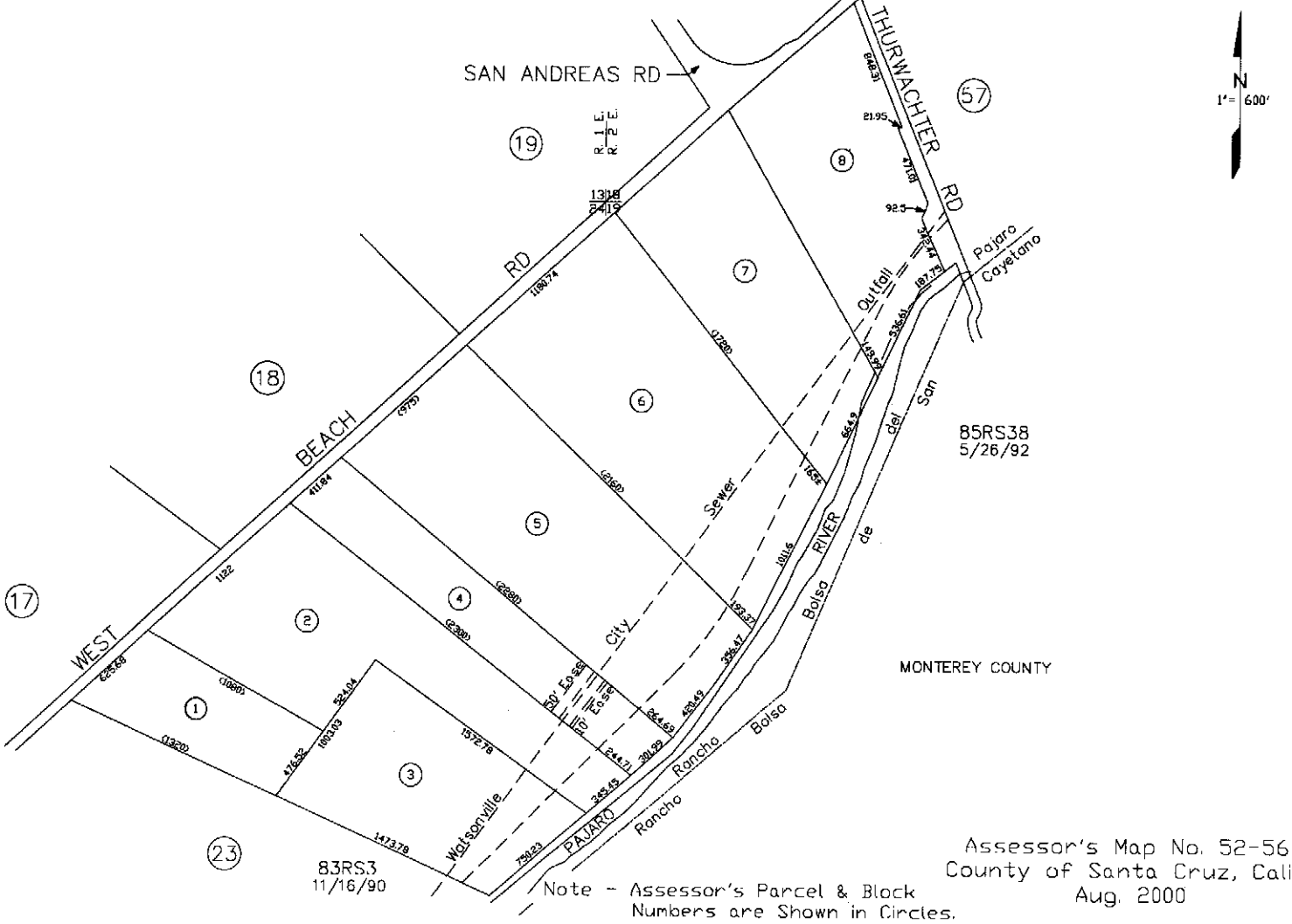
POR. RANCHO BOLSA DEL PAJARO
SECS. 24, T.12S., R.1E., &
SECS. 18 & 19, T.12S., R.2E., M.D.B. & M.

Tax Area Code
69-262

52-56



Note - Assessor's Parcel & Block Numbers are Shown in Circles.

Assessor's Map No. 52-56
County of Santa Cruz, Calif.
Aug. 2000

Electronically redrawn 8/8/00 KSA
Rev. 8/8/00 KSA (Por. From Pg. 23)

EXHIBIT F

106

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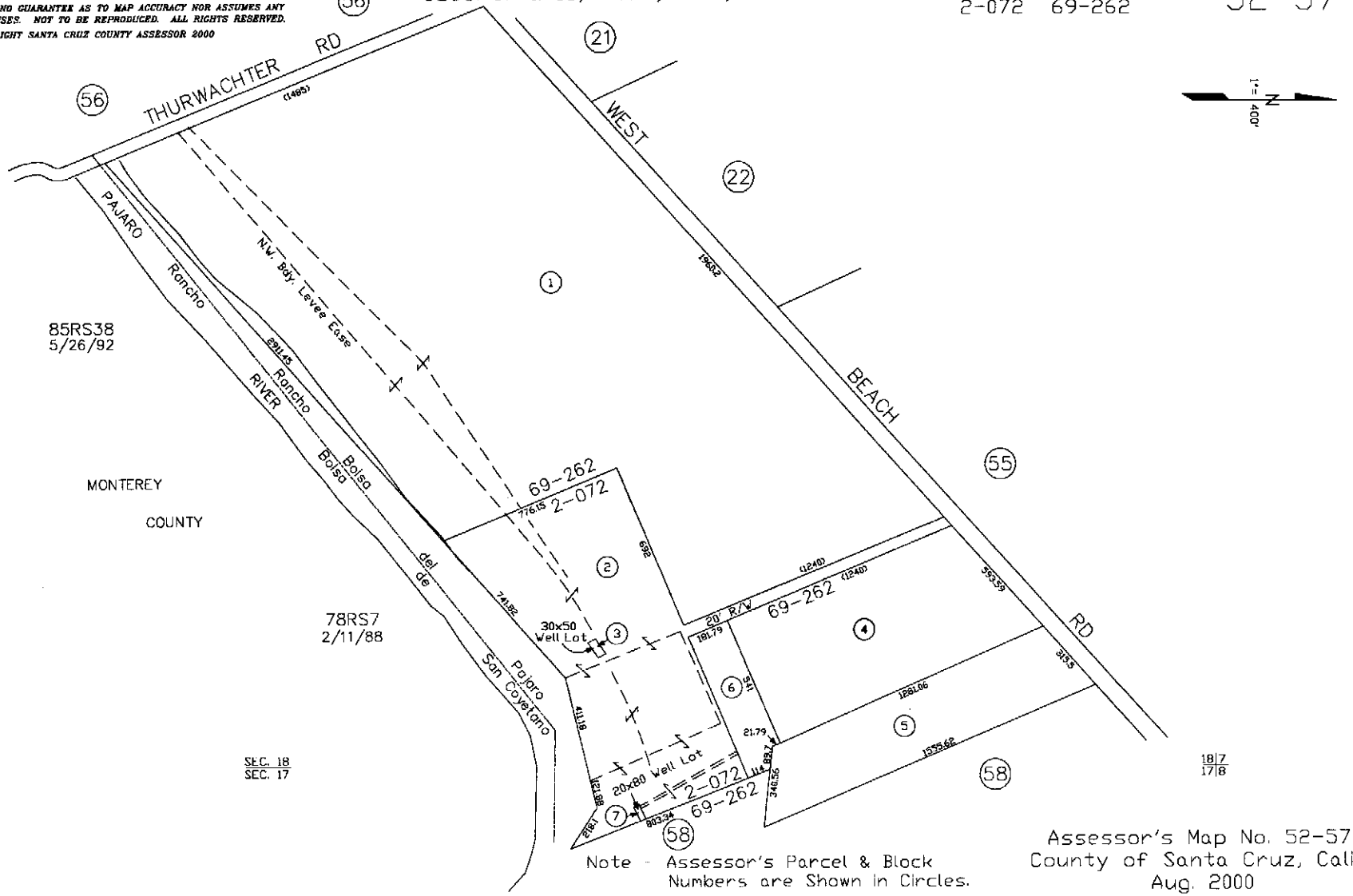
SECS. 17 & 18, T.12S., R.2E., M.D.B. & M.

Tax Area Code
2-072 69-262

52-57

1" = 400'



Note - Assessor's Parcel & Block Numbers are Shown in Circles.

Assessor's Map No. 52-57
County of Santa Cruz, Calif.
Aug. 2000

Electronically reandsn 8/13/00 KSA
Rev. 8/13/00 KSA (Por. from Pg. 24)

52-58
1" = 400'
Tax Area Code
69-262
72RS3
8/27/82
Assessor's Map No. 52-58
County of Santa Cruz, Calif.
Aug. 2000
POR. RANCHO BOLSA DEL PAJARO
SECS. 8,17 & 18, T.12S., R.2E., M.D.B. & M.
Note - Assessor's Parcel & Block Numbers are Shown in Circles.
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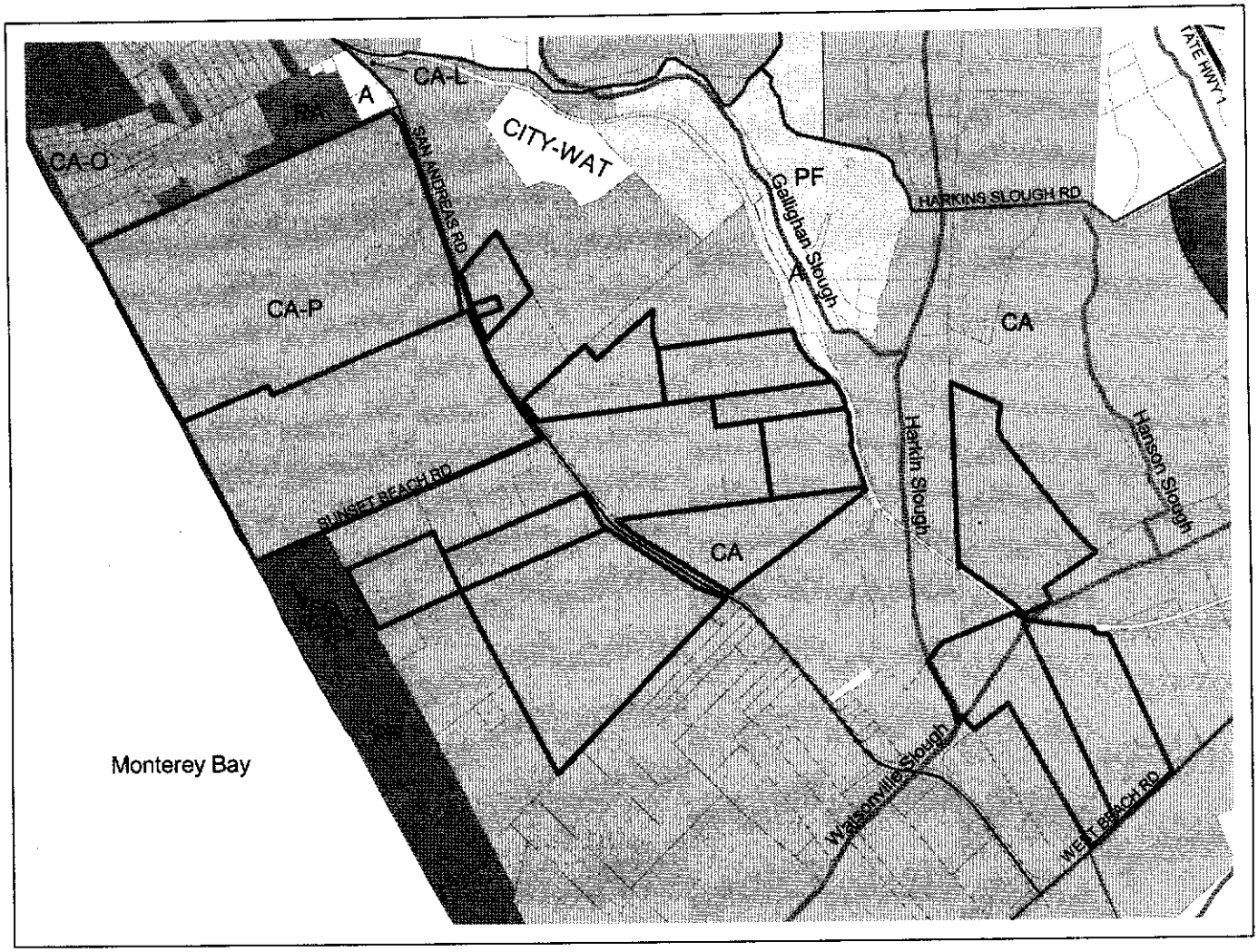
© COPYRIGHT SANTA CRUZ COUNTY ASSESSOR 2000
Electronically Prepared 8/13/00 KSA
Rev. 8/13/00 (Por. from Pg. 24)
BEACH RD
WEST
LEE RD
STATE HWY 1
HWY 1
STATE
PAJARO RIVER
Del Pajaro
Rancho Bolsa
20' R/W
Bk.18 30
Bk.18 30

Zoning **Map**



1 0 1 2 Miles

Legend

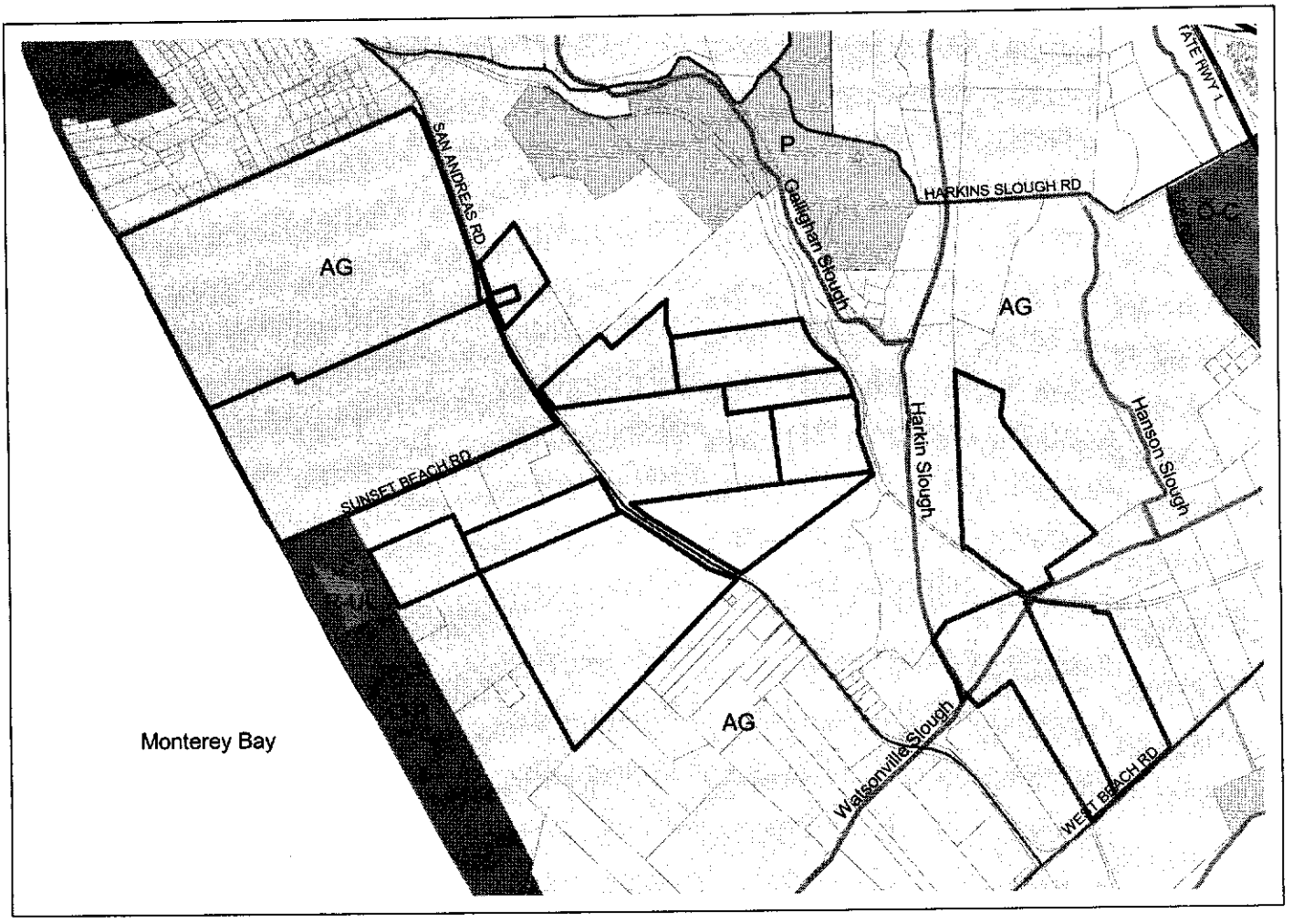
- Subject Parcels
- State highways
- Streets
- Perennial Stream
- Parcel boundaries
- A
- PF
- CA
- RA
- PR
- R-1-6

N

Map created by Santa Cruz County Planning Department: June 2004

EXHIBIT G

General Plan Map



1 0 1 2 Miles

Legend

- Subject Parcels
- State highways
- Perennial Stream
- Parcel boundaries
- Agriculture
- Public Facilites
- Residential - Urban Low Density
- Resource Conservation
- Parks and Recreation

N

Map created by Santa Cruz County Planning Department: June **2004**

EXHIBIT G

ESA Environmental Science Associates

June 2, 2004

Joan Van der Hoeven
Santa Cruz County
Planning Department
701 Ocean Street, 4'' Floor
Santa Cruz, CA 95060

Subject: Coastal Permit Application Submittal for the Pajaro Valley Water Management Agency Revised (PVWMA) Basin Management Plan Projects

Dear Ms. Van der Hoeven:

On August 12,2003. the Pajaro Valley Water Management Agency (PVWMA) initiated the process to obtain a Coastal Development Permit by attending a preapplication meeting for implementation of its Revised Basin Management Plan Projects (project). The project is proposed to develop new water supplies to the Pajaro Valley Basin. and to alleviate conditions of groundwater overdraft. ground subsidence and seawater intrusion.

The proposed project is comprised of three components: the Import Pipeline?Recycled Water Facility, and Integrated Coastal Distribution System (ICDS). Portions of the Import Pipeline and Integrated Coastal Distribution System (ICDS) are located in Santa Cruz County. The purpose of the Import Pipeline is to connect the Pajaro Valley Basin with the Santa Clara Conduit of the San Felipe Unit facilities to allow PVWMA to take delivery of CVP contract water and water from other sources. This water would be used for distribution to agricultural users via the ICDS. Project components within the Coastal Zone in Santa Cruz County include 12-inch diameter pipelines, distribution turnouts, and pump stations. The ICDS is the second phase of the PVWMA Water Supply Project which is a component of the Revised Basin Management Plan. The first phase included the Harkins Slough Project and the Accelerated Pipeline which both involved development in the Coastal Zone in Santa Cruz County under a previously issued Coastal Development Permit.

The proposed project requires approval by the U.S. Department of the Interior, Bureau of Reclamation; therefore, an Environmental Impact Statement (EIS) was prepared to satisfy requirements under the National Environmental Policy Act (NEPA). In addition, formal consultation with the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries under Section 7 of the Endangered Species Act was completed during the NEPA process. A Biological Opinion (BO) was issued by NOAA Fisheries and the USFWS in August 2003 and March 2004, respectively. In addition, a Programmatic Agreement between the State Historic Preservation Office *(SHPO)* and the Army Corps of Engineers issued in 2000 for the Harkins Slough Project is currently under amendment to include the entire project (i.e. Import Pipeline, ICDS, and Recycled Water Facility).

EXHIBIT H

225 Bush Street, Suite 1700 San Francisco, California 94104 (415) 896-5900 *fax* 896-0332 email: esa.sf@esassoc.com

PVWMA is submitting an application for a Coastal Development Permit pertaining to portions of the Import Pipeline and ICDS that are located in the coastal zone in Santa Cruz County and therefore subject to the Local Coastal Program. Included in this submittal are 15 copies of the following:

- Project Description
- Project Location Maps and Site Plans

The project description provides the necessary information required for a Coastal Development Permit as the application requirements apply to the proposed project. The project location maps and site plans provide both an overview of the project components and detailed site plans with on an aerial base demonstrating the proposed location for pipelines in relation to existing features. The site plans also include parcel number information. A table is provided as an appendix in the project description that provides land owner information for each of the parcel numbers provided in the site plans. PVWMA is currently in the process of attaining the necessary owner/agent documentation required by the County. It is expected that this information will be available in early July, and will be forwarded as soon as it is completed.

A meeting was held with Santa Cruz County on April 23.2004, to discuss the project and the needed application materials to streamline the permitting process. At this meeting, PVWMA provided Santa Cruz County with copies of the Lead Agency Findings and Notice of Determination for the Local Coastal Project EIR prepared and certified in May 1999.

It is PVWMAs intent to provide this information in a clear and concise manner in order to expedite your review. Please contact Jennifer Johnson or myself at (415) *896-5900,* or Mary Bannister of PVWMA at (831) 722.9292 if additional information is required pertaining to the application submission.

Sincerely.

Johanna Evans, Permit Manager
Environmental Science Associates
Consultant for PVWMA

Enclosures: Project Maps and Site Plans (15 copies)
Project Description (15 copies)
NOAA Fisheries and USFWS Biological Opinions
CD containing: Local Water Supply and Distribution Final EIR, EIR Addendum and NOD;
Revised Basin Management Plan Project Draft EIS and Final EIS

EXHIBIT H

ESA Environmental Science Associates

June 23, 2004

Joan Vanderhoeven
County of Santa Cruz, Planning Department
701 Ocean Street
Santa Cruz, CA 95060

Subject: Pajaro Valley Water Management Agency Revised (PVWMA) Basin Management Plan Project.

To Whom It May Concern:

The Pajaro Valley Water Management Agency (PVWMA) is proposing to implement the Basin Management Plan Projects (project) to develop new water supplies to the Pajaro Valley Basin, and to alleviate conditions of groundwater overdraft, ground subsidence and seawater intiusion. The objective of this project stems from the need to augment Pajaro Valley water supplies to address problems of groundwater overdraft and seawater intrusion. In the Pajaro Valley Basin, groundwater levels have declined as the groundwater pumping rate has exceeded the rate of natural replenishment. In the coast areas overdraft conditions have caused groundwater levels to drop below sea level, creating a landward pressure gradient that causes the fresh water to stratify above sea water.

In order to attain the objectives of this project, a 22.2 mile pipeline will be constructed to link the Pajaro Valley Basin with the Santa Clara Conduit of the San Felipe Unit facilities to allow the PVWMA to take delivery of CVP contract water and water from other sources. This pipeline (Import Pipeline) will connect to the proposed Integrated Coastal Distribution System (ICDS) on the north side of the Pajaro river levee, roughly 1,900 feet west of SR 1. The ICDS consists of facilities (pipelines, pump stations, turnouts, and crossings) required to provide complete irrigation to agricultural user in the coastal area of the Pajaro Valley Basin. With the delivery of the water, growers have agreed to eliminate groundwater pumping in the coastal area roughly bounded by Monterey Bay to the west, SR 1 to the east, Elkhorn Slough to the south, and Buena Vista Drive and Harkins Slough Road to the north.

Under the Santa Cruz County General Plan and Local Coastal Program, policies are provided to guide land use decisions within the "coastal zone" in Santa Cruz County. For purposes of attaining this Coastal Development Permit, the "coastal zone" is defined as property in Santa Cruz County west of Highway 1. Although this project encompasses several components in several different counties, only two components, one portion of the Import Pipeline project and

225 Bush Street, Suite 1700 San Francisco, California 94104 (415) 896-5900 fax 896-0332 email: esa.sf@esa.socal.com

EXHIBIT H

two portions of the ICDS, the North Plateau Lateral & the Northeast Addition Lateral, are located within the "coastal zone" of Santa Cruz County.

Moreover, the California Coastal Commission (CCC), after review of their post certification maps has determined that it retains permitting jurisdiction for a portion of the proposed Import Pipeline in the "coastal zone" of Santa Cruz County located from the county border in the center of the Pajaro River to the edge of the existing levee.

For your information and records, in addition to the CCC Application for Coastal Development PVWMA is actively pursing the necessary approval from other appropriate Federal, State and County agencies for the implementation of the pipeline project in this area of the Pajaro River as retained under the jurisdiction of the CCC. Numerous permits are being pursued for the project as a whole; however, the following is a list of the permits as well as environmental documentation specifically necessary for the pipeline crossing at the Pajaro River.

- Federal

    a. United States Army Corp of Engineers, Section 404 Nationwide Permits 12 (Utility Line Activities) and 33 (Temporary Construction, Access, and Dewatering). **Issued**

    b. United States Fish and Wildlife Service and NOAA Fisheries, Consultation under Section 7 of the Endangered Species Act. **Biological Opinions Issued**

- State

    a. California Regional Water Quality Control Board, Central Coast Region, Section 401 Standard Water Quality Certification for Discharge of Dredged and/or Fill Materials: **Issued**

    b. California Regional Water Quality Control Board, Central Coast Region, Section 401 Water Quality Certification or Waiver of Certification for Fill of Wetlands and Other Waters of the United States: **Issued**

    c. California Department of Fish and Game, Section 1603 Notification of Lake or Streambed Alteration: **Pending**

    d. California Coastal Commission, Application for Coastal Development Permit: **Pending**

Lastly, a requirement of the CCC's Coastal Development Permit Application, is that the applicant. PVWMA. must submit evidence that the development proposed within the

EXHIBIT H

ESA Environmental Science Associates

Commission's jurisdiction in Santa Cruz County, as described above, has been approved by Monterey County. Therefore, we respectfully request, that the County of Santa Cruz Planning Department consider this requirement during its review of PVWMA's application. If you have any questions regarding this matter, please feel free to contact me at 415-896-5900, or Mary Banister of PVWMA at (831) 722-9292.

Sincerely,

Jennifer Johnson, Senior Associate
Environmental Science Associates
Consultant for PVWMA

EXHIBIT H

ESA Environmental Science Associates

July 9, 2004

Joan Van der Hoeven
County of Santa **Cruz,** Planning Department
701 Ocean Street
Santa Cruz. CA 95060

Subject: PVWMA Preliminary Comments, Application 04-0258 Response to Comments

To Whom It May Concern:

The Pajaro Valley Water Management Agency (PVWMA) is proposing to implement Phase 3 of the Basin Management Plan Projects (project) to develop new water supplies to the Pajaro Valley Basin. and to alleviate conditions of groundwater overdraft, ground subsidence and seawater intrusion. **As** discussed in Permit No.: 99-0335. the objective of Phase 3 was to implement pipeline construction of the Northeast Addition Lateral, which starts approxiinately .25 miles northeast of the intersection of San Andreas/Beach Road following a farm road for approximately 1.25 miles (*now .6 miles*) northwest. to serve 14 (*now 4*) parcels. The Northeast Addition Lateral is proposed to cross Watsonville Slough. In addition to the Northeast Addition Lateral, a new lateral, the North Plateau Lateral is proposed for construction as part of Phase 3.

The North Plateau Lateral begins just north of the Harkins Slough Recharge Basin extending about .4 miles from which point it continues both east. approximately .4 miles and west. approximately .5 miles. crossing San Andreas Road. From the road crossing of San Andreas Road the lateral extends north for approximately 1.5 miles ending on Academy Road. There are three sub-laterals that extend off the San Andreas Road lateral. The first is a .2 mile lateral following Sunset Beach Drive westward. The second is following a county road approximately 100 feet north of the Sunset Beach/San Andreas Road intersection. extending approximately .3 miles east then extending an additional 200 feet south. Off this second lateral. at approximately mile inarker .4, another sub-lateral extends north for .3 miles. The third lateral is approximately 1 mile south of Academy Road and extends approximately .2 miles northwest following a county road that leads to the city dump. The North Plateau Lateral will serve 20 parcels of land.

The following remarks are in response to a memo entitled "Preliminary Coininents, Application 04-0258". faxed to ESA on 6/23/04 from Joan Van der Hoeven of the County of Santa Cruz Planning Department.

Comment 1: The 1999 EIR describes the anticipated network of distribution lines and lateral. This network was somewhat modified and a few hydraulic features added and therefore an EIR addendum was produced in August 2003. The plan that came in with the Application 04-0258 (Figure 1. Key Plan) is somew hat modified from what was analyzed in 2003.

EXHIBIT H

225 **Bush** Street, Suire 1700 San **Francisco, California** 94104 (415) 896-5900 *fax* 896-0332 email: **era.sf@erasioc.com**

ESA Environmental Science Associates

Comment **1a:** Please confirm that there is no extension at Beach Drive proposed at this time and no crossing of the Pajaro River. These are both in the 2003 addendum hut not on the current plan. These are the two areas in which the Coastal Commission (CCC) indicated jurisdiction. If the applicant proposes to accomplish these two crossings but under separate permit directly with the CCC then this permit that we issue should show the areas but explicitly state "not a part" of the approval.

Response **1a:** There is no extension at Beach Drive proposed at this time. However, there will be a crossing at the Pajaro River. This crossing is within the "coastal zone" and is part of the Import Pipeline project. Information provided by the CCC regarding this project indicates that coastal permit jurisdiction for the pipeline is limited to the crossing of the Pajaro (between the top edges of the existing levees). We understand that because the CCC will take jurisdiction of the portion of the Import Pipeline in the Pajaro River, Santa Cruz County permit will not include this crossing in approval of this project.

Comment **1b:** Is the pump station (2003 addendum) part of the application. If yes, it should be shown on Figure 1. Also they should submit plans showing the station and fence so we can evaluate need for conditions to mitigate visual impact in the special coastal scenic area (such as building and fence color/materials).

Response **1b:** Although a pump station is under consideration, and studies continue for the siting and design of the facility. it is not part of the current application.

Comment **1c:** Of the lines and crossing discussed in the 2003 addendum six are environmentally sensitive. However, three or four of those don't appear in this application, therefore the focus will be on the lines crossing Harkins Slough and Watsonville Slough I need a to see details of proposed crossing to see how mitigation measures specifying certain construction/design techniques are bring implemented. Also, my Figure 1 is missing the Harkins slough "j" line (it only goes through "I").

Response **1c:** Based on refined project designs of turnout locations and alignments, the only environmentally sensitive location in Santa Cruz County is the crossing of Watsonville Slough. Unlike the originally proposed crossing techniques, which was to trench across the slough, the alignment is now proposed to stay within the road and trench under the culvert; therefore, impacts to the slough are not anticipated and no marsh vegetation or habitat wiii be directly disturbed. The Biological Opinion issued by Fish and Wildlife Service (March 19,2004) for this project indicated that this location of Watsonville Slough was poor habitat for California red legged frog, California tiger salamander, western pond turtle. and Santa Cruz long-toed salamander (these were the species identified as sensitive in this area).

Construction across Watsonville Slough will be contained to the road, biological fencing will be erected to prevent construction equipment spoils and any other construction related debris or materials from entering the slough. In addition, activities at this location will be monitored daily by a qualified biologist. As indicated in the Local Supply Project EIR, PVWMA will implement standard protective measures to maintain water quality and control erosion and sedimentation through the implementation of a Storm Water Pollution Prevention Plan (SWPPP). Mitigation measures as stipulated in the Biological Opinion will also he applied to consti-uction including preconstruction surveys. environmental training of construction crews, and all affected areas will be returned to their original condition at tlie end of all project activities. If dewatering of the trench is required during construction, intakes will be completely screened, and water will be released or pumped downstream at an appropriate rate to maintain

EXHIBIT 4

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ESA Environmental Science Associates

downstream flows during construction. ***(See*** Biological Opinion for further details of required mitigation measures)

If you have any questions or need further information clarifying these matters, please feel free to contact me at 415-896-5900, or Mary Banister of PVWMA at (831) 722-9292.

Sincerely

Jennifer Johnson

Jennifer Johnson, Senior Associate
Environmental Science Associates
Consultant for PVWMA

cc Mary Banister, PVWMA
Lidia Gutierrez, RMC
Pete Rude. CH2MHill

EXHIBIT 1

221 Bush Street, Suite 1700 San Francisco, California 94104 (415) 896-1900 *fax* 896-0332 email: esa.sf@esassoc.com

COUNTY OF SANTA CRUZ
PLANNING DEPARTMENT

DATE July 22,2004
TO Joan Van der Hoeven, Cathy Graves
FROM: Paia Levine, Environmental Planning
SUBJECT: Comments PVWMA

Comments on PVWMA AP # 04-0258 dated July 5, 2004

I received plans showing the pipeline construction and specifically the crossing of Watsonville Slough on Monday July 19. I have reviewed those plans and have the following comments (this is the second set of comments for the project). Note that Bob Loveland is also preparing comments addressing Resource Planning issues and technical issues related to the Preliminary Grading Approval.

1. These comments apply only to the portion of the ICDS that appears on the Key Index, Figure 1, CH2MHill, June 11 2004. The plans show pipeline segments that are not connected to each other and future additional lines may be expected.
   There should be a project condition that states that only segments shown on the Key Index are covered and that future connectors will be evaluated separately. Reason: The future connections may include crossings of wetland and riparian areas.

2. We have been provided with 30% plans to review. A *permit* condition should state that EP staff shall review and approve the final plans in writing prior to exercise of the permit.

3. The sensitive part of the project is the portion of pipe that crosses Watsonville Slough. The comments apply to that portion of pipeline.

4. The EIR, EIR addendum, and the project biological opinion (BO) prepared by the USFWS (March 19, 2004) required a series of avoidance and mitigation measures to mitigate impacts from possible sedimentation of drainages, disturbance within wetlands and/or riparian corridors, impacts to wildlife, etc. At the permit stage those mitigation measures must be translated into a site specific erosion and sediment control plan for the crossing (the elements of which are specified in the mitigation measures), vegetation restoration plan, etc. Specific plans that implement the various mitigation measures have not been submitted. Normally we would require these plans prior to the public hearing, but due to the funding deadline we can require them prior to exercising the permit.

   a. Please add a project condition that states that a detailed erosion control plan, including spoils management, location of staging areas, diversion of flows as necessary, timing of the construction activities, details of sediment control structures, designated site to receive spoils, and all other elements required by the applicable Mitigation Measures and BO must be reviewed and approved in writing by EP staff prior to exercise of the permit.
      Further project conditions having to do with erosion control and containment:
      - work shall occur between August 1 and October 15;
      - staging areas shall be located at least 50 feet from waterway and shall be confined to the southwest si& of the railroad track;
      - project plans shall be revised to show detail of the boring entry and exit pits adequate to verify design consistent with standards called for in the BO.

   b. Please add a project condition that states that if any wetland or riparian vegetation is disturbed a detailed revegetation plan, including replacement with locally collected plants at the ratio of 3: 1, success goals, three year maintenance and monitoring plan, weed control, and all other elements required by the applicable Mitigation Measures must be reviewed and approved in writing by EP staff prior to exercise of the permit.
      Further project conditions having to do with vegetation:
      - Revise the project plans to indicate fencing demarcating the 25 foot riparian comdor setback where work will occur within thirty feet of the comdor.

EXHIBIT H

c. ***Project conditions*** regarding impacts to wildlife:

- Biological monitor shall conduct surveys for special status species covering the **slough** crossing and the staging areas within two weeks of beginning that portion of the work, **as** called for in the BO. Results of the surveys **shall** be **submitted** to **EP** *staff.*
- Biological monitor shall be **on** site during all drilling and construction of the crossing;
- Final plans **shall show** the location of exclusionary fencing;
- **Recommendations** of the BO, including follow up monitoring of relocated individuals, shall be followed.

For *ANY* **portion** of the **ICDS:**

- Final plans shall indicate **areas** of Freshwater Emergent Wetland **or** Valley Foothill Riparian **(as** designated in the EIR). No construction shall **occur** between March 1 **and** July 30 within 500 feet of these **areas unless** work is preceded by surveys, carried **out as described in the EJR** and BO, **that show** an absence of protected **bird** species. Survey results shall be **submitted** to EP staff prior to disturbance in these **areas**.

EXHIBIT H

Project Planner: Joan Van Der Hoeven
Application No.: 04-0258
APN: 046-151-06

Date: July 28. 2004
Time: 10:48:14
Page: 1

Environmental Planning Completeness Comments

========= REVIEW ON JULY 2, 2004 BY PAIA X LEVINE ========= 1. Applicant to clarify scope of project:does project include extension of Beach Drive and crossing of Pajaro? If so show on plans, even if those ========= UPDATED ON JULY 2, 2004 BY PAIA X LEVINE =========
========= UPDATED ON JULY 2, 2004 BY JOSEPH L HANNA =========
The project requires the construction of pipe through areas of liquefactionand also areas of weak soils. Please provide the design level please provide these reports. The PVWMA should who will inspect the installation.

The project should be conditioned for an erosion control plan.

Environmental Planning Miscellaneous Comments

========= REVIEW ON JULY 2. 2004 BY JOSEPH L HANNA =========
========= UPDATED ON JULY 23, 2004 BY ROBERT S LOVELAND =========

The following "Conditions of Approval" are based on a review of the "30% Design Drawings", dated 7/5/04:

1. Submit an approved storm water pollution prevention plan (covering areas shown on sheets: PP-23, PP-25 & PP-26).

2. Submit a detailed erosion control plan (covering areas shown on sheets: PP-23 PP-25 & PP-26).

3. Obtain a riparian exception from Environmental Planning

Project Review Completeness Comments

LATEST COMMENTS HAVE **NOT YET** BEEN SENT TO PLANNER FOR THIS AGENCY

========= REVIEW ON JULY 2, 2004 BY JOAN VAN DER HOEVEN =========
Submit owner/agent documentaion for all properties associated with the project. Identify any specific changes from the approved exhibits associated with Coastal Permit #99-0335 and this implementing phase. Document Coastal Commission jurisdiction of work adjacent to the Pajaro River, slough areas - identify specific areas.

Project Review Miscellaneous Comments

LATEST COMMENTS HAVE **NOT YET** BEEN SENT TO PLANNER FOR THIS AGENCY

========= REVIEW ON JULY 2, 2004 BY JOAN VAN DER HOEVEN =========
address all environmental planning comments, June 21 2004 levine memo

Dpw Drainage Completeness Comments

========= REVIEW ON JULY 1, 2004 BY CARISA REGALADO =========
Plans accepted as submitted and discretionary stage application review is complete

EXHIBIT I

for this division.

Dpw Drainage Miscellaneous Comments

========== REVIEW ON JULY 1, 2004 BY CARISA REGALADO ==========
No comment.

Dpw Driveway/Encroachment Completeness Comments

========== REVIEW ON JUNE 10, 2004 BY RUTH L ZADESKY ==========
ENCROACHMENT PERMIT REQUIRED FOR ANY WORK IN THE COUNTY ROAD RIGHT OF WAY

Dpw Driveway/Encroachment Miscellaneous Comments

========== REVIEW ON JUNE 10, 2004 BY RUTH L ZADESKY ==========
Encroachment permit required for all off-site work in the County road right-of-way

Dpw Road Engineering Completeness Comments

========== REVIEW ON JUNE 25, 2004 BY GREG J MARTIN ==========

Dpw Road Engineering Miscellaneous Comments

========== REVIEW ON JUNE 25, 2004 BY GREG J MARTIN ==========
An encroachment permit shall be required for any work in the Cour / right-of-way
Engineered plans shall be required.

Environmental Health Completeness Comments

========== REVIEW ON JUNE 29, 2004 BY JIM G SARRANEK ========== If any wells in the project are to be decomissioned (abandoned) a permit through EHS will be required.

Once a property is receiving water from the ICDS. how does PVWMA confirm that growers "have taken their wells out of service" (p.5) Does this mean well abandonment via a permit, or a well pump gets pulled (who confirms this ?). or some other protocol? Compliance with keeping wells out of service seems to be critical in implementing the plan.

Environmental Health Miscellaneous Comments

========== REVIEW ON JUNE 29, 2004 BY JIM G SARRANEK ==========
NO COMMENT

EXHIBIT M

COUNTY OF SANTA CRUZ
Planning Department

COASTAL ZONE/DEVELOPMENT/ RIPARIAN EXCEPTION PERMIT

Applicant: Pajaro Valley Water Management Agency **Permit Number** 99-0335
Address: 36 Brennan Street **Parcel Number(s)** 052-191-08, et al.

PROJECT DESCRIPTION AND LOCATION

Proposal to construct facilities and infrastructure to implement the Pajaro Valley Water Management Agency's Harkins Slough Recharge and Water Redistribution Project. The project consists of an intake and treatment facility at the existing Harkins Slough pump station, construction of a 50,000 cubic yard recharge basin and associated production wells, and approximately 26,000 lineal feet of distribution pipeline. Requires a Coastal Development Permit, Riparian Exception, preliminary Grading approval, and a General Plan policy interpretation. The proposed intake facility site is located at a reach of Harkins Slough near San Andreas Road. The recharge basin site is located at the end of Dairy Road. Distribution pipes are proposed on San Andreas and Dairy Roads between both sites and on Beach Road north and south of the Beach and San Andreas roads intersection, San Andreas planning area.

SUBJECT TO ATTACHED CONDITIONS.

Approval Date: 2-23-00 **Effective Date:** 3-8-00
Exp. Date (if not exercised): 3-8-02 **Coastal Appeal Exp. Date:** Call Coastal Comm.
Denied by: _____ **Denial Date:** _____

— This project requires a coastal zone permit which is not appealable to the California Coastal Commission. It may be appealed to the Planning Commission. The appeal must be filed within **14** calendar days of action by the decision body.

X This project requires a Coastal Zone Permit, the approval of which is appealable to the California Coastal Commission. (Grounds for appeal are listed in the County Code Section *13.20.110.)* The appeal must be filed with the Coastal Commission within **10** business days of receipt by the Coastal Commission of notice of local action. Approval or denial of the Coastal Zone Permit is appealable. The appeal must be filed within **14** calendar days of action by the decision body.

This permit cannot be exercised until after the Coastal Commission appeal period. That appeal period ends on the above indicated date. Permittee is to contact Coastal *staff* at the end of the above appeal period prior to commencing any work.

A Building Permit must be obtained (if required) and construction must be initiated prior to the expiration date in order to exercise this permit. **THIS** PERMIT **IS** NOT **A** BUILDING PERMIT.

By signing this permit below, the owner agrees to accept the terms and conditions of this permit and to accept responsibility for payment of the County's costs for inspections and all other actions related to noncompliance with the permit conditions. This permit shall be null and void in the absence of the owner's signature below

s/signature

Owner March 13, 2000
Date

Kim Echarte
Staff Planner

March 13, 2000
Date

EXHIBIT 1

Distribution: Applicant, File, Clerical, Coastal Commission

a

CONDITIONS OF APPROVAL

Zo e pm i Exception mit No.
l ng a l a Grading oval

Applicant and Property Owner: Pajaro Valley Water
gency NM) for the Boyle Trust, J-and D Farms,
Paul Tao and various other

A c F l M et al.

Property location and address: The il: rati ilit is a at
a reach of l kins Slough near u ndreas Road. Tl
g s site is located at the end of y Road.
distribution p li is t on Dairy Road and
1 / dl Road en oth sites describes above
and on Beach Road, north and south of e intersecti
of Beach and San Andreas Roads, in the San Andreas
planning area

EXHIBITS:

A: Site Map and Listing of Project Parcels

B: Selected Pages of Project Plans prepared by Montgomery Watson, dated October 1999 consisting of 13 sheets

C: Preliminary Grading and Erosion Control Plan prepared by Montgomery Watson, dated October 1999 with revisions, consisting of 6 sheets,
Title Sheet
Sheet G-6 - Key Map
Sheet C-2 - Plan View of Intake/Filtration Facility Site
Sheet C-4 - Plan View of Recharge Basin Site and Immediate Vicinity
Sheet C-5 - Plan View of Recharge Basin
Sheet C-6 - Cross-sections of Recharge Basin
Sheet C-9 - Plan View and Details of Segment of Dairy Road to be Paved

D: Erosion Control Plan Narrative prepared by Montgomery Watson, undated, consisting of 2 sheets

E: Wetland/Riparian Mitigation Plan prepared by CH2M Hill, dated November 9, 1999 consisting of 3 sheets

F: Mitigation Monitoring and Reporting Program prepared by County Planning dated February 23, 2000

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EXHIBIT 1

CONDITIONS:

I. This permit authorizes the construction of:

- A surface water intake/filtration facility as shown on Sheet C-2 of Exhibit C;
- An earthen recharge basin and associated recovery and monitoring wells as shown on Sheets **C-4** and C-5 of Exhibit C;
- A buried pipeline to convey water from the intake facility to the basin a **s** shown on Sheet G-6 of Exhibit C; and
- A buried pipeline to distribute recovered water to the 48 project parcels shown on Exhibit A.

This is a three phase project. The intake facility, recharge basin, associated wells and the pipelines between the intake facility and the basin will be constructed as phase 1. This phase will include water distribution to 8 of the project parcels. Pipeline construction paralleling San Andreas Road and Beach Road southwest of the San AndreaslBeach Road intersection to serve 21 parcels and pipeline construction west of the recharge basin to serve 5 parcels will be done as phase 2. Pipeline construction northeast of the San AndreaslBeach Road intersection to serve 14 parcels will be done as phase 3.

This permit also authorizes the grading of 73,400 cubic yards of earth to construct the facilities described above.

Prior to exercising any rights granted by this permit including, without limitation, any construction or site disturbance, the applicant/ owner shall:

A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.

B. Obtain a Grading Permit from the County of Santa Cruz Planning Department.

C. Pay an EIR filing fee of $850.00 to the Clerk of the Board of the County of Santa Cruz as required by the California Department of Fish and Game mitigation fees program or submit written documentation that this fee has been previously paid.

D. Adopt PVWMA Ordinance 2000-02, or a substantially similar ordinance, establishing regulations for the classification and operation of groundwater wells in the PVWMA local water supply service area, and submit a certified copy to County Planning.

II. Prior to issuance of a Grading Permit the PVWMA shall:

A. Conduct geologic investigations of the proposed pipeline alignment and

EXHIBIT I

pumping facilities prior to the final design and implement design recommendations. The investigations will specify hazards related to ground movements and co-seismic effects, especially liquefaction. This report shall be submitted to County Planning for review and approval by making an application for a geologic report review. The County approved recommendations of an engineering geologist shall be incorporated into the design and specifications of grading plans and shall be implemented by the construction contractor.

B. Obtain NPDES permit for construction dewatering and any discharges into the stream during construction and submit a copy of the permit to County Planning.

C. Obtain a Streambed Alteration Permit from the State Department of Fish and Game for all work proposed in or adjacent to Harkins and Watsonville Sloughs and the seasonal wetland on the Tao parcel (APN 52-191-08), and comply with all conditions thereof.

D. Obtain a Water Rights Permit (Water Diversion License) for the proposed use of Harkins Slough water from the State Water Resources Control Board.

E. Obtain an Encroachment Permit from the Department of Public Works for any work performed in the public right-of-way. All work shall be consistent with the Department of Public Works Design Criteria.

F. Establish the final details of the procedure to compensate growers for the financial losses that they incur as a result of the impacts caused by the excavation and construction activities that occur in the easements for the placement of the local distribution system. The growers will receive compensation based upon the total amount of farmland disrupted, the amount of time of the disruption, the historical type of crop planted on the land and the current year unit market price for the unplanted crop. A written description of this procedure which has been formally adopted by the P W M A Board shall be submitted to County Planning staff for review and approval.

G. Complete a detailed study identifying utilities along the proposed alignment. The results of this study will be used during pipeline construction to minimize impacts to area utilities during the construction stage of the project.

H. Conduct a pre-construction survey of the road conditions on key access routes to project sites which shall be used to document road conditions prior to construction.

I Conduct a pre-construction survey of road conditions on key access

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EXHIBIT I 4

routes to the project sites which shall be used to document the road conditions prior to construction.

J. Submit written documentation that $2,000.00 has been provided to the Natural Resources Conservation Service specifically to fund habitat restoration activities at the seasonal wetland on the Tao parcel (APN 52-191-08).

K. Submit written documentation that the PVWMA has both temporary construction easements and permanent maintenance easements over the project parcels adequate to allow project facilities to be constructed and maintained as proposed; or in the alternative, documentation that P W M A owns the property or has obtained a court order allowing access.

III. All construction shall be performed in accordance with the approved plans, including Exhibits **B,** C and D of this permit. PVWMA shall comply with the following conditions:

A. All work adjacent to or within a County road shall be subject to the provisions of Chapter 9.70 of the County Code, including obtaining an encroachment permit where required. Where feasible, all improvements adjacent to or affecting a County road shall be coordinated with any planned County-sponsored construction on that road.

B. To minimize conflicts with uses on projects parcels and surrounding properties, the P W M A will provide advance notification of construction activities to all property owners, residents, and businesses in the vicinity of construction areas at least two weeks in advance of construction. In addition, PVWMA shall publish notices in local newspapers at least two weeks in advance of construction and place a large temporary sign along San Andreas Road at least two weeks in advance of construction advising the public of the planned construction and any potential inconveniences caused by the construction (i.e. traffic delays). The temporary sign shall remain in place during the entire construction period and shall be removed within 1 week of the completion of construction affecting or within clear view of a public roadway.

C All project grading and construction of facilities shall conform to requirements of the Santa Cruz County Grading Ordinance and all recommendations of the geotechnical report prepared by CH2M Hill for this project dated May 26, 1999. All grading related work and inspections shall comply with the requirements contained in the County acceptance letter dated October 19, 1999, including the submittal of final grading inspection letters from the project engineer to County Planning. Site grading and construction work areas shall expose as little new ground surface as possible. Vegetation cover should be left intact to the extent

EXHIBIT I

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practical. The project geotechnical engineer shall conduct inspections of the construction sites to verify compliance with these requirements. If non-compliance **is** noted, the identified problems shall be immediately communicated to the construction contractor with remedial actions

necessary to solve the identified problem and the deadline to rectify the problem.

D. All grading shall be done with the construction related erosion control measures in place as specified in Exhibits. C and D of this permit. All grading activities in non-cropped areas shall be limited to the period between April 15 and October **15.** In areas where the soil is tilled, grading activities will be coordinated with the local farmers to ensure consistency between their erosion control and farming practices and construction disturbance Upon completion of construction at each site, final erosion control measures shall be implemented. Any stockpiled soils shall be spread and all areas shall be reseeded to ensure that a stable soil cover will remain.

E. **No** land clearing, grading or excavating shall take place between October 15 and April 15 unless a separate winter erosion-control plan is approved by the Planning Director.

F. All grading and construction of project facilities shall be done in accordance with the County approved recommendations of the engineering geologic report described in condition II.A above. The project engineering geologist shall conduct inspections of the construction sites to verify compliance with these requirements. If non-compliance is noted, the identified problems shall be immediately communicated to the construction contractor with remedial actions necessary to solve the identified problem and the deadline to rectify the problem.

G The PVWMA shall implement conditions of the NPDES Permit. Any discharges that occur must meet water quality objectives specified in the RWQCB's Pajaro Basin Management Plan. As part of complying with the permit, the PVWMA shall monitor construction activities to verify compliance with best management practices, water quality objectives and all other conditions of the NPDES permit. If non-compliance is noted, the construction contractor shall be notified immediately of the problem, remedial actions necessary to solve the identified problem and the deadline to rectify the problem.

H. To minimize potential impacts to aquatic wildlife, all construction near Harkins and Watsonville Sloughs shall include erecting exclusion fencing at the .perimeter of the construction zone for the intake/filtration facility and pipeline alignment, along the edge of the wetland vegetation

for 25 feet in either direction. If wetland habitat will not be entirely avoided, P W M A shall inform County Planning, USFWS and the U.S. Army Corps of Engineers (COE) and conduct the surveys for the California red-legged frog *(Rana* aurora draytonii), the Santa Cruz long-toed salamander (Ambystoma macrodactylon *croceum*) and the Tiger salamander (Ambystoma californiense) according to USFWS protocol. The PVWMA shall consult with the USFWS and the COE regarding the results of the surveys and shall implement the protective measures to benefit the three amphibian species as required by the USFWS and COE. If protective measures are implemented, the P W M A shall provide County Planning with a written description of the measures that will be implemented during and after construction. In the event that protective measures are warranted, the project wildlife biologist shall monitor construction activities to verify compliance with these requirements. If non-compliance is noted, the biologist shall immediately notify the construction contractor of the identified problem, required remedial actions and the deadline for compliance.

I. To minimize construction impacts to biotic habitats of wetlands and riparian corridors, PVWMA shall implement the construction related measures of Exhibit E, including retaining at least 6 inches of a trunk of any cut willow to allow resprouting. The contractor shall be provided a copy of Exhibit E and advised of measures to minimize biotic impacts.

J. To avoid any contribution to capacity problems at the County's Buena Vista landfill, all excess fill material exported from the project sites shall be transported to and disposed of at the Monterey Peninsula Waste Management Agency's landfill near Marina in accordance with the agreement made with that agency.

K. To avoid any potential for impacts to archaeologic resources, final pipeline and facility plans shall locate facilities and pipeline alignments away from all identified important cultural resource sites. **A** qualified cultural resource specialist shall be retained to educate construction workers of sighs that are indicative of buried archaeological resources and to assist in identifying any possible finds during construction. The project cultural specialist/archaeologist shall inspect the site periodically during project construction to determine if any impacts to archaeological resources could occur from construction activities..
Should any as yet undiscovered cultural resources, such as structural features, or unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work will be suspended and PVWMA will contact County Planning and follow the requirements of County Code Section 16.40.040. Any applicable State and federal agencies shall also be contacted at that time. The project archaeologist will perform any necessary investigations to determine the significance of the find. and

map the areal extent of important cultural resource sites to be avoided. This may include the preparation of detailed cultural resource evaluation reports and consultation with local, state, and federal agencies as well as the local Native American Commission. If important cultural resource sites cannot be avoided, the PVWMA will enter into a Programmatic Agreement with the U.S. Army Corps of Engineers, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation and County Planning to develop an appropriate mitigation plan for the cultural resource.

I. To minimize traffic problems on public roadways during construction, PVWMA shall require the contractor to do the following:

1. Schedule truck trips outside of peak commute hours and use haul routes that minimize truck traffic on local roadways to the extent possible;

2. Prepare traffic safety and control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plan shall be reviewed for appropriateness, and approved by the County Public Works Departments;

3. Cover construction trenches with steel trench plates to allow access to driveways; and

4. Contact emergency vehicle agencies serving properties in the project vicinity to identify detours during construction.

These requirements shall be included in the contract specifications for the construction contractor hired to provide construction services for this project.

J. To minimize air quality impacts of construction activities, the construction contractor shall implement a dust control program that includes watering down exposed earthen surfaces at a frequency that prevents significant amounts of dust from leaving the project sites.

K. All construction staging areas shall be located off wetland and riparian habitats or other environmentally sensitive areas and any areas where archeological resources are discovered. Staging areas shall also be located off arable agricultural land to the fullest extent feasible.

IV. PVWMA shall conduct the following activities immediately after construction/pipeline installation at each project site:

A. Final erosion control measures shall be installed, including the planting of native groundcover in accordance with Exhibit C of this permit. Planting of groundcover shall include the following soil conditioning:

Soil shall be tilled to a depth of 6 inches and amended with six cubic yards of organic material per 1,000 square feet to promote infiltration and water retention. After planting, a minimum of 2 inches of mulch shall be applied to retain moisture, reduce evaporation and inhibit weed growth.

B. The side slopes of the recharge basin shall be planted with native perennial grass and forbs species as specified in Exhibit D of this permit prior to October 15. This planting shall be irrigated on a regular basis to allow sufficient growth of the groundcover to prevent erosion of the side slopes from winter or filling of the basin with diverted surface water. Two vehicular access ramps shall be provided on the side slopes to provide access to the bottom of the basin for farming equipment. The ramps shall have a maximum gradient of 15% and be surfaced with 5 inches of class 2 base rock (or better).

C. The 700 foot long segment of Dairy Road connecting with San Andreas Road shall be surfaced with 6 inches of class 2 base rock overlain with 1-1/2 inches of asphalt (or better). Asphaltic emulsion shall be applied over the asphalt. Roadside drainage improvements shall be installed according to Sheet C-9 of Exhibit C. All this work must be completed prior to October 15.

D. The alder trees shown on Sheet C-1 of Exhibit B shall be planted as shown at the westerly edge of the intake/filtration facility site. These trees shall be 15 gallon size and provided with irrigation for a minimum of 3 years or until adequately established. PVWMA shall request an inspection by County Planning staff to determine when the irrigation should cease.

E. Financially compensate growers for loss of cropland from pipeline installation during the construction period as described in condition II.E above.

F. Extinguish the construction easements on all project parcels.

G Roads damaged by construction shall be repaired to a conditions equal to, or better than, that which existed prior to construction activity.

V. Operational Conditions.

A. All 48 project parcels shall be connected to the project pipeline so they

can benefit from the alternative source irrigation water this project will provide. Extending the pipeline to serve other parcels in the future will require an amendment to this permit.

B. Project water will be used solely to provide untreated irrigation water to agricultural properties for agricultural purposes. The filtration of all project water shall be limited that necessary to remove sediment and allow the proper conveyance of water in a manner that will not result in deposition of sediment in the project pipeline or recharge basin. Project water shall not be used as a primary source or supplemental source of domestic water to serve other types of land uses.

C. All pipelines used to convey project water shall always be limited to that purpose. The pipelines shall never be used to convey domestic water nor water unrelated to PVWMA's efforts to remedy seawater intrusion and groundwater overdraft problems.

D. The withdrawal of surface water from Harkins Slough shall be limited to the winter months when surface flows are high enough to commence flood control pumping by the County Public Works pump station on Harkins Slough. Water withdrawals shall be supplied by the existing County pump station facility, which may received minor upgrades to provide an adequate volume of water for the project.

E. Any proposed changes to the operation of the project or the method to which PVWMA will serve its project water customers is subject to review by the Planning Director. Such review shall determine if the proposed change requires an amendment or Minor Variation to this permit.

F. All groundcover and trees planted under conditions IV.A-IV.D above shall be permanently maintained by PVWMA.

F. The bottom of the recharge basin (6.7 acres) shall be made available for organic crop raising during the months the basin is not being used to percolate project water into the ground. The lessee of the basin bottom shall have full access to the basin for regular farming equipment and labor during the time crop cultivation, growing and harvesting occurs.

G. Any future disturbance of agricultural land within the maintenance easement for the pipeline shall be kept to the minimum period possible for maintenance purposes. Disturbed land shall be restored to an arable condition immediately after needed maintenance activities have been completed.

H. In the event that future County inspections of the subject property disclose noncompliance with any Conditions of this approval or any violation of the County Code, the owner shall pay to the County the full

cost of such County inspections, including any follow-up inspections and/or necessary enforcement actions, up to and including permit revocation.

I. Water diversions shall be limited to that specified by the Water Rights Permit described in condition II.H. All other requirements and conditions of the Water Rights Permit shall be complied with on a permanent basis.

J. The PVWMA shall maintain vegetation around the perimeter of the pond to keep ground cover but prevent riparian vegetation growth and mosquito breeding.

K. PVWMA shall provide biannual reports.to County Planning on its progress towards using reclaimed water from the City of Watsonville wastewater treatment plant for a supplemental source of agricultural irrigation water. These reports shall be placed on the consent agenda of the Planning Commission and shall be submitted until the reclaimed wastewater becomes used as an irrigation water source, or it has been determined that such use is not feasible

VI. As a condition of this development approval, the holder of this development approval ("Development Approval Holder"), is required to defend, indemnify, and hold harmless the COUNTY, its officers, employees, and agents, from and against any claim (including attorneys' fees), against the COUNTY, it officers, employees, and agents to attack, set aside, void, or annul this development approval of the COUNTY or any subsequent amendment of this development approval which is requested by the Development Approval Holder.

A. COUNTY shall promptly notify the Development Approval Holder of any claim, action, or proceeding against which the COUNTY seeks to be defended, indemnified, or held harmless. COUNTY shall cooperate fully in such defense. If COUNTY fails to notify the Development Approval Holder within sixty (60) days of any such claim, action, or proceeding, or fails to cooperate fully in the defense thereof, the Development Approval Holder shall not thereafter be responsible to defend, indemnify, or hold harmless the COUNTY if such failure to notify or cooperate was significantly prejudicial to the Development Approval Holder.

B. Nothing contained herein shall prohibit the COUNTY from participating in the defense of any claim, action, or proceeding if both of the following occur:

1. COUNTY bears its own attorney's fees and costs; and

2. COUNTY defends the action in good faith.

C. Settlement. The Development Approval Holder shall not be required to

pay or perform any settlement unless such Development Approval Holder has approved the settlement. When representing the County, the Development Approval Holder shall not enter into any stipulation or settlement modifying or affecting the interpretation or validity of any of the terms or conditions of the development approval without the prior written consent of the County.

D. Successors Bound. "Development Approval Holder" shall include the applicant and the successor(s) in interest, transferee(s), and assign(s) of the applicant.

E. Within 30 days of the issuance of this development approval, the Development Approval Holder shall record in the office of the Santa Cruz County Recorder an agreement which incorporates the provisions of this condition, or this development approval shall become null and void.

VII. Mitigation Monitoring Program

A. The mitigation measures listed in Exhibit F of this permit have been incorporated into the conditions of approval for this project in order to mitigate or avoid significant effects on the environment. As required by Section 21081.6 of the California Public Resources Code, a monitoring and reporting program for the above mitigations is hereby adopted as a condition of approval for this project. This monitoring program is specifically described following each mitigation measure listed in Exhibit F. The purpose of this monitoring is to ensure compliance with the environmental mitigations during project implementation and operation. Failure to comply with the conditions of approval, including the terms of the adopted monitoring program, may result in permit revocation pursuant to Section 18.10.462 of the Santa Cruz County Code.

B. There shall be a review of condition compliance and mitigation monitoring by the Planning Commission at the three project stages listed below after the PVWMA has submitted a progress report on condition compliance and mitigation monitoring to County Planning staff for review. Staff shall place the report on the consent agenda of the Planning Commission within **2** months of receipt of the report from the PVWMA. The report shall use Exhibit F as a guide to prepare the report so it is easy to discern the monitoring results of each individual permit condition that is derived from an EIR mitigation measure. The monitoring of other permit conditions shall also be provided in these reports in a format identical or similar to that provided for by Exhibit F for mitigation measures. PVWMA shall submit these reports at the following intervals:

1. On of before October 1, 2000 (Partial completion of overlapping

phases 1 and 2);
2. On or before October 1, 2001 (Completion of ahases 1 and 2); and
3. Within 1 month of completion **of** phase 3 of the project.

(Refer to condition I for description of project phases)

Minor variations to this permit which do not affect the overall concept or densify may be approved by the Planning Director at the request of the applicant or Planning staff in accordance with Chapter 18.10 of the County Code.

PLEASE NOTE: THIS PERMIT EXPIRES TWO **YEARS FROM DATE OF APPROVAL UNLESS YOU OBTAIN YOUR GRADING PERMIT AND COMMENCE CONSTRUCTION.**

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EXHIBIT

EXHIBIT A
PERMIT NO. 99-0335

Property Owners of Parcels Enumerated on Map E-1
(Project Property Owners)

Property Reference	Owner	Parcel Number
200	Boyle, Lorraine E.	052-211-27
205	Colendich Farms, Inc.	052-241-33
206	Crosetti, Jr., J.J. (Trustee)	052-551-05
207	Pecci and Antle	052-171-13
218	Fuji, Yoshiteru and Kimiyo	052-191-23 052-191-50
227	Hirahara, Teyo (Trustee)	052-231-13
228	Innes, Gail F. (Trustee)	052-231-34
229	J and D Farms	052-181-16 052-181-17 052-181-18
231	Joji, Toshio and Shizumi	052-191-24
232	Jones, T. Larry and Susan	052-191-57
233	Larse, John	052-191-53 052-191-54
234	LCM Properties	052-211-26
236	Malatesta, Andrew (Trustee)	052-171-21
238	Malatesta, Clara	052-191-56
242	Marinelli, Mary and Wells Fargo	052-551-01
247	Mine, Susan	052-241-09
248	Mine, Tom I.	052-241-26 052-241-38 052-241-39
249	Mine, William and Sayono	052-241-10
254	PVUSD and Wells Fargo	052-551-04
255	Radovich, Marlene	052-191-20
257	Robert Trafton Family	052-231-07
262	Tanimura and Antle	052-231-06
263	Tao, Akira and Mitsuyo	052-191-08 052-191-55
265	Telles, Marjorie	052-241-04
266	Torbensen, Robert and Leona (Trustees)	052-231-09 052-231-12 052-231-08
267	Trafton, Harold and Leona (Trustees)	052-181-15
268	Trafton, Harold and Leona (Trustees)	052-181-10 052-181-11
272	Wait, Charles and Wells Fargo	052-551-03
27[illegible]	SCP-1	052-191-58

Kim Tschantz
COUNTY OF SANTA CRUZ
PLANNING DEPARTMENT
Feb 23, 2000

EXHIBIT I

TAB1 2-23-00.DOC

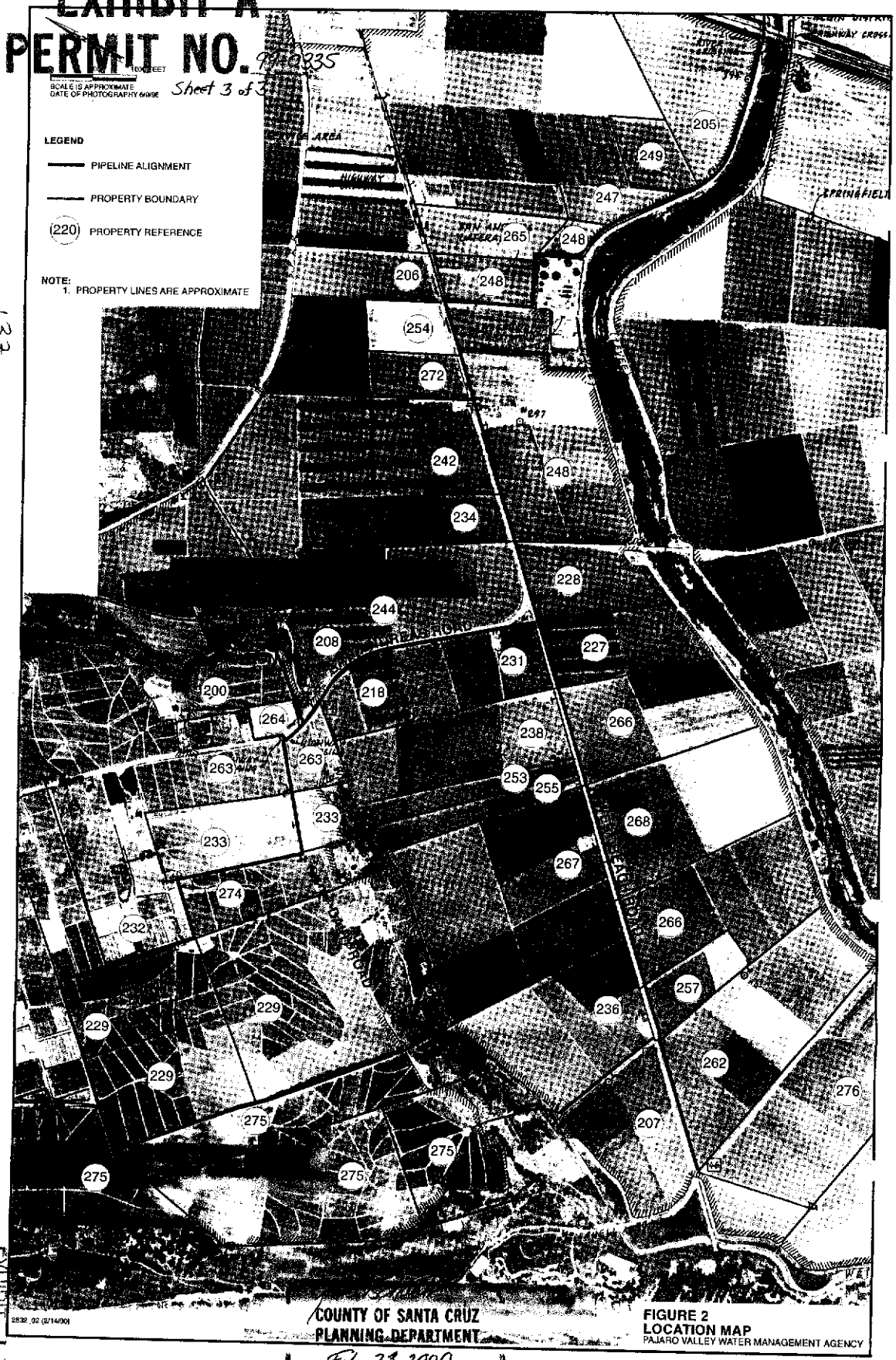
Property Reference	Owner	Parcel Number
275	SCP-1	052-171-05 052-171-20 052-541-01 052-541-02 046151-24
276	Jeanne Ashcroft	052-231-05
	Rocchi	052-231-04
	Desante	052-231-03
	Innes	052-191-25

EXHIBIT A
PERMIT NO. 99-0335

Kim Schaub
COUNTY OF SANTA CRUZ
PLANNING DEPARTMENT
Feb. 23, 2000

EXHIBIT I

EXHIBIT A
PERMIT NO. 99-0235
Sheet 3 of 3



2832_02 (2/14/00)

COUNTY OF SANTA CRUZ
PLANNING DEPARTMENT

FIGURE 2
LOCATION MAP
PAJARO VALLEY WATER MANAGEMENT AGENCY

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EXHIBIT 1

Feb. 23, 2000

COUNTY OF SANTA CRUZ
Planning Department

COASTAL ZONE PERMIT AMENDMENT

Owner Susan Mine
Address No Situs
Watsonville. CA

Permit Number 02-0596
Parcel Number(s) 052-581-06 & -09

PROJECT DESCRIPTION AND LOCATION

Permit to retrofit an existing well on Assessor's Parcel Number 052-581-06, install a new well at APN 052-581-09, and install connections to the Integrated Coastal Distribution System as a part of the Pajaro Valley Water Management Agency Basin Management Plan. Requires an Amendment to Coastal Zone Permit 99-0335. Project located on the south side of West Beach Road in Watsonville, about 3,000 feet southwest from Highway One.

SUBJECT TO ATTACHED CONDITIONS.

Approval Date: 6/6/03
Exp. Date (if not exercised): 6/20/05
Denied by: _____

Effective Date: 6/20/03
Coastal Appeal Exp. Date: Call Coastal Corn.
Denial Date: _____

___ This project requires a Coastal Zone Permit which is not appealable to the California Coastal Commission. It may be appealed to the Planning Commission. The appeal must be filed within **14** calendar days of action by the decision body.

_x_ This project requires a Coastal Zone Permit, the approval of which is appealable to the California Coastal Commission. (Grounds for appeal are listed in the County Code Section 13.20.110.) The appeal must be filed with the Coastal Commission within 10 business days of receipt by the Coastal Commission of notice of local action. Approval or denial of the Coastal Zone Permit is appealable. **The** appeal must be filed within **14** calendar days of action by the decision body.

This permit cannot be exercised until after the Coastal Commission appeal period. That appeal period ends on the above indicated date. Permittee is to contact Coastal staff at the end of the above appeal period prior to commencing any work.

A Building Permit must be obtained (if required) and construction must be initiated prior to the expiration date in order to exercise this permit. **THIS PERMIT IS NOT A BUILDING PERMIT.**

By signing this permit below, the owner agrees to accept the terms and conditions of this permit and to accept responsibility for payment of the County's costs for inspections and all other actions related to noncompliance with the permit conditions. This permit shall be null and void in the absence of the owner's signature below.

Mark Mohler — 6-6-03
Signature of Owner/Agent — Date

Joan VanderHoeven — 6-20-03
Staff Planner — Date

Distribution: Applicant, File. Clerical, Coastal Commission

EXHIBIT J

CONDITIONS OF APPROVAL

Exhibit A: Amendment to the Harkins Slough Project #99-0335 and Grading Permit #00126057 to Construct Two Supplemental Wells by RMC Consulting Engineers, dated November 2002.

I. This permit authorizes the retrofit and construction of two water wells. Prior to exercising any rights granted by this permit including, without limitation, any construction or site disturbance, the applicant/owner shall:

A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.

B. Obtain the required Well Drilling Permits from the Santa Cruz County Environmental Health Service. The individual well capacity shall not exceed 2,000 gallons per minute. The wells shall be used exclusively for agriculture and agriculture related purposes.

C. Obtain an Encroachment Permit from the Department of Public Works for all off-site work performed in the County road right-of-way.

II. All construction shall be performed according to the approved plans for the Well Drilling Permit. Prior to final inspection, the applicant/owner must meet the following conditions:

A. All inspections required by the Environmental Health Service shall be obtained. The wells shall comply with all conditions of the Environmental Health Service Well Drilling Permit.

III. Operational Conditions

A. In the event that future County inspections of the subject property disclose noncompliance with any Conditions of this approval or any violation of the County Code, the owner shall pay to the County the full cost of such County inspections, including any follow-up inspections and/or necessary enforcement actions, up to and including permit revocation.

B. All requirements of Coastal Development Permit #99-0335 and Grading Permit # 00126882 remain in effect

IV. As a condition of this development approval, the holder of this development approval ("Development Approval Holder"), is required to defend, indemnify, and hold harmless the COUNTY, its officers, employees, and agents, from and against any claim (including attorneys' fees), against the COUNTY, it officers, employees, and agents to attack, set aside, void, or annul this development approval of the COUNTY or any subsequent amendment of this development approval which is requested by the Development

EXHIBIT J
EXHIBIT C

Approval Holder.

A. COUNTY shall promptly notify the Development Approval Holder of any claim, action, or proceeding against which the COUNTY seeks to be defended, indemnified, or held harmless. COUNTY shall cooperate fully in such defense. If COUNTY fails to notify the Development Approval Holder within sixty (60) days of any such claim, action, or proceeding, or fails to cooperate fully in the defense thereof, the Development Approval Holder shall not thereafter be responsible to defend, indemnify, or hold harmless the COUNTY if such failure to notify or cooperate was significantly prejudicial to the Development Approval Holder.

B. Nothing contained herein shall prohibit the COUNTY from participating in the defense of any claim, action, or proceeding if both of the following occur:

1. COUNTY bears its own attorney's fees and costs; and

2. COUNTY defends the action in good faith.

C. Settlement. The Development Approval Holder shall not be required to pay or perform any settlement unless such Development Approval Holder has approved the settlement. When representing the County, the Development Approval Holder shall not enter into any stipulation or settlement modifymg or affecting the interpretation or validity of any of the terms or conditions of the development approval without the prior written consent of the County.

D. Successors Bound. "Development Approval Holder" shall include the applicant and the successor'(s) in interest, transferee(s), and assign(s) of the applicant.

E. Within 30 days of the issuance of this development approval, the Development Approval Holder shall record in the office of the Santa Cruz County Recorder an agreement which incorporates the provisions of this condition, or this development approval shall become null and void.

Minor variations to this permit which do not affect the overall concept or density may be approved by the Planning Director at the request of the applicant or staff in accordance with Chapter 18.10 of the County Code.

EXHIBIT J

EXHIBIT C

PLEASE NOTE: THIS PERMIT EXPIRES TWO YEARS FROM THE EFFECTIVE DATE UNLESS YOU OBTAIN THE REQUIRED PERMITS AND COMMENCE CONSTRUCTION.

Approval Date: June 6.2003

Effective Date: June 20.2003

Expiration Date: June 20,2005

Don Bussey
Deputy Zoning Administrator

Joan Van der Hoeven
Project Planner

Appeals: Any property owner, or other person aggrieved, or any other person whose interests are adversely affected by any act or determination of the Zoning Administrator, **may** appeal the act or determination to the Planning Commission in accordance with chapter 18.10 of the Santa Cruz County Code.

EXHIBIT J

EXHIBIT *C*

PVWMA BASIN MANAGEMENT PROJECTS

PROJECT DESCRIPTION - COASTAL DEVELOPMENT PERMIT APPLICATION

1.0 INTRODUCTION

In 1984, the Pajaro Valley Water Management Agency (PVWMA) was formed and given the responsibility of managing groundwater resources within the Pajaro Valley. The PVWMA service area encompasses approximately 79,600 acres of irrigated agricultural lands, native and nonirrigated lauds in the hillside areas, the City of Watsonville, and the unincorporated communities of Pajaro, Freedom, Corralitos, and Aromas. The boundaries of the PVWMA service area generally correspond to the topographic and hydrologic boundaries of the valley. The Pajaro Valley is home to over 80,000 residents, all of whom, to a great degree, rely on the existing groundwater supply. In addition, agriculture is the most significant economic industry in the valley with high-value crops including strawberries, bush berries, apples, flowers, lettuce, artichokes, and a variety of other vegetables.

In the coastal areas and throughout much of the groundwater basin of the Pajaro Valley, overdraft conditions have caused groundwater levels to drop below sea level, creating a landward pressure gradient that causes seawater from the Pacific Ocean to move inland, where it mixes with fresh water. Seawater intrusion, documented since the 1950's, increasingly is degrading water quality, and limiting the utility of groundwater for irrigation and domestic purposes. These conditions are not expected to improve without the elimination of groundwater pumping in areas adjacent to the coast and development and delivery of additional water supplies.

PVWMA prepared a Basin Management Plan (BMP) that identified elimination of groundwater pumping to inigated lands as the key to restoring the Pajaro Basin average annual groundwater yield and to slowing seawater intrusion. The BMP includes the importation of water supplies via a 22-mile pipeline ("Import Pipeline") to connect the Pajaro Valley Basin with the Santa Clara Conduit of the San Felipe. Unit facilities allowing PVWMA to take delivery of CVP contract water and water from other sources. This water would be used for distribution to agricultural users via an Integrated Coastal Distribution System (ICDS).

2.0 PROJECT OVERVIEW AND BACKGROUND

2.1 PROJECT OBJECTIVES AND NEEDS

The purpose of the proposed project is to prevent further overdraft of the groundwater basin and to halt seawater intrusion by providing quality water for the long-term sustainability of agricultural irrigation and production.

OVERDRAFT

Overdraft occurs when the amount of groundwater withdrawn from a basin exceeds the amount of fresh water replenishing the basin. In the Pajaro Valley Basin, groundwater levels have declined as the groundwater pumping rate has exceeded the rate of natural replenishment. These overdraft conditions result in increased pumping costs and land subsidence, which in turn can cause building settlement and increased flooding.

SEAWATER INTRUSION

In the coastal areas and throughout much of the basin, overdraft conditions have caused groundwater levels to drop below sea level, creating a landward pressure gradient that causes seawater to move inland, mixing with fresh groundwater. The density difference between seawater and fresh water causes the fresh water to stratify above the seawater. As seawater encroaches into the fresh groundwater basin, water quality degrades, limiting the usability of groundwater for imgation and domestic purposes, and the wells have to be abandoned. Seawater intrusion creates a progressive increase in the concentrations of chloride, magnesium, and/or other constituents in groundwater. Chloride is used as an indicative constituent for seawater intrusion; increasing chloride concentrations in well water samples are an indication of seawater intrusion. For agricultural uses, acceptable chloride concentrations range depending on the salt tolerance of the crop. However, water is likely to result in increasing problems for agricultural irrigation when chloride levels exceed 142 mg/L.

CURRENT AND FUTURE WATER USE

The current total water demand is estimated at 71,500 acre feet per year (afy) with total groundwater demand estimated at 69,000 afy. Conservation measures are expected to reduce groundwater demand by 5,000 afy. The difference between total groundwater demand (69,000 afy) and a basin sustainable yield of 47,000 afy (assuming fluctuations in the supplemental water supply) is 17,000 afy. Groundwater modeling results indicate that PVWMA needs to supply a total of 18,500 afy to the coastal area in order to create a hydrostatic barrier to prevent further seawater intrusion into the groundwater basin while also meeting near-tern (2007) demand and 27,500 afy to prevent further seawater intrusion into the groundwater basin while meeting future 2040 demands. The Harkins Slough project supplies approximately 1,100 afy of the 18,500 afy needed; PVWMA proposes to obtain the balance – 17,400 afy – via CVP water and other water sources.

2.2 BACKGROUND

ENVIRONMENTAL HISTORY

The proposed project requires approval by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), and therefore an Environmental Impact Statement (EIS) was prepared to satisfy requirements under the National Environmental Policy Act (NEPA). In addition, formal consultation with the U.S. Fish and Wildlife Service (USFWS) and NOAA

Fisheries under Section 7 of the Endangered Species Act was completed during the NEPA process. A Biological Opinion (BO) was issued by NOAA Fisheries and the **USFWS** in August 2003 and March 2004, respectively. In addition, a Programmatic Agreement between the State Historic Preservation Office (SHPO) and the Army ***Corps*** of Engineers issued in 2000 for the Harkins Slough Project is currently under amendment to include the entire project (i.e. Import Pipeline, ICDS, and Recycled Water Facility).

In addition to NEF'A requirements, the process required **for** the California Environmental Quality Act (CEQA) is completed and an EIR ***(PVWMA Local Water Supply and Distribution EZR)*** addressing the **ICDS was** certified in May 1999. An addendum to the "Local Projects" EIR was approved in August 2003. The addendum proposed changes to the location of laterals to serve specific agricultural users in the coastal area, the construction ***of*** two additional booster pumps, the construction of a potential new pump station to serve agriculture in the "North Plateau" area (in Santa Cruz County), and additional crossings at the Pajaro River, Hanson Slough and Watsonville Slough. During the CEQA process, mitigation measures were adopted **to** address the resources discussed in the EIR (primarily Biological Resources, Hydrology and Water Quality) to address potential impacts resulting from project activities.

PUNNING HISTORY

As early as August 1953, the State Water Resources Control Board documented groundwater overdraft, seawater intrusion, and safe (sustainable) yield in the Pajaro Valley Basin. Following a series of events, including legislation passed to have CVP water delivered to the area, and the creation of the PVWMA, the BMP was adopted and subsequently revised to outline the extent and degree ***of*** seawater intrusion, and to identify a preferred water supply alternative for meeting needs. In February 2002, the PVWMA Board of Directors identified a "Recommended Alternative" (outlined in **Table 1**), adopted the Revised **BMP,** and certified the **EIR.**

3.0 IMPORT WATER PROJECT AND IMPORT PIPELINE.

3.1 WATER SUPPLY

As previously discussed, the PVWMA will need to supply a total of **17,400** afy to the coastal area in order to prevent further seawater intrusion into the groundwater basin while also meeting near-term (2007) demand. An additional 27,500 afy ***of*** water supply will be needed to prevent further seawater intrusion into the groundwater basin while also meeting future (2040) demand.

The water supply imported to the valley would be made up of CVP water from a contract assigned by Mercy Springs Water District (6,260 afy), as well as water from other local sources (College Lake, Watsonville, Harkins Slough, diversion from the Pajaro River at Murphy Crossing, and existing large capacity wells located in inland areas). These local supply components are expected to yield a combined average surface water supply ***of*** approximately 5,000 to 6,000 afy.

TABLE 1
PVWMA WATER SUPPLY PROJECT

Project	status
Phase 1	
▪ Coastal Distribution System (Harkins Slough portion located in Santa Cruz County only)	Completed 2003
▪ Conservation: (5,000 afy)	Currently underway; full implementation in 2007
▪ Harkins Slough with Harkins Slough Recharge Basin, Supplemental Wells, and Connections (1,100 afy)	In operation
Phase 2 - 2004-2007	
▪ Remaining portions of the Integrated Coastal Distribution System (ICDS)	Evaluated in the 2003 EIS
▪ Import Water Project with Out-of-Basin Banking (13,400afy) and Supplemental Wells	Evaluated in the 2003 EIS
▪ Water Recycling Project (4,000 afy)	Evaluated in the 2003 EIS
▪ Watershed Management Programs (e.g., nitrate management)	To be developed
Phase 3 – After 2007 (Potential Future Projects)	
▪ Wells for conjunctive use of CVP water ▪ Inland Distribution System ▪ College Lake (storage project) ▪ Watsonville Slough (local surface water diversion project) ▪ Murphy Crossing (local surface water diversion project)	Need for and selection of Phase 3 projects to be implemented will be determined after 2007, based on future water supply and demand conditions. Additional environmental review will be required.

SOURCE RMC, Inc., 2002

Additionally, the United States Bureau of Reclamation has reserved a CVP entitlement for PVWMA from the San Felipe Committee of the CVP for 19,990 afy. However, with the passage of the Central Valley Project Improvement Act (CVPIA) in 1992, Congress prohibited Reclamation from entering into new contracts for water supply until an environmental analysis (e.g. the PEIS) was completed. Reclamation signed the Record of Decision (ROD) for the CVPIA PEIS in January 2001. Reclamation expects that the environmental review implementation requirements in the ROD will not be completed for several years, at which point PVWMA could negotiate a contract with Reclamation.

CVP contractors experience supply reductions during dry years. The yield in any given year could range from zero percent to 100 percent of a contract entitlement because of dry-year reductions. Due to legal restrictions, such as future implementation of the CVPIA and requirements established by CALFED for fisheries and water quality in the Sacramento-San Joaquin Delta, as well fluctuations in weather conditions, Reclamation has predicted that

agricultural CVP contractors south of the Delta may receive only 60 percent of their annual contract allocations on a long-term average basis.[1]

In order to offset the anticipated shortfall in CVP water supplies due to dry-year reductions, PVWMA would rely on groundwater banking within the basin and in a groundwater basin outside the Pajaro Valley (out-of-basin banking). The basin sustainable yield is then reduced from 48,000 afy to 47,000 afy due to increased reliance on groundwater pumping during dry years, when cutbacks in CVP water could occur.

3.2 IMPORT PIPELINE

To supply water to the Pajaro Valley Basin, PVWMA has proposed an import pipeline as a key component of the BMP. The Import Pipeline would link the Pajaro Valley with the Santa Clara Conduit of the San Felipe Unit facilities. The San Felipe Unit of the CVP supplies water to Santa Clara Valley, the northern portion of San Benito County, the southern portion of Santa Cruz County, and the northern edge of Monterey County. The proposed Import Pipeline would connect to the Watsonville turnout on the Santa Clara Conduit. Potential future delivery of water to Pajaro Valley was incorporated into the design of the San Felipe Unit pumping and transmission facilities. The design capacity available to PVWMA in the Santa Clara Conduit is 67 cubic feet per second (cfs), equal to approximately 4,500 to 4,600 acre feet per month. Facilities are planned **per** contract limitations on flow (67 cfs) but may be exceeded consistent with the operations of Santa Clara Valley Water District and San Benito County Water District. Except for the connection to the Santa Clara Conduit, no construction or physical modifications to CVP facilities are anticipated. The pipeline would extend from the existing Watsonville turnout across portions of San Benito, Santa Clara, Santa Cruz, and Monterey Counties and would connect with the ICDS near SR 1.

4.0 INTEGRATED COASTAL DISTRIBUTION SYSTEM

Another key component of the BMF' is the Integrated Coastal Distribution System or ICDS. The purpose of the ICDS is to deliver water to growers in the coastal area roughly bounded by Monterey Bay to the west, SR **1** to the east, Elkhom Slough to the south, **and** Buena Vista Drive and **Harkins** Slough Road to the north. Growers in this area receiving water from the ICDS would take their wells out of service, thereby reducing the groundwater pumping rate. The ICDS consists **of** facilities required to provide complete irrigation to approximately 10,000 acres (gross), approximately 8,960 acres (net), with imported water supplies.

In addition to blended recycled water and imported water, the ICDS has a third supply source: the Harkins Slough diversion project, located in Santa Cruz County. The **Harkins** Slough project was completed in 2001, including segments of the ICDS, to deliver water to nearby growers.

[1] This delivery figure, while subject to various considerations, is explained further in the CVPIA Programmatic EIS.

pipeline has already been constructed as part of the Harkins Slough project (site plans and pipeline alignment maps provided under separate cover).

5.0 PROJECT COMPONENTS WITHIN THE COASTAL ZONE

5.1 IMPORT PIPELINE

As the pipeline alignment continues west across Salinas Road, south of the community of Pajaro, it enters the "coastal zone" of Monterey County. The alignment continues west across SR 1 and turns north along a farm road, roughly 1,900 feet west of SR 1. The alignment continues north across the Pajaro River to the north side of the river levee, which is the end point of the Import Pipeline and the beginning of the distribution system.

5.2 ICDS

The South Plateau Lateral which would serve the Monterey County Service Area is wholly located in the "coastal zone. This lateral extends west along the south levee of the Pajaro River, and then proceeds south to a farm road. The pipeline follows this farm road for approximately two miles to its western terminus near the Pajaro River. The lateral travels south from this pipeline (approximately 1,500 feet west of the Pajaro River) then continues south approximately 18 miles, crosses McClusky Slough, and ends just north of the Struve Road / Giberson Road intersection. A main north-south sub-lateral extends branches from the South Plateau Lateral up the bluff just west of SR 1, and then travels south for about 1.5 miles before turning east and crossing SR 1.

The ICDS pipeline in the Santa Cruz County Service Area would begin approximately 700 feet west of SR 1 on the north side of the Pajaro River. It parallels the Pajaro River along the outside of the north levee for approximately 0.3 mile in a westerly direction, and proceeds north past the wastewater treatment facility to West Beach Road. ~~A main lateral extends west along Beach Road for approximately 2.25 miles, ending at the intersection of Beach and Shell Roads~~.

Two main laterals branch off of the Beach Road Lateral. The Northeast Addition Lateral travels north along a farm road approximately 1.25 miles. The North Plateau Lateral branches north off of the Beach Road alignment and follows San Andreas Road for approximately one-half mile to the north side of Watsonville Slough. From this point, the pipeline parallels the Harkins Slough pipeline, turns west along Dairy Road, and extends northwest for about one-half mile to the Harkins Slough recharge basin. The North Plateau Lateral then extends east to San Andreas Road and north along that road for approximately 1.5 miles. In addition, the system includes 16 sub-laterals (four along the Beach Road Lateral, four along the Northeast Addition Lateral, and eight along the North Plateau Lateral) to provide service to all parcels of land.

EXHIBIT K

6.0 BIOLOGICAL AND CULTURAL RESOURCES WITHIN THE COASTAL ZONE

6.1 VEGETATION, FISH, AND WILDLIFE

The ICDS can be divided into two service areas. Santa Cruz and Monterey Counties. The ICDS pipeline in the Santa Cruz Service Area would begin approximately 700 feet west of SR 1 on the north side of the Pajaro River. It parallels the Pajaro River on the outside of the north levee for approximately 0.3 mile in a westerly direction surrounded by agriculture to the north and the Pajaro River Valley Foothill Riparian vegetation south of the levee. The pipeline then proceeds north past the Watsonville Wastewater Treatment Facility and agricultural fields to Beach Road. ~~A main lateral extends west along Beach Road for approximately 2.25 miles, ending at the intersection of Beach Road and Shell Road.~~ Drainage ditches which support patches of freshwater emergent wetland in some locations parallel Beach Road.

Two main laterals branch off of the Beach Road Lateral. The Northeast Addition Lateral travels north along a farm road for approximately 1.25 miles. The surrounding habitat is agricultural with the exception of a bore and jack crossing of Hanson Slough, two crossings of Watsonville Slough, and another imgation ditch crossing. Hanson Slough supports freshwater emergent wetland and willows. Watsonville Slough and the irrigation ditch are channelized at the crossing locations and support Freshwater Emergent Wetland The North Plateau Lateral branches north off of the Beach Road alignment and follows San Andreas Road for approximately one-half mile across Watsonville Slough, which supports Freshwater Emergent Wetland and willows[2]. From this point, the pipeline parallels the Harkins Slough pipeline and turns west along Dairy Road and extends northwest for about one-half mile to the Harkins Slough recharge basin. From this point, the North Plateau Lateral extends east to San Andreas Road and north along that road for approximately 1.5 miles. Habitat surrounding the alignment is all agricultural with the exception of irrigation ditches and ponds, some of which support degraded Freshwater Emergent Wetland. In addition, the system includes 16 sub-laterals (four along the Beach Road Lateral, four along the Northeast Additional Lateral and 8 along the North Plateau Lateral) to provide service to all parcels of land.

The South Plateau Lateral would service the Monterey Service Area. This lateral extends west adjacent to the south levee of the Pajaro River and valley foothill riparian habitat beyond, and then proceeds south along farm roads. The pipeline follows farm roads for approximately two miles to its western terminus near the Pajaro River through agricultural fields and across irrigation ditches, some of which support degraded freshwater emergent wetland. The Lateral travels south along a farm road across Trafton Road and a steeply sloping area of natural vegetation, primarily coastal scrub and mixed chaparral. The alignment crosses an unnamed drainage within this habitat at the location of a culvert within an existing road and then continues south through agricultural fields. This drainage supports freshwater emergent wetland habitat as well as extensive willows. From this point the pipeline continues south approximately 18 miles, crosses McClusky Slough

[2] The bore and jack crossing of Watsonville Slough has already been constructed as part of the Harkins Slough Pipeline Project.

through trenchless construction methods, and ends just north of the Struve Road / Giberson Road intersection adjacent to Bennett Slough. Both Bennett Slough and McClusky Slough support extensive and highquality examples of freshwater emergent wetland. Numerous laterals branch off of the South Plateau Lateral through agricultural fields lacking natural habitat. Irrigation ponds and ditches which support degraded freshwater emergent wetland and a patch of coastal scrub a few hundred feet south of Jensen Road are also located in the project area.

WILDLIFE

The agricultural portions of the ICDS area support little wildlife habitat, but the areas of natural vegetation contain suitable habitat for a number of species. McCluskey Slough is the most notable habitat, since it is a large and well-developed freshwater marsh. McCluskey Slough is a known locality for the Santa Cruz long-toed salamander, and was rated as excellentquality habitat for the California red-legged frog and western pond turtle. The seeps and drainage south of Trafton Road were noted as being potential habitat for the California red-legged frog. Santa Cruz long-toed salamander, California tiger salamander, and western pond turtle may inhabit suitable areas in Hanson Slough and Bennett Slough. Finally, Watsonville and Harkins Sloughs were considered potential movement comdors for California red-legged frog and western pond turtle. A small drainage parallel to San Andreas Road empties into Watsonville Slough and lies within the project area. Although identified as a Waters of the U.S. (ESA, 1999c), this drainage sustains only ephemeral flow and was not considered to be a movement comdor or temporary habitat for California red-legged frog or western pond turtle.

WETLANDS

The Pajaro River, McCluskey Slough, Bennett Slough, and Hanson Slough support moderate to high quality wetland habitat. Within the immediate project area, Watsonville Slough and downstream reaches of Harkins Slough are channelized irrigation ditches that support lower quality habitat. Some upstream and downstream reaches of these sloughs maintain more natural features and provide higher quality habitat as a result. Lastly, imgation ditches throughout the ICDS project area support wetlands with cattail (*Typha* sp.), tule (*Scirpus* sp.), and other wetland indicator species. Habitat in these manmade ditches is degraded due to surrounding agricultural practices. With the exception of manmade imgation ditches, all of the abovementioned wetland features likely fall under the jurisdiction of the U.S. Army Corps of Engineers.

FISHERIES

The Pajaro River provides important migration habitat for steelhead, and the Pajaro Lagoon is known to contain a population of tidewater gobies. With the exception of the lower reaches of Watsonville Slough below the tide gates, which are located outside the ICDS project area, the various sloughs discussed above do not provide habitat for sensitive fish species.

EXHIBIT K

NATURAL COMMUNITIES

Sensitive natural communities are found at wetlands with moderate to high quality habitat (coastal freshwater marsh), and along the Pajaro River (valley foothill riparian). Manmade irrigation ditches with fragmented wetland habitat are not considered sensitive natural communities.

6.2 CULTURAL RESOURCES

Five previously recorded prehistoric cultural resources (CA-SCR-60, CA-SCR-61, CASCR-102, CA-SCR-130, and CA-SCR-154) are located along or adjacent to the proposed laterals within the Santa Cruz Service Area of the ICDS. CA-SCR-60 consists of a large flaked-stone and shell scatter, while CA-SCR-61 is a large prehistoric habitation site with extensive shell midden and ground-stone tool scatter. CA-SCR-102, CASCR-130, and CA-SCR-154 generally consist of flaked-stone scatter with shell deposits.

In addition to the prehistoric sites, three properties listed as Santa Cruz County historic places are also located along or adjacent to the proposed laterals within the Santa Cruz Service Area **of** the ICDS. These sites consist of two large concrete water tank towers (constructed in 1912) and the Thurwachter Road Marker (constructed in **1934).** None of these sites are considered eligible for listing on the NRHP (Holson, 1997). These sites were avoided during construction.

Proceeding under the terms of the Programmatic Agreement (PA) between the U.S. Army Corps of Engineers (USACOE) and the California *SHPO* executed in 2000 for the PVWMA Local Water Supply and Distribution Project, CA-SCR-60 and CA-SCR-130 were the subject of subsurface investigations prior to construction of the Harkins Slough project. Both sites contain deep stratified deposits and human remains, and thus were determined eligible for listing on the NRHP. Analysis of the materials and reporting was completed in Spring 2003. Subsurface probing at CA-SCR-61 suggested that the site is located outside of the pipeline alignment. Monitoring was conducted at this site during pipeline construction. CA-SCR-154 and CA-SCR-102 were outside of the pipeline alignment.

Cultural resource studies for the ICDS in the Santa Cruz Service **Area** were conducted and continue to be conducted in accordance with the PA between the USACOE and the California SHPO. CA-SCR-60 and CA-SCR-130 were determined eligible for inclusion in the NRHP. Mitigation of pipeline construction impacts were completed for these sites. CA-SCR-61, CA-SCR-102, and CA-SCR-154 were avoided during construction.

7.0 CONSTRUCTION OF COMPONENTS

7.1 PIPELINE CONSTRUCTION METHODS

Construction methods for the installation of pipelines would involve open trench methods **for** standard pipeline installation and potential microtunneling or jack and **bore** methods for crossings

where trenching methods are not feasible or permissible by regulatory agencies (e.g., rivers, wetlands/sloughs).

Open Trench

Trench width for the Import Pipeline installation would be approximately 15 feet with a depth of 12 feet depending on the size of the pipeline being installed. For the ICDS, trench width would be approximately 4 feet with a depth of 7 feet depending on the size of the pipeline being installed. Trenches would be braced using a trench box or speed shoring. The active work area along the open trench would extend about 5 to 10 feet to one side of the trench and 20 to 30 feet to the other side when area is available, allowing for access by trucks and loaders. The minimum construction right-of-way would be approximately 15 feet; the maximum construction easement would be 110 feet wide. On narrower farm roads or where deemed necessary, parking restrictions may be imposed during the construction period to facilitate traffic flow around the construction area.

Staging areas during construction would occur along the pipeline alignment and construction equipment and other materials would be located in parking lots, vacant lots, or segments of temporarily closed street lanes. Staging areas would be selected to minimize hauling distances and long-term disruption. Material excavated from trenches would be almost exclusively reused to limit the amount of off-haul material. The amount of excavation material to be off-hauled and the location for the off-haul material will be further refined during the final engineering phases of the project.

Jack and Bore

lack and bore construction techniques may be used for the crossing of busy intersections, wetlands, sloughs, and other environmentally sensitive locations. The jack and bore method involves use of a horizontal boring machine or auger to drill a hole and a hydraulic jack to push a casing through the hole. As the boring proceeds, a steel casing pipe is jacked into the hole; the pipeline is then installed in the casing. The casing is jacked using a large hydraulic jack in a pit located at one end of the crossing. The jacking pit is approximately 15 feet by 20 feet; the temporary pits are typically excavated to a few feet below pipe depth. If water flows persist within the channels at the time of construction, sheetpile cofferdams would be installed in a portion of the channel and the construction area would be dewatered.

Microtunneling

Microtunneling methods provide the ability to construct pipelines in a cost-effective manner and, at the same time, minimize construction impacts. Microctunneling is a trenchless construction method for installing pipelines simultaneously as soil is excavated and removed. Microtunneling uses a remote controlled boring machine equipped with a guidance system to install pipeline by consecutively pushing pipes and the boring machine through the ground using a jacking system for thrust. During this process, continuous pressure is provided to the face of the excavation to balance groundwater and earth pressures.

7.2 IMPORT PIPELINE

The proposed 22.2-mile Import Pipeline would consist of pipe segments 16 to 18 feet in length. The maximum pipe diameter would be 66 inches; however, pipe diameter may be reduced to 48 inches in areas where accessibility to the site and easement width is constrained (e.g., at Pajaro River crossings near Chittenden Pass). The entire pipeline would be located underground beneath five to 10 feet of cover.

Along most of the alignment, the pipe would be installed in a trench with 2:1 sideslopes, with one foot of bedding material below the pipe and five feet of cover material. In general, the pipeline alignment is located in open areas where conventional excavation methods can be used for open-cut (open-trench) pipeline installation. Open-cut installation is typically the least expensive method **of** installing pipe and is the preferred method for the Import Pipeline. Open-cut construction methods would be employed to construct most of the proposed overland, road, and dry river channel crossings; however, optional methods **of** installation would be used in some areas where the alignment crosses major roads, the Pajaro River, creeks with flowing water, dense vegetation, or other conditions where surface disturbance needs to be minimized.

The Import Pipeline would cross the Pajaro River twice in Monterey and Santa Cruz Counties: once to deliver water to the blending facility on the Monterey County side of the river, and again for delivery **of** the blended water to Santa Cruz County. Crossing of the river is proposed using a trenchless crossing method, microtunneling, due to the length and depth of the crossing and diameter of the casing pipe. This construction method involves excavating the soil in front of the pipe with an auger or other means, and using a jack to push the pipe sections forward as the soil is removed.

7.3 ICDS

The proposed ICDS contains a total of 165,670 linear feet (LF) of pipeline and is divided into two service areas: Santa Cruz and Monterey. 28, 530 LF of pipeline has already been constructed as part of the previously authorized Harkins Slough Project, approximately 54,000 LF would be constructed in Santa Cruz County and approximately 84,000 LF in Monterey County.

7.4 SLOUGHS

The majority **of** the ICDS alignment runs along **farm** roads, county roads and some private lands, however, portions of the proposed ICDS alignment cross rivers, and environmentally sensitive areas. Although recommended lateral routes minimize the number and length **of** special crossings, the ICDS would cross two sloughs: Hanson Slough and McClusky Slough. The crossing of these sloughs would occur via trenchless construction methods (i.e. jack and bore, microtunnel).

8.0 IMPACTS AND MITIGATION

Appendix **B** summarizes the impacts of the proposed project. For each impact considered to be significant or potentially significant, the table summarizes the recommended mitigations. The discussion of potential impacts can be focused into a few key project elements. The chief element **is** potential disturbance effects of facility construction and operation (e.g., effect on biological resources, water quality, traffic and circulation). The second element is effects, primarily on biological resources, from water diversions. With the implementation of recommended mitigation measures, most significant impacts would be avoided or substantially lessened to a level that is less than significant.

Appendix B is only intended to provide a summary of the impacts and mitigation measures which are described in detail in The Pajaro Valley Water Management Agency Local Water Supply and Distribution Environmental Impact Report, May 7, 1999. Chapter 8 of this report gives a detail description of the Environmental Setting, Impacts and Mitigation of the Irrigation Coastal Distribution System.

9.0 OTHER AGENCY APPROVALS

Table **2** lists the permits and approvals required for the project and approving agencies.

TABLE 2
POTENTIAL PERMITS AND APPROVALS

Action Requiring Permit/Consultation	Agency/Organization	Permit or Approval
Federal		
Impacts to wetlands / waters of the United States.	U.S. Army Corps of Engineers	Section 404 Permit
Construction in wetland and upland areas where federally listed species may be present.	U.S. Fish and Wildlife Service; National Marine Fisheries Service	Consultation and Coordination under Endangered Species Act
State		
Development of water supplies.	State Water Resources Control Board	Water Rights Permits
Alteration of streambeds during Construction.	California Department of Fish and Game	1601 Streambed Alteration Agreement
Projects west of Highway 1.	Coastal Commission	Coastal Development Permits
Potential for water quality impairment from sediment discharge to waterways during construction.	Regional Water Quality Control Board	401 Certification
Construction under Highways 1, 25, 101, and 129.	Caltrans	Encroachment Permits
Change in place of use, purpose of use for CVP water.	State Water Resources Control Board	
Protection of water courses from erosion, sediment, and pollutant discharge during construction.	State Water Resources Control Board	National Pollutant Discharge Elimination System Permit for Construction; Stormwater Pollution Prevention Plan
Local		
Construction and excavation activities in Monterey County.	Monterey County Planning Department	Grading Permit; Coastal Development Permit; Development Permit (inland areas)
Construction in County-maintained roadways.	Monterey County Public Works	Encroachment Permit

TABLE 2 (Continued)
POTENTIAL PERMITS AND APPROVALS

Action Requiring Permit/Consultation	Agency/Organization	Permit or Approval
Construction affecting Pajaro River levees and drainage ditches.	Montercy County Water Resources Agency Flood Control	Encroachment Permit Approval
Construction and excavation activities in Santa Cruz County.	Santa Cruz County Planning	Grading Permit; Riparian Exception; Coastal Development Permit
Construction in County-maintained roadways.	Santa Cruz County Public Works	Encroachment Permit

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REFERENCES

Pajaro Valley Water Management Agency (PVWMA), *PVWMA Basin Management Plan Draft EIR*, 2001.

Pajaro Valley Water Management Agency (PVWMA), *PVWMA Local Water Supply and Distribution Final EIR*, 1999.

United States Department of Interior, Bureau of Reclamation, *PVWMA Basin Management Plan Draft EIS*, 2003.

EXHIBIT K

APPENDICES

APPENDIX A

ASSESSOR PARCEL NUMBERS

EXHIBIT K

Santa Cruz County
CDS Alignment
APNs within 500 feet

APN #	Land Owner	Land Owner Address				Site Address			
Property Owners Along the ICDS alignment									
046-151-06	MAYEDA HARRY H & ROSE M TRUSTE	487 SAN ANDREAS RD	WATSONVILLE	CA	95076	555	SAN ANDREAS RD	WATSONVILLE	95076
046-151-07	KITAYAMA BROTHERS	481 SAN ANDREAS RD	WATSONVILLE	CA	95076	481	SAN ANDREAS RD	WATSONVILLE	95076
046-151-16	BONTADELLI ERNEST J M/M ETAL	101 PLAYA BLVD	WATSONVILLE	CA	95076				
046-151-19	IMAZIO BRUNO & LUCINDA TRUSTEE	590 VIVIENNE DRIVED	WATSONVILLE	CA	95076	197	SUNSET BEACH DR	WATSONVILLE	95076
046-201-09	KAJIHARA FRANK K & TERRIE T TR	13841 HUTCHINGS CT	WATSONVILLE	CA	95076				
046-201-15	KODA RODNEY N & GWEN K TRUSTEE	596 SAN ANDREAS RD	WATSONVILLE	CA	95076	596	SAN ANDREAS RD	WATSONVILLE	95076
046-201-17	KAJIHARA BILL K & LYNN H JT ET	229 VIA NOVELLA	APTOS	CA	95003				
046-201-18	NTGARGIULO L P	P O BOX 1570	WATSONVILLE	CA	95077	252	SAN ANDREAS RD	WATSONVILLE	95076
046-201-20	JONES J WARREN U/M TC ETAL	3-A GONZALES STREET	WATSONVILLE	CA	95076	520	SAN ANDREAS RD	WATSONVILLE	95076
046-201-21	LESLIE ALBERT A & BETTY J H/W	P O BOX 1808	FREEDOM	CA	95019	706	SAN ANDREAS RD	WATSONVILLE	95076
046-201-25	DAUTOFF FLOWER GROWERS INC	475 6TH ST	SAN FRANCISCO	CA	94103	570	SAN ANDREAS RD	WATSONVILLE	95076
046-371-01	CENTRAL CALIF CONF ASSN SEVENT	P O BOX 770	CLOVIS	CA	93613	783	SAN ANDREAS RD	WATSONVILLE	95076
046-371-02	BONTADELLI ERNEST J & BEVERLEY	101 PLAYA BLVD	WATSONVILLE	CA	95076	70	SUNSET BEACH DR	WATSONVILLE	95076
052-081-34	J & R REALTY COMPANY	P O BOX 2289	APTOS	CA	95001	495	HARKINS SLOUGH RD	WATSONVILLE	95076
052-211-26	LMC PROPERTIES LLC	5841 SIERRA CIELO	IRVINE	CA	92612				
052-551-01	WELLS FARGO BANK TRUSTEE ETAL	P O BOX 63700	SAN FRANCISCO	CA	94163				
Property Owners within 500 feet of the ICDS alignment									
046-151-26	CALIFORNIA STATE OF	1416 9TH ST RM 1147	SACRAMENTO	CA	95814				
046-151-28	AG LAND INC	P O BOX 1418	WATSONVILLE	CA	95077				
046-151-29	AG LAND INC	P O BOX 1418	WATSONVILLE	CA	95077				
046-151-30	AG LAND INC	P O BOX 1418	WATSONVILLE	CA	95077				
046-151-32	U S FLOWERS INC A CALIF CORP	P O BOX 537	BRIGHTON	CO	80601	67	SHELL RD	WATSONVILLE	95076
046-201-05	KODA RODNEY N & GWEN K TRUSTEE	596 SAN ANDREAS RD	WATSONVILLE	CA	95076				
046-201-16	TELLES RANCHES INC	P O BOX 35	FIREBAUGH	CA	93622				

EXHIBIT K

Santa Cruz County
CDS Alignment
APNs within 500 feet

APN #	Land Owner	Land Owner Address				Site Address			
Property Owners within 500 feet of the ICDS alignment (cont)									
046-201-26	NTGARGIULO L P	P O BOX 1570	WATSONVILLE	CA	95077	482	SAN ANDREAS RD	WATSONVILLE	95076
052-081-35	HUNGSLAND PROPERTIES ETAL	3428 BALBOA STREET	SAN FRANCISCO	CA	94121	275	LEE RD	WATSONVILLE	95076
052-221-19	BRYANT PAUL M & KAREN J TRUSTE	COURT	SAN JOSE	CA	95120				
052-551-02	NTGARGIULO L P	P O BOX 1570	WATSONVILLE	CA	95077				
052-551-03	WELLS FARGO BANK NA SUCC TRUST	P O BOX 63700	SAN FRANCISCO	CA	94163				
052-551-04	WELLS FARGO BANK NA TRUSTEE	P O BOX 63700	SAN FRANCISCO	CA	94163				
052-551-05	CROSETTI J J JR TRUSTEE	P O BOX 160	WATSONVILLE	CA	95077				
052-551-06	MINE GARY D	P O BOX 2156	WATSONVILLE	CA	95077	1970	W BEACH ST	PAJARO DUNES	95076
052-551-07	MINE ROBERT W	P O BOX 1434	SOQUEL	CA	95073				
052-551-08	WELLS FARGO BANK NA SUCC TRUST	P O BOX 63700	SAN FRANCISCO	CA	94163				
052-561-01	ROBERT TRAFTON FAMILY PARTNERS	111 BAYWOOD AVE	HILLSBOROUGH	CA	94010				
052-571-04	MINE TOM I & SONS	233 MARTINELLI ST	WATSONVILLE	CA	95076				

APPENDIX B

MITIGATION MEASURES SUMMARY TABLE

EXHIBIT K

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8/03

TABLE 1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
4.1 Land Use and Planning – College Lake		
Impact 4.1.3-1: Construction of the College Lake facilities would result in short-term disturbance of adjacent land uses.	**Mitigation Measure 4.1.3-1 (Recommended):** The PVWMA will provide advance notification of construction activities to all property owners, residents, and businesses in the vicinity of construction areas. See also mitigation measures in Sections 4.6.3, Traffic, and 4.7.3, Air Quality, of this EIR.	Less than significant.
Impact 4.1.3-2: The proposed College Lake component would be generally consistent with policies of the Watsonville General Plan and the Santa Cruz County General Plan/LCP.	None required.	Less than significant.
Impact 4.1.3-3: Development of the College Lake component would result in the permanent loss of up to one-half acre of agricultural lands.	None available	Significant and unavoidable.
5.1 Land Use and Planning –Harkins Slough		
Impact 5.1.3-1: Construction of the proposed facilities of the Harkins Slough component could result in short-term disturbance of adjacent land uses.	**Mitigation Measure 5.1.3-1 (Recommended):** Implement Measure 4.1.3-1, above.	Less than significant.
Impact 5.1.3-2: The proposed Harkins Slough component would be generally consistent with the policies of the Santa Cruz County General Plan/LCP.	None required.	Less than significant.
Impact 5.1.3-3: Development of the Harkins Slough component would result in the permanent loss of approximately one-half acre of agricultural land.	None available.	Significant and unavoidable.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	AFTER MITIGATION
6.1 Land Use and Planning – Murphy Crossing		
Impact 6.1.3-1: Construction of the proposed facilities at Murphy Crossing would result in short-term disturbance of adjacent land uses.	**Mitigation Measure 6.1.3-1 (Recommended):** Implement Measure 4.1.3-1, above.	Less than significant.
Impact 6.1.3-2: Development of the Murphy Crossing component would convert approximately eleven acres of prime farmland to water supply infrastructure uses.	None available.	Significant and unavoidable.
7.1 Land Use and Planning – Watsonville Reclamation		
Impact 7.1.3-1: Construction of the proposed facilities of the Watsonville wastewater reclamation component would result in short-term disturbance of adjacent land uses.	**Mitigation Measure 7.1.3-1 (Recommended):** Implement Measure 4.1.3-1, above.	Less than significant.
8.1 Land Use and Planning – Coastal Distribution		
Impact 8.1.3-1: Construction of the proposed coastal distribution system would result in short-term disturbance of adjacent land uses.	**Mitigation Measure 8.1.3-1 (Recommended):** Implement Measure 4.1.3-1, above.	Less than significant.
Impact 8.1.3-2: The proposed coastal distribution system would be generally consistent with policies of the Santa Cruz County General Plan/LCP and the Monterey County General Plan, North County Area Plan, and North County LUP/LCP.	None required.	Less than significant.
9.1 Land Use and Planning – Inland/Murphy Crossing Distribution		
Impact 9.1.3-1: Construction of the inland distribution system and the Connecting Pipeline would result in short-term disturbance of adjacent land uses.	**Mitigation Measure 9.1.3-1 (Recommended):** Implement Measure 4.1.3-1, above.	Less than significant.

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EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
4.2 Geology and Soils – College Lake		
Impact 4.2.3-1: Construction of the proposed pipeline and water diversion and treatment facilities would result in accelerated erosion and attendant loss of soil resources and effects on sediment discharges in water courses. The impact would be significant on slopes over 2 percent and in areas with soils having moderate or greater erosion hazard.	**Mitigation Measure 4.2.3-1a**: All grading and construction shall conform to requirements of the Santa Cruz County Grading Ordinance.	Less than significant.
	Mitigation Measure 4.2.3-1b: Site grading and construction work areas shall expose as little new ground surface as possible. Vegetation cover should be left intact to the extent practical.	Less than significant.
	Mitigation Measure 4.2.3-1c: To the extent possible, grading activities in non-cropped areas shall be limited to the period between April 15 and October 31. If dry conditions persist after October 31, one week extensions of grading activities will be obtained from the County Public Works Department. In areas where the soil is tilled, grading activities will be coordinated with the local farmers to ensure consistency between their erosion control and farming practices and construction disturbance.	*Less than significant.*
	Mitigation Measure 4.2.3-1d: Implement best construction practices at all grading sites, regardless of soil erodibility hazard.	*Less than significant.*
	Mitigation Measure 4.2.3-1e: Upon completion of construction at all sites, loose soils shall be removed or spread and all areas shall be re-soiled and reseeded to ensure that a stable soil cover will remain.	*Less than significant.*

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE
Impact 4.2.3-1 (cont.)	**Mitigation Measure 4.2.3-1f**: PVWMA will prepare and implement an inspection and maintenance program for the right-of-way and all facility sites. The plan will include routine inspection plans and reporting, and prescriptive methods for correcting erosion or soil instability problems.	Less than significant.
Impact 4.2.3-2: The proposed increase in the storage capacity of College Lake would expand the lake's inundation area, which could result in exposure of soils to erosion.	**Mitigation Measure 4.2.3-2 (Recommended):** Periodic inspection of the shoreline area is recommended to identify if soil losses in the expanded inundation area of College Lake are resulting in noticeable soil losses and erosion of the adjacent slopes. If enhanced erosion conditions are identified, corrective actions for slope and soil stabilization would be undertaken.	Less than significant.
Impact 4.2.3-3: *The project would result in a less than* significant loss of prime agricultural soils.	None required.	Less than significant.
Impact 4.2.3-4. Weak, expansive and corrosive soil hazards. Proposed pipelines pass through some areas with weak soils subject to settlement, expansive soils and potentially corrosive soils that could damage the proposed facilities.	**Mitigation Measure 4.2.3-4:** Conduct soil engineering investigations of the proposed pipeline alignment and pumping facilities prior to the final design, and implement design recommendations. The investigations will specify hazards related to corrosion, weak soils and settlement, including differential settlement. The recommendations of an engineering geologist shall be incorporated into the design and specifications and shall be implemented by the construction contractor. The construction manager shall conduct inspections and certify that all design criteria have been met. While these measures would not ensure that some damage to the facilities would not occur, it would ensure that design standards have been met and the hazards have been reduced to an acceptable level of risk. Therefore, the impact would be reduced to a less than significant level.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 4.2.3-5: Large earthquakes would be expected to damage the proposed facilities, impairing and/or disrupting their intended operations.	Mitigation Measure 4.2.3-5: Conduct geologic investigations of the proposed pipeline alignment and pumping, diversion and filtration facilities prior to the final design and implement design recommendations. The investigations will specify hazards related to ground movements and co-seismic effects, especially liquefaction. The recommendations of an engineering geologist shall be incorporated into the design and specifications and shall he implemented by the construction contractor. The construction manager shall conduct inspections and certify that all design criteria have been met. While these measures would not ensure that damage to the facilities would not occur, it would ensure that the hazards have been reduced to an acceptable level of risk and, therefore, the impact would be reduced to a less than significant level.	Less than significant.
***5.2* Geology and Soils – Harkins Slough**		
Impact 5.2.3-1: Construction of the proposed pipeline and infiltration facilities would result in accelerated erosion and attendant loss of soil resources and effects on sediment discharges in water courses. The impact would be significant on slopes over 2 percent and in areas with soils having moderate or greater crosion hazard, which includes the entire area of the coastal dunes distribution system.	Mitigation Measure 5.2.3-1: Implement Measures 4.2.3-1a through 4.2.3-If, above..	Less than significant
Impact 5.2.3-2: As the project would create no change in water levels in Harkins Slough, no impact on soils or crosion of wetlands would occur.	None required.	Less than significant.
Impact 5.2.3-3: The project would result in a loss of agricultural soils.	None required.	Less than significant.

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EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact **5.2.3-4:** Proposed pipelines pass through some areas with weak soils subject to settlement, and expansive and potentially corrosive soils that could damage the proposed facilities.	Mitigation Measure **5.2.3-4:** Implement Measure 4.2.3-4, above.	**Less** than significant.
Impact **5.2.3-5:** Large earthquakes would be expected to damage the proposed facilities, impairing and/or disrupting their intended operations.	**Mitigation *Measure* 5.2.3-5:** Implement Measure 4.2.3-5, above. While these measures would not ensure that damage lo the facilities would not occur, it would ensure that the hazards have been reduced to an acceptable level of risk and, therefore, the impact would be reduced to a less than significant level.	Less khan significant.
6.2 Geology and Soils – Murphy Crossing		
Impact **6.2.3-1:** Construction of the proposed infiltration galleries, pipeline, and recharge basins would result in accelerated erosion and attendant loss of soil resources and effects on sediment discharges in water courses. Almost the entire project area is characterized by soils with slight erosion hazard. The impact would be significant on slopes over **2** percent.	Mitigation Measure **6.2.3-1**: lmplement Measures **4.2.3-la** through **4.2.3-If,** above.	Less than significant.
Impact **6.2.3-2:** The project would result in a **loss** of prime agricultural soils.	None available	Significant and unavoidable
Impact **6.2.3-3:** The proposed pipelines connecting the groundwater extraction wells and the infiltration gallery to the recharge basins as well **as** distribution pipelines pass through some areas with weak soils subject to settlement and expansive soils that could damage the proposed facilities.	Mitigation Measure **6.2.3-3:** Implement Measure **4.2.3-4,** above.	Less than significant.
Impact **6.2.3-4:** Large earthquakes would be expected to damage the proposed facilities, impairing and/or disrupting their intended operations.	Mitigation Measure **6.2.3-4:** lmplement Measure 4.2.3-5. above.	Less than significant.

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
7.2 Geology and Soils – Watsonville Reclamation		
Impact **7.2.3-1:** Construction **of** the proposed reclaimed water pipeline and facilities at the treatment plan could result in accelerated erosion and attendant loss of soil resources. Almost the entire project area is characterized by soils with slight erosion hazard.	Mitigation Measure **7.2.3-1:** Implement Measures 4.2.3-la through 4.2.3-1f, above.	Less than significant.
Impact **7.2.3-2:** The project would result in a temporary loss of prime agricultural soils.	None required	Less than significant.
Impact **7.2.3-3:** Large earthquakes would be expected to damage the proposed facilities, impairing and/or disrupting their intended operations.	Mitigation Measure **7.2.3-3.** Implement Measure 4.2.3-4, above.	Less than significant.
8.2 Geology and Soils – Coastal Distribution System		
Impact **8.2.3-1:** Construction of the proposed pipelines would result in accelerated erosion and attendant loss of soil rcsources and effects on sediment discharges in water courses. The impact would be significant on slopes over 2 percent and in areas with soils having moderate or greater erosion hazard, which includes the entire area ***of*** the coastal distribution systcm.	Mitigation Measure **8.2.3-1**: Implement Measures 4.2.3-la through 4.2.3-1f, above.	Less than significant.
Impact **8.2.3-3:** The project would result in a less than significant loss of prime agricultural soils.	None required	Less than significant.
Impact 8.2.3-4: Proposed pipelines on the Pajaro floodplain pass through areas with Clear Lake clay soils that are weak soils subject to settlement, expansive soils and potentially corrosive soils that could damage the proposed Cacilities.	Mitigation Measure **8.2.3-4:** Implement Measure 4.2.3-4, above.	Less than significant.
Impact **8.2.3-5:** Large earthquakes would be expected to damage the proposed facilities, impairing and/or disrupting their intended operations.	Mitigation Measure 8.2.3-5: Implement Measure 4.2.3-5, above.	Less than significant

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EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS **AND MITIGATION MEASURES**

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
9.2 Geology and Soils – Inland/Murphy Crossine Distribution		
Impact 9.2.3-1: Construction of the proposed pipelines would result in accelerated erosion and attendant loss of soil resources and effects on sediment discharges in water courses. Almost the entire project area is characterized by soils with slight erosion hazard. The impact would be significant on slopes over 2 percent.	Mitigation Measure 9.2.3-la: All grading and construction shall conform to requirements of the Santa Cruz County Grading Ordinance and Monterey **County** Grading Ordinance. Mitigation Measure 9.2.3-1b: Implement Measures 4.2.3-1b through 4.2.3-1f, above.	Less than significant
Impact 9.2.3-2: The proposed pipelines would not result in a permanent loss of prime agricultural soils.	None required	Less than significant.
Impact 9.2.3-3: The proposed pipelines pass through some areas with weak soils subject to settlement and expansive soils that could damage the proposed facilities.	Mitigation Measure 9.2.3-3: Implement Measure 4.2.3-4, above.	Less than significant.
Impact 9.2.3-4: Large earthquakes would be expected to damage the proposed facilities, impairing and/or disrupting their intended operations.	Mitigation Measure 9.2.3-4: Implement Measure 4.2.3-5, above.	Less than significant.
4.3 Hydrology and Water Quality – College Lake		
Impact 4.3.3-1: Construction activities would increase soil erosion and may transport other contaminants to downstream receiving waters.	Mitigation Measure 4.3.3-1: Employ construction storm water quality management practices.	Less than significant.

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL **IMPACT**	MITIGATION	LEVEL **OF** SIGNIFICANCE **AFTER** MITIGATION
Impact **4.3.3-2:** Construction activities at the proposed project site could result in dewatering of shallow groundwater resources and contamination of surface water.	Mitigation Measure **4.3.3-2:** Obtain NPDES permit for construction dewatering and implcmcnt conditions of the permit. An NPDES permit will be required from the RWQCB for all discharges for construction dewatering. Discharges must meet water qualityobjectives specified in the Basin Management Plan as dcscrihcd in Section 3.3. The RWQCB may require certain conditions of the permit, such as treatmcnt of the flows prior to discharge.	Less than significant.
Impact **4.3.3-3:** Operation of the project will change historical water levels patterns in College Lake and discharges hy pumping to Salsipuedes Creek.	None required.	Less than significant.
Impact **4.3.3-4:** Raising the level of College Lake may expose people and structures to increased flood hazards.	None required.	Less than significant.
Impact **4.3.3-5:** The College Lake project would convey water that normally would flow to the ocean to agricultural lands for irrigation, thereby decreasing the need to pump groundwater.	None required.	Beneficial
5.3 Hydrology and Water Quality – Harkins Slough		
Impact **5.3.3-1:** Construction activities would increase soil erosion and may transport other contaminants to downstream receiving waters.	Mitigation Measure **5.3.3-1:** Implement Measure 4.3.3-1, above.	Less than significant.
Impact **5.3.3-2:** Construction activities at the proposed project site could result in dewatering of shallow groundwater rcsources and contamination of surface water.	Mitigation Measure **5.3.3-2:** Implement Measure 4.3.3-2, above.	Less than significant.

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact **5.3.3-3:** Operation of the project will change historical discharges of flood waters in Watsonville and Harkins Sloughs to the Pajaro River.	None required.	Less than significant.
Impact **5.3.3-4:** Development at the project site would not expose people and structures to flood hazards.	None required.	Less than significant.
Impact **5.3.3-5:** The Harkins Slough project component would convey water that normally would flow to the Pajaro River and the ocean, to irrigation users or to groundwater recharge facilities which would reduce groundwater overdraft conditions.	None required.	Beneficial.
6.3 Hydrology and Water Quality – Murphy Crossing		
Impact **6.3.3-1:** Construction activities **would** increase soil erosion and may transport other contaminants to downstream receiving waters.	Mitigation Measure **6.3.3-1:** Implement Measure 4.3.3-1, above.	Less than significant.
Impact **6.3.3-2:** Construction activities **at** the proposed project site could result in the temporary depletion of groundwater resources and contamination of surface water.	Mitigation Measure **6.3.3-2:** Implement Measure **4.3.3-2,** above.	Less than significant.
Impact **6.3.3-3:** Operation of the project would lower water levels and flow in the Pajaro River and reduce flows to the ocean.	None required,	Less than significant.
Impact **6.3.3-4:** Development at the project site may expose people and structures to flood hazards.	None required.	Less than significant.

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 6.3.3-5: The project will construct a pipeline adjacent to PVWMA Well No. 54 **at** the corner of Murphy Road and Riverside Drive / Highway ***129.*** Construction activities could damage the well or block access to the well.	**Mitigation Measure 6.3.3-5:** Avoid construction impacts to well. The precise well location shall he identified in preconstruction surveys. The pipeline construction trench, material stockpile areas and **soil** excavation stockpiles shall he designated in the construction plans and specifications to specifically avoid impacting the well and access to the well.	Less than significant.
Impact 6.3.3-6 The Murphy Crossing project would convey water that normally would flow to the ocean to groundwater recharge facilities or to irrigation users which would reduce groundwater overdraft conditions.	None requircd.	Beneficial.
7.3 Hydrulow and Water Quality – Watsonville Reclamation		
Impact 7.3.3-1: Construction activities would increase soil erosion and may transport other contaminants to downstream receiving waters.	**Mitigation Measure 7.3.3-1:** Implement Measure 4 above.	Less than significant.
Impact 7.3.3-2: Construction activities at the proposed project site could result in the dewatering of shallow groundwater resources and contamination of surface water.	**Mitigation Measure 7.3.3-2:** Implement Measure 4.3.3-2, above.	Less than significant.
Impact 7.3.3-3: Development at the project site may expose people and structures to flood hazards.	None required	Less than significant.
Impact 7.3.3-4: The discharge of treated wastewater to agricultural fields may degrade surface or groundwater or may not he suitable for various crops. However, the proposed project would blend reclaimed water with other water sources to achieve acceptable water quality	None required.	Less than significant.

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TABLE 1 (Continued)
SUMMARY **OF** IMPACTS **AND MITIGATION** MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	**LEVEL OF SIGNIFICANCE** AFTER MITIGATION
Impact **7.3.3-5:** The reclamation project would convey treated wastewater that normally would flow to the ocean to agricultural lands for irrigation, thereby decreasing the need to pump groundwater.	None required.	*Beneficial*
8.3 Hydrology and Water **Quality** – Coastal Distribution		
Impact **8.3.3-1:** Construction activities would increase soil erosion and may transport other contaminants to downstream receiving waters.	Mitigation Measure **8.3.3-1:** Implement Measure above.	Less than significant.
Impact **8.3.3-2:** Construction activities at the proposed project site could result **in** dewatering *of shallow* groundwater resources and contamination of surface water.	Mitigation Measure **8.3.3-2:** Implement Measure 4.3.3-2, above.	Less than significant.
Impact **8.3.3-3:** Development at the project site may expose structures to flood hazards. However, after construction, **all** of **the** project pipeline will be underground and will not cause a flood hazard.	None required.	Less than significant.
Impact **83.3-4:** The proposedpipelinc would be constructed adjacent **io** a number of wells, Construction activities could damage the wells or block access **io** the wells.	Mitigation Measure **8.3.3-4:** Implement Measure 6.3.3-5, above.	Less than significant.
Impact **8.3.3-5:** The coastal distribution system project would convey water to agricultural hinds for irrigation, thereby decreasing the need to pump groundwater.	None required.	Beneficial.
9.3 Hydrology and Water Quality – **Inland/Murphy** Crossing Distribution		
Impact **9.3.3-1:** Construction activities would increase soil erosion and may transport other contaminants to downstream receiving waters.	Mitigation Measure **9.3.3-1:** Implement Measure 4.3.3-1, above.	Less than significant.

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EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	*MITIGATION*	LEVEL OF SIGNIFICANCE *AFTER MITIGATION*
Impact 9.3.3-2: Construction activities at the proposed project site could result in dewatering of shallow groundwater resources and contamination of surface water.	**Mitigation Measure 9.3.3-2:** Implement Measure 4.3.3-2, above.	Less than significant.
Impact 9.3.3-3: Development at the project site may expose structures to flood hazards. However, after construction, all of the project pipeline will be underground and will not cause a flood hazard.	None required.	Less than significant.
Impact 9.3.3-4: The proposed pipelines would be constructed adjacent to two wells. Construction activities could damage the wells or block access to the wells.	**Mitigation Measure 9.3.3-4:** Implement Measure 6.3.3-5, above.	Less than significant.
Impact 9.3.3-5: The distribution systems project would convey water to agricultural lands for irrigation, thereby decreasing the need to pump groundwater.	None required.	Beneficial.
4.4 Vegetation and Wildlife – College Lake		
Impact 4.4.3-1--*Wetlands*: Construction of the headgate and pipeline crossing could result in temporary impacts of up to 0.7 acres of potential jurisdictional wetlands/waters of the U.S. and streambeds and banks under the jurisdiction of CDFG. Potential impacts include sedimentation of the channels adjacent to the construction area during trenching activities, and temporary loss of wetland-associated vegetation, stream function as wildlife and fishery habitat, and loss of special status natural communities.	**Mitigation Measure 4.4.3-1a—*Wetlands Avoidance*:** Crossings of Corps jurisdictional areas at Corralitos Creek and Salsipuedes Creek for the pipeline shall be avoided by project construction. All facilities and construction activities shall be maintained outside the jurisdictional area. This measure would also avoid impacts to special status species potentially occurring in these water ways (see Impact 4.4.3-2). This mitigation measure would avoid significant impacts at Corralitos Creek. Impacts to waters at Salsipuedes Creek and elsewhere along the pipeline route would be minimized through implementation of the following mitigation.	Less than significant.

EXHIBIT K

IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 4.4.3-2: Construction of facilities in and near wetlands could result in temporary impacts to special status animal species and their habitats. Impacts could occur due to increased sedimentation in streams, dewatering of pools, habitat loss through vegetation removal, destruction of nests and burrows and construction disturbance.	**Mitigation Measure 4.4.3-1b—*Implement Standard Protective Measures to Maintain Water Quality and Control Erosion and Sedimentation*:** Standard measures to maintain water quality and to control erosion and sedimentation are recommended. **Mitigation Measure 4.4.3-1c--*Revegetation Measures in Riparian Forest*:** Where adverse impacts to coastal riparian forest occur at Corralitos and Salsipuedes creeks, revegetation measures will be developed as part of a revegetation plan approved by CDFG. **Mitigation Measure 4.4.3-2a—*Avoid Disturbance to Riparian Vegetation*:** Avoid removal or damage to all riparian vegetation within the project corridor. Erect exclusion fencing during construction along the edge of riparian vegetation where the construction area is within 25 feet of the riparian zone. If complete avoidance is infeasible, implement Measure 4.4.3-2b. The above measure is applicable at crossings of Salsipuedes Creek and Corralitos Creek. **Mitigation Measure 4.4.3-2b—*Survey, Consultation and Protection Measures for California Red-Legged Frog*:** Since potential habitat for the California red-legged frog is present at Corralitos and Salsipuedes creeks, informal consultation with USFWS was initiated and a site assessment was carried out as part of the field surveys in 1999. Since red-legged frogs are presumed present, reasonable and prudent protection measures outlined in the programmatic Biological Opinion (FWS, 1999)(required by the Endangered Species Act) will be carried out for this project.	Less than significant.

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 4.4.3-2: (cont.)	**Mitigation Measure 4.4.3-2c—*Survey and Protection of Raptor and Passerine Nesting Sites*:** To avoid conflicts with nesting raptors and passerine birds, construction activities within 500 feet of riparian habitat shall begin prior to the nesting season (March to July). The potential occurrence of nesting raptors shall be evaluated and mitigation measures carried out in all areas of suitable habitat near the College Lake headgates, and along Corralitos and Salsipuedes Creek. **Mitigation Measure 4.4.3-2d—*Survey and Protection of Western Pond Turtles*:** Prior to construction activities a qualified biologist will perform pond turtle surveys of suitable habitat within 300 feet of the waterway where construction activities would remove riparian habitat. Surveys will include nests as well as individuals. The project biologist will be responsible for the survey and for relocating adult turtles which move into the construction zone after construction has begun. Construction will not proceed until the area is determined to be free of turtles or their nests. If a nest is located within a work area, a biologist with the appropriate permits may move the eggs to a suitable facility for incubation, and release hatchlings into the creek system in late fall. **Mitigation Measure 4.4.3-2e—*Construction Protection Measures for Steelhead:*** Construction of the headgate/weir structure on Salsipuedes Creek below College Lake shall be limited to June 1 to November 1 to avoid impacts to migrating steelhead.	

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 4.4.3-3: Operation of the proposed project would reduce streamflows for steelhead passage in Salsipuedes Creek, particularly for down-migrating smolts in the spring months. Raising the headgates at College Lake could present a barrier to up-migrating adult steelhead. Significant. The impact would be reduced to a less than significant level with mitigation identified in this EIR.	**Mitigation Measure 4.4.3-3a—*Maintenance of Streamflow for Steelhead*:** Impacts to steelhead smolt passage by altering College Lake storage and/or reducing the pumping of College Lake water into Salsipuedes Creek can be avoided by providing minimum bypass flows during the steelhead smolt migration period. **Mitigation Measure 4.4.3-3b—*Protection of Up-Migrating Steelhead at College Lake Headgates*:** The height of the headgates at College Lake shall be adjustable and will be maintained so that upstream passage is no more difficult than the present conditions. **Mitigation Measure 4.4.3-3c—*Protection of Down-Migrating Steelhead at College Lake Intake Facilities*:** The current pumping facilities move water out of College Lake and directly into Salsipuedes Creek, so that down-migrating smolts remain in their traditional stream. With the construction of a diversion pipeline, the intake structure must assure that smolt are not entrained, since the diverted water will be used for irrigation or recharge. The intake facilities must then be reviewed to assure that their design will result in no entrapment or entrainment of steelhead smolts. In addition, an attraction flow of 2 cfs will be maintained over the outlet weir when lake water elevations are at 60.2 ft or more.	Less than significant

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
5.4 Vegetation and Wildlife – Harkins Slough		
Impact 5.4.3-1: Construction and operation of water diversion facilities at Harkins Slough would result in impacts to special status animal species dependent on wetland habitats. Impacts could occur due to increased sedimentation in waterways, dewatering of pools, habitat loss through changes in salinity in Lower Watsonville Slough, vegetation removal, destruction of nests and burrows and construction disturbance.	**Mitigation Measure 5.4.3-1a**—Implement Measure 4.4.3-2a, above.	Less than significant.
	Mitigation Measure 5.4.3-1b—***Survey, Consultation and Protection Measures for California Red-legged Frog, California Tiger Salamander and Santa Cruz Long-toed Salamander*:** Since potential habitat was identified at Watsonville Slough for the California red-legged frog and the Santa Cruz long-toed salamander as part of the habitat assessment, informal consultation with USFWS was initiated. If the Corps determines that potential impacts to habitat for the California red-legged frog will occur, requirements under the programmatic Biological Opinion for this species will be carried out.	
Impact 5.4.3-2: Construction of pipeline facilities could result in impacts to special status plant species.	None required.	Less than significant.

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
6.4 Vegetation and Wildlife – Murphy Crossing		
Impact 6.4.3-1: Construction of the proposed project could result in disruption to special status wildlife species that breed in the riparian habitat of the Pajaro River.	**Mitigation Measure 6.4.3-1—*Timing of Construction Activity near the Pajaro River to Protect Passerines, Raptors, Steelhead, Reptiles and Amphibians*:** To avoid conflicts with raptors, yellow warblers, steelhead, California red-legged frogs and western pond turtles, construction activities within riparian habitat on the Pajaro River shall be limited to August 1 to November 1. All applicable reasonable and prudent measures in the programmatic Biological Opinion for the California red-legged frog shall be fully implemented for both the shallow vertical well site and for the infiltration gallery. **Mitigation Measure 6.4.3-1b—Restoration of Tree Cover, Pajaro River:** Habitat for California red-legged frogs, western pond turtles, yellow warblers and steelhead trout shall be enhanced by planting woody vegetation. At the shallow vertical wells site, woody vegetation is well established and is in good condition. Moreover, no woody vegetation will be removed in connection with the project. At this site, woody vegetation will be enhanced by interplanting woody vegetation in a 1:1 ratio. At the Murphy Crossing site, all woody trees and shrubs removed as part of the construction will be replaced with similar species in a 3:1 ratio.	Less than significant.
Impact 6.4.3-2: Construction and operation of water diversion facilities at Murphy Crossing could result in adverse impacts to Central Coast steelhead by reducing flow necessary for migration.	**Mitigation Measure 6.4.3-2—*Maintenance of Flow for Steelhead Migration*:** The impact to steelhead passage by diversion of Pajaro River water near Murphy's Crossing can be avoided by providing minimum bypass flows during the steelhead migration period.	Less than significant.

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EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
7.4 Vegetation and Wildlife – Watsonville Reclamation		
Impact 7.4.3-1: *Construction of the proposed project* component would result in temporary impacts to up to 0.6 acı of potentially jurisdictional wetlands/waters of the U.S. and streambed and at the Pajaro River crossing near Highway 1. Potential impacts could occur due to sedimentation of the channels outside of the construction area during trenching activities, and loss of riparian vegetation and stream function wildlife and fishery habitat.	**Mitigation Measure 7.4.3-1a—*Wetlands Avoidance*: Wetlands at the Highway 1 crossing of the Pajaro River may be avoided entirely by using bore and jack construction. Alternatively, the riparian wetland habitat will be avoided if the pipeline is suspended beneath the Highway 1 bridge.** If complete avoidance is infeasible, implement Measures 7.4.3-1b and 7.4.3-1c.	Less than significant.
	Mitigation Measure 7.4.3-1b—*Implement Standard Protective Measures to Maintain Water Quality and Control Erosion and Sedimentation*: Standard measures to maintain water quality and to control erosion and sedimentation shall be implemented, as described in Mitigation Measure 4.4.3-1b. These measures include timing construction to take place during low flow periods, maintaining bypass flow areas outside the zone of construction, as appropriate, placing sediment curtains around construction, placing spoils sites outside the levees, developing a spill prevention plan, storing equipment and materials outside the river levees, maintaining vehicles and equipment to avoid spills, and developing a revegetation plan for disturbed habitats.	
Impact 7.4.3-1 (cont.)	**Mitigation Measure 7.4.3-1c—*Minimize Overall Loss of Wetlands by Constructing Parallel Pipeline Elements Concurrently Within the Same Construction Zone*:** Other project elements (Coastal Distribution Pipeline) also include construction of a pipeline across the Pajaro River near the Highway 1 crossing. If both project elements are implemented, they shall be constructed concurrently and in the same construction zone, potentially reducing loss of wetlands by as much as 0.6 acre.	

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Mitigation Measure 7.4.3-1d—*Restore Pajaro River Riparian Forest:* The revegetation plan for the project shall include restoration of riparian forest impacted by construction. Revegetation shall include installation of locally obtained, locally indigenous species of trees and shrubs in a ratio of 3:1 to replace lost vegetation, specifications for the after-installation care, weed control, and monitoring for a three year period following installation.	
Impact 7.4.3-2: Construction of facilities at the Pajaro River crossing near Highway 1 would result in temporary impacts to up to 0.6 acre of habitat for special status animal species. Impacts could occur due to risk of increased sedimentation in streams, dewatering of pools, habitat loss through vegetation removal, destruction of nests and burrows and construction disturbance.	**Mitigation Measure 7.4.3-2a—*Avoidance of Habitat*:** Avoid removal or damage to riparian vegetation within the levees of the Pajaro River. Construct the pipeline across the Pajaro River under the Highway 1 bridge or by using the bore and jack method. If complete avoidance is infeasible, implement Measure 7.4.3-2b.	Less than significant.
	Mitigation Measure 7.4.3-2b—*Minimize Habitat Loss*: If complete avoidance of the riparian areas is not possible, by bridging or bore and jack for example, then the river crossing shall be designed to cross the Pajaro River on the east side of Highway 1 where the riparian vegetation has already been largely removed.	

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 7.4.3-2 (cont.)	**Mitigation Measure 7.4.3-2c—*Survey, Consultation, and Protection Measures for Special Status Wildlife Species*:** Since the Central Coast steelhead and tidewater goby are known to be present and potential habitat for the California red-legged frog was found as part of the site assessment, reasonable and prudent measures for protection of the California red-legged frog contained in the Programmatic Biological Opinion for this species shall be implemented if the U.S. Army Corps of Engineers finds that impact to this species is likely. If impacts to the Central Coast steelhead or tidewater goby may occur as a part of this project, a formal consultation and Biological Opinion must be prepared for FWS under the Endangered Species Act. **Mitigation Measure 7.4.3-2d—*Survey and Protection of Nesting Raptors*:** To prevent raptors nesting in trees within the construction zone in the Pajaro River floodway, trees that must be cut down for the project shall be felled in the summer or fall preceding construction. See Mitigation Measure 4.4.3-2c. **Mitigation Measure 7.4.3-2e—*Survey and Protection of Western Pond Turtles*:** Prior to construction activities a qualified biologist will perform pond turtle surveys within 300 feet of the construction area within the Pajaro River levees. See Mitigation Measure 4.4.3-2d. **Mitigation Measure 7.4.3-2f—*Protection of Steelhead Habitat*:** Impacts to steelhead smolt passage will be minimized by carrying out construction in the Pajaro River after June 1, when smolt are assumed to have completed their spring migration. None required.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
8.4 Vegetation and Wildlife – Coastal Distribution		
Impact 8.4.3-1—***Wetlands*****:** Construction of the proposed project could result in temporary impacts of up to 1.4 acres of potential jurisdictional wetlands/waters of the U.S. and streambeds and banks. Potential impacts could occur due to sedimentation of the channels outside of the construction area during trenching activities, loss of riparian vegetation and stream function as wildlife and fishery habitat, and loss of special status natural communities..	**Mitigation Measure 8.4.3-1a**—***Avoidance of Wetlands*****:** The crossings of jurisdictional areas at the Pajaro River, McClusky Slough, and Watsonville Slough shall be avoided to the extent feasible by project construction, maintaining all facilities outside the jurisdictional area defined by riparian or emergent vegetation. Bore and jack, tunneling and directional drill methods shall be used to install the pipeline under creek channels, and culverts. Trenching shall be limited to existing filled or developed areas, to the extent possible. This measure would also avoid impacts to special status species potentially occurring in the waterways (see Impact 8.4.3-2). If complete avoidance is infeasible, implement Measure 8.4.3-1b. **Mitigation Measure 8.4.3-1b**—***Implement Standard Protective Measures to Maintain Water Quality and Control Erosion and Sedimentation*****:** Standard measures to maintain water quality and to control erosion and sedimentation are recommended, as in Mitigation Measure 4.4.3-1b. This includes trenching across wetlands during low flow periods, excluding water from construction by diversions as feasible, use of sediment curtains, placing spoil sites outside waterways, preparing and implementing a spill prevention plan, storing equipment and materials outside the wetlands, and revegetating impacted wetland vegetation according to a detailed revegetation plan approved by the Corps and/or CDFG.	Less than significant

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.4.3-1 (cont.)	**Mitigation Measure 8.4.3-1c--*Restore Pajaro River riparian forest, McClusky Slough wetlands and Watsonville Slough wetlands*:** The revegetation plan for the project shall include restoration of riparian forest and wetlands that may have been impacted by construction (i.e. bore and jack staging). Revegetation shall include installation of trees and shrubs in a ratio of 3:1 to replace lost vegetation, specifications for after-installation care, weed control, and monitoring for a three year period following installation. Wetland restoration shall include salvage of sod and soil, maintenance during construction, reinstallation following the completion of construction, weed control, and monitoring, performance criteria and replacement measures, as needed. Revegetation materials shall consist of locally obtained, locally indigenous species.	
Impact 8.4.3-2: Construction of facilities in and near wetlands could result in temporary loss of up to 1.4 acres of habitat for special status animal species. Impacts could occur due to increased sedimentation in streams, dewatering of pools, habitat loss through vegetation removal, destruction of nests and burrows and construction disturbance.	**Mitigation Measure 8.4.3-2a--*Avoid Loss of Riparian and Wetland Habitat*:** Avoid removal or damage to all riparian and wetland vegetation within the project corridor using bore and jack and/or directional drilling techniques or remaining entirely within existing developed or filled areas to avoid all impacts to McClusky Slough and to the lower crossing of Watsonville Slough, resulting in a potential reduction of 0.8 acres of sensitive wildlife habitat. **Mitigation Measure 8.4.3-2b--*Protect Riparian and Wetland Habitat*:** Erect exclusion fencing during construction along the edge of riparian and wetland vegetation where the construction area is within 25 feet of the riparian zone. If complete avoidance is infeasible, implement Measure 8.4.3-2b.	Less than significant.

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EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	*MITIGATION*	*LEVEL OF SIGNIFICANCE AFTER MITIGATION*
Impact 8.4.3-2 (cont.)	**Mitigation Measure 8.4.3-2c--*Survey, Consultation and Protection Measures for special status wildlife species*:** As part of the habitat assessment, potential habitat for the California red-legged frog was found to be present at Watsonville Slough. Potential habitat may also be present for Santa Cruz long-toed salamander. Central Coast steelhead, and tidewater goby are present at the Pajaro River, and potential habitat for California red-legged frog was identified here as well. As a result, PVWMA will initiate formal consultation with USFWS and CDFG if these areas will be impacted. **Mitigation Measure 8.4.3-2d--*Protection of Nesting Special Status Birds*:** To avoid conflicts with nesting raptors, yellow warblers and tricolored blackbirds, construction activities within 500 feet of Valley Foothill Riparian or Fresh Emergent Wetland habitat shall begin prior to or after the nesting season (March to July). **Mitigation Measure 8.4.3-2e—*Protection of Steelhead Migration Habitat:*** Impacts to steelhead smolt passage shall be reduced by avoiding construction in the Pajaro River until after June 1, when smolt are assumed to have completed their migration. **Mitigation Measure 8.4.3-2f—*Protection of Santa Cruz long-toed salamander Habitat at McClusky Slough:*** Since McClusky Slough is known to support a population of Santa Cruz long-toed salamanders, the special protection measures shall be carried out there (see Section 8.4.3 for details).	

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 8.4.3-3: Construction of facilities in coastal scrub habitat above Trafton Road could result in temporary or permanent impacts to special status plant species.	**Mitigation Measure 8.4.3-3—*Protection of Special Status Plants*:** Prior to construction of the coastal distribution pipeline, preconstruction surveys for the robust spineflower and Monterey spineflower shall be carried out during the appropriate flowering period of these species. If any populations are found, they will be flagged and avoided during construction.	Less than significant
9.4 **Vegetation and Wildlife – Inland/Murphy Crossing Distribution**		
Impact 9.4.3-1: Construction of the proposed project would result in temporary impacts to potentially jurisdictional wetlands/waters of the U.S. and streambed and bank at the crossing of the Pajaro River at Murphy Crossing, at the crossing of the Pajaro River one mile east of Watsonville, and at the Coward Creek crossing, a total of 1.4 acres of potential jurisdictional wetlands. Potential impacts could occur due to sedimentation of the channels outside of the construction area during trenching activities, and loss of riparian vegetation and stream function as wildlife and fishery habitat.	**Mitigation Measure 9.4.3-1a—*Implement Standard Protective Measures to Maintain Water Quality and Control Erosion and Sedimentation*:** Standard measures to maintain water quality and to control erosion and sedimentation shall be implemented, as described in Mitigation Measure 4.4.3-1b. These measures include timing construction to take place during low flow periods, maintaining bypass flow areas outside the zone of construction, as appropriate, placing sediment curtains around construction, placing spoils sites outside the levees, developing a spill prevention plan, storing equipment and materials outside the river levees, maintaining vehicles and equipment to avoid spills, and developing a revegetation plan for disturbed habitats.	Less than significant.

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 9.4.3-1 (cont.)	**Mitigation Measure 9.4.3-1b:** Where unavoidable temporary impacts to coastal riparian forest habitat will occur, revegetation measures will be developed as part of a revegetation plan approved by CDFG and/or the Corps. It will include specific plans for the revegetation of impacted vegetation, and for restoration of nearby creek riparian habitat, as appropriate. Revegetation will include the use of locally obtained plant materials, a detailed description of installation methods, after-installation care, weed control measures, success criteria, and corrective measures if the success criteria are not met.	
Impact 9.4.3-2: Construction of facilities at the Pajaro River crossing near Highway 1 would result in temporary impacts to up to 1.4 acres of habitat for special status animal species. Impacts include risk of increased sedimentation in streams, dewatering of pools, habitat loss through vegetation removal, destruction of nests and burrows and construction disturbance.	**Mitigation Measure 9.4.3-2a—*Avoidance of Habitat*:** Avoid removal or damage to riparian vegetation within the levees of the Pajaro River. Construct the pipeline under the Pajaro River using the bore and jack or directional drilling method. If complete avoidance is infeasible, implement Measure 7.4.3-2b.	Less than significant.
	Mitigation Measure 9.4.3-2b—*Minimize Habitat Loss*: If complete avoidance of the riparian areas is not possible, by bridging or bore and jack for example, then cross the river in the center of the old road crossing at Murphy Crossing where the riparian vegetation has already been largely removed.	
Impact 9.4.3-2 (cont.)	**Mitigation Measure 9.4.3-2c—*Survey, Consultation, and Protection Measures for Special Status Wildlife Species*:** As part of the habitat assessment, potential habitat for the California red-legged frog was found to be present in the Pajaro River. Central Coast steelhead are known to be present as well. As a result, formal consultation with USFWS and CDFG must be initiated by PVWMA if habitat for these species will be impacted. Protection measures will be consistent with the Programmatic Biological Opinion for the California red-legged frog (FWS, 1999).	

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Mitigation Measure 9.4.3-2d—***Survey and Protection of Nesting Raptors:*** To avoid conflicts with nesting raptors, construction activities within 500 feet of riparian habitat shall begin prior to the nesting season (March to July). See Mitigation Measure 4.4.3-2c for further details **of** mitigation. Preconslruction survey for nesting raptors will determine whether this protection measure is necessary. Mitigation Measure 9.4.3-2e—***Protection of Steelhead Habitat:*** Impacts to steelhead smolt passage will he minimized by carrying out construction in the Pajaro River after June 1, when smolt arc assumed to have completed their spring migration.	
4.5 Cultural Resources – College Lake		
Impact 4.5.3-1: Construction activities associated with the proposed College Lake Lateral alignment and associated facilities may result in the alteration or destruction ***of*** identified cultural resources.	Mitigation Measure **4.5.3-la:** Final pipeline and facility plans shall locate facilities and pipeline alignments away from these identified important cultural resource sites. **A** qualified cultural resource specialist shall be retained to assist in identifying the areal extent of important cultural resource sites to be avoided, which may include the preparation of detailed cultural resource evaluation reports and consultation with local, state, and federal agencies **as** well as the local Native American Commission.	Less than significant.

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EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	Mitigation Measure 4.5.3-1b: If important cultural resource sites cannot he avoided, the Pajaro Water Management Agency will enter into a Programmatic Agreement with the U S . Army Corps of Engineers, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation to develop an appropriate mitigation plan for the cultural resource. Possible mitigation measures for important cultural resources may include documentation and recordation of the resource, recovery and relocation, or stabilization of the resource.	
Impact 4.5.3-2: Construction activities associated with the proposed water diversion and filtration facilities and additional College Lake inundation may result in the alteration or destruction of identified cultural resources.	Mitigation Measure 4.5.3-2a: Final College Lake facility plans shall locate new facilities away from these identified important cultural resource sites, as well as avoid inundation of significant cultural resource sites. A qualified cultural resource specialist shall he retained to assist in identifying the extent of important cultural resource sites to he avoided, which may include the preparation of detailed cultural resource evaluation reports and consultation with local, state, and federal agencies as well as the local Native American Commission.	Less than significant.
Impact 4.5.3-2 (cont.)	Mitigation Measure 4.5.3-2b: Implement Measure 4.5.3-1h, above.	

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 4.5.3-3: Ground-disturbing activities associated with the proposed pipelines and facilities could reveal previously unknown buried or otherwise obscured significant prehistoric and historic cultural resources.	**Mitigation Measure 4.5.3-3:** Should any as yet undiscovered cultural rcsources, such as structural features, or unusual amounts of bone or shell, artifacts, human remains, or architectural remains be encountered during any development activities, work will he suspended and PVWMA staff will be contacted. A qualified cultural resource specialist will be retained and will perform any necessary investigations to determine the significance of the fmd. PVWMA will then implement any mitigation deemed necessary for the recordation and/or protection of the cultural resources. In addition, pursuant to Sections 5097.107 and 5097.108 of the State Public Resources Code **and** Section *7050.5* of the State Health and Safety Code, in the event of the discovery of human remains, all work must be halted and the County Coroner shall bc immediately notified. If the remains are determined to be Native American, guidelines **of** the Native American Heritage Commission **shall** be adhered to in the treatment and disposition of the remains.	Less than significant.
Impact 4.5.3-4: Potential indirect impacts to cultural resources, primarily vandalism, could result from the increased access to and use of the general area during construction. Such disturbance could result in the loss of integrity **of** important cultural resources.	Mitigation **Measure 4.5.3-4a:** The resource boundaries shall be marked as exclusion zones both on the ground and on construction maps. **Mitigation Measure 4.5.3-4b:** Construction supervisory personnel shall be notified of the existence of these resources and required to keep personnel and equipment away from these areas. During construction and operations, personnel and equipment will be restricted to the surveyed comdor.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact **4.5.3-4** (cont.)	Mitigation Measure 4.5.3-4c: Monthly monitoring of cultural resources to be avoided shall he completed to insure that no inadvertent damage to the resources occurs as a result of conshuction or construction-related aclivilies. *If* damage is detected, a guard will he posted to patrol the site and adjacent important resources (such as gravestones and churches).	
5.5 Cultural Resources – Harkins Sloughs		
Impact 5.5.3-1: Construction activities associated with the proposed diversion and filtration facilities and pipeline connections for the Harkins Slough component may result in the alteration or deshuction of identified cultural resources.	Mitigation Measure 5.5.3-1: Implement Measures 4.5.3-la and 4.5.3-1b, above..	Less than significant.
Impact 5.5.3-2: Ground-disturbing activities associated with the proposed pipelines and facilities could reveal previously unknown buried or otherwise obscured significant prehistoric and historic cultural resources.	Mitigation Measure 5.5.3-2: Implement Measure 4.5.3-3, above.	Less than significant.
Impact 5.5.3-3: Potential indirect impacts to cultural resources, primarily vandalism, could result from the increased access to and use of the general area during construction. Such disturbance could result in the loss of integrity of important cultural resources.	Mitigation Measure 5.5.3-3: Implement Measures 4.5.3-4a through 4.5.3-4c, above.	Less than significant.
6.5 Cultural Resources – Murnhy Crossing		
Impact 6.5.3-1: Ground-disturbing activities associated with the proposed pipelines and facilities could reveal unknown buried or otherwise obscured significant prehistoric and historic cultural resources.	Mitigation Measure 6.5.3-1: Implement Measure 4.5.3-3, above.	Less than significant.

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EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 6.5.3-2: Potential indirect impacts to cultural resources, primarily vandalism, could result from the increased access to and use of the general area during construction. Such disturbance could result in the loss of integrity of important cultural resources.	**Mitigation Measure 6.5.3-2:** Implement Measures 4.5.3-4a through 4.5.3-4c.	Less than significant
7.5 **Cultural Resources – Watsonville Reclamation**		
Impact 7.5.3-1: Ground-disturbing activities associated with the proposed pipelines and facilities could reveal unknown buried or otherwise obscured significant prehistoric and historic cultural resources.	**Mitigation Measure 7.5.3-1:** Implement Measure 4.5.3-3, above.	Less than significant.
8.5 **Cultural Resources – Coastal Distribution**		
Impact 8.5.3-1: Construction activities associated with the proposed coastal distribution system may result in the alteration or destruction of identified cultural resources.	**Mitigation Measure 8.5.3-1:** Implement Measures 4.5.3-1a and 4.5.3-1b, above.	Less than significant.
Impact 8.5.3-2: Ground-disturbing activities associated with the proposed coastal distribution system could reveal previously unknown buried or otherwise obscured significant prehistoric and historic cultural resources.	**Mitigation Measure 8.5.3-2:** Implement Measure 4.5.3-3, above.	Less than significant.
Impact 8.5.3-3: Potential indirect impacts to cultural resources, primarily vandalism, could result from the increased access to and use of the general area during construction. Such disturbance could result in the loss of integrity of important cultural resources.	**Mitigation Measure 8.5.3-3:** Implement Measures 4.5.3-4a through 4.5.3-4c, above.	Less than significant.

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
9.5 Cultural Resources – Inland/Murphy Crossing Distribution		
Impact 9.5.3-1: Ground-disturbing activities associated with the proposed Inland/Murphy Crossing distribution systems and Connecting Pipeline could reveal unknown buried or otherwise obscured significant prehistoric and historic cultural resources.	**Mitigation Measure 9.5.3-1:** Implement Measure 4.5.3-3, above.	Less than significant.
Impact 9.5.3-2: Potential indirect impacts to cultural resources, primarily vandalism, could result from the increased access to and use of the general area during construction. Such disturbance could result in the loss of integrity of important cultural resources.	**Mitigation Measure 9.5.3-2:** Implement Measures 4.5.3-4a through 4.5.3-4c, above.	Less than significant.
4.6 Traffic and Circulation – College Lake		
Impact 4.6.3-1: Traffic on area roadways would temporarily increase as a result of project-generated vehicle trips by construction workers and construction vehicular activities.	**Mitigation Measure 4.6.3-1a (Recommended):** Schedule truck trips outside of peak commute hours. **Mitigation Measure 4.6.3-1b (Recommended):** Use haul routes that minimize truck traffic on local roadways to the extent possible.	Less than significant.
Impact 4.6.3-2: Project construction would increase traffic delays for vehicles traveling past the construction zone.	**Mitigation Measure 4.6.3-2a:** Limit construction hours to off-peak traffic periods on commute streets. **Mitigation Measure 4.6.3-2b:** The construction contractor shall prepare traffic safety and control plans to show specific methods for maintaining traffic flows. This shall include identifying roadway locations where special trenching techniques would be used to minimize impacts to traffic flow and operations. The traffic control plan shall be reviewed for appropriateness, and approved by Caltrans and the governing Public Works Departments.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 4.6.3-3: Project construction would affect access to adjacent land uses for both general and emergency access	**Mitigation Measure 4.6.3-3a:** Construction trenches shall be covered by steel trench plates to allow access to driveways. **Mitigation Measure 4.6.3-3b:** To minimize disruption of emergency vehicle access, contractors will work with affected jurisdictions (Santa Cruz or Monterey County or City of Watsonville) to identify detours during construction. **Mitigation Measure 4.6.3-3c:** Police, fire, and emergency services shall be notified of the timing, location, and duration of construction activities and the locations of detours and lane closures.	Less than significant.
Impact 4.6.3-4: Project construction would increase wear-and-tear on area roadways used by construction vehicles.	**Mitigation Measure 4.6.3-4:** Conduct a *preconstruction* survey of road conditions on key access routes to the project site. The pavement conditions of local streets and designate roads judged to be in good condition for use by heavy truck traffic will be monitored. Roads damaged by construction shall be repaired to a condition equal to, or better than, that which existed prior to construction activity.	Less than significant.
Impact 4.6.3-5: Project construction would increase potential traffic safety hazards for vehicles and pedestrians in the construction area.	**Mitigation Measure 4.6.3-5a:** The traffic control plans prepared by the contractor (see Mitigation Measure 4.6.3-2b) shall include detours for bicyclists. **Mitigation Measure 4.6.3-5b:** The contractor shall provide advanced public notification of construction activity and roadway/access closures.	Less than significant.
Impact 4.6.3-6: Project construction would generate a demand for parking spaces for construction worker vehicles.	None required.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
5.6 Traffic and Circulation – Harkins Slough		
Impact 5.6.3-1: Traffic on area roadways would temporarily increase as a result of project-generated vehicle trips by construction workers and construction vehicular activities.	**Mitigation Measure 5.6.3-1 (Recommended):** Implement Measure 4.6.3-1, above.	Less than significant
Impact 5.6.3-2: Project construction would increase traffic delays for vehicles traveling past the construction zone.	**Mitigation Measure 5.6.3-2:** Implement Measure 4.6.3-2, above.	Less than significant.
Impact 5.6.3-3: Project construction would affect access to adjacent land uses for both general and emergency access.	**Mitigation Measure 5.6.3-3:** Implement Measure 4.6.3-3, above..	Less than significant
Impact 5.6.3-4: Project construction would increase wear-and-tear on area roadways used by construction vehicles.	**Mitigation Measure 5.6.3-4:** Implement Measure 4.6.3-4, above.	Less than significant.
Impact 5.6.3-5: Project construction would increase potential traffic safety hazards for vehicles and pedestrians in the construction area.	**Mitigation Measure 5.6.3-5:** Implement Measure 4.6.3-5, above.	Less than significant.
Impact 5.6.3-6: Project construction would generate a demand for parking spaces for construction worker vehicles.	None required.	Less than significant.
6.6 Traffic and Circulation – Murphy Crossing		
Impact 6.6.3-1: Traffic on area roadways would temporarily increase as a result of project-generated vehicle trips by construction workers and construction vehicular activities.	**Mitigation Measure 6.6.3-1 (Recommended):** Implement Measure 4.6.3-1, above.	Less than significant.
Impact 6.6.3-2: Project construction would increase traffic delays for vehicles traveling past the construction zone.	**Mitigation Measure 6.6.3-2:** Implement Measure 4.6.3-2, above.	Less than significant
Impact 6.6.3-3: Project construction would affect access to adjacent land uses for both general and emergency access.	**Mitigation Measure 6.6.3-3:** Implement Measure 4.6.3-3, above.	Less than significant

EXHIBIT K

TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 6.6.3-4: Project construction would increase wear-and-tear on area roadways used by construction vehicles.	**Mitigation Measure 6.6.3-4:** Implement Measure 4.6.3-4, above.	Less than significant.
Impact 6.6.3-5: Project construction would increase potential traffic safety hazards for vehicles and pedestrians in the construction area.	**Mitigation Measure 6.6.3-5:** Implement Measure 4.6.3-5, above.	Less than significant.
Impact 6.6.3-6: Project construction would generate a demand for parking spaces for construction worker vehicles.	None required.	Less than significant.
7.6 Traffic and Circulation – Watsonville Reclamation		
Impact 7.6.3-1: Traffic on area roadways would temporarily increase as a result of project-generated vehicle trips by construction workers and construction vehicular activities.	**Mitigation Measure 7.6.3-1 (Recommended):** Implement Measure 4.6.3-1, above.	Less than significant.
Impact 7.6.3-2: Project construction would increase traffic delays for vehicles traveling past the construction zone.	None required.	Less than significant.
Impact 7.6.3-3: Project construction would affect access to adjacent land uses for both general and emergency access.	None required.	Less than significant.
Impact 7.6.3-4: Project construction would increase wear-and-tear on area roadways used by construction vehicles.	**Mitigation Measure 7.6.3-4:** Implement Measure 4.6.3-4, above.	Less than significant.
Impact 7.6.3-5: Project construction would increase potential traffic safety hazards for vehicles and pedestrians in the construction area.	**Mitigation Measure 7.6.3-5:** Implement Measure 4.6.3-5, above.	Less than significant.
Impact 7.6.3-6: Project construction would generate a demand for parking spaces for construction worker vehicles.	None required.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
8.6 Traffic and Circulation – Coastal Distribution		
Impact 8.6.3-1: Traffic on area roadways would increase as a result of project-generated vehicle trips by construction workers and construction vehicular activities.	**Mitigation Measure 8.6.3-1 (Recommended):** Implement Measure 4.6.3-1, above.	Less than significant.
Impact 8.6.3-2: Project construction would increase traffic delays for vehicles traveling past the construction zone.	**Mitigation Measure 8.6.3-2:** Implement Measure 4.6.3-2, above.	Less than significant.
Impact 8.6.3-3: Project construction would affect access to adjacent land uses for both general and emergency access.	**Mitigation Measure 8.6.3-3:** Implement Measure 4.6.3-3, above.	Less than significant.
Impact 8.6.3-4: Project construction would increase wear-and-tear on area roadways used by construction vehicles.	**Mitigation Measure 8.6.3-4:** Implement Measure 4.6.3-4, above.	Less than significant.
Impact 8.6.3-5: Project construction would increase potential traffic safety hazards for vehicles and pedestrians in the construction area.	**Mitigation Measure 8.6.3-5:** Implement Measure 4.6.3-5, above.	Less than significant
Impact 8.6.3-6: Project construction would generate a demand for parking spaces for construction worker vehicles.	None required.	Less than significant.
9.6 Traffic and Circulation – Inland/Murphy Crossing Distribution		
Impact 9.6.3-1: Traffic on area roadways would temporarily increase as a result of project-generated vehicle trips by construction workers and construction vehicular activities.	**Mitigation Measure 9.6.3-1 (Recommended):** Implement Measure 4.6.3-1, above.	Less than significant.
Impact 9.6.3-2: Project construction would increase traffic delays for vehicles traveling past the construction zone.	**Mitigation Measure 9.6.3-2:** Implement Measure 4.6.3-2, above.	Less than significant.
Impact 9.6.3-3: Project construction would affect access to adjacent land uses for both general and emergency access.	**Mitigation Measure 9.6.3-3:** Implement Measure 4.6.3-3, above.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 9.6.3-4: Project construction would increase wear-and-tear on area roadways used by construction vehicles.	**Mitigation Measure 9.6.3-4:** Implement Measure 4.6.3-4, above.	Less than significant.
Impact 9.6.3-5: Project construction would increase potential traffic safety hazards for vehicles and pedestrians in the construction area.	**Mitigation Measure 9.6.3-5:** Implement Measure 4.6.3-5, above.	Less than significant.
Impact 9.6.3-6: Project construction would generate a demand for parking spaces for construction worker vehicles.	None required.	Less than significant.
4.7 **Air Quality – College Lake**		
Impact 4.7.3-1: Construction of the College Lake project components would temporarily generate criteria air pollutants, particularly PM_{10}, over the duration of the construction period.	**Mitigation Measure 4.7.3-1:** The construction contractor shall implement a dust control program that includes the following elements: • Water all active construction sites at least twice daily. • Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard. • Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites. • Sweep daily (with water sweepers) all paved access roads, paved parking areas and paved staging areas at construction sites. • Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.	Less than significant.

TABLE 1 (Continued)
SUMMARY **OF** IMPACTS **AND MITIGATION MEASURES**

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact **4.7.3-1** (cont.)	• Hydroseed or apply (nou-toxic) soil hinders to inactive construction areas. However, do not apply these measures in operating agricultural fields under cultivation unless requested by the grower. • Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.). • Limit traffic on unpaved roads to 15 mph. • Install sandbags or other erosion control measures to prevent silt runoff to public roadways. • Replant vegetation in disturbed areas as quickly as possible.	
Impact **4.7.3-2:** Lane closures and detours necessitated by construction of the project could temporarily increase vehicular emissions.	None required.	Less than significant.
Impact **4.7.3-3:** Vehicle trips resulting from operation and maintenance of the various coinponcnts of the project would generate emissions of criteria air pollutants.	None required.	Less than significant.
Impacts **5.7** through **9.7:** Temporary construction impacts described in Section 4.1, with minor changes also describe impacts that would be expected under all other project components.	Implementation of the Mitigation Measures described in Section **4.7** would further reduce these less than significant impacts.	Less than significant
4.8 Socioeconomics and **Public** Utilities – College Lake		
Impact **4.8.2-1:** Pipeline and/or facility construction could result in temporary, planned or accidental disruption to utility services provided by undergruund lines.	Mitigation **Measure** 4.8.2-1: **A** detailed study identifying utilities along the proposed alignment will be done during the prc-design stages **of** the project.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 4.8.2-2: Pipeline construction could temporarily impede vehicle access to emergency services as well as to collection and delivery services. This impact could affect Counties' Sheriffs Departments, fire departments, emergency services (e.g. ambulance companies), delivery and collection services.	Mitigation Measure 4.8.2-2: implement Mitigation Measures 4.6.3-3a, h, c.	Less than significant.
Impact 4.8.2-3: Construction activities for all facilities could require short-term police and fire protection services to assist in traffic management or respond to construction accidents and other service requests.	None required.	Less than significant.
Impact 4.8.2-4: The proposed project would increase water augmentation fees required to support the costs of the project and will cause Pajaro Valley growers' crop production costs to rise and increase production costs would lower their net return per unit of production. This could result in substantial adverse economic impacts on some small, economically marginal farming operations and force them out of business. However, cost increases attributable tu the project would he less than two percent to net returns. In addition the increase in irrigation water fees will tend to be mitigated by better management practices and increased conservation and for the market forces to lower land rents to reflect the lower net returns for growers.	None required.	Less than significant
Impact 4.8.2-5: During the Construction phase of the proposed project, the farmlands within construction access easements, the requircd distribution systcm easements would not be in production for one growing season.	Mitigation Measure 4.8.2-5: The PVWMA will establish a procedure tu compensate growers for the financial losses that they incur as a result of the impacts caused by the excavation and construction activities that occur in the easements for the placement of the local distribution system. ***The*** growers will receive compensation based upon the total amount of farmland disrupted, the amount of time of the disruption, the historical type of crop planted on the land and the current year unit market price **for** the unplanted crop.	Less than significant

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impacts 5.8 through 9.8: The discussion of impacts presented in Section 4.8 also applies to these project components.	Mitigation Measures described in Section 4.8 will also apply to these project components	Less than significant
4.9 *Visual/Aesthetic and Recreational Resources – College Lake*		
Impact 4.9.3-1: Development of the pumping and filtration facilities of the College Lake component would alter the visual character of the project area.	**Mitigation Measure 4.9.3-1a:** The PVWMA will use design elements and landscaping to enhance visual integration of the pumping and filtration facilities with their surroundings. Proposed facilities will be painted low-glare earth-tone colors that blend closely with the surrounding terrain. Vegetation will be planted at proposed facilities to provide screening from views of the facilities from Highway 152. **Mitigation Measure 4.9.3-1b:** The PVWMA will revegetate disturbed natural areas to minimize textural contrasts with the surrounding vegetation using grasses, shrubs and trees typical of the immediately surrounding area. **Mitigation Measure 4.9.3-1c:** The PVWMA will ensure that its contractors restore the topography of disturbed areas along the pipeline alignment to their pre-project condition such that short-term construction disturbance does not result in long-term visual impacts.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 4.9.3-2: Development of the College Lake component would introduce new sources of light onto the project site and increase ambient light in the project area.	**Mitigation Measure 4.9.3-2 (Recommended):** The PVWMA shall ensure that all exterior lighting is directed downward and oriented to insure that no light source is directly visible from neighboring residential areas. If necessary, landscaping shall be provided around proposed facilities. This vegetation shall be selected, placed, and maintained to minimize off-site light and glare onto surrounding areas. In addition, highly reflective building materials and/or finishes shall not be used in the designs for proposed structures.	Less than significant.
Impact 4.9.3-3: Development of the College Lake component would temporarily disrupt designated recreational bikeways in the project area.	None required.	Less than significant.
5.9 Visual/Aesthetic and Recreational Resources – Harkins Slough		
Impact 5.9.3-1: Development of the pumping and diversion facilities of the Harkins Slough component would alter the visual character of the project area.	**Mitigation Measure 5.9.3-1 (Recommended):** The PVWMA will plant vegetation at the proposed facilities to provide screening.	Less than significant.
Impact 5.9.3-2: Development of the Harkins Slough component would temporarily disrupt designated recreational bikeways in the project area.	None required.	Less than significant.
6.9 Visual/Aesthetic and Recreational Resources – Murphy Crossing		
Impact 6.9.3-1: Development of groundwater extraction wells, infiltration gallery, pipeline and recharge basins of the Murphy Crossing component would alter the visual character of the project area.	**Mitigation Measure 6.9.3-1:** Implement Measures 4.9.3-1a 4.9.3-1b, and 4.9.3-1c, above.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	*LEVEL OF SIGNIFICANCE AFTER MITIGATION*
Impact 6.9.3-2: Development of the Murphy Crossing component would temporarily disrupt recreational uses along Highway 129, a designated bikeway in Santa Cruz County.	None required.	Less than significant.
7.9 Visual/Aesthetic and Recreational Resources – Watsonville Reclamation		
Impact 7.9.3-1: Development of the pumping and tertiary treatment facilities of the Watsonville wastewater reclamation component would alter the visual character of the project area.	**Mitigation Measure 7.9.1-1:** Implement Measures 4.9.3-1b and 4.9.3-1c, above.	Less than significant.
8.9 Visual/Aesthetic and Recreational Resources – Coastal Distribution		
Impact 8.9.3-1: Installation of the coastal distribution system lateral lines would disturb roadways and remove crops and vegetation, which would temporarily alter the visual landscape.	**Mitigation Measure 8.9.3-1:** Implement Measures 4.9.3-1b and 4.9.3-1c, above.	Less than significant.
Impact 8.9.3-2: Development of the coastal distribution system component would temporarily disrupt recreational uses along designated recreational bicycle trails in Santa Cruz and Monterey Counties.	**Mitigation Measure 8.9.3-2:** Implementation of Measures 4.6.3-4, 4.6.3-5a and 4.6.3-5b would ensure that damaged roads would be repaired to pre-construction conditions, and that detours would be provided for bicyclists and motorists during the construction period.	Less than significant.
9.9 Visual/Aesthetic and Recreational Resources – Inland/Murphy Crossing Distribution		
Impact 9.9.3-1: Installation of the inland distribution system lateral lines and the Connecting Pipeline would disturb lands within the alignments, which would temporarily alter the visual landscape.	**Mitigation Measure 9.9.3-1a:** Implement Measures 4.10 and 4.9.3-1c, above.	Less than significant.

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TABLE 1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION	LEVEL OF SIGNIFICANCE AFTER MITIGATION
Impact 9.9.3-2: Development of the inland and Murphy Crossing distribution system and the Connecting Pipeline component would temporarily disrupt recreational uses along Highway 129, a designated bikeway in Santa Cruz County.	**Mitigation Measure 9.9.3-2:** Implementation of Measures 4.6.3-4, 4.6.3-5a and 4.6.3-5b would ensure that damaged roads would be repaired to pre-construction conditions, and that detours would be provided for bicyclists and motorists during the construction period.	Less than significant.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ventura Fish and Wildlife Office
2493 Portola Road. Suite E
Ventura, California 93003

In Reply, Refer TO PAS 289.298.373

March 19, 2004

Memorandum

To: Environmental Protection Specialist, South-Central California Area Office, Bureau of Reclamation, Fresno, California

From: Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California
Raymond Sanfield

Subject: Biological and Conference Opinion for the Pajaro Valley Water Management Agency's Revised Basin Management Plan Projects (SCC-416, ENV-7.00), San Benito, Santa Cruz, Santa Clara, and Monterey Counties, California (1-8-03-F-14)

This document transmits the U.S. Fish and Wildlife Service's (Service) biological and conference opinion based on our review of the proposed Pajaro Valley Water Management Agency's (PVWMA) revised basin management plan projects and their effects on the federally endangered least Bell's vireo *(Vireo bellii pusillus)*, San Joaquin kit fox (*Vulpes macrotis mutica*), Santa Cruz long-toed salamander (*Ambystoma macrodactylurn croceum*), tidewater goby (*Eucyclogobius newberryi*), Conservancy fairy shrimp (*Branchinecta conservatio*), and longhorn fairy shrimp (*Branchinecta longiantenna*), the threatened Califomia red-legged frog (*Rana aurora draytonii*) and vernal pool fairy shrimp (*Branchinecta lynchi*), and the proposed threatened Califomia tiger salamander ***(Ambystoma californiense),*** in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Your February 10, 2003 request for formal consultation was received on February 12, 2003.

This biological opinion is based on information which accompanied your February 10, 2003 request for consultation, including the biological assessment (Environmental Science Associates (ESA) 2003), the environmental impact report (EIR) for the revised basin management plan (ESA 2001), the EIR for the local water supply and distribution (ESA 1998), discussions between our staff and your consultants, and information contained in our files. A complete administrative record of this consultation is on file in the Ventura Fish and Wildlife Office.

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CONSULTATION HISTORY

We have coordinated with the Bureau of Reclamation (Reclamation), the PVWMA, and ESA for many years regarding the development of the basin management plan. Our earlier involvement in the project primarily consisted of providing basic information on the Act, identification of listed species in the proposed project area, and review of a habitat assessment for California red-legged frogs that was conducted in 1997.

More recently, our agencies, the National Marine Fisheries Service, and the PVWMA met on January 15,2002, to discuss the details of the recommended project for the revised basin management plan. The purpose and need and an overview of the recommended project, the biological resources issues, the mitigation approaches, the project schedule, and the next steps in the process were all discussed at that meeting.

We met again with Reclamation and the PVWMA on March 20,2003, to discuss the section 7 consultation process. At this meeting, the effects to listed species were discussed in greater detail and we provided input on points that needed clarification to proceed with the formal consultation process for the basin management plan projects. We also discussed the possibility of Reclamation requesting a Fish and Wildlife Coordination Act (FWCA) report for the proposed projects.

On April 10,2003, we met to follow-up on the unresolved issues from earlier meetings related to the section 7 consultation. Although we requested more information to complete the consultation, including the jack and bore and frac-out plans, we agreed to confirm the start of the formal consultation process on the day we received your request for consultation. We agreed to initiate consultation in an attempt to accommodate the proposed schedule for the project, which included issuance of the final environmental impact statement (EIS) in September 2003. Further discussions with Reclamation staff confirmed that November or December 2003 was a more realistic date for issuing the final EIS for the proposed projects.

After the April 10,2003, meeting, the PVWMA's consultants provided the information we needed to proceed with drafting the biological opinion. Subsequent discussions and brief meetings continued regarding details of the proposed projects and the timeline for the consultation based on the projected issuance of the EIS. In correspondence dated June 16,2003, you provided us additional information on the trenchless construction plan, revegetation plan, and additional modifications to measures in the biological assessment. During this period, you also agreed with our recommendation that a FWCA report was not necessary for the proposed projects.

We provided a draft biological and conference opinion to you on November 21,2003 and received your comments on December 19,2003. In addition, ESA provided editorial comments on December 8,2003.

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BIOLOGICAL AND CONFERENCE OPMON

DESCRIPTION OF THE PROPOSED ACTION

Project Background **and** Objective

In 1984, the PVWMA was formed and given the responsibility of protecting the Pajaro Valley water supply. The geographic boundaries of the PVWMA correspond approximately to the topographic and hydrologic boundaries of the Pajaro Valley. The PVWMA service area encompasses approximately 70,000 acres of imgated agricultural lands and native and non-imgated lands in the hillside areas, the city of Watsonville, and the communities of Pajaro, Freedom, Corralitos, and Aromas. Agriculture is the most important economic industry in the valley and groundwater is the principal source of water.

The objective of the proposed project is to augment water supplies to address problems of groundwater overdraft and seawater intrusion. These concerns were first documented by the 1953 Santa Cruz-Monterey Counties investigations of the State Water Board (Bulletin 5). **A** 1964 San Felipe Unit feasibility study prepared by Reclamation also confirmed overdraft and seawater intrusion problems in the PVWMA service area **(ESA** 2001).

Overdraft occurs when the amount of groundwater withdrawn from a basin exceeds the amount of water replenishing the basin. In the Pajaro Valley basin, groundwater levels have declined as the groundwater pumping rate has exceeded the rate of natural replenishment. These overdraft conditions result in increased pumping costs and land subsidence that, in turn, can **cause** building settlement and increased flooding. In the coastal areas, overdraft conditions have caused groundwater levels to drop below sea level, creating a landward pressure gradient that causes seawater to move inland, displacing fresh groundwater. The density difference between seawater **and** freshwater causes the freshwater to stratify above the seawater. **As** seawater encroaches into the **fresh** groundwater basin, water quality degrades, limiting its utility for irrigation and domestic use, and eventually wells have IO be abandoned. These conditions are not expected to improve without development and delivery of alternative water supplies and balancing existing groundwater use with recharge.

Current water demand for agricultural and urban uses within the PVWMA service area is approximately 71,500 acre-feet per year (afy). Groundwater provides over 95 percent ***of*** the water that is used. Modeling results indicate that, under current basin-wide pumping conditions, groundwater pumping would have to be reduced by 45,000 **afy** (65 percent) to eliminate seawater intrusion throughout the coastal area. The P V W A has identified **an** array ofprojects to bring water demand into balance with supply, including conservation and development of new water supplies. The import water project and recycled water Project seek to alleviate the seawater intrusion problem by providing 17,400 afy of water for agricultural irrigation and a concomitant reduction in groundwater pumping along the coast. Although. the PVWMA forecasts demands to year 2040, the water quantities associated with the proposed project are for existing demand.

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After 2007, the PVWMA will reassess future demand characteristics and develop future supply sources accordingly. Eventually, as part of its overall Water Supply Project, the PVWMA will seek an additional 9,000 afy to meet projected water demand in year 2040.

Project Description

The components of the projects addressed in this biological and conference opinion include:

1. Import Pipeline (13,400 afy). Includes a22.2-mile long pipeline to import Central Valley Project (CVP) water and potentially water from other sources into the Pajaro Valley. The pipeline would be approximately 54 inches in diameter on average, with some reaches of a larger diameter due to system hydraulic requirements. The entire pipeline would be located underground beneath 5 to 10 feet of cover.

2. Recycled Water Facility (4,000 afy). Includes construction of tertiary treatment facilities adjacent to the Watsonville Wastewater Treatment Plant to produce recycled water.

3. Supplemental wells. Includes up to six wells to produce blending water for the recycled water.

4. Integrated Coastal Distribution System. Includes 165,670 linear feet of pipcline to deliver water to growers in the Pajaro Valley.

The goal of developing these facilities is to assist in bringing the groundwater basin into balance with existing and future water demand. Each component is described below.

1. ***Import Pipeline Project***

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mport Pipeline

The 22-mile-long import pipeline would supply surface water to the coastal distribution system serving approximately *8,960* acres of irrigated agricultural lands in the **Pajaro** Valley. The pipeline would extend **from** the existing Watsonville turnout on the Santa **Clara** Conduit of the CVP **San** Felipe Division across portions of San Benito, Santa Clara, Santa Cruz and Monterey counties and would connect with the proposed distribution system near Highway 1. Except for the connection to the Santa Clara Conduit, no construction or physical modification to CVP facilities is proposed.

Pipeline Construction

The PVWMA would obtain a permanent easement up to 60 feet wide along most of the pipeline alignment. In drainage channels or other sensitive habitat, the permanent easement would be 30 feet wide. Near the Graniterock ***quarry,*** where the alignment would be limited by existing terrain, roads and railroad tracks, the permanent easement would be only **25** feet wide. **A** temporary construction easement ranging from 15 to 110 feet would be acquired. The maximum width for the project construction right-of-way would be 140 feet in open **country;** near the Graniterock **quarry** property, the right-of-way would be **40** feet wide.

Construction is expected to begin in early 2005, with delivery of imported water supply beginning in 2007. **Up** to 100 linear feet of pipe may be installed each work day, on average. Assuming that construction would occur 7 days a week, as is planned, the pipeline would be completed in approximately **3** years. Use of multiple starting points and pipe installation crews could reduce the construction time to 18 months or less.

Along most of the pipeline alignment, the pipe would be installed in **a** trench with 2:1 sideslopes, with 1 foot of bedding material **below** the pipe and **5** feet of cover material, In general, the pipeline alignment is located in open areas where conventional excavation methods can be used for open cut (open trench) **pipeline** installation. In open **areas,** including croplands, excavated topsoil would be stockpiled during construction and replaced following pipeline installation. The **amount** of topsoil that would be stockpiled would be determined in the final design phase by a soils engineer. Alternative methods of pipeline installation would be used in some areas where the alignment crosses major roads, creeks with flowing water, dense vegetation, or other conditions where surface disturbance may need to be minimized.

The PVWMA would select the final alignment within the preferred comdor based on local landforms **and** potential slope failure areas, **the** ongoing operations of the Union Pacific Railroad (UPRR) **and** Graniterock **quarry,** highway and local roadway traffic patterns, and sensitive resource areas.

The proposed pipeline alignment includes open trench crossings of the Pajaro River near the Graniterock **quarry** property, Pescadero Creek, Sargent Creek, nvo **unnamed** tributaries to the

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Pajaro River near Pescadero Creek, an unnamed drainage east of Soda Lake, and a small channelized drainage west of Aromas. **All** river and stream crossings are proposed to occur during the dry season. If water flows persist within the channels at the time of construction, sheet pile cofferdams would be used in a portion of the channel and the construction area would be dewatered.

Two crossings of the Pajaro River (just west of Highway 101 and just west of Highway 1) and a crossing of Millers Canal will be constructed using trenchless methods. Bore-and-jack construction or directional drilling would be used for these crossings. This construction method involves excavating the soil in front of the pipe with an auger or other means and using a jack to push the pipe sections forward as the soil is removed.

The pipeline alignment includes crossings of three major roadways: U.S. 101, Highway 129, and Highway 25. Tunneling or bore-and-jack techniques would be used at these crossings to prevent disruption of traffic flow.

Construction access roads have not been identified. The construction contractor would likely access the site from existing roadways and by moving equipment and materials within the construction easement. Temporary construction access may be required where the alignment is located within open fields. The contractor would likely access the construction easement using the shortest possible route from existing roadways. Access to these sites, if different than that shown on the final design drawings, will be addressed in the traffic control plan to be prepared by the contractor and submitted to the appropriate county and state regulatory agencies. The project specifications would prohibit the contractor from locating site access, storage, or staging areas within known or identified sensitive habitat or environmental areas. Wherever possible, identified sensitive areas within the construction easement would be mapped in the project plans or addressed in the project specifications.

The PVMWA has not determined the location of storage sites for soils removed from the trench. They may be side-cast to areas adjacent to the pipeline alignment and within the construction easement. **A** qualified biologist will survey all potential staging areas **and** storage areas **prior** to construction. The project specifications would prohibit the use of sensitive environmental areas, roadways, and farmed lands outside of the construction easement for materials and equipment storage, **unless** the contractor receives approval from the appropriate regulatory agencies for sensitive environmental areas and the property owner for farmed lands or roadways.

A qualified biologist would also survey areas proposed for pipe and materials storage. These areas would comply with the project specifications that will prohibit the use of sensitive environmental areas, roadways, and farmed lands outside of the construction easement for materials and equipment storage, unless the contractor receives approval from the appropriate regulatory agencies sensitive environmental areas and the property owner for farmed lands or roadways.

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Site restoration to pre-construction contours in open areas and along transportation corridors will be completed as the pipeline is installed. In fields and areas of sensitive habitat, the top 6 to 12 inches of soil will be stockpiled during construction and replaced following pipe installation and erosion control methods will he used. Revegetation may be accomplished by allowing the area to re-seed naturally. .

2. Recycled Water Facility

The recycled water facility includes construction and operation of a recycled water facility adjacent *to* the Watsonville Wastewater Treatment Facility (WWTF) and 4,200 feet of 24-inch-diameter pipeline to connect to the import pipeline and the coastal distribution system. The pipeline is located in agricultural habitat and would require a construction corridor of approximately 40-100 feet in width. The proposed recycled water facility would involve construction of tertiary treatment facilities at the WWTF and pumping, blending, storage, and distribution facilities. Construction of tertiary treatment, pumping, storage, and associated facilities (the recycled water facility) would be located in a fully developed, primarily agricultural area and would require acquisition of 8 acres of land from the adjacent agricultural areas. Portions of the property are undeveloped, and contain weedy vegetation typical of disturbed sites. The lowest reach of the Pajaro River with a floodplain Fully contained by levees is nearby.

From the proposed recycled water facility, the pipeline would pass through agricultural lands parallel to and north of the Pajaro River levees, before passing beneath the river via trenchless construction (e.g., microtunneling). No riparian vegetation would he disturbed (in this area. the riparian comdor is contained within levees). All of the proposed locations for facilities are in agricultural or weedy, disturbed areas.

3. *Supplemental Wells*

The use of groundwater for blending would **require** up to six groundwater extraction wells, referred to herein as the supplemental wells, with lateral pipelines connecting the main pipeline to the blending facilities in agricultural habitat near the intersection of Highway I and the Pajaro River. These wells also would be used to supply groundwater to irrigators during the dry-year **periods.**

Up to six wells to produce blending water would be sited in the area east of the WWTF bounded by Highway 1 on the west, the city of Watsonville on the north, Bolsa De **San** Cayetano on the south, and the area south of the Pajaro River and south of the eastern extent of the city of Watsonville on the east. Wells would be spaced approximately 2,000 feet apart, within a boundary extending 1,000 feet on each side of the Import Pipeline, extending **4** miles east **from** Highway I. The total area anticipated for each well would be approximately 30 feet by 40 feet. Lateral pipelines would connect the wells io the Import Pipeline. Some existing wells may be converted to this purpose. and some new wells would be constructed. New wells most likely would be sited in areas currently used for agricultural production as would the pipeline

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connecting the wells to the Import Pipeline, although other land uses exist within the siting area. New wells would be sited so as not to affect nearby wells that are expected to remain in operation.

4. *Integrated Coastal* Distribution System

The purpose of the Integrated Coastal Distribution System (ICDS) is to deliver water to growers in the area roughly bounded by Monterey Bay to the West, Highway 1 to the East, Elkhorn Slough to the South, and Buena Vista Drive and Harkins Slough Road to the north. Growers in this area would then take their wells out of service, thereby reducing the groundwater pumping rate. The ICDS consists of facilities required to provide complete irrigation with imported water supplies to 10,000 acres, 8,500 acres of which is farmable. Facilities include:

- pipelines,
- pump stations,
- turnouts, and
- crossings.

In addition to blended recycled water and imported water, the ICDS receives water from the Harkins Slough diversion project. The Harkins Slough project was constructed in 2000 and 2001 and, with it segments of the ICDS, to deliver water to nearby growers.

Operation and Location

The proposed ICDS contains a total of 165,670 feet of pipeline and is divided to provide service to areas in Santa Cruz and Monterey Counties, Approximately 28,530 feet of pipeline has already been constructed as part of the Harkins Slough project.

During field surveys conducted by ESA in 1999, a small population of the federally threatened Monterey spineflower (*Chorizanthe pungens* var. *pungens)* was identified in an old sand pit between Trafton and Bluff roads. The pipeline route does not cross this area and construction activities will not take place within 100 feet of suitable habitat for this species.

The ICDS contains 127 turnouts. These turnouts are located at sites along the ICDS laterals and at the terminus of each sub-lateral in agricultural habitat.

Pump Stations

Results of hydraulic modeling showed that minimum pressures in the Monterey Service Area would be adequate and a pump station would not be required. Minimum pressures anticipated in the Santa Cruz Service Area may require the addition of a pump station. Assuming worst-case conditions, a North Plateau Pump Station would be required near the intersection of Sunset Beach Road and San Andreas Road in agricultural habitat. Any necessary booster pumps would

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be located in agricultural habitat and would be similar to those currently used at many wells in the area, consisting of a horizontal centrifugal pump connected to a turnout, with a bypass line for taking water at line pressure.

Crossings

The proposed ICDS alignment crosses roads, railroads, rivers, and environmentally sensitive areas (i.e., sloughs). Recommended lateral routes minimize the number and length of special crossings. Trenchless crossing methods include conventional jacking, horizontal boring, directional drilling, and microtunneling.

Import Pipeline and ICDS Trenchless Crossings

Trenchless construction techniques are expected to be utilized at roads and railroads and six locations along the following drainages: Pajaro River, Hanson Slough, and McClusky Slough.

Pajaro River (15+001) - microtunnel/horizontal directional drilling: At this location, two adjacent trenchless crossings of the Pajaro River would be constructed. One crossing of the river would bring water from the Import Pipeline to the Recycled Water Facility. The other crossing of the river would bring water to the ICDS southern service area. Staging areas for this drainage crossing will be located outside the levees of the river. These areas support row crops and do not provide habitat for special status species.

Hanson Slough - bore and jack or microtunnel: The ICDS would cross Hanson Slough once. Hanson Slough is surrounded by row crops. The staging areas for the pipeline crossing would be located within row crops outside the limits of any vegetation associated with the slough. These proposed staging areas do not provide habitat for special status species.

McClusky Slough - bore and jack or microtunnel: The ICDS would cross McClusky Slough once. McClusky Slough is surrounded by row crops at the proposed crossing location. The staging areas for the pipeline crossing would be located within row crops outside the limits of any vegetation associated with the slough. These proposed staging areas do not provide habitat for special status species.

Measures Proposed to Minimize Effects to Listed and Proposed Species

Least Bell's Vireo

The following measures will be implemented to minimize the effects to least Bell's vireos:

a. The construction corridor width will be confined to 40 feet or less in riparian or wetland habitat. In most cases, the crossings will be located in previously disturbed areas or areas with little riparian canopy cover. All wetland and riparian habitat removed during

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construction will be replaced at a ratio acceptable to the California Department of Fish and Game (CDFG) and the Service through the implementation of a revegetation and monitoring plan.

b. Additional protection measures for least Bell's vireos are dependent on the construction timing. Construction activities in the vicinity of riparian vegetation may begin prior to March 1 or after July 15 without limitation. If construction begins during the March-July breeding period, pre-construction surveys for sensitive nesting birds will be carried out. If no least Bell's vireos or other passerines are breeding within 500 feet of the construction area, construction may proceed during this period without limitation. If least Bell's vireos or other passerines are nesting within 500 feet, either construction must be delayed until the young have fledged or suitable avoidance measures would be developed in coordination with the Service and CDFG. Current CDFG .avoidance guidelines require a minimum 250-foot buffer zone around the nests of non-raptor birds.

Snn Joaquin Kit Fox

The following measures are derived from the Service's *Standardized Recommendations for Protection of the San Joaquin Kit* ***Fox*** (Service 1999). These measures will be implemented for construction areas in grassland habitats east of Highway 101 and adjacent to the easternmost 1,500 feet of the import pipeline:

a. During construction, project related vehicles will observe a 20 miles-per-hour speed limit in habitat areas, except as posted on county roads and State and Federal highways. To the extent possible. nighttime construction is prohibited on UPRR right-of-way and will be minimized elsewhere. Off-road traffic outside the designated project area will be prohibited.

b. To prevent inadvertent entrapment of San Joaquin kit foxes or other animals during construction, all excavated or deep-walled holes or trenches greater than 2 feet will be covered at the end of each work day by plywood or similar materials or provided with escape routes constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If trapped animals are discovered, the procedures under measure i of this section will be implemented.

c. San Joaquin kit foxes are attracted to den-like structures such as pipes and may enter stored pipe and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at construction sites for one or more overnight periods will be thoroughly inspected for San Joaquin **kit** foxes before the pipe is subsequently buried, capped, or other wise used or moved in any way. Other pipes or casings located in the trench will be inspected each morning prior to construction. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until a qualified biologist has been consulted. If necessary, and under the

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direct supervision of a qualified biologist, the pipe may be moved once to remove it from the path of construction activity, until the San Joaquin kit fox has escaped.

d. All food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed at least once a week from the project site.

e. No firearms will be allowed on the project site.

f. To prevent disturbance and mortality of San Joaquin kit foxes or destruction of dens by dogs or cats, no pets will be allowed on project sites.

g. An employee education program will be conducted for the project to explain San Joaquin kit fox concerns to contractors, their employees, and agency personnel involved in the project. The program will consist of a brief presentation by a person knowledgeable in San Joaquin kit fox biology and legislative protection and would include the following: a description of the San Joaquin kit fox and its habitat needs; the occurrence of the species in the project area; status of the species and its protection under the Federal and State Endangered Species Acts; legal penalties for violating the provisions of the Act; and measures being taken to reduce impacts to the species during project construction and implementation. A fact sheet conveying this information will be prepared for distribution to the above-mentioned people and anyone else who may enter the project site

h. After construction, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, and pipeline corridors will be recontoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but that after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas will be determined on a site-specific basis in consultation with the Service, CDFG, and revegetation experts..'

i. In the case of trapped animals, escape ramps or structures will be installed immediately to allow the animal(s) to escape.

j. Within no less than 14 days and no more than 30 days prior to the commencement of construction activities, a qualified biologist shall survey all construction areas within San Joaquin kit fox habitat. During these surveys, dens likely to be inhabited by San Joaquin kit foxes will be flagged for avoidance. Disturbance to all known San Joaquin kit fox dens will be avoided to the maximum extent possible. Limited destruction of dens may be allowed if avoidance is not a reasonable option, provided measures l and m are implemented.

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k. Occupied natal or pupping dens will not be destroyed until the pups and adults have vacated and then only after consultation with the Service.

l. Flagged dens occumng within the construction area shall be monitored for 3 days with tracking medium or an infra-red beam camera to determine current usage. If no San Joaquin kit fox activity is observed during this period, the den will be destroyed immediately to preclude subsequent use. If San Joaquin kit fox activity is observed, the den will be monitored for at least 5 consecutive days from the time of observation to allow any resident San Joaquin kit fox to move to another den. Use of the den can be discouraged during this period by partially plugging its entrance(s) with soil in such a manner that any resident animal can escape easily. Only when the den is determined to be unoccupied may the den be excavated under the direction of a qualified biologist. If the San Joaquin kit fox is still present after 5 or more consecutive days of plugging and monitoring, the den may have to be excavated when, in the judgment of a qualified biologist, it is temporarily vacant (e.g., during normal foraging period). Hand excavation is the preferred method; however, excavating equipment may be required due to soil conditions.

Destruction of the San Joaquin kit fox den will be accomplished by careful excavation until the absence of San Joaquin kit foxes is confirmed. The den will be fully excavated and filled with dirt and compacted to ensure that San Joaquin kit foxes cannot reenter or use the den during the construction period. If a San Joaquin kit fox is observed to reenter an excavated den, construction activity in the vicinity will cease and monitoring activities as described above will be implemented until the biologist has determined that the San Joaquin kit fox has escaped.

Snnta Cruz Long-toed Salamander

Construction activities will avoid aquatic and upland habitat for the Santa Cruz long-toed salamander through bore and jack and other trenchless methods. In addition, the measures proposed to minimize effects to California red-legged frogs will also minimize effects to the Santa Cruz long-toed salamander.

Tidewater **Goby**

The following measures will be implemented to minimize the potential for impacts to tidewater gobies resulting from underground construction at the Pajaro River west of Highway 1:

a. All underground construction activities in the vicinity of potential tidewater goby occurrences will be restricted to the low-flow period of June 15 through November 1. If the channel is dry. construction can occur prior to June 15. Restricting construction activities to this work window will minimize potential impacts to tidewater gobies resulting from bentonite releases.

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b. A qualified biological monitor will be on site during all underground pipeline construction activities in the vicinity of potential tidewater goby occurrences. In the event of a contaminant release, the biological monitor will have the authority to halt construction until the source of contamination is controlled.

Longhorn Fairy Shrimp, Conservancy Fairy Shrimp, and Vernal Pool Fairy Shrimp

Measures designed to prevent impacts to the California red-legged frog will also ensure that impacts to vernal pool invertebrates will not occur. In addition, the following measures will be applied to construction activities within 100 feet of the vernal pool just east of Highway 101:

a. Runoff from the adjacent upland construction site will be either retained in the defined work area or directed away from the identified vernal pool.

b. Construction exclusion fencing will be erected to keep project vehicles and activities within the defined work area.

c. A qualified biologist will conduct training sessions for all construction personnel before activities begin.

d. A qualified biologist will monitor construction activities that have potential to affect the identified habitat.

California Red-legged Frog

Prior to and during construction, the following actions will be performed to minimize adverse effects to California red-legged frogs:

a. The name and credentials of a biologist qualified to act as construction monitor will be submitted to the Service for approval at least 15 days prior to commencement of work.

b. A Service-approved biologist will survey the work sites 2 weeks before the onset of construction activities. If California red-legged frogs, tadpoles, or eggs are found, the approved biologist will contact the Service to determine if moving any of these life-stages is appropriate. If the Service approves moving the animals, the approved biologist will be allowed sufficient time to move California red-legged frogs from the work sites before work activities begin. If California red-legged frogs are not detected, construction may proceed at these sites.

c. All work activities within or adjacent to potential California red-legged frog aquatic habitat will be completed between May 1 and November 1 (except where construction will take place outside an established habitat boundary such as a levee).

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d. Exclusionary fencing (i.e., silt fences) will be installed around all construction areas that are within 100 feet of or adjacent to potential California red-legged frog habitat.

e. A Service-approved biologist will conduct a training session for all construction personnel. At a minimum, the training will include a description of the California red-legged frog and its habitat, the importance of the California red-legged frog and its habitat, the general measures that are being implemented to conserve the California red-legged frog as they relate to the project, and the boundaries within which the project may be accomplished.

f. A Service-approved biologist will be present at the active work sites until such time that the removal of California red-legged frogs, instruction of workers, and habitat disturbance have been completed. After this time, the contractor or permittee will designate a person to monitor on-site compliance with all minimization measures. The Service-approved biologist will ensure that this individual receives training outlined above in measure e and in the identification of California red-legged frogs.

g. During work activities, all trash that may attract predators will be properly contained, removed from the work site and disposed of regularly. Following construction, all trash and construction debris will be removed From work areas.

h. All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 66 feet from any riparian habitat or water body. Reclamation and the PVWMA will ensure contamination of habitat does not occur during such operations. Prior to the onset of work, Reclamation will ensure that the PVWMA has prepared a plan to allow a prompt and effective response to any accidental spills.

i. Project sites will be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan describing pre-project conditio&, restoration and monitoring success criteria will be prepared prior to construction.

In addition to the measures previously described, the following measures from the California red-legged frog programmatic consultation issued to the U.S. Army Corps of Engineers (Corps) (Service 1999b) will be implemented at all project areas that provide potential breeding and upland habitat for Califomiared-legged frogs and as needed in construction areas that border potential Califomia red-legged frog habitat:

j. A Service-approved biologist will ensure that the spread or introduction of invasive exotic plant species is avoided to the maximum extent possible. When practicable, invasive exotic plants in the project areas will be removed.

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k. Stream contours will be returned to their original condition at the end of project activities, unless consultation with the Service has determined that it is not beneficial to the species or feasible.

l. The number of access routes, number and size of staging areas, **and** the total area of the activity will be limited to the minimum necessary to achieve the project goal. Routes and boundaries **will** be clearly demarcated, and these areas will be outside of riparian and wetland areas. Where impacts occur in these staging areas and access routes, restoration will occur **as** identified in measures i and **k.**

m. To control erosion during and after project implementation, the **PVWMA** will implement best management practices, as identified by the appropriate Regional Water Quality Control Board.

n. If a work site is to be temporarily dewatered by pumping, intakes **will** be completely screened **with** wire mesh not larger than five millimeters to prevent California red-legged ***frogs*** from entering the pump system. Water will be released or pumped downstream at an appropriate rate to maintain downstream flows during construction. Upon completion of construction activities, any barriers to flow will be removed in a manner that would allow flow to resume with the least disturbance to the substrate.

o. **A** Service-approved biologist will permanently remove, from within the project area, any individuals of exotic species, such as bullfrogs (*Rana catesbciana*), crayfish, and centrarchid fishes, to the maximum extent possible. The PVWMA **is** responsible to **ensure** that its activities are in compliance with the California Fish and Game Code.

California Tiger Salamander

In addition **to** measures described for the California red-legged frog, the following measures will further minimize adverse effects to the California tiger salamander:

a. At the two sites which provide aquatic habitat **and** grassland estivation habitat (the vernal pool and the drainage east of Soda Lake), aquatic and nocturnal surveys will be performed prior to construction by a qualified biologist according to the CDFG protocol (1998). Surveys will include standard aquatic surveys in 2 consecutive years with one standard nocturnal survey during the second year survey. If the surveys result in a negative finding, no further action is required.

b. If protocol level surveys indicate the presence of California tiger salamanders within aquatic or estivation habitat at these two **sires,** a pre-construction survey will be conducted at the site to identify suitable burrow estivation **areas.** Estivation habitat will be defined **as** the presence of two or more small mammal burrows greater **than** one-inch diameter within a 10-foot diameter area **and** within 10 feet of proposed construction sites

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(i.e., the presence of a single isolated gopher hole would not be considered habitat). As feasible within the context of the work area, estivation areas will be temporarily fenced and avoided.

c. Fencing will consist of silt fence material strung between temporary stakes, with the lower edge set in a 6-inch deep trench and back-filled. Fencing will be monitored daily for gaps or undermining burrows and will be maintained in good condition. Following construction, all fencing materials will be removed.

d. At locations where estivation burrows are identified and cannot be avoided, estivation burrows will be excavated by hand prior to construction and individual animals moved to natural burrows or artificial burrows constructed of PVC pipe within 0.25 mile of the construction site.

e. To ensure compliance with these measures and minimize adverse effects to California tiger salamanders, a qualified biological monitor will be present during all construction operations at locations with suitable estivation burrows.

f. Following removal of individuals, construction areas will be fenced with temporary silt fencing as described previously in this section.

Trenchless Construction Measures

Staging and storage areas for equipment, materials, fuels, lubricants, and solvents will be located outside of the stream channel and banks at least 50 feet from waterways, but within the pipeline right-of-way. Prior to construction, a biological monitor will survey the proposed staging area to ensure that it is located outside of riparian vegetation or other sensitive habitat. Stationary equipment such as motors, pumps, generators, and compressors located within or adjacent to the stream that may leak materials deleterious to aquatic life will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily, to prevent leaks of materials. Vehicles will be moved away from the stream prior to refueling and lubrication. All fueling and maintenance of vehicles and other equipment and staging areas will occur at least 60 feet from any riparian habitat or water body. No trash or debris will be stored or deposited within 100 feet of streams or wetlands.

Prior to construction, the biological monitor will survey proposed staging areas to ensure that they are not located within sensitive habitat and resources, perform any required preconstruction surveys, and conduct an environmental training session for the construction crew. During construction of the drainage crossings, the biological monitor will patrol the staging areas and bore entry and exit pits and monitor the drilling fluid returns to ensure that no fluid is escaping during trenchless construction. In addition, the biological monitor will regularly search rhe drainage, including upstream and downstream reaches from the construction site, and surrounding areas to identify frac-outs or fluid release into the stream or adjacent habitat.

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Bentonite will be specified to contain a non-toxic purple dye that aids in the identification of drilling fluid seepage within turbid waters.

The contractor will provide a trained site inspector with experience in trenchless construction techniques to monitor drilling fluid returns at the site. If the biological monitor or site inspector identifies seepage of drilling fluid, the monitor will have the authority to halt construction until the source of contamination is controlled and corrective action taken. The biological monitor will be responsible for reporting any drilling fluid seepage or spill in the daily monitoring report and notifying the appropriate agencies as discussed below.

Spill Prevention and Containment **Measures**

Protective measures (a) through (g) will be applied individually or in combination based on sound field observation at each trenchless construction site, to prevent drilling fluids from affecting streams, wetlands, riparian vegetation or other sensitive habitat:

a. A dike/berm will be constructed around the bore pit to entrap all boring fluids:

- The dike will extend around the boring equipment as necessary to contain all drilling fluids around equipment and the bore;
- The bore pit will be sized to fully contain the return flow of drilling fluids;
- A receiving pit will be excavated on the far side of the bore to collect any cutting fluid that may exit the bore;
- Drilling fluid flow controls will be available to quickly seal any leakage that may occur and spill containment materials shall be on site;
- A similar dike/berm will be constructed at the exit point to contain all drilling fluid around equipment and the bore;
- A straw barrier (certified weed free) and/or silt fence will be installed between the bore pit dike/berm and flowing stream or wetland. (This protection is meant to prevent seepage occurring outside the primary dike/berm fiom reaching the stream or wetland, as needed);

b. An 800-gallon or larger vacuum truck will be on site to periodically remove drilling fluids from the boring pit and around equipment;

c. A 3,000-gallon or larger vacuum truck will be available on call in case a spill or seep occurs;

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d. Should rain be forecasted, additional protection measures may be suggested and implemented at the discretion of the Biological Monitors on site or as required by the permit conditions set by the regulatory agencies;

e. The contractor will be required to route any natural runoff or drainage away from or around the bore entry and exit pits;

f. Water entering the bore entry or exit pits, either by means ofprecipitation or groundwater inflow, may be contaminated by residue on boring/drilling equipment and will be discharged in accordance with the appropriate stormwater or dewatering discharge permits; and

g. Excess supplies of containment materials (i.e., weed-free straw bales, silt fence, shovels) will be available for use as needed.

A biological monitor will be present on site during all trenchless construction activities. The biological monitor will ensure that the following spill prevention and containment equipment is available at the site at all times. Construction activities shall not commence without on site spill prevention and containment equipment. At a minimum, the following equipment must be available at the site:

- Heavy weight plastic gravel filled and sealed bags (at least 40 bags each at **30** to 50 pounds);
- A splash board with 3 layers of a heavy weight plastic;
- Several **5** gallon hard plastic pails;
- One wide, heavy-duty push broom;
- Three flat blade shovels;
- Silt fence and T-posts ;
- Chicken wire or connecting material to tie off the perimeter of a dewatering structure;
- Two bundles of absorbent pads to use with plastic sheeting for placement beneath motorized equipment while in operation in a riparian/stream zone;
- A minimum of two IO-foot rolls of straw logs (wattles or fiber rolls);

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- **A** floating silt barrier of sufficient length to reach from the water's surface to the river bed to contain any frac-out in flowing drainage; and

- **A** minimum of 100 feet of hose and sump pump that will be available for clean up.

If seepage of drilling fluid occurs:

- Directional boring will stop immediately.

- The bore stem will be pulled back to relieve pressure on the seep.

- Existing berms, barriers, or silt fences will be strengthened to contain drilling fluids.

- If the frac-out occurs within **a** flowing stream, floating silt barriers will be deployed in a semi-circle around the frac-out, downstream of the discharge.

- An 800-gallon or larger vacuum truck will begin recovering drilling fluid immediately. Trucks will be staged from the top of the bank rather than within the stream.

  Actions will be taken to divert drilling fluid from entering a stream or wetland.

- A 3,000-gallon or larger vacuum truck will be called to the site, if necessary, to accommodate the amount or location of the spill or seepage.

- **The** collected mud recovered from the stream will be disposed of properly at an approved and permitted disposal location outside of sensitive habitat.

  In the event that drilling fluids adversely affect wetlands or streams, the Biological Monitor will notify the appropriate agencies (the Service, CDFG, the Corps, and Regional Water Quality Control Board) and consult on proper cleanup and implementation of mitigation measures.

- Mitigation measures for habitat restoration (as described in the Streambed Alteration Agreement or other consultation document produced by CDFG in coordination with the applicant) will be implemented immediately following completion of the work on a particular segment or in the first rainy season following completion of work, whichever comes first.

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Site-specific containment measures

As discussed in the biological assessment (ESA 2002), underground crossings of the Pajaro River and Millers Canal will occur between June 15 and November 1 during the low-flow period for the drainages to minimize disturbance to the federally threatened steelhead *(Oncorhynchus mykiss).* To minimize impacts to Santa Cruz long-toed salamander, underground crossings of Hanson Slough and McClusky Slough will occur between August 1 and October 31. During these months, reaches of the Pajaro River, Hanson Slough, and McClusky Slough may be dry, depending on rainfall and other conditions that vary annually. Some reaches of the Pajaro River and Millers Canal have the potential to contain some water throughout the year. Prior to construction, the contractor will evaluate hydrologic conditions at each underground drainage crossing location to determine which spill prevention measures are appropriate and most effective for the site.

STATUS OF THE SPECIES

Least Bell's Vireo

The least Bell's vireo was listed as endangdred by the Service on May 2, 1986 (51 ***Federal Register*** 16474). Critical habitat was designated for the least Bell's vireo on February 2, 1994 (59 *FR* 4845). A *draft* recovery plan has been published (Service 1998a). Additional information on the least Bell's vireo may be found in Wilbur (1980), Garrett and Dum (1981), Miner (1989), Pike and Hays (1992), and Zembal et al. (1985).

The least Bell's vireo is a small, olive-grey migratory songbird that nests and forages almost exclusively in riparian woodland habitats. Bell's vireos as a group are highly territorial and are almost exclusively insectivorous.

Least Bell's vireo nesting habitat typically consists of well-developed overstories and understories, and low densities of aquatic and herbaceous cover. The understory frequently contains dense subshrub or shrub thickets. These thickets are often dominated by sandbar willow (*Salix hindsiana*), mule fat (*Baccharis salicifolia*), young individuals of other willow species such as arroyo Willow (*S. lasiolepis*) or black willow (S. *gooddingii*), and one or more herbaceous species. Important overstory species include mature arroyo willows and black willows. Occasional cottonwoods (*Populus* spp.) and western sycamores (*Platanus racemosa*) occur in some habitats and coast live oaks (*Quercus agrifolia*) may be locally important in the overstory.

Least Bell's vireos generally begin to arrive from their wintering range in southern Baja California and establish breeding territories by mid-March to late March. Most breeding least Bell's vireos apparently depart their breeding grounds by the third week of September and only a very few individuals are found wintering in California or the United States. Following pair formation, it takes approximately 5 to 7 days for least Bell's vireos to finish nest construction and

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egg-laying. Young typically fledge within **20** to 24 days after eggs are laid. The egg-laying and incubation periods are critical to the nesting success as disturbance at this point may result in abandonment of the nest. Once young are fledged, they wander widely throughout the parents' territory.

Although least Bell's vireos occupy home ranges that typically range in size from 0.5 to 7.5 acres, a few may be as large as 10 acres. In general, areas containing relatively high proportions of degraded habitat seem to have lower productivity (hatching success) than areas that contain high quality riparian woodland.

As much as 90 percent of the original extent of riparian woodland in California has been eliminated, and most of the remaining 10 percent is in a degraded condition (Smith 1977). Oberbauer (1990) reported a 61 percent loss of riparian habitat for San Diego County. **It** appears that least Bell's vireos nesting in areas containing a high proportion of degraded habitat have lower productivity (e.g., hatching success) than those in areas of high quality riparian woodland **(Pike** and Hays 1992). Additionally, widespread habitat losses have fragmented most remaining populations into small, disjunct, widely dispersed subpopulations (Franzreb 1989). Habitat fragmentation negatively affects abundance and distribution of neotropical migratory songbirds, in ***part*** by increasing incidence of nest predation and parasitism (Whitcomb et al. 1981, Small and Hunter 1988).

Least Bell's vireos are sensitive to many forms of human disturbance including noise, night lighting, and consistent human presence in **an** area. Excessive noise can cause vireos to abandon an ***area.*** Greaves (1989) hypothesized that the lack of breeding vireos in apparently suitable habitat was due to human disturbances (e.g., bulldozers, off-highway vehicles, and hiker travel). He further suggested that buffer zones between natural areas and surrounding degraded and disturbed areas could be used to increase the suitability of some least Bell's vireo habitat.

The features or elements of habitat that are essential ***to*** the conservation of the least Bell's vireo can be described **as** riparian woodland vegetation that generally contains both canopy and shrub layers, **and** includes some associated upland habitats. General activities that could cause destruction or adverse modification of least Bell's vireo habitat include the following: 1) removal or destruction of riparian vegetation, **2)** thinning of riparian growth, especially near ground level, 3) removal or destruction of adjacent upland habitats used for foraging, and 4) increases in human-associated or human-induced disturbances. Specific actions that could adversely affect least Bell's vireo critical habitat include stream channelization, water impoundment or extraction, water diversion, intensive recreation, and development.

Historically described as common to abundant in the appropriate riparian habitats from as far **north** as Tehama County, California to northern Baja California, Mexico, the least Bell's vireo currently occupies a small fraction of its former range. Widespread habitat losses have fragmented most remaining populations into **small,** disjunct, widely dispersed subpopulations. The decline of this species is attributed, in pan, to the combined, perhaps synergistic effects of

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the widespread loss of riparian habitats and brood-parasitism by the brown-headed cowbird (*Molothrus ater*). The final listing rule estimated the number of pairs in southern Califomia at 330. By 1996, the estimated number of pairs had increased to **1,346,** possibly due to the trapping of brown-headed cowbirds and habitat conservation and restoration (Service 1998).

San Joaquin *Kit* Fox

The San Joaquin kit fox was federally listed as endangered on March 11, 1967 ***(32 Federal Register*** 4001), and state listed as threatened on June 27, 1971. Critical habitat has not been proposed. Information in the following species account was obtained primarily from the recovery plan for upland species of the San Joaquin Valley (Service 1998b), Morrell (1972), and Egoscue (1956).

The San Joaquin kit fox is the smallest canid in North America with a length of approximately 30 inches including the tail. It is a nocturnal animal but can be active during daylight hours in late spring and early summer. The diet of San Joaquin kit foxes varies geographically, seasonally, . and annually based on variation in abundance of potential prey. They feed primarily on kangaroo rats (*Dipodomys* sp.), ground squirrels, mice, and lagomorphs. San Joaquin kit foxes will also eat insects, birds, and vegetation.

San Joaquin kit foxes use dens for temperature regulation, shelter from adverse environmental conditions, reproduction, and escape from predators. They may change dens four or **five** times during summer months and change natal dens one or two times per month, During September and October, adults begin to prepare natal and pupping dens, usually selecting sites with multiple openings. Mating takes place between late December and March. Litters of two to six pups are usually born between February and late March. Pups emerge from dens at slightly more than one month old and begin to disperse about four to five months later. Reproductive success of kit foxes is correlated with prey abundance. Success decreases when the density of prey species drops because of drought, too much rainfall, or other circumstances. Home ranges of approximately one to **12** square miles have been reported.

The **San** Joaquin **kit** fox historically was distributed within an 8,700-square mile range in central Califomia **from** the vicinity **of** Tracy in the upper San Joaquin Valley south to the general vicinity of Bakersfield. The current range of the San Joaquin kit fox is divided into two areas, the northern range centering around Contra Costa County and the southern range in the **San** Joaquin Valley and neighboring valleys. They also occur in interior coastal ranges and watersheds from Monterey County to Ventura County. Throughout their range, San Joaquin kit foxes are currently limited to remaining grassland, saltbush, open woodland, alkali sink valley floor habitats, and other similar habitats located along bordering foothills and adjacent **valleys** and plains. The largest extant populations of San Joaquin kit foxes are in the Elk Hills and the Buena Vista Naval Petroleum Reserve in Kern County, and the Carrizo Plain Natural Area in San Luis Obispo County. In the southern San Joaquin Valley, San Joaquin kit foxes also appear to make extensive **use** of habitat fragments in an urbanizing environment.

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Intensive agriculture, urbanization, and other land-modifying actions have eliminated extensive portions of habitat and are the most significant causes of this species' endangerment. Such habitat losses contribute to San Joaquin kit fox decline through displacement, direct and indirect mortalities, barriers to movement, and reduction of prey populations. The coyote (*Canis latrans*) and the introduced red fox (*Vulpes vulpes*) compete for food resources with the smaller San Joaquin kit fox and are known to prey upon San Joaquin kit foxes as well. Predation, competition, poisoning, illegal shooting and trapping, prey reduction from rodent control programs, and vehicle strikes contribute substantially to the vulnerability of this species.

A primary recovery strategy in the recovery plan is to establish a viable complex of San Joaquin kit fox populations (i.e., a viable metapopulation) on private and public lands throughout its geographic range. The recovery plan recommends protecting the Carrizo Plain Natural *Area*, western Kern County, and the Ciervo-Panoche Natural Area as core populations while reducing their isolation by managing populations on connecting private and public lands through conservation agreements. The recovery plan for upland species also recommends enhancing natural connections between populations to help reduce the harmful effects of habitat loss and fragmentation. Natural connections exist between the Salinas-Pajaro Region and the Carrizo Plain Natural Area. Three occurrences of San Joaquin kit fox movement have been documented between Salinas-Pajaro Region and the Carrizo Plain Natural Area and the area east of Paso Robles: (1) one San Joaquin kit fox was documented to move From the Camzo Plain Natural Area to Camp Roberts military installation along the Monterey/San Luis Obispo County line; and. (2) two kit foxes were recently documented to move from Camp Roberts to areas south of Shandon and Cholome, San Luis Obispo County, respectively. Although the total movement of San Joaquin kit foxes between these areas is unknown, land development along the natural movement corridors between the Canizo Plain Natural Area and the Salinas Valley as well as development within the Salinas Valley itself has probablyreduced immigration of San Joaquin kit foxes into the Salinas Valley, possibly contributing to their decline. Data from Camp Roberts show that the number of San Joaquin kit foxes trapped annually ranged from 17 and 52 individuals during 1989 to 1994 and dropped to a range of 5 to 9 individuals during 1995 and 1996, respectively (California Army National Guard 1997).

Although the causes of the decline at Camp Roberts are unknown, it has been attributed to a combination of potential factors that include an increase in the number of predators, such as coyotes and bobcats (*Felis rufus*); displacement by the red fox; a decrease in prey populations, such as lagomorphs and ground squirrels; flooding of dens during the pupping season during storm events in 1995; rabies and distemper; and reductions in grazing and burning associated with changes in land use practices at Camp Roberts (California Army National Guard 1997). However, in contrast to the Camp Roberts population, the San Joaquin kit fox population at the Carrizo Plain Natural Area reversed the decline and reached a record high by the mid-1990s. Even though numbers decreased slightly again in 1997 and 1998, the Carrizo Plain population is within normal bounds, considered to be stable, and has expanded its range northward in the last year. The abundance of San Joaquin kit foxes at the Carrizo Plain Natural Area appears tied closely to the abundance of their prey species, kangaroo rats and lagomorphs (R. Stafford,

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Associate Wildlife Biologist, CDFG, pers. comm. 2000). However, we do not know if a low prey base is the driving factor in the low number of observations of San Joaquin kit foxes in Monterey County. The role that natural connections between the Salinas Valley and the Carrizo Plain Natural Area may play in maintaining the vigor and ensuring the survival of the metapopulation is complex and yet to be Characterized, especially given the difference in population dynamics between the *two* population units.

Santa Cruz Long-toed Salamander

The Santa Cruz tong-toed salamander was federally listed as endangered on March 11, 1967 (32 *Federal Register* 4001). A recovery plan was approved in 1977 (Service 1977) and revised in 1985 (Service 1985). Critical habitat has not been proposed. Information obtained in this account was obtained primarily from Anderson (1960, 1961, 1964, 1967, 1968, 1972), Hayes and Miyamoto (1984), Hayes and Tennant (1985), Hayes and Kremples (1986), Hayes and Jennings (1988), Reed (1979, 1981), Ruth (1988a, 1988b), and Ruth and Tollestrup (1973).

Santa Cruz long-toed salamanders are small, dark colored salamanders with a series of discrete, irregular dull orange or metallic-yellow dorsal markings. Head markings are small scattered dots and are often absent anterior to the eyes. The ventral surface is sooty black. They are thought to be long-lived creatures, possibly living for a decade or more. The Santa Cruz long-toed salamander is a subspecies of the long-toed salamander that is isolated by 150 miles from the nearest other subspecies.

Santa Cruz long-toed salamanders are known from at least 14 locations in Santa Cruz and Monterey Counties. They spend most of their lives underground in small mammal burrows and along the root systems of plants in upland chaparral and woodland areas of coast live oak or Monterey pine (*Pinus radiata*) and riparian strips of arroyo willows and other species. These areas are desirable because they are protected from the heat and drying rays of the sun. The soil is usually a sandy loam, the result of old marine terraces. The breeding ponds are usually shallow, ephemeral, freshwater ponds. In Santa Cruz County, breeding has been documented at Valencia Lagoon, and at Buena Vista, Calabasas, Ellicott, Green's, Millsap, Rancho Road, Seascape, and Tucker ponds (Service 1999a, Dana Bland and Associates 2002). In Monterey County, breeding has been documented at Bennett Slough, McClusky Slough, Elkhom Slough, Moro Cojo Slough, and McClusky vernal pool (Service 1999a). However, many of these sites have not been surveyed recently and may no longer support breeding populations. The breeding ponds at the Buena Vista, Calabasas, Millsap, Rancho Road, Seascape, Tucker, and Valencia sites are man-made or human modified. The extent of the upland habitat adjacent to the ponds varies from a narrow ring of riparian vegetation on the perimeter of the pond to as far as a mile or more out from the pond. Although no adult Santa Cruz long-toed salamanders have been observed to move more than about *0.6* mile (straight-line distance) from a breeding site where they were originally marked, few, if any studies have looked for them beyond that distance. The distance between known breeding and estivation locations varies greatly from site to site and apparently depends largely upon soil type, vegetation presence (or absence), vegetation structure

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or composition, slope, aspect, and size of the breeding pond (Mark Jennings, U.S. Geological Survey, Biological Resources Division, pers. ob., 1996). Juvenile Santa Cruz long-toed salamanders have also been found at several other sites in Santa Cruz and Monterey Counties. Whether any of these juveniles represent undiscovered breeding populations or merely wandering individuals from marginal or currently identified breeding habitats is unknown. Further discovery of new breeding sites is likely given the amount of privately owned habitat in the region that has not been surveyed for Santa Cruz long-toed salamanders.

Adult Santa Cruz long-toed salamanders leave their upland chaparral and woodland summer retreats with the onset of the rainy season in mid- to late-November or December and begin their annual nocturnal migration to the breeding ponds. They often forage for invertebrates, especially isopods, on the surface in and around breeding sites during the rainy season. All adult Santa Cruz long-toed salamanders migrate primarily on nights of rain, mist, or heavy fog. They arrive at the breeding ponds from November through March, with most arriving in January and February. Peak breeding occurs during January and February because earlier rains are usually insufficient to fill the breeding ponds. Adults may skip breeding for one or more seasons if no surface water is present during drier years (Russell and Anderson 1956). As individuals enter the pond, they pair up, court, and breed. Males apparently remain in ponds twice as long (1 to 5 weeks) as females and may successfully breed with more than one female each season. Female Santa Cruz long-toed salamanders have specialized and selective egg-laying habits. Eggs are laid singly on submerged stalks of spike rush (*Eleocharis* sp.) or other vegetation about 2 to 3 centimeters apart. Free floating, unattached, and clustered eggs have also been observed. Each female lays approximately 300 (range 215 to 411) eggs per year. After courtship and egg laying, most adults leave the pond in March or April and return to the same general areas where they spent the previous summer, often foraging for food while en route. Some adults may remain in the vicinity of the breeding site for a year or more before returning to more distant terrestrial retreats. The eggs and the subsequent larvae are left unattended by the adults.

According to Reed (1979, 1981) and Ruth (1988a), eggs usually hatch 15 to 30 days into the aquatic larval stage. The exact amount of time for development depends on water temperature. The larvae, which subsists largely on aquatic invertebrates, such as worms and mosquito larvae, and other larval amphibians, such as Pacific treefrogs (*Hyla regilla*) and conspecifics, remain in the pond environment for 90 to 145 days until they reach a minimum size of about 1.25 inches snout to vent length. Once this general size is reached, the larvae may metamorphose in a relatively short period of time if the pond environment becomes unsuitable (i.e., dries up) for continued larval growth. However, a complex set of factors determines the timing of metamorphosis in ambystomatid salamanders. Metamorphosis typically occurs from early May to mid-August. In the closely related mole salamander (*Ambystoma talpoideum*), metamorphosis can be induced in the laboratory by starvation, water pollution, increased water temperatures, or drying of the aquatic habitat (Shoop 1960). If water is available to the larvae for a longer period of time, remaining in the pond may be advantageous for the juveniles. A larger body size at metamorphosis increases resistance to desiccation, makes the individual less vulnerable to predation, and increases the size range of food items that can be eaten (Werner 1986). As the

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pond begins to dry, the juveniles move at night and seek underground refuge at or near the pond. During the next rainy season, these recently metamorphosed juveniles disperse further away from the pond, not returning until they reach sexual maturity at 2 to 3 years.

Santa Cruz long-toed salamanders are vulnerable to several predators. Predators of juvenile Santa Cruz long-toed salamanders include introduced Virginia opossums *(Didelphis virginiana)*, striped skunks *(Mephitis mephitis)*, and ringneck snakes (*Diadophis punctatus*) (Reed 1979). Adults are probably preyed upon by these animals as well as raccoons *(Procyon lotor)*. Large California tiger salamanders, coast garter snakes (*Thamnophis atratus*), western terrestrial garter snakes (*T. elegans*), and common garter snakes (*T. sirtalis*) have been observed to prey on larvae, juveniles and adults when the opportunity presents itself. Larval Santa Cruz long-toed salamanders are eaten by conspecifics (Blau 1972), a number of predacious aquatic insects, and a few bird species including mallard ducks (*Anas platyrhynchos*). Larval Santa Cruz long-toed salamanders are parasitized by a digenetic trematode (Plagiochiidae) which causes the creation of supernumerary limbs as well as other limb deformities (Sessions and Ruth 1990). Burrowing mammals, such as moles (*Scapanus* spp.) and shrew-moles *(Neurotrichus gibbsii)*, apparently avoid Santa Cruz long-toed salamanders because of toxic skin secretions. Predation on adults by herons (*Ardea herodias, Burorides striatus, Egretta* spp.), belted kingfishers (*Ceryle alcyon*), owls (*Tyto alba. Bubo virginianus, Megascops kennicotti*), blackbirds *(Agelaius* spp.), and grebes (*Podilymbus podiceps* and *Podiceps* spp.) is probably minimized because of the secretive and primarily nocturnal activities of mature Santa Cruz long-toed salamanders above ground and the availability of sufficient cover.

The Santa Cruz long-toed salamander is vulnerable to contaminants found in its aquatic breeding habitat. The eggs, larvae, juveniles, and adults of the Santa Cruz long-toed salamander may directly absorb contaminants contained in the water; larvae, juveniles, and adults may directly ingest contaminants by eating contaminated aquatic animals.

The Santa Cruz long-toed salamander is currently known from more locations than when it was listed. However, only four are currently managed by public agencies, with a fifth site currently under acquisition. A sixth site is on a preserve as part of mitigation for a habitat conservation plan for a residential development. The remaining locations continue to be threatened by the direct or indirect effects of human and natural events. The principal threats to its continued existence include degradation of existing breeding ponds by siltation, growth of excessive aquatic vegetation, destruction of upland and breeding habitat by land use practices such as urbanization and highway construction, vehicles, saltwater intrusion, weather conditions, runoff from adjacent agricultural and urban areas, and predation by introduced and native organisms. The very restricted and disjunct distribution of the Santa Cruz long-toed salamander populations has made the species particularly susceptible to population declines.

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Tidewater **Goby**

The tidewater goby was listed as endangered on March 7, 1994 (59 ***Federal Register*** 5494). Critical habitat was designated on November 20, 2000 (65 ***Federal Register*** 69693). On June 24, 1999, we published a proposed rule to remove the northern populations of the tidewater goby, including those in Monterey and Santa Cruz Counties, from the list of species protected by the Act. A final rule for this action has not been published nor has a recovery plan. Detailed information on the biology of the tidewater goby can be found in Wang (1982), Irwin and Soltz (1984), Swift *et al.* (1989), Worcester (1992), and Swenson (1995); much of the information from this account was taken from these sources.

The tidewater goby is a small, elongate, grey-brown fish with dusky fins not exceeding 1.91 inches standard length (SL). The species, which is endemic to California, is typically found in coastal lagoons, estuaries, and marshes with relatively low salinities (approximately ten parts per thousand). Its habitat is characterized by brackish shallow lagoons and lower stream reaches where the water is fairly still but not stagnant. However, tidewater gobies can withstand a range of habitat conditions; they have been documented in waters with salinity levels from 0 to 42 parts per thousand, temperatures from 8 to 25° Celsius, depths from 10 to 80 inches, and dissolved oxygen levels of less than one milligram per liter.

Tidewater gobies may range upstream into fresh water, up to 1.24 miles from the estuary. In San Antonio Creek and the Santa Ynez River, Santa Barbara County, tidewater gobies are often collected 3 to 5 miles upstream of the tidal or lagoonal areas, sometimes in sections of streams impounded by beavers (*Castor canadensis*). Conversely, tidewater gobies enter marine environments if sandbars are breached during storm events. The species' tolerance of high salinities (up to 60 parts per thousand for shorter time periods) likely enables it to withstand the marine environment, allowing it to colonize or re-establish in lagoons and estuaries following flood events.

The tidewater goby is primarily an annual species in central and southern California, although some variation has been observed. If reproductive output during a single season fails, few if any tidewater gobies survive into the next year. For this reason, populations are exceedingly sensitive to short-term adverse environmental conditions. In one notable case, a population estimated at between 10,000 and 30,000 individuals was extirpated after a single construction project (Swift and Holland 1998). However, recent research suggests that tidewater gobies have adapted to climatically dynamic conditions and are adept at recolonizing sites from which they have been extirpated (Lafferty et al. 1999a).

Reproduction peaks from late April or May to July and can continue into November or December depending on the seasonal temperature and rainfall. Males begin the breeding ritual by digging burrows (3 to 4 inches deep) in clean course sand. Females then deposit eggs into the burrows, an average of 400 eggs per spawning effort (Swenson 1999). Males remain in the burrows to guard the eggs. Males frequently forgo feeding during this period, possibly contributing to the

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mid-summer mortality noted in some populations. Within 9 to 10 days, larvae emerge at approximately 0.2 to 0.3 inch SL. The larvae live in vegetated areas within the lagoon until they are 0.6 to 0.7 inch SL, when they become substrate oriented, spending the majority of time on the bottom rather than in the water column. Both males and females can breed more than once in a season, with a lifetime reproductive potential of **3** to 12 spawning events.

Tidewater gobies feed on small invertebrates, usually mysids, amphipods, ostracods, snails, and aquatic insect larvae, particularly dipterans. Small tidewater gobies (0.15 to 0.3 inch SL) probably feed on unicellular phytoplankton or zooplankton similar to many other early stage larval fishes (Swenson and McCray 1996).

Historically, the tidewater goby occurred in at least 110 California coastal lagoons from Tillas Slough near the Oregon border to Agua Hedionda Lagoon in northern San Diego County. The southern extent of its distribution has been reduced by approximately eight miles. The species is currently known to occur in about 85 locations, although the number of sites fluctuates with climatic conditions. Today, the most stable populations are in lagoons and estuaries of intermediate sizes (5 to 124 acres) that have remained relatively unaffected by human activities. These populations have probably provided colonists for the smaller ephemeral sites (Swift et **al.** 1997, Laffertyet al. 1999b).

The tidewater goby can be adversely affected by urban, agricultural and industrial development in and surrounding the coastal wetlands and alteration of habitats from seasonally closed lagoons to tidal bays and harbors. Some extirpations are believed to be related to pollution, upstream water diversions, and the introduction of exotic fish species (most notably sunfishes and black bass [Centrarchidae]). These threats continue to affect some of the remaining populations of tidewater gobies. Tidewater gobies have been extirpated from several water bodies that are impaired by degraded water quality (e.g., Mugu Lagoon, Ventura County), but still occur **in** others (e.g., Santa Clara River, Ventura County).

Longhorn Fairy Shrimp, Conservancy Fairy Shrimp, **and** Vernal **Pool** Fairy Shrimp

The **vernal** pool fairy shrimp was listed as threatened and the conservancy and longhorn fairy shrimp were listed as endangered on September 19, 1994 (59 FR 48136). **A** recovery plan for vernal pool species. including the vernal pool fairy shrimp, is being prepared (E. Cypher, Research Ecologist, San Joaquin Valley Endangered Species Recovery Program, Fresno, California, pers. comm. 2000). Most of the information in this species account was taken from the draft San Joaquin County Multi-Species Conservation and Open Space Plan, available from the Service's Sacramento Fish and Wildlife Office. Additional infoxmation on the life history and ecology of these species may be found in the **final** rule (59 FR 48136), Eng et al. (1990), Simovich et al. (1992), and Helm (1998).

Fairy shrimp are translucent, slender crustaceans that eat algae and plankton by scraping and straining them from vegetation or other surfaces within the vernal pool. Fairy shrimp have

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delicate elongate bodies, large stalked compound eyes, no carapace, and 11 pairs of swimming legs. They swim or glide gracefully upside down by means of complex beating movements of the legs that pass in a wave-like anterior to posterior direction.

Fairy shrimp are restricted to vernal pools or swales, an ephemeral freshwater habitat that forms in areas where slight depressions become seasonally saturated or inundated following fall and winter rains. Due to local topography and geology, the pools are usually clustered into pool complexes. In southern California, these pools or swales typically form on mesa tops or valley floors and are surrounded by very low hills, usually referred to as mima mounds. None of these listed branchiopods are known to occur in permanent bodies of water, riverine waters, or marine waters. If habitat conditions are appropriate, these species can occur in depressions formed as a result of human activities, such as large ruts in roads. Water remains in these pools or swales for a few months at a time, due to an impervious layer such as hardpan, claypan, or basalt beneath the soil surface. Water chemistry is one of the most important factors in determining the distribution of fairy shrimp (Branchiopod Research Group 1996).

The Conservancy fairy shrimp inhabits vernal pools with highly turbid water. The longhorn fairy shrimp inhabits clear to turbid grass-bottomed vernal pools in grasslands and clear-water pools in sandstone depressions. The vernal pool fairy shrimp inhabits alkaline pools, ephemeral drainages, rock outcrop pools, ditches, stream oxbows, stock ponds, vernal pools, vernal swales, and other seasonal wetlands. Occupied habitats range in size from rock outcrop pools as small as one square yard to large vernal pools up to 11 acres; the potential ponding depth of occupied habitat ranges from 1.2 inches to 48 inches.

Fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus. The females carry eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. The "resting" or "summer" eggs are known as cysts and are capable of withstanding heat, cold, and prolonged desiccation. When the pools fill in the same or subsequent seasons, some, but not all, of the eggs may hatch. The egg bank in the soil may consist of eggs from several years of breeding (Donald 1983). The eggs hatch when the vernal pools till with rainwater. The early stages of the fairy shrimp develop rapidly into adults. These non-dormant populations often disappear early in the season long before the vernal pools dry up.

The primary historic dispersal method for the fairy shrimp likely was large-scale flooding resulting from winter and spring rains which allowed the animals to colonize different individual vernal pools and other vernal pool complexes. This mechanism of dispersal likely does not exist currently due to the construction of dams, levees, and other flood control measures and widespread urbanization and other development within substantial portions of the ranges of these species. Waterfowl and shorebirds likely are now the primary dispersal agents for fairy shrimp. The eggs of these crustaceans can be ingested or adhere to the legs and feathers and be transported to new habitats.

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The vernal pool fairy shrimp has been collected from early December to early May. Vernal pool fairy shrimp develop rapidly and may become sexually mature within 2 weeks after hatching. Such quick maturation permits vernal pool fairy shrimp populations to persist in short-lived, shallow bodies of water.

The longhorn fairy shrimp is known only from four disjunct populations along the eastern margin of the central coast range From Concord, Contra Costa County south to Soda Lake in San Luis Obispo County: the Kellogg Creek watershed, the Altamont Pass area, the western and northern boundaries of Soda Lake on the Carrizo Plain, and Kesterson National Wildlife Refuge in the San Joaquin Valley.

All known populations of vernal pool fairy shrimp inhabit sites in California or southern Oregon. The geographic range of this species encompasses most of (and particularly the eastern side of) the Central Valley from Shasta County to Tulare County and the central coast range from northern Solano County to Santa Barbara County, California; additional disjunct populations have been identified in western Riverside County, California, and in Jackson County, Oregon near the city of Medford. A number of occurrences of fairy shrimp species have been documented within Monterey County and-adjacent counties.

Conservancy fairy shrimp are known only from six disjunct populations: Vina Plains, north of Chico, Tehama County; south of Chico, Butte County; Jepson Prairie, Solano County; Sacramento National Wildlife Refuge, Glenn County; near Haystack Mountain northeast of Merced in Merced County; and the Lockwood Valley of northern Ventura County.

Approximately two thirds of the grasslands that once supported vernal pools in the Central Valley had been destroyed by 1973 with an associated loss of nearly 90 percent of vernal pool habitat. Habitat loss resulted from direct destruction and modification of pools and modification of surrounding uplands which altered the watersheds of the vernal pools. In subsequent years, a substantial amount of the remaining habitat for vernal pool crustaceans has been destroyed with estimates of habitat loss ranging from two to three percent per year. Current data indicate vernal pool grasslands are being lost in the southern San Joaquin Valley at a rate of approximately one percent per year. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use, alterations of vernal pool hydrology, fertilizer and pesticide contamination, activity, invasions of aggressive non-native plants, gravel mining, and contaminated stormwater runoff. Although developmental pressures continue, only a small fraction of vernal pool habitat is protected from the threat of destruction.

California Red-legged **Frog**

The California red-legged frog was federally listed as threatened on May 23, 1996 (61 *Federal Register* 25813). A recovery plan has been published (Service 2002). Critical habitat for the California red-legged frog was designated on March 13,2001 (66 *Federal Register* 14625). On November 6,2002, the United States District Court for the District of Columbia set aside the

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designation and ordered the Service to publish a new final rule with respect to the designation of critical habitat for the California red-legged frog *(Home* ***Builders*** *Association of Northern* ***California*** *et al. versus* ***Gale A*** *Norton,* ***Secretary*** *of the Department of* ***Inrerior el al.*** Civil Action No. 01-1291 (RJL) U.S. District court, District of Columbia.) Consequently, critical habitat will not be discussed further in this biological opinion.

Detailed information on the biology of California red-legged frogs can be found in Storer (1925), Stebbins (2003), and Jennings et al. (1992). This species is the largest native frog in the western United States, ranging from **1.5** to 5.1 inches in length. The abdomen and hind legs of adults are largely red; the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on **a** brown, gray, olive, or reddish background color. Dorsal spots usually have light centers, and dorsolateral folds are prominent on the back. Tadpoles range from 0.6 to 3.1 inches in length and are dark brown and yellow with dark spots.

California red-legged frogs spend most of their lives in and near sheltered backwaters of ponds, marshes, springs, streams, and reservoirs. Deep pools with dense stands of overhanging willows and an intermixed fringe of cattails are considered optimal habitat. Eggs, larvae, transformed juveniles, and adults also have been found in ephemeral creeks and drainages and in ponds that do not have riparian vegetation. Accessability to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be **a** factor limiting population numbers and distribution. Some California red-legged frogs have moved long distances over land between water sources during winter rains. Adult California red-legged frogs have been documented to move more than 2 miles in northern Santa Cruz County "without apparent regard to topography, vegetation type, or riparian corridors" (Bulger et al., 2003). Most of these overland movements occur at night.

California red-legged frogs breed from November through March with earlier breeding records occurring in southern localities. California red-legged frogs are often prolific breeders, typically laying their eggs during or shortly after large rainfall events in late winter and early spring. Female California red-legged frogs deposit egg masses on emergent vegetation so that the masses float on the surface of the water. Egg masses contain about 2,000 to 5,000 moderate-sized (2.0 to 2.8 millimeters) in diameter, dark reddish brown eggs. Embryos hatch 6 to 14 days after fertilization and larvae require 3.5 to 7 months to attain metamorphosis. Tadpoles probably experience the highest mortality rates of all life stages, with less than 1 percent of eggs laid reaching metamorphosis. Sexual maturity normally is reached at **3** to 4 years of age; California red-legged frogs may live 8 to 10 years. Juveniles have been observed to be active diurnally and nocturnally, whereas adults are mainly nocturnal.

The diet of California red-legged frogs is highly variable. Invertebrates are the most common food items for adults, although vertebrates such as Pacific treefrogs and California mice (*Peromyscus californicus*) can constitute over half of the prey mass eaten by larger frogs (Hayes and Tennant 1985). Larvae likely eat algae.

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The California red-legged frog has been extirpated or nearly extirpated from 70 percent of its former range. Historically, this species was found throughout the Central Valley and Sierra Nevada foothills. At present, California red-legged frogs are known to occur in 243 streams or drainages from 22 counties, primarily in central coastal California. The most secure aggregations of California red-legged frogs are found in aquatic sites that support substantial riparian and aquatic vegetation and lack non-native predators. Over-harvesting, habitat loss, non-native species introduction, and urban encroachment are the primary factors that have negatively affected the California red-legged frog throughout its range (Jennings and Hayes 1985, Hayes and Jennings 1988). Ongoing causes of decline include direct habitat loss due to stream alteration and disturbance to wetland areas, indirect effects of expanding urbanization, and competition or predation from non-native species.

California **Tiger** Salamander

The California tiger salamander was federally proposed as threatened on May 23,2003 (68 *Federal* ***Register*** 28648). Critical habitat has not been proposed. No recovery activities have been completed to date, although the California tiger salamander is included in the developing draft Recovery Plan for Vernal Pool Species and may benefit to some degree from recovery actions specified in the plan.

The California tiger salamander is a lowland species wholly endemic to central California. They persist in disjunct remnant vernal pool complexes in Sonoma County and Santa Barbara County, in vernal pool complexes and isolated ponds scattered along a narrow strip of rangeland on the fringes of the Central Valley from southern Colusa County south to northern Kern County, and in sag ponds and human-maintained stock ponds in the coast ranges from the San Francisco Bay Area south to the Temblor Range. The California tiger salamander has been eliminated from an estimated 55 to 58 percent of its documented historic breeding sites. Currently, approximately 150 known local populations **of** California tiger salamanders remain. Only one vernal pool complex where California tiger salamanders exist is presently protected (Jepson Prairie Natural Preserve).

The California tiger salamander is restricted to grasslands and low-elevation foothill regions in California (generally under 1,500 feet), where it uses seasonal aquatic habitats for breeding. California tiger salamanders breed in natural ephemeral pools, or ponds that mimic ephemeral pools (stock ponds that go *dry),* **and** occupy substantial areas surrounding the breeding pool as adults. Among salamanders, California tiger salamanders require a relatively short period to complete development of the aquatic larvae, and may breed successfully in waters that last for more than 2 months. In colder weather, the developmental period is prolonged, with periods in excess of **4** months being relatively common. This requirement restricts California tiger salamander breeding to deeper vernal pools, vernal playas, large sag ponds, and artificial ponds with adequate periods of inundation. However, California tiger salamander larvae are vulnerable to the predators that commonly occur in permanent waters, and the species is rarely found in permanent ponds, streams, or **rivers.** A typical breeding population in a pond can fluctuate due to

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random natural processes, in some years to fewer than 20 adults plus juveniles, making these populations prone to extinction. California tiger salamanders therefore require large contiguous areas of vernal pools (vernal pool complexes) containing multiple breeding ponds to ensure that recolonization occurs at individual pond sites.

California tiger salamander larvae obtain oxygen through gills and through the skin. The larvae feed largely on invertebrates, including a variety of aquatic insects and crustaceans. The frequent occurrence of midge larvae (Chironomidae) in their guts suggests a tendency to feed at or near surficial bottom sediments (Steve Morey, Service, pers. comm., 1997). Larvae may also feed on other larval amphibians. The larvae probably rest in contact with pond bottom muds during part of the day, and are known to bury themselves in the mud when pursued. At metamorphosis, the gills are resorbed, and the animal transitions to aprirnarily terrestrial lifestyle. After metamorphosing and emerging from breeding pools as juveniles, California tiger salamanders spend most of their time in the grasslands surrounding breeding pools. The skin remains moist in both the juvenile and adult stages; consequently, California tiger salamanders can only survive brief periods in low humidity conditions, especially at higher temperatures. They survive hot, dry summers by estivating (going through a dormant period) in refugia, such as burrows created by ground squirrels and other mammals and deep cracks or holes in the ground, where the soil atmosphere remains near the water saturation point. During wet periods, California tiger salamanders may emerge from refugia and feed in the surrounding grasslands. The adults' diet is not well known but may include insects, isopods, and worms.

Mass migrations of adults to breeding ponds occur annually with the onset of reliable, pool-filling rains, typically between December and March.. Juveniles do not participate in these breeding migrations. Individual adults spend only limited amounts of time in the breeding pool (a few days to a week or two), where they mate and lay eggs. The females lay their eggs singly or occasionally in clusters of two to four, attached to plant stems in the water column. Adults do not feed intensively during the breeding period (Morey, pers. comm. 1997). Little is known about whether juveniles may disperse from their natal pool in search of other breeding habitat, although dispersing juvenile California tiger salamanders have been found to travel as far as 0.93 miles away from breeding sites (Austin and Shaffer 1992, Jennings and Hayes 1994). California tiger salamanders may live up to several years in the wild.

The primary causes of the decline of California tiger salamander populations are the loss and fragmentation of habitat from human activities and the encroachment of nonnative predators. The California tiger salamander has lost an estimated 75 percent of its habitat due to human activities including uplands and sites that were likely habitat but never sampled. All of the estimated seven genetic populations of this species have been reduced substantially because of urban and agricultural development, land conversion, and other human-caused factors. Development tbreatens to reduce the amount of grassland and ground squirrel habitat available to California tiger salamanders and to destroy natural ephemeral water bodies they require. Automobiles and off-road vehicles kill a substantial number of migrating or estivating California tiger salamanders each year.

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A strong negative association between bullfrogs and California tiger salamanders has been documented. Although bullfrogs are unable to establish permanent breeding populations in vernal pools, dispersing immature bullfrogs can take up residence and prey on California tiger salamanders in ephemeral pools if a permanent water source is located within 2 miles. Louisiana swamp crayfish (*Procambarus clarkii*), mosquitofish (*Gambusia affinis*), green sunfish (*Lepomis cyanellus*) and other introduced fishes also prey on the California tiger salamanders.

Ground squirrel control programs, carried out on more than 10 million acres in California, **are** likely have an adverse effect on the California tiger salamander. Poison typically used on ground squirrels (fumigants) is likely to adversely affect California tiger salamanders, which are smaller and have more permeable skins. Use of insecticides, such **as** methoprene, in mosquito abatement may have an indirect adverse effect on the California tiger salamander by reducing the availability of prey. Contaminated runoff from roads, urban areas, and agriculture may also adversely affect the breeding, survival, or development of California tiger salamanders.

Deformities caused by a trematode infection have affected pond-breeding amphibians in California at known California tiger salamander breeding sites; this infection **has** become widespread among amphibian populations in Minnesota and poses the threat of becoming widespread in California. In addition, tiger salamanders have been known to be locally extirpated by a pathogenic, chytrid fungus (*Batrachochytrium dendrobatidis*) at stock tanks in Arizona (Davidson et al., 2003).

Various non-native subspecies of the tiger salamander within the *Ambystoma tigrinum* complex have been imported into California for use as fish bait. The introduced tiger salamanders may competitively exclude California tiger salamander, or interbreed with the natives to create hybrids that may be less adapted to the local climate, or are not reproductively viable past the first or second generations.

ENVIRONMENTAL BASELINE

An analysis of known and potential occurrence of sensitive plants and animals was carried out for the entire **PVWMA** Local Water Supply and Distribution study area. This analysis included a review of several sources of information: 1) previous studies conducted within project area concerning the presence of sensitive plant and animal species **(ESA** 1998, 1999; HRG, 1997; PVWMA, 1993); 2) consultation with the CNDDB (CNDDB 2002) and the Service; **3)** a review of the *CNPS* inventory (Skinner and Pavlik 1994); and 4) reconnaissance and habitat surveys. Following this review, a list of sensitive plant and **animal** species known or with a potential to occur in the project area was compiled and checked for completeness and accuracy. From this list and a review of known occurrences and ecological associations, no sensitive plant species and 12 sensitive animals were identified **as** having at **least** a moderate potential of being affected by the proposed project.

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Habitat quality was defined for these sensitive species, and a "likelihood of occurrence" determination made, during a field habitat inventory and classification process. A habitat assessment was completed for all areas of project impact. Using habitat classifications developed for the Wildlife Habitat Relationships (WHR) program, biologists rated habitat requirements for sensitive species against the vegetation and landscape attributes of the habitat as it exists in the project area. High quality habitat was considered capable of supporting all listed species associated with that habitat type, in all species' life stages for which the habitat was used. A lower category (medium or moderate) was used to categorize habitat below optimum due to ecological factors (such as succession); low quality habitats were degraded by current or adjacent use.

The main pipeline and distribution system travel primarily through agricultural habitats. Natural upland habitats crossed by the Import Pipeline include coastal *oak* woodland, coastal scrub, and annual grassland. Most of the drainages crossed by the pipelines are agricultural ditches either lacking vegetation or supporting ruderal freshwater emergent wetland. Natural vegetation in the vicinity of Highway 1 and the Pajaro River consists of valley foothill riparian habitat that has been somewhat degraded due to agriculture and river channeling activities.

In addition to agricultural ditches, the Import Pipeline crosses the following larger drainages, some of which support valley foothill riparian vegetation and habitat for the species considered in this biological and conference opinion: Pajaro River and two tributaries, Pescadero Creek, Sargent Creek, Millers Canal, Watsonville Slough, Hanson Slough, McClusky Slough, an unnamed drainage east of Soda Lake, and a small channelized drainage west of Aromas. A vernal pool is also located adjacent to the Import Pipeline project alignment.

Least Bell's Vireo

Potential habitat for the least Bell's vireo exists along some portions of the Pajaro River riparian corridor and tributaries. A pair of least Bell's vireos nested north of the project area along Llagas Creek between Highway 152 and its confluence with the Pajaro River east of Gilroy in 1997 (Doug Padley, Santa Clara Valley Water District, pers. comm., 2001). Surveys in subsequent years did not detect least Bell's vireos there again until 2 or 3 singing males were observed in May2001 (D. Padley pers. comm., 2001). These observations, and a singing male near the mouth of the Pajaro River in May 1996 (David Suddjian, Santa Cruz Bird Club, pers. comm., 2001), are the only recent records of the species north of its current breeding range along the coast. Although least Bell's vireos are mostly found in southern California, individuals of the species may be present in riparian habitats at the river and stream crossings of the pipeline alignment in the eastern portion of the project area. Critical habitat has been designated for the least Bell's vireo, but none occurs within or near the action area.

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San **Joaquin Kit Fox**

Grassland habitat and fallow fields suitable for the San Joaquin kit fox are located adjacent to the project pipeline alignment east of Highway 101. The CNDDB contains a record of a San Joaquin kit fox occurrence on the Tres Pinos **USGS** 7.5 minute quadrangle. **This** occurrence is over 10 miles from the project alignment. However, the occurrence is described as the area surrounding Hollister north to Gilroy and south to Paicines and represented by a polygon encompassing suitable habitat in ten quadrangles. The eastern end of the project alignment is located approximately **3** miles from this polygon. Grassland habitat suitable for the San Joaquin kit fox is also located 0.5 mile from the eastern end of the project alignment along the northern side of Highway 152.

The Recovery Plan for Upland Species of the San Joaquin Valley, California includes recorded occurrences of the San Joaquin kit fox in the San Felipe Valley. These locations are approximately 5 miles east of the first mile of the Import Pipeline (Service 1998b). Within the project region, populations of San Joaquin kit foxes are known from San Benito County. The species is also known from eastern Santa Clara County in the Pajaro River watershed (Service 1998b).

A site assessment using the Service's San Joaquin Kit Fox Habitat Evaluation Form was conducted by **ESA** in February and March 2002 to identify potential habitat within the project area. Grassland habitat adjacent to the project alignment just east of Highway 101 and at the eastern end of the alignment were determined to be potential San Joaquin kit fox habitat. Transect surveys were not completed to identify the presence or absence of potential dens. Grassland habitat is continuous to the south of the route at the foot of Lomerias Muertas. The rest of the project alignment east of Highway 101 is within the known range of the species. Though intensively maintained row crops isolate much of the alignment in this area, 1,500 feet of the eastern end of the Import Pipeline alignment is surrounded by fallow agricultural fields which contain ground squirrel burrows. Aerial photos from 1997 show this area as intensive agriculture and these fields are likely not left fallow very long. If San Joaquin kit foxes are present in grassland or pastures in the project area, they may forage withii these fallow fields. If left fallow long enough, a low potential exists for San Joaquin kit fox dens to be located within these fields.

Santa Cruz Long-toed Salamander

The CNDDB **(2002)** reports Santa Cruz long-toed salamander occurrences 0.5 mile west of San Andreas Road and Highway 1, 0.8 mile south of the Rob Roy Junction, 0.6 mile east of the intersection of White Road and Freedom Boulevard, at the Santa Cruz long-toed salamander Ecological Reserve and Ellicott Slough National Wildlife Reserve, **3.2 miles** northwest of Watsonville Municipal Airport, the San Hernandez Reservoir, Calabasas Pond, Moro Cojo Slough, and in the vicinity of Corralitos. Potentially suitable habitat was observed within the project zone of influence at a pond located approximately 750 feet north east of the eastern terminus of the proposed Import Pipeline alignment, Hanson **Slough,** Bennett **Slough,** McClusky

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Slough, and an irrigation pond 500 feet west of Jensen Road during the February-July 2002 site assessment. Santa Cruz long-toed salamanders have been documented breeding at Bennett Slough and McClusky Slough.

Tidewater **Goby**

Tidewater gobies are known to occur in the Pajaro Lagoon (Moyle et al. 1995 and CNDDB 2002), which appears to support a large and secure population of the species (Moyle et al. 1995). Tidewater gobies have been observed up to one mile upstream of the mouth of the Pajaro River (CNDDB 2002). Tidewater gobies do not extend as far upstream as the terminus of the Import Pipeline and therefore do not occur in the immediate vicinity of the Import Pipeline alignment. Critical habitat has been designated for the tidewater goby, but none occurs within or near the action area.

A sand bar forms across the mouth of the Pajaro River in most years. **Sand** bar formation usually occurs in mid to late summer. The sand bar is important for providing the calmer lagoon conditions favored by tidewater gobies, but the salinity of the lagoon is generally not important to goby viability (Habitat Restoration Group 1997). After partial sand bar formation in late spring and summer, the lagoon surface elevation increases, backing brackish water upstream to above Highway 1. Depending on environmental conditions, tidewater gobies may inhabit areas up to a mile or more upstream of the mouth **of** the Pajaro River. However, in years of heavy winter floods, this species is probably confined to the downstream portion of the Pajaro River estuary and to Watsonville Slough (Smith, unpublished). Tidewater gobies are assumed to be present at the Pajaro River crossing west of Highway 1.

Longhorn Fairy Shrimp, Conservancy Fairy Shrimp, and Vernal **Pool Fairy Shrimp**

The degraded vernal pool north of the project alignment just east of Highway 101 has a low potential to support listed fairy shrimp species. Critical habitat has been designated for the Conservancy fairy shrimp, longhorn fairy shrimp, and vernal pool fairy shrimp, but none occurs within or near the action area.

California Red-legged Frog

The California red-legged frog occurs in the vicinity of permanent water bordered with vegetation. This species has been reported along the Pajaro River between Highway 101 and Betabel Road and upstream (Mike Westphal, Service, pers. cornm. 1997). Habitat assessments carried out as part of this study showed that suitable habitat is present along much of the Pajaro River and its major tributaries. Variations in streambed and vegetation attributes may allow these animals to occupy habitats along the entire length of the Pajaro River; all such habitat is considered potential habitat for this species. In addition, all agricultural ponds and reservoirs may be suitable habitat for the California red-legged frog.

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The CNDDB (2002) reports 21 occurrences of California red-legged frogs within 5 miles of the project **area,** including occurrences on the Pajaro River between Highway 101 and the Highway 25 overpass and in the east branch of Hanson Slough. Various other sightings are discussed in the California red-legged frog site assessment conducted for the proposed project.

The site assessment, conducted in February, March, June, and July 2002, identified several areas within the Pajaro Valley that may provide habitat for California red-legged frogs. Other tributaries to these rivers and streams may provide movement corridors for the California red-legged frog; however, most tributaries are ephemeral and would not provide breeding habitat. These sloughs and lakes are freshwater to brackish, which, if permanent, would provide the necessary breeding and upland estivation sites. Several larger irrigation reservoirs may provide habitat for the species if emergent vegetation is allowed to remain annually. Within the project areas, California red-legged frogs are presumed to be present in areas of suitable habitat in the Pajaro River west of Highway 1, unnamed drainage east of Soda **Lake,** Miller's Canal at the Pajaro River, former blue-line drainage west of Aromas, Pescadero Creek, Sargent Creek, vernal pool 700 feet east of Highway 101, Hanson Slough, the unnamed drainage south of Trafton Road, the Pajaro River near Graniterock quarry, Bennett Slough at Struve Slough Road; and McClusky Slough 1000 feet north of Struve Slough Road. The irrigation ponds 3,000 feet east of San Andreas Road, 2,000 feet south of Sunset Beach Road, adjacent to the east side of Salinas Road, adjacent to Salinas Road, and 500 feet west of Jensen Road are also presumed to be occupied by California red-legged frogs. In addition, dispersing California red-legged frogs may **use** low quality habitat at 17 irrigation ditches and sloughs and drainages within the project area that have been modified for agricultural irrigation, and habitat in three seasonal tributaries to the Pajaro River within the project **area.**

California Tiger Salamander

The CNDDB (2002) reports 21 records for California tiger salamanders from the four-quadrangle study area. **A** degraded vernal pool, the unnamed drainage east of Soda **Lake, and a** pond 750 feet from the eastern terminus of the proposed Import Pipeline alignment provide potential breeding habitat for this species. Grassland habitat surrounding these potential breeding ponds provides estivation habitat if small mammal burrows are present. Other potentially suitable habitat was observed within the project zone of influence at Hanson Slough, Bennett Slough. McClusky Slough, the vernal pool 700 feet east of Highway 101, and an irrigation pond 500 feet west of Jensen Road during the site assessment.

EFFECTS OF THE ACTION

Noise Disturbance

Work-related noise and activities may flush least Bell's vireos and induce nest abandonment or provoke temporary or permanent emigration. Flushing individual least Bell's vireos **also** could alert predators to the location of eggs or young, making them more vulnerable to predators. We

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anticipate that such effects would be minimal because least Bell's vireos are unlikely to occur within the project area, project activities will occur outside of the breeding season if least Bell's vireos or other passerines are nesting with *500* feet of construction areas, and construction corridors within riparian habitat will be confined and located in previously disturbed areas where possible. Work-related noise and activities may flush Least Bell's vireos from foraging and roosting habitat, provoking temporary or permanent emigration and increasing vulnerability to predation.

Noise and other project-related activities could disturb San Joaquin kit foxes to the extent that foraging and burrowing behavior could be altered, breeding or burrowing activity could be delayed, and change hunting patterns could change. These alterations in behavior could cause San Joaquin kit foxes to become more susceptible to predation and other forms of mortality or injury. San Joaquin kit foxes could also be displaced to other locations due to temporary loss of habitat.

Work activities, including noise and vibration, may cause California red-legged fiogs, Santa Cruz long-toed salamanders, and California tiger salamanders to leave work areas, increasing potential for predation and desiccation. Relocating Califomia red-legged fiogs and California tiger salamanders found during surveys would reduce the likelihood of such effects, and may further minimize injury or mortality. Furthermore, minimizing the area disturbed by project activities would reduce the potential fot dispersal resulting from the action.

Tidewater gobies upstream and downstream of crossing sites may be disturbed by noise and vibration associated with boring and'other equipment and would likely move from the area when disturbed in this manner. Conducting activities during low-flow periods of the Pajaro River would eliminate this effect.

Destruction of Burrows and Dens

Vehicles associated with installation, repair, and maintenance activities could kill or injure any listed species within the project area by crushing or striking them. Species that use or dig burrows (San Joaquin kit foxes, California red-legged fiogs, Santa Cruz long-toed salamanders, and California tiger salamanders) could also be killed or injured by increased vehicle use of new or existing roads and off-road areas which contain appropriate substrates that may provide burrowing *or* denning habitat. Vehicles could drive over burrow sites, crush animals, or cause burrows to collapse and entrap animals. Conducting preconstruction surveys *for* San Joaquin kit fox dens and taking appropriate follow-up measures including exclusion zones around active dens, closing inactive dens, and covering excavated holes or trenches at the end of each workday would minimize these effects. Avoiding and temporarily fencing California tiger salamander estivation habitat, or excavating and removing California tiger salamanders where burrows cannot be avoided, would minimize the potential for crushing this species while it occupies burrows.

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Direct Mortality **or Injury**

San Joaquin kit foxes may be injured or killed by construction activities related to installation of the proposed pipeline. Trenching and other excavations, grading, and filling during construction may **kill** or injure San Joaquin kit foxes by trapping or crushing them in underground dens or by inadvertently trapping them in open trenches. Direct injury and mortality to San Joaquin kit foxes may also result from inadvertent trapping in uncapped pipes and culverts. Such effects to San Joaquin kit foxes would be reduced by covering trenches at the close of each working day, providing escape ramps in trenches and excavations, and implementing other measures to prevent entrapment of San Joaquin kit foxes in trenches or stored pipes and culverts.

Vehicle traffic associated with the transportation of workers and construction materials could result in vehicles striking San Joaquin kit foxes. Because San Joaquin kit foxes are primarily nocturnal, conducting construction activities at night would increase the chances of project-related injury or death of San Joaquin kit foxes. Such effects to San Joaquin kit foxes would be reduced by the proposed measures to establish a speed limit of 20 miles per hour and to minimize nighttime construction activities.

Vehicular and foot traffic by workers associated with construction activities, biological surveys, and restoration activities could also kill or injure California red-legged frogs, Santa Cruz long-toed salamanders, California tiger salamanders, Conservancy fairy shrimp, longhorn fairy shrimp, and vernal pool fairy shrimp. Workers could crush step on listed amphibians and fairy shrimp during any life stage in aquatic habitat. California red-legged frogs, Santa Cruz long-toed salamanders, and California tiger salamanders found in upland habitats (i.e., chaparral, woodlands, grasslands) could also be crushed. The potential for any listed species to be killed or injured during these activities would be greatest within appropriate habitats when workers are concentrated in those areas.

Reducing the size of and clearly demarcating the boundaries of work areas and equipment access routes and locating staging areas at least 66 feet outside of riparian areas or other water bodies should reduce the chance of crushing California red-legged frogs, Santa Cruz long-toed salamanders, and California tiger salamanders. In addition, relocating individual California red-legged frogs and California tiger salamanders may further reduce injury or mortality. However, California red-legged frogs that are removed and relocated to a different site may attempt to return to the work area from which they were removed. This attempt to return to the project site may subject California red-legged frogs and California tiger salamanders to dessication or being crushed by work activities. The use of a biological monitor regularly checking the work area will reduce mortality of these species attempting to re-enter the project site. Additionally, translocated California red-legged frogs, Santa Cruz long-toed salamanders, and California tiger salamanders may be required to compete for food and living space with animals in adjacent areas.

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Least Bell's vireo eggs may be destroyed or nestlings killed during construction activities that would be conducted in breeding habitat. This effect would be reduced by conducting construction activities outside the breeding season of the least Bell's vireo.

The capture and handling of California red-legged frogs and California tiger salamanders to move them from a work area could cause injury or mortality. Transport of individuals or releasing them into unsuitable habitat (e.g., where exotic predators are present) may cause injury or mortality. Improper handling, containment, or transport of individuals will be reduced or prevented by use of a Service-approved biologist.

Clearing of vegetation associated with the proposed project may disturb, injure, or kill California red-legged frogs, Santa Cruz long-toed salamanders, and California tiger salamanders through contact with tools or machinery. Clearing of vegetation will remove cover or shelter, thereby subjecting California red-legged frogs, Santa Cruz long-toed salamanders, and California tiger salamanders to higher predation and reduce available prey. Preconstruction surveys by a Service-approved biologist and the subsequent relocation of California red-legged fiogs and California tiger salamanders will reduce these effects as will minimizing the areas disturbed by project activities.

Direct effects to tidewater gobies during construction activities could include injury or mortality from being crushed by construction equipment and vehicles, falling debris, and worker foot traffic during construction and installation of rock slope protection. These impacts would be reduced by minimizing and clearly demarcating project areas, conducting pre-project briefings to alert construction personnel of the presence of the tidewater goby, and conducting construction activities while the stream channel is dry.

The use of pumps to dewater work areas may trap California red-legged frog tadpoles and tidewater gobies in the pump intakes and cause mortality. Screening pump intakes with wire with no greater than five millimeter mesh size should reduce the potential that California red-legged frog tadpoles greater than 8 weeks old and tidewater gobies would be caught in the inflow.

Trash left during or after project activities could attract predators to work sites, which could, in turn, disturb or prey on the listed species. For example, raccoons are attracted to trash and also prey opportunistically on the California red-legged frog. This potential impact can be reduced or avoided by careful control of waste products at all work sites.

Removal of exotic species from a project site may result in lower mortality to resident California red-legged frogs, Santa Cruz long-toed salamanders, and California tiger salamanders. However, individuals of the listed species may be accidentally caught, injured, or killed during exotic species removal (e.g., bullfrogs). The effects of this activity will be reduced by ensuring eradication activities are conducted by a biologist who is familiar with the identification of native and exotic amphibians.

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The development of the pipeline may cause long-term effects to the species discussed in this consultation and their habitat due to the high probability that it is likely to require maintenance. For example, the pipeline may burst or leak and may require excavating the line with earth-moving equipment to make necessary repairs. However, because a large portion of the pipelines are not located in sensitive habitat, these impacts are not likely to be substantial.

The potential exists for uninformed workers to intentionally or unintentionally disturb, injure, or kill least Bell's Vireos, San Joaquin kit foxes, Santa Cruz long-toed salamanders, tidewater gobies, Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, California red-legged frogs, and California tiger salamanders. The potential for this impact will be greatly reduced by informing workers of the presence and protected status of these species and the measures that are being implemented to protect them during project activities.

Habitat Degradation

Disturbance of riparian habitat and vernal pools may cause the spread or establishment of non-native invasive species, such as giant reed (*Arundo donax*), salt cedar (*Tamarix spp.*), or other species that are not valuable for wildlife. Invasion of brushy ornonnative plant species into vernal pools can degrade water quality and alter the natural cycles of filling and drying of pools. Avoiding areas with established native vegetation, controlling and preventing the spread or introduction of non-native invasive species, restoring disturbed areas with native species, and post-project monitoring may reduce or eliminate this effect. .

Listed fairy shrimp could be adversely affected as a result of runoff and sedimentation into vernal pools from project activities within the drainage area. Runoff and sedimentation can be particularly damaging when pools contain water and individuals of the listed species. Excessive sedimentation can fill vernal pools and result in changes in the drainage patterns of the site, affecting the timing and duration of inundation of the habitat of the listed fairy shrimp.

Grading and filling within the riparian corridors may affect surface flow dynamics or increase erosion and deposition of sediments, resulting in alterations of habitat onsite and downstream of the project. Loss of sediments from the streambed may result in down-cutting downstream of the project, which could further degrade the stability of banks, and functions of the riparian ecosystem. Sedimentation in pools where California red-legged frogs breed could suffocate California red-legged frog egg masses and alter the quality of the habitat to an extent that use by individuals of the species is precluded. Tidewater gobies downstream of the project area could be affected by increased sedimentation which could bury eggs and disrupt normal breeding and feeding activities. Conversely, changes in flow dynamics and sediment deposition could result in positive changes to the riparian habitat downstream by increasing sinuosity, which would increase the habitat available to California red-legged frogs. Implementing best management practices and reducing the area to be disturbed to the minimum necessary should assist in reducing the amount of sediment that is washed downstream as a result of project activities.

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Contaminant Spills

The pipeline crossing of the Pajaro River west of Highway 1 will be constructed using underground construction methods (horizontal directional drilling or microtunneling). Although underground pipeline construction avoids the potential impacts associated with open trench construction, tidewater gobies may nevertheless be affected by potential releases of construction materials, particularly bentonite, into the watercourse. The release of bentonite or other construction materials onto channel substrate or into water would result in effects to water quality that may be deleterious to tidewater gobies. Conducting underground construction activities during the low-flow period or when the channel is completely dry, monitoring underground pipeline construction activities for contaminant releases, and implementing the spill prevention and containment measures described earlier will reduce the potential for adverse effects to tidewater gobies during these construction activities.

Accidental spills of hazardous materials, potential releases of bentonite or other construction materials during trenchless crossing of drainages, and careless fueling or oiling of vehicles or equipment could degrade water quality or upland habitat to a degree where tidewater gobies, Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, California red-legged frogs, Santa Cruz long-toed salamanders, and California tiger salamanders are adversely affected or killed. The potential for this impact to occur can be reduced by thoroughly informing workers of the importance of preventing hazardous materials from entering the environment, locating staging and fueling areas a minimum of 66 feet (20 meters) from riparian areas or other water bodies, and by having an effective spill response plan in place.

Habitat **Loss**

The project will temporarily affect a linear corridor **through** grassland habitat for the San Joaquin kit fox. **This** corridor is approximately 110 feet wide and 5,500 feet long (roughly **13.9** acres). The project will also temporarily affect a linear corridor through **3.8** acres of fallow agricultural habitat (110 feet wide and 1,500 feet long). Thus, the project will temporarily affect 17.7 total acres of grassland and fallow habitat which may support San Joaquin kit foxes.

The temporary loss ***of*** 1.6 acres of riparian nesting habitat for the least Bell's vireo may occur at riparian stream and river crossings that will be trenched. Breeding, foraging, and roosting habitat may be destroyed by removal of vegetation or degraded by the invasion of exotic vegetation into areas disturbed by construction activities. These effects would be reduced by confining the width of the construction corridor in riparian habitats to 40 feet or less, locating the pipeline crossings in previously disturbed areas with little riparian canopy cover where possible, and replacing wetland and riparian habitat removed as a result of the project. The use of bore **and** jack or directional drilling construction methods at select river and stream crossings will avoid the potential loss of riparian habitat in those areas. All wetland and riparian habitat removed during construction will be replaced at a ratio acceptable to CDFG and the Service through the implementation of a revegetation and monitoring plan.

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Most of the project area is cultivated and provides limited natural habitat for the California red-legged frog. The proposed project will result in the temporary loss of up to 0.47 acre of potential aquatic and streamside habitat for the California red-legged frog along the pipeline route. This acreage estimate includes the habitat identified as suitable as well as habitat in three seasonal tributaries to the Pajaro River and habitat in Watsonville Slough. Low quality habitat at the remaining disturbed irrigation ditch sites identified earlier as potential dispersal corridors is not included in this acreage estimate. The proposed minimization measures will be applied to construction activities at these sites to prevent adverse effects to dispersing California red-legged frogs. Potential estivation habitat surrounding two sites (the unnamed drainage east of Soda Lake and the vernal pool) will also be temporarily affected. All California red-legged frog potential habitat will be restored to pre-project conditions and monitored to ensure adequate revegetation. With implementation of these measures, fhe project is not expected to degrade habitat over the long term within the proposed project area for the California red-legged frog.

The potential project construction impacts to Santa Cruz long-toed salamanders and California tiger salamanders are very similar to those described for California red-legged fiogs although no permanent loss of habitat is anticipated for either of these species. Construction activities will avoid aquatic and estivation habitat for the Santa Cruz long-toed salamander through bore and jack or other trenchless methods; therefore, no direct loss of habitat for the Santa Cruz long-toed salamander is expected. Project construction would cause a short-term disturbance of potential aquatic habitat for California tiger salamanders at the drainage east of Soda Lake. Potential grassland estivation habitat surrounding this site and surrounding the vernal pool east of Highway 101 will also be disturbed. This habitat disturbed during construction would be returned to a condition with essentially the same characteristics that existed before construction. Construction activities will avoid all other sites which provide potential aquatic habitat for California tiger salamander through bore and jack or other trenchless construction methods. These other sites are surrounded by agriculture and do not provide grassland estivation habitat.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. At this time, we are unaware of any non-federal actions that are reasonably certain to occur in the action areas.

CONCLUSION

We have reviewed the current status of the least Bell's vireo, San Joaquin kit fox, Santa Cruz long-toed salamander, tidewater goby, Conservancy fairy shrimp, longhorn *fairy* shrimp, California red-legged frog, vernal pool fairy shrimp, and California tiger salamander, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects during the preparation of the biological and conference opinion. It is the Service's

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biological opinion that the revised basin management plan projects for the Pajaro Valley, as proposed, are not likely to jeopardize the continued existence of the least Bell's vireo, San Joaquin kit fox, Santa Cruz long-toed salamander, tidewater goby, Conservancy fairy shrimp, longhorn fairy shrimp, California red-legged frog, and vernal pool fairy shrimp. It is the Service's conference opinion that the revised basin management plan projects for the Pajaro Valley, as proposed, are not likely to jeopardize the continued existence of the California tiger salamander. We base these conclusions on the following:

1. Adverse effects to the species are expected to be minimal because relatively few of these species have been observed in the project area to date;

2. Small portions of the ranges of some of the species would be affected by the proposed action.

   a. The 17.7 acres of habitat for the San Joaquin kit fox that would be temporarily affected is of marginal quality.

   b. The proposed projects will result in no permanent loss and only 1.6 acres of temporary disturbance of riparian habitat suitable for the least Bell's vireo:

   c. Only 0.47 acre of potential aquatic and streamside habitat for the California red-legged frog will be temporarily disturbed;

3. The vernal pool within the project area will be avoided and therefore the likelihood of adverse effects to the Conservancy fairy shrimp, longhorn fairy shrimp, and vernal pool fairy shrimp is low;

4. No loss of California tiger salamander habitat will occur;

5. Underground trenching will avoid most effects to Santa Cruz long-toed salamanders and tidewater gobies;

6. If Califomiared-legged frogs and California tiger salamanders are found in the project area and are at risk, they will be relocated to nearby, suitable habitat; and

7. Reclamation and the PVWMA have proposed measures to reduce adverse effects of the projects on the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to

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engage in any such conduct: Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and Reclamation must make them binding conditions of any grant or permit issued to the PVWMA, as appropriate, for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation fails to require the PVWMA to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, Reclamation or the PVWMA must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR $402.14(i)(3)].

The prohibitions against taking the species found in section 9 of the Act do not apply until the species is listed. However, the Service advises Reclamation to consider implementing the reasonable and prudent measures for the California tiger salamander. If this conference opinion for the California tiger salamander is adopted as a biological opinion following a listing, these measures, with their implementing terms and conditions, will be non-discretionary.

This biological and conference opinion anticipates the following forms of take as a result of implementing the revised basin management plan projects within the proposed project areas.

Least Bell's vireo: Harassment of an unknown number of least Bell's vireos could result from construction activities that interfere with the breeding and foraging of this species on or near the site. Mortality of eggs, nestlings, or juveniles may occur if least Bell's vireos establish nests in areas adjacent to the project site. Noise or other project activities could disturb these nesting individuals to the point that the brood is not successfully reared. Harm to an unknown number of least Bell's vireos could also occur from the temporary loss of 1.6 acres of riparian habitat within the project area. Loss of this riparian habitat could result in the loss of breeding, feeding, or sheltering. We do not expect adult least Bell's vireos to be directly killed or injured by project activities because they can fly away from harmful situations, although they could be displaced into less suitable habitat. The actual number of least Bell's vireos that might be taken cannot be accurately predicted because of their difficulty of detection, the patchy distribution of suitable habitat, and other environmental factors. However, we do not expect take leading to the injury or

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death of these birds to exceed the eggs, nestlings, or juveniles from one nest of the least Bell's vireo over the entire duration of the project and throughout the entire area affected by project activities, because of the small amount of habitat that would be affected, the proposed protective measures, and the low likelihood that Least Bell's vireo will nest in the project area in the near future.

San Joaquin kit fox: We anticipate that few San Joaquin kit foxes will be taken through injury or mortality during the proposed activities analyzed in this document. The amount of incidental take of San Joaquin kit foxes that may occur during construction will be difficult to quantify because of a lack of information on movement patterns of San Joaquin kit foxes in the eastern half of the proposed project area where the species may occur. However, based on previous records, habitat conditions, and proposed measures, we expect the amount of incidental take of San Joaquin kit foxes to be very low and do not expect take leading to the injury or death of San Joaquin kit foxes to exceed one San Joaquin kit fox.

Tidewater goby: Some tidewater gobies may be killed during dewatering the creek and pipeline installation. The exact number of tidewater gobies that could be affected cannot be predicted because of the natural fluctuations in numbers that this species experiences and the difficulty in determining how many individuals are present at any given time. However, we expect that few tidewater gobies will be killed or injured because of the proposed protective measures and the small areas of habitat that will likely be affected by *the* project. Reclamation or the PVWMA must contact the Service immediately if evidence of any large-scale mortality event is detected downstream of work areas; any work that could lead to contamination of waters inhabited by the tidewater goby must cease in such an event.

Conservancy fairy shrimp. longhorn fairy shrimp. and vernal pool fairy shrimp: We anticipate that the Conservancy fairy shrimp, longhorn fairy shrimp, and vernal pool fairy shrimp may be taken through mortality in the event of an accidental spill during the proposed activities analyzed in this document. One small vernal poll occurs within the proposed project area and direct disturbance of the pool is unlikely to occur based on the minimization measures proposed by Reclamation and the PVWMA. The number of individuals of these species that may be taken cannot be determined because their numbers vary from year *to* year and we cannot anticipate the magnitude of any accident. However, because of the small size of the pool, a proportionately small number of Conservancy fairy shrimp, longhorn fairy shrimp, and vernal pool fairy shrimp may be killed.

California red-legged frog. Santa Cruz lone-toed salamander. and California tiger salamander: We anticipate that few California red-legged frogs, Santa Cruz long-toed salamanders, and California riger salamanders will be killed or injured as a result of actions that are evaluated in this biological opinion. Take may occur in the form of death or injury from crushing by equipment or foot traffic, exposure to predation, accidental spills or leaks of hazardous materials, siltation, and capturing and handling of California red-legged frogs for relocation purposes. Incidental take of the California red-legged frog, Santa Cruz long-toed salamander. and

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California tiger salamander will be difficult to detect because of their small body size; these species also spend large amounts of time concealed in vegetation or debris or underground. Additionally, finding a dead or injured specimen is unlikely. Consequently, we cannot accurately predict the number of California tiger salamanders, Santa Cruz tiger salamanders, and California red-legged frogs that may be taken.

Reclamation or the PVWMA must contact the Service whenever a least **Bell's** vireo, San Joaquin kit fox, Santa Cruz long-toed salamander, tidewater goby, Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool **fairy** shrimp, California red-legged frog, and California tiger salamander is killed or injured. Provided that protective measures proposed by Reclamation and the PVWMA and the terms and conditions of this biological opinion are being fully implemented, operations need not cease while the cause of mortality is being determined. The cause of death or injury must be determined by an authorized biologist and the Service. Once the cause of death or injury **has** been determined, the Service and Reclamation will decide whether any additional protective measures are required to address the cause of the loss of any of these species.

This biological opinion does not exempt from the prohibitions against take contained in section 9 of the Act any form of take that is not incidental to the completion of the PVWMA's revised basin management plan projects within the proposed project areas. Note that the exemption to the prohibition against take applies only to activities that are conducted within work areas **as** demarcated by the PVWMA.

REASONABLE AND PRUDENT MEASURES

We believe the following reasonable and prudent measures are necessary and appropriate to minimize take of the San Joaquin **kit** fox, least Bell's vireo, California red-legged frog, Santa Cruz long-toed salamander, California tiger salamander, tidewater goby, Conservancy fairy shrimp, longhorn fairy shrimp, and vernal pool fairy shrimp:

1. Biologists who intend to capture, move, and survey for California red-legged frogs and California tiger salamanders in work areas must be qualified and authorized by the Service.

2. The take of California red-legged frogs and California tiger salamanders found within the proposed project area must be reduced **through** careful monitoring of animals located adjacent to work areas, the removal of animals in harm's way to suitable adjacent habitat prior to and during the proposed activities, and by proper handling during their capture.

3. The authorized biologist must have the ability to coordinate with the PVWMA to ensure work activities can be halted, if necessary.

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4. Biologists who intend to conduct pre-activity surveys, monitoring, and den closures for San Joaquin kit foxes in work areas must be qualified and authorized by the Service.

5. Take of the species discussed in this biological and conference opinion, through injury or death due to the straying of construction equipment, must be reduced through the establishment of clearly defined construction access roads.

Our evaluation of the effects of the proposed action includes consideration of the measures to reduce the adverse effects of the proposed action on the least Bell's vireo, San Joaquin kit fox, Santa Cruz long-toed salamander, tidewater goby, Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, California red-legged frog, and California tiger salamander that were developed by Reclamation and the PVWMA and repeated in the Description of the Proposed Project portion of this biological opinion. Any subsequent changes in these measures proposed by Reclamation and the PVWMA may constitute a modification of the proposed action and may warrant reinitiation of formal consultation, as specified at 50 CFR 402.16. These reasonable and prudent measures are intended to supplement the protective measures that were proposed by Reclamation and the PVWMA as part of the proposed action.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, Reclamation must ensure that the PVWMA complies with the following terms and conditions, which implement the reasonable and prudent measures and reporting and monitoring rcquirements. These terms and conditions are non-discretionary.

1. The following term and condition implements reasonable and prudent measure 1:

> Reclamation or the PVWMA must submit the credentials of biologists it intends to survey for, capture, and relocate California red-legged frogs and California tiger salamanders, for our review and approval, at least 15 days prior to their participation in these activities. Reclamation or the PVWMA must not begin project activities until the Service has provided written approval that the biologist(s) is authorized to conduct the work. Only qualified biologists authorized by the Service under the auspices of this biological opinion may survey for, capture. and move California red-legged frogs and California tiger salamanders from work areas.

2. The following terms and conditions implement reasonable and prudent measure 2:

a. Any California red-legged frogs observed outside of, but within, 100 feet of the immediate work site shall be monitored closely to ensure they do nor enter the work site.

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b. Prior to the onset of construction activities, the approved biologists must identify appropriate areas to receive translocated California red-legged frogs and California tiger salamander; these habitats must be suitable and appropriate for whatever life stage of the species to be moved. These areas must be in proximity to the capture site, support suitable vegetation, and be free of exotic predatory species (e.g., bullfrogs) to the best of the approved biologists' knowledge.

c. To avoid transferring disease or pathogens between aquatic habitats during the course of surveys and handling of California red-legged frogs and California tiger salamanders, Service-approved biologists must follow the Declining Amphibian Population Task Force's Code of Practice. A copy of this Code of Practice is attached. You may substitute a bleach solution (0.5 to 1.0 cup of bleach to 1.0 gallon of water) for the ethanol solution. Care must be taken so that all traces of the disinfectant are removed before entering the next aquatic habitat.

3. The following term and condition implements reasonable and prudent measure 3:

The authorized biologist must be able to coordinate with individuals at the PVWMA or other appropriate person to halt actions that might result in impacts that exceed the levels anticipated by the Service during review of the proposed action. If work is stopped, Reclamation and the Service must be notified immediately by the authorized biologist or the PVWMA.

4. The following term and condition implements reasonable and prudent measure 4:

At least 15 days prior to the onset of project activities, the PVWMA must submit the credentials of the biologists who would conduct pre-activity surveys, monitoring, and den closures for San Joaquin kit foxes. Project activities must not begin until the project proponent has received written approval of the biologists from the Service. Only qualified biologists authorized by the Service under the auspices of this biological opinion may conduct pre-activity surveys, monitoring, and den closures for the San Joaquin kit fox.

5. The following term and condition implements reasonable and prudent measure 5:

Construction access roads must be identified before project activities commence. Vehicles must access construction sites from existing roadways and move equipment and materials within the construction easement. Construction easements must be accessed using the shortest possible route from existing roadways, taking into consideration safety and other relevant factors. Identified sensitive areas within the construction easement must be mapped in the project plans or addressed in the project specifications.

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DISPOSITION OF DEAD OR INJURED SPECIMENS

Upon locating dead or injured listed or proposed species, initial notification must be made in writing to the Service's Division of Law Enforcement in Torrance, California (370 Amapola Avenue, Suite 114, Torrance, California 90501) and by telephone and writing to the Ventura Fish and Wildlife Office, 2493 Portola Road, Suite B, Ventura, California 93003, (805) **644-1766,** within 3 working days of finding the animal. The report must include the date, time, location of the carcass, a photograph, cause of death, if known, and any other pertinent information.

Care must be taken in handling injured animals to prevent additional injury. Injured animals may be released to the wild after receipt of concurrence from the Service. Care must be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. The remains of listed or proposed species must be placed with the California Academy of Sciences Herpetology Department (Contact: Jens Vindum, Collections Manager, California Academy of Sciences Herpetology Department, Golden Gate Park, San Francisco, California, 94118, (415) 750-7037). Arrangements regarding proper disposition of potential museum specimens must be made with the California Academy of Sciences by Reclamation or the PVWMA prior to implementation of any actions.

REPORTING **REQUIREMENTS**

Reclamation or the PVWMA must provide **us** a copy of compiled applications, annual site reports, and field inspection reports by January 31 of each year this project is under construction. Reclamation or the PVWMA must provide a final report to **us** within 90 days of the completion of project activities that have the potential to adversely affect the species discussed in this biological opinion. The compiled report must document the effectiveness of the minimization measures and terms and conditions, the number of individuals of listed or proposed species killed or injured, the number of listed or proposed species observed, the number of listed or **proposed** species moved and released, and the date(s) and places of capture and release. The report must note the amount of habitat **affected** and must contain recommendations for modifymg the stipulations to enhance the conservation of listed or proposed species, results of biological surveys and sighting records, and **any** other pertinent information. This document will assist the Service and Reclamation in evaluating future measures for conservation of listed or proposed species during similar activities.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use 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 to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following conservation measures to promote recovery of listed species:

1. Reclamation and the PVWMA should support the control of brown-headed cowbirds along the Pajaro River to help promote recovery of the least Bell's vireo and other neotropical birds.

2. We recommend that areas to which California red-legged frogs and California tiger salamanders have been translocated be monitored to determine the success of the translocation. To assess the survival and movement patterns of translocated California red-legged frogs and California tiger salamanders, they may be fitted with radio transmitters and tracked as part of the monitoring effort. Plans to radio-track California red-legged frogs and California tiger salamanders captured pursuant to this biological opinion must be approved by the Service prior to implementation.

3. We recommend that on-site biologists relocate any southwestern pond turtles (*Clemmys marmorata pallida*), black legless lizards (*Anniela pulchra nigra),* Pacific treefrogs, and any other reptiles or amphibians found within work areas to suitable habitat outside of the survey area, if such actions are in compliance with State laws.

We request notification of the implementation of m y conservation recommendations so we may be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats.

REMITIATION NOTICE

This concludes formal consultation on the Pajaro Valley Water Management Agency Revised Basin Management Plan projects. 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 retained (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 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.

You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the California tiger salamander is listed. The request must be in writing. If the Service reviews the proposed action and finds that the level or extent of take has not been exceeded. the action has not changed in any substantive matter, and no new adverse effects to the California tiger salamander have been identified. the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

EXHIBIT L

The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. No take of California tiger salamanders may occur between the time take prohibitions for the species become effective and the adoption of the conference opinion through formal consultation or the completion of a subsequent formal consultation. The final rule to list the species will contain information on when take prohibitions will become effective; the prohibitions will take effect when the final rule is published or 30 days after it is published.

If you have any questions regarding this biological opinion, please contact David Pereksta of my staff at (805) 644-1766.

Attachment

cc: Terry Palmisano, California Department of Fish and Game

EXHIBIT L

LITERATURE CITED

Anderson, J.D. 1960. A comparative study of coastal and montane populations of ***Ambystoma macrodactylum.*** Unpublished Ph.D. Dissertation, University of California, Berkeley. ii+261 pp.

_____. 1961. The courtship behavior of ***Ambystoma macrodactylum croceum.*** Copeia 1961(2):132-139.

_____. 1964. Reactions of the western mole to skin secretions of ***Ambystoma macrodactylurn croceum.*** Herpetologica 19(4):282-284.

_____. 1967. A comparison of the life histones of coastal and montane populations of ***Ambystoma macrodactylurn*** in California. The American Midland Naturalist 77(2):323-355.

_____. 1968. A comparison of the food habits of ***Ambystoma macrodactylum sigillatum, Ambystoma macrodactylum croceum,*** and ***Ambystoma tigrinum californiense.*** Herpetologica 24(4):273-284.

_____. 1972. Embryonic temperature tolerance and rate of development in some salamanders of the genus ***Ambystoma.*** Herpetologica 28(2):126-130.

Austin, C.C., and H.B. Shaffer. 1992. Short-, medium-, and long-term repeatability of locomotor performance in the tiger salamander ***Ambystoma californiense.*** Functional Ecology 6(2):145-153.

Barlow, J. 1962. Natural History of the Bell Vireo, ***Vireo bellii*** Audubon. University of Kansas Publication, Museum of Natural History 12(5): **241-296.**

Blau, S.F. 1972. Interrelationships of larval growth rates and their morphological sequences in ***Ambystoma macrodactylum croceum.*** Unpublished Student Report, Museum of Vertebrate Zoology, University bf California, Berkeley, California.

Branchiopod Research Group. 1996. Vernal Pool Faunal Survey Naval Air Station Miramar. Prepared for the Naval Air Station Miramar, San Diego, California.

Bulger, J.B., N.J. Scott, and R.B. Seymour. 2003. Terrestrial activity and conservation of adult California red-legged frogs Rana aurora draytonii in coastal forests and grasslands. Biological conservation 110(2003) 85-95.

California Army National Guard. 1997. Report of the training activities and results of the endangered species protection program at Camp Roberts National Guard training site, January - December 1996.

EXHIBIT L

California Natural Diversity Data Base (CNDDB). 2002. California Natural Diversity Data Base printout for U.S.G.S. 7.5 minute topographic quadrangles: San Felipe, Chittenden, Watsonville East, Watsonville West, and Moss Landing.

Dana Bland and Associates. 2002. Results of pitfall trapping study for Santa Cruz long-toed salamander at Tucker-Madigan property in Aptos, California. Dana Bland and Associates, Aptos, California.

Davidson, E.W., M. Parris, J.P. Collins, J.E. Longcore, A.P. Pessier, and J. Brunner. 2003. Pathogenicity and transmission of chytridiomycosis in tiger salamanders (Ambystoma tigrinum). Copeia, 2003 (3): 601-607.

Donald, D. B. 1983. Erratic occurrence of anostracans in atemporary pond colonization and extinction or adaptation to variations in annual weather? Canadian Journal of Zoology 61: 1492-1498.

Egoscue, **H.J.** 1956. Preliminary studies of the kit **fox** in Utah. J. Mammal. 37:351-357.

Eng, L. L., D. Belk and C. H. Ericksen. 1990. Californian Anostraca: Distribution, habitat, and status. Journal of Crustacean Biology 10: 247-277.

Environmental Science Associates. 2003. Draft Pajaro Valley Water Management Agency Revised Basin Management Plan Projects Biological Assessment. Prepared for the Bureau of Reclamation. San Francisco, California.

Environmental Science Associates. 2002. Pajaro Valley Water Management Agency Revised Basin Management Plan Final Environmental Impact Report. Prepared for the Pajaro Valley Water Management Agency, Watsonville. San Francisco, California.

Environmental Science Associates. 2001. Pajaro Valley Water Management Agency Revised Basin Management Plan Draft Environmental Impact Report. Prepared for the Pajaro Valley Water Management Agency, Watsonville. San Francisco, California.

Environmental Science Associates. 1999. Pajaro Valley Water Management Agency Local Water Supply and Distribution Sensitive Species Habitat Assessment. Prepared for the Pajaro Valley Water Management Agency, Watsonville. San Francisco, California.

Environmental Science Associates. 1998. Pajaro Valley Water Management Agency Local Water Supply and Distribution Draft Environmental Impact Report. Prepared for the Pajaro Valley Water Management Agency, Watsonville. **San** Francisco, California.

Franzreb, K. 1989. Ecology and conservation of the endangered least Bell's vireo. U.S. Fish and Wildlife Biological Report 89(1).

EXHIBIT L

Garrett, K., and J. Dunn. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Society, California.

Greaves, J. 1989 Maintaining site integrity for breeding least Bell's vireos. Pp. 293–298 *in* D.L. Abell, ed. California riparian systems conference: protection, management, and restoration for the 1990's; 1988 September 22–24, Davis, CA. Pacific Northwest Forest and Range Experiment Station, Berkeley, CA; USDA Forest Service Gen. Tech. Rep. PSW–I 10. 544 pp.

Habitat Restoration Group. 1997. Fisheries Report for the Pajaro Valley Water Management Agency Water Supply Project. Prepared for Environmental Science Associates, San Francisco. Appendix D.

Hayes, M.P., and D.M. Kremples. 1986. Vocal sac variation among frogs of the genus *Rana* from western North America. Copeia 1986(4):927-936.

Hayes, M.P., and M.M. Miyamoto. 1984. Biochemical, behavioral and body size differences between *Rana aurora aurora* and *R. a. draytonii*. Copeia 1984(4): 1018-1022.

Hayes, M.P., and M.R. Tennant. 1985. Diet and feeding behavior of the California red-legged frog *Rana aurora draytonii* (Ranidae). The Southwestern Naturalist 30(4):601-605.

Hayes, M.P., and M.R. Jennings. 1988. Habitat correlates of distribution of the California red-legged frog (*Rana aurora draytonii*) and the foothill yellow-legged frog (*Rana boylii*): Implications for management. Pages 144-158 *in* R. Sarzo, K.E. Severson, and D.R. Patton (technical coordinators). Proceedings of the Symposium on the Management of Amphibians, Reptiles, and Small Mammals in North America. USDA Forest Service General Technical Report RM-I66.

Helm, B. P. 1998. Biogeography of eight large branchiopods endemic to California. Pp. 124-140, *In*, C.W. Witham, E.Bauder, D. Belk, W. Ferren, and R. Ornduff, **eds.** ***Ecology. Conservation and Management of Vernal Pool Ecosystems.*** California Native Plant Society, Sacramento, California.

Irwin, J.F. and D.L. Soltz. 1984. The natural history of the tidewater goby, *Eucyclogobius newberryi*, in the San Antonio and Schuman Creek system, Santa Barbara County, California. U.S. Fish and Wildlife Service, Sacramento Endangered Species Office Contract No. 11310-0215-2.

Jennings M. 1996. Personal observation. Research Fish and Wildlife Biologist, Biological Resource Division. U.S. Geological Survey.

Jennings, M.R., and M.P. Hayes. 1985. Pre- 1900 overharvest of California red-legged frogs (*Rana aurora draytonii*): The inducement for bullfrog (*Rana catesbeiana*) introduction. Herpetological Review 31(1):94-103.

EXHIBIT L

Jennings, M. and M. Hayes. 1994. Amphibian and reptile species of special concern in California. Final report submitted to California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, Control No. 8023.

Jennings, M.R., M.P. Hayes, and D.C. Holland. 1992. A petition to the U.S. Fish and Wildlife Service to place the California red-legged frog (*Rana aurora draytonii)* and the western pond turtle (*Clemmys marmorata*) on the list of endangered and threatened wildlife and plants. 21 pp.

Lafferty, K.D., C.C. Swift, and R.F. Ambrose. 1999a. Post flood persistence and recolonization of endangered tidewater goby populations. North American Journal of Fisheries Management, in press.

Lafferty, K.D., C.C. Swift, and R.F. Ambrose. 1999b. Extirpation and recolonization of endangered tidewater goby *(Eucyclogobius newberryi)* metapopulations. Conservation Biology, in press.

Miner, K.L. 1989. Foraging ecology of the least Bell's Vireo, *Vireo bellii pusillus*. Unpublished Masters Thesis, San Diego State University, San Diego, California.

Morrell, S.H. 1972. Life history of the San Joaquin kit fox. California Fish and Game 58:162-174.

Moyle, P. B., R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake. 1995. Fish Species of Special Concern in California. Second Edition. Prepared for the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA.

Oberbauer, T.A. 1990. Areas of vegetation communities in San Diego County. Unpublished report County of San Diego, Department of Planning and Land Use, San Diego, California. Cited in Noss, R.F., LaRoe, E.T. III, and Scott, J. M. 1995. Endangered Ecosystems of the United States: A Preliminary Assessment of Loss and Degradation. U.S. Department of Interior. National Biological Service. Washington, D.C.

Pajaro Valley Water Management Agency (PVWMA). 1993. Final Program Environmental Impact Report, Basin Management Plan. Volume 1. State Clearinghouse No. 9302-3035.

Pike, J., and L. Hays. 1992. The status and management of the least Bell's vireo within the Prado Basin, California, 1986-1991. Unpublished report, California State University, Long Beach Foundation and U.S. Fish and Wildlife Service, Laguna Niguel, California.

Reed, R. J. 1979. Population study of the Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum)* at Valencia Lagoon 1977-78, with notes on habitat and occurrence in Santa Cruz and Monterey counties. Final report to the California Department of Fish and Game, Sacramento, CA, under contract (S-1180). vi+115 pp.

EXHIBIT L

_____. 1981. Reproductive ecology and migratory activity of ***Ambystoma macrodactylum croceum.*** Unpublished M.S. Thesis, University of California, Davis. vi+78 pp.

Russell, R. W., and J. D. Anderson. 1956. A disjunct population of the long-nosed [sic.] salamander from the coast of California. Herpetologica, 12(2):137-140.

Ruth, S.B., and K. Tollestrup. 1973. Aspects of the life history and current status of the Santa Cruz long-toed salamander ***(Ambystoma macrodactylum croceum)*** at Valencia Lagoon, Santa Cruz County, California. Mus. Vert. Zoology. University of California, Berkeley. 53 pp.

Ruth, S.B. 1988a. The life history and current status of the Santa Cruz long-toed salamander[,] ***Ambystoma macrodactylum croceum.*** Pages 89-110 in H. F. De Lisle, P. R. Brown, B. Kaufman, and B. M. McGurty (editors). Proceedings of the conference on California herpetology. Southwestern Herpetologists Society, Special Publication (4):1-143.

_____. 1988b. Seascape Uplands Santa Cruz long-toed salamander study. Final report prepared for the Seascape Land Company by Stephen B. Ruth, Science Research and Consulting Services, Marina, California. vi+159 pp.+appendices.

_____. 1994. Willow Canyon Santa Cruz long-toed salamander study during the 1991/1992 migration. Prepared by Stephen B. Ruth, Science Research and Consulting Services, Manna, California iv+73pp.appendices.

Sessions, S. K., and S. B. Ruth. 1990. Explanation for naturally occumng supernumerary limbs in amphibians. The Journal of Experimental Zoology, 254(1):38-47.

Shoop, C. R. 1960. The breeding habits of the mole salamander ***Ambystoma talpoideum*** (Holbrook), in southeastern Louisiana. Tulane Studies in Botany and Zoology, 8(3):65-82.

Simovich, M. A., J. King, and R. Brusca. 1992b. Branchiopod survey. Volume 2. *In*, Invertebrate Survey, 1991-1993: PGT-PG&E Pipeline Expansion Project. Report prepared for the Bechtel Corporation, San Francisco, California.

Skinner, M. W. and B. M. Pavlik (Eds.). 1994. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California. Special Publication No. 1 (Fifth Edition). California Native Plant Society, Sacramento, California.

Small, M.F. and M.L. Hunter. 1988. Forest fragmentation and avian nest predation in forested landscapes. Journal of Wildlife Management 52:123-126.

Smith, F. 1977. A short review of the status of riparian forests in California. Pp. 1–2 *in* A. Sands. ed. Riparian forests in California: their ecology and conservation. Inst. Ecol Publ. 15.

EXHIBIT L

Stebbins, R.C. 2003. A field guide to western reptiles and amphibians-third ed. Houghton Mifflin Company, Boston, MA. **514** pp.

Storer, T.I. 1925. A synopsis of the amphibia of California. University of California Publications in Zoology 27:1-342.

Swenson, R.O. 1995. The reproductive behavior and ecology of the tidewater goby ***Eucyclogobius newberryi*** (Pisces: Gobiidae). Ph.D. Dissertation, University of California at Berkeley.

Swenson, R.O. 1999. The ecology, behavior, and conservation of the tidewater goby, ***Eucyclogobius newbenyi.*** Environmental Biology of Fishes, 55:99-114.

Swenson, R.O. and A.T. McCray. 1996. Feeding ecology of the endangered tidewater goby: effects of season, habitat, and time of day. Transactions of the American Fisheries Society 125: 956-970.

Swift, C.C., P. Duangsitti, C. Clemente, K. Hasserd and L. Valle. 1997. Biology and distribution of the tidewater goby, ***Eucyclogobius newberryi,*** on Vandenberg Air Force **Base,** Santa Barbara County, California. Final report for U.S. National Biological Service Cooperative Agreement No. 1445-0007-94-8129.

Swift, C.C., J.L. Nelson, C. Maslow, and T. Stein. 1989. Biology and distribution of the tidewater goby, ***Eucyclogobius newberryi*** (Pisces: Gobiidae) of California. Natural History Museum of Los Angeles County, No. 404.

Swift, C.C., and **D.C.** Holland. "1998. The status and distribution of the tidewater goby, ***Eucyclogobius newberryi*** (Pisces, Gobiidae), on MCB Camp Pendleton, California. Unpublished report.

U.S. Fish and Wildlife Service. 1977. Santa Cruz long-toed salamander ***(Ambystoma macrodactylum croceum)*** recovery plan. Portland, Oregon.

U.S. Fish and Wildlife Service. 1985. Santa Cruz Long-Toed Salamander Recovery Plan. Portland, Oregon. 64 pp.

U.S. Fish and Wildlife Service. 1998a. Draft recovery plan for the least Bell's vireo (***Vireo bellii pusillus***). Portland, Oregon.

U.S. Fish and Wildlife Service. 1998b. Recovery plan for upland species of the San Joaquin Valley, California Portland, Oregon.

US. Fish and Wildlife Service. 1999a. Draft revised recovery plan for the Santa Cruz long-toed salamander. Portland, Oregon.

EXHIBIT L

2dy

U.S. Fish and Wildlife Service. 1999b. Programmatic formal Endangered Species Act consultation on issuance of permits under section **404** of the Clean Water Act or authorizations under the Nationwide Permit Program for projects that may affect the California red-legged frog. Dated January *26.* Issued to: *Art* Champ, U. S. Army Corps of Engineers, Sacramento District, Sacramento; Calvin Fong, U. S. Army Corps of Engineers, San Francisco District, San Francisco, California; and Richard Schubel, U. S. Army Corps of Engineers, Los Angeles District, Los Angeles, California. Issued by: Ventura and Sacramento Fish and Wildlife Offices, Ventura and Sacramento, California.

U.S. Fish and Wildlife Service. 2002. Recovery plan for the California red-legged frog ***(Rana aurora draytonii).*** Portland, Oregon.

Wang, J.C.S. **1982.** Early life history **and** protection of the tidewater goby, ***Eucyclogobius newberryi*** (Girard), in the Rodeo Lagoon of the Golden Gate National Recreation Area. Cooperative National Park Research Study Unit, Technical Report 7, Institute of Ecology, University of California, Davis, CPSU/UCD 022/3.

Werner, Earl E. **1986.** Amphibian metamorphosis: **growth** rate, predation risk, and the optimal size at transformation. American Naturalist. 135(2). pp. 19-40.

Whitcomb, R.R., C.S. Robbins, J.F. Lynch, B.L. Whitcomb, M.K. Klimkiewicz, and D. Bystrak. 1981. Effects of forest fragmentation on avifauna of the eastern deciduous forest. In Forest island dynamics in man-dominated landscapes (R.L. Burgess **and** D.M. Sharpe, eds.). Springer-Verlag, New York, New York. Pp. **125-205.**

Wilbur, S. 1980. Status report on the least Bell's vireo. Unpublished report. **U.S.** Fish and Wildlife Service. Portland, Oregon.

Worcester, K.R. **1992.** Habitat utilization in a central California coastal lagoon by the tidewater goby ***(Eucyclogobius newberryi).*** Masters thesis, California Polytechnic State University, San Luis Obispo.

Zembal, R., K. Kramer, and R. Bransfield. **1985.** Survey of Vegetation and Vertebrate Fauna in ***the*** Prado **Basin** and the Santa Ana River Canyon, California. Unpublished report, U.S. Fish and Wildlife Service. Laguna Niguel, California.

EXHIBIT L

The Declining Amphibian Populations Task Force Fieldwork Code of Practice

1. Remove mud, snails, algae, and other debris from nets, traps, boots, vehicle tires, and all other surfaces. Rinse cleaned items with sterilized (e.g., boiled or treated) water before leaving each work site.

2. Boots, nets, traps, and other types of equipment used in the aquatic environment should then be scrubbed with 70 percent ethanol solution and rinsed clean with sterilized water between study sites. Avoid cleaning equipment in the immediate vicinity of a pond, wetland, or riparian area.

3. In remote locations, clean all equipment with 70 percent ethanol or a bleach solution, and rinse with sterile water upon return to the lab or "base camp" Elsewhere, when washing-machine facilities are available, remove nets from poles and wash in a protective mesh laundry bag with bleach on the "delicates" cycle.

4. When working at sites with known or suspected disease problems, or when sampling populations of rare or isolated species, wear disposable gloves and change them between handling each animal. Dedicate sets of nets, boots, traps, and other equipment to each site being visited. Clean them as directed above and store separately at the end of each fieldday.

5. When amphibians are collected, ensure that animals from different sites are kept separately and take great care to avoid indirect contact (e.g., via handling, reuse of containers) between them or with other captive animals. Isolation from unsterilized plants or soils which have been taken from other sites is also essential. Always use disinfected and disposable husbandry equipment.

6. Examine collected amphibians for the presence of diseases and parasites soon after capture. Prior to their release or the release of any progeny, amphibians should be quarantined for a period and thoroughly screened for the presence of any potential disease agents.

7. Used cleaning materials and fluids should be disposed of safely and, if necessary, taken back to the lab for proper disposal. Used disposable gloves should be retained for safe disposal in sealed bags.

The Fieldwork Code of Practice has been produced by the Declining Amphibian Populations Task Force with valuable assistance from Begona Arano, Andrew Cunningham, Tom Langton, Jamie Reaser, and Stan Sessions.

For further information on this Code, or on the Declining Amphibian Populations Task Force, contact John Wilkinson, Biology Department, The Open University, Walton Hall, Milton Keynes, MK7 6AA, UK.
E-mail: DAPTF@ouen.ac.uk Fax: +44 (0) 1908-654167

EXHIBIT

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 *West* Ocean Boulevard, Suite 4200
Long Beach. California 90802- 4213

In Response Please Refer To:
151422SWR01SR939:JMA

AUG 15 2003

Mr. David K. Young
Environmental Specialist
United States Department of the Interior
Bureau of Reclamation
South-Central California Area Office
1243N Street
Fresno, Califomia 93721-1813

Dear **Mr.** Young:

This document transmits the National Marine Fisheries Service's (NOAA Fisheries) biological opinion based on our review of the **U.S.** Bureau of Reclamation's (Reclamation) permitting of the Pajaro Valley Water Management Agency (PVWMA) to receive Central Valley Project water resulting in construction of apipeline project across the mainstem Pajaro River, Millers Canal, and Sargent and Pescadero Creeks, tributaries to the Pajaro River, in San Benito, Santa Clara, Monterey, and Santa Cruz Counties, California. The PVWMA will construct the pipeline. The biological opinion addresses the effects of the proposed project on South-Central California Coast (S-CCC) Evolutionarily Significant Unit steelhead (*Oncorhynchus mykiss*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 ***etseq.)***. Your March 27, 2003, request for consultation was received on March 29, 2003.

The biological opinion **is** based on information provided in the draft biological assessment, prior site reviews, telephone conversations, and electronic mail. The biological opinion concludes the Reclamation's proposed permitting of the PVWMA's pipeline project is not likely to jeopardize the continued existence of threatened S-CCG steelhead. NOAA Fisheries believes the proposed action **is** likely to result in take of S-CCC steelhead, and therefore, an incidental take statement **is** also included with this biological opinion. A complete administrative record of this consultation is on file at our Santa Rosa field office.

Mr. Jonathan Ambrose is the lead biologist for this project. He can be contacted at (707) 575-6091 or via email at jonai.han.ambros&,noaa.gov if you would **like** additional information regarding the enclosed biological opinion.

Sincerely,

Rodney R. McInnis
Acting Regional Administrator

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cc: Jim Lecky, NOAA Fisheries
Penny Ruvelas, NOAA Fisheries
Dave Johnston, CDF&G - Monterey
Jill Hamilton, Env. Sci. Assoc. - San Francisco

Enclosure

EXHIBIT M

BIOLOGICAL OPINION

ACTION AGENCY	**U.S.** Bureau of Reclamation
ACTION:	Pajaro Valley Water Management Agency proposed connection, construction, and operation of a pipeline to convey Central Valley Project water from the San Felipe Turnout in Santa Benito County, California, into the Pajaro Valley located in coastal Monterey and Santa Cruz Counties, Caliiomia.
CONSULTATION CONDUCTED B Y	NOAA Fisheries, Southwest Region
FILE NUMBER.	151422SWR01SR849
DATE ISSUED:	AUG 15 2003

I. CONSULTATIONHISTORY

On March 29,2003, the U.S. Department of the Interior, Bureau of Reclamation, South-Central California Office (Reclamation) requested formal consultation with the National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). The consultation applies to the Pajaro Valley Water Management Agency's (PVWMA) request to Reclamation to connect a pipeline to the Santa Clara Conduit (at the San Felipe Turnout) of the Central Valley Project (CVP); use CVP water in the Pajaro Valley; and provide funding support for the design, planning, and construction of a recycled water facility and distribution pipelines. Reclamation determined the project may affect South-Central California Coast (S-CCC) Evolutionarily Significant Unit (ESU) steelhead (*Oncorhynchus mykiss*).

NOAA Fisheries previously commented on the proposed project on July 10,1998, and December 3,2001, in letters addressed to the General Manager of the PVWMA where we outlined concerns regarding the general overdraft issue and the proposed project. In a telephone conference call on January 15,2002, between regulatory agencies, the Bureau of Reclamation and the PVWMA, the NOAA Fisheries learned the construction of the CVP pipeline would consist entirely of either directional drilling or jack and bore for all water course crossing. Based on the PVWMA's proposed water course pipeline construction techniques, the NOAA Fisheries believed the project

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would have no effect on S-CCC ESU steelhead trout thereby precluding the need for interagency consultation pursuant to section 7 of the ESA.

The project description, as indicated by the draft BA, has been revised and will now necessitate formal section 7 consultation due to the proposed open ditch pipeline trenching across seven watercourse crossings. Three of these crossings have the potential for steelhead presence. Additionally, this consultation assesses potential impacts of trenchless construction at three watercourse crossings with potential steelhead presence. NOAA Fisheries met with Environmental Science Associates, consultants to PVWMA, on January 21,2003, to discuss proposed aspects of the final action and information necessary for an adequate biological assessment. Numerous telephone calls and electronic mail regarding information necessary for the biological assessment, including appropriate minimization measures. quantifying take, and clarification of potential impacts, occurred between NOAA Fisheries and Environmental Science Associates prior to initiation of section 7 consultation.

Communications between NOAA Fisheries and Environmental Science Associates (consultant to PVWMA) resulted in identification of potential impacts to S-CCC steelhead from the proposed project. Impact minimization and conservation measures were developed to ensure the project was constructed in the manner believed least damaging to the environment. The measures were deemed necessary to minimize the effects to threatened S-CCC steelhead resulting from project activities. Many of these measures were incorporated into the Description of the Proposed Action section in this biological opinion.

II. DESCRIPTION OF THE PROPOSED ACTION

The Federal action involves Reclamation providing approval, under the authority of the Central Valley Projects Improvement Act, the Reclamation Reform Act, and Title XVI of Public Law 102-575, to the PVWMA for connection of a pipeline to the Santa Clara Conduit of the CVP, use of CVP water, and funding support to the PVWMA. The primary purpose of the proposed action is to address groundwater overdraft concerns in the Pajaro Valley. The PVWMA has purchased water assignments from existing Central Valley Project contracts and is attempting to purchase other existing assignments. The 23-mile long 54-inch diameter Import Pipeline would extend from the Watsonville turnout on the Santa Clara Conduit of the CVP (San Felipe Turnout) in San Benito County, California, to a location near the Highway 1 crossing of the Pajaro River near the City of Watsonville, Santa Cruz County, California Construction of the pipeline will require several stream crossings, six of which could adversely affect listed salmonids. These six stream crossings analyzed in this biological opinion occur at Millers Canal, Pescadero Creek, Sargent Creek, Pajaro River west of Highway 101, Pajaro River west of Highway 1, and Pajaro River near Graniterock Property (Chittenden). PVWMA intends to use CVP water to manage water supplies in the Pajaro Valley Basin and deliver approximately 13,400 acre-feet of water per year (afy) of CVP water to farmers in PVWMA's service area for agricultural irrigation.

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Approximately 7,000 *afy* of the CVP water will be blended with 3,000 afy of inland groundwater and 4,000 afy of tertiary treated water from the City of Watsonville's wastewater treatment facility. Construction is anticipated to begin during the summer of 2004 and continue year round. Open trench construction is anticipated to take between two to four weeks and trenchless construction is anticipated to take between four to six weeks. Delivery of the imported water supply is anticipated to begin in early 2007.

In the coastal areas of the Pajaro Valley, overdraft conditions have caused groundwater levels to drop below sea-level, creating a landward pressure gradient causing seawater to move inland, displacing freshwater. Additionally, the overdraft has likely decreased water surface elevations in Corralitos Creek (tributary to the Pajaro River) to the point where portions of the creek now *go dry* during the summer period. These conditions are not expected to stabilize without changes in water management options that balance water use with recharge. The PVWMA will utilize the CVP water in order to bring its water supply into balance with existing agricultural demand, prevent continued overdraft of the groundwater basin, and to halt seawater intrusion into the aquifer. The Import Pipeline would supply surface water to the coastal distribution system serving approximately 8,960 acres of irrigated agricultural lands in the Pajaro Valley. The coastal area currently relies on groundwater for irrigation. As part of the project, PVWMA would eliminate pumping along the coast, thus reducing seawater intrusion. Although the proposed project involves the inter-watershed transfer of water to the Pajaro Valley, all imported water will be transported through enclosed pipelines and will be used either for direct application to agricultural field or for blending with recycled water prior to application. Thus, the imported water is not expected to directly enter the Pajaro River or its tributaries.

A. Construction Methods

Construction crews will be able to install up to 100 linear feet of pipe (in 16 to 18 foot lengths) each work day, on average. Assuming construction will occur seven days a week, as is planned, the pipeline would be completed in approximately three years. Construction in flat open fields may allow more pipe to be installed each day, whereas construction in constrained areas, such as across or along major roads and railroads, stream crossings, or in areas with many utility lines, would slow construction. Use of multiple starting points and pipe installation crews could reduce construction time to 18 months or less.

Along most of the pipeline alignment, the pipe would be installed in a trench with 2:1 sideslopes with five to ten feet of cover material. In general, the pipcline alignment is located in open areas where conventional excavation methods will be used to construct most of the proposed overland and road crossings. Final selection of the Import Pipeline alignment within the preferred alignment comdor will consider local landforms and potential slope failure areas and sensitive resource areas.

The proposed pipeline alignment includes open trench crossings of the Pajaro River near the Graniterock Property (Chittenden), Pescadero Creek, Sargent Creek, and an unnamed drainage

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east of Soda Lake, two small unnamed drainages west of Pescadero Creek, and a small channelized drainage west of Aromas, San Benito County. All river and stream crossings are proposed to occur during the dry season (August 15 -November 1, if water is present; June 1 - November 15, if no water is present). If water flows persist within the stream channel at the time of construction, sheet pile cofferdams in a portion of the channel and the construction area will be dewatered. Two crossings of the Pajaro River (just west of Highway 101 and just west of Highway 1) and a crossing of Millers Canal will be constructed with trenchless methods. Bore-and-jack construction or directional drilling is proposed for these crossings. Adverse impacts to steelhead are limited to possible accidental bentonite releases and loss of riparian vegetation.

Site restoration in open areas and along transportation corridors would be completed as the pipeline is installed. The project areas would be restored to preconstruction contours. In fields and areas with sensitive habitats, the top six to 12 inches of soil would be stockpiled during construction and replaced following pipe installation. Erosion control methods will be used to minimize sediment transport. Revegetation may be accomplished by allowing the area to reseed naturally.

S-CCC ESU steelhead presence has been assumed (for at least a portion of their life history) at the proposed open trench crossings at Pescadero Creek, Sargent Creek, and mainstem Pajaro River near the Graniterock Property (Chittenden). Presence is also assumed (for at least a portion of their life history) at the crossings on Millers Canal, Pajaro River west of Highway 1, and Pajaro River west of Highway 101. Steelhead are assumed not to be present (for any portion of their life history) at the open trench crossing on two unnamed drainages adjacent to Pescadero Creek, one unnamed drainage east of Soda Lake, and one unnamed drainage west of Aromas due to lack of adequate water flow during the summer construction period.

B. Minimization Measures

Details of the S-CCC ESU steelhead take minimization measures are described in the Biological Assessment developed for the project (See Section 6.0 in PVWMA, March 2003, and letter from Environmental Science Associates to NOAA Fisheries dated March 27,2003). The following general conditions will be applied to the three watercourse crossings with potential for S-CCC ESU steelhead presence utilizing underground pipe construction techniques (Millers Canal, Pajaro River West of Highway 1, Pajaro River West of Highway 101):

- Construction will be restricted to the low-flow period of June 15 through November 1. If the channel is dry, construction can occur as early as June 1. Restricting construction activities to this work window will minimize potential impacts to migrating adult and smolt steelhead potentially resulting from bentonite releases.

- A qualified biological monitor will be on site during all underground pipeline construction activities in the vicinity of potential steelhead occurrences. The

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biological monitor will have the authority to halt construction if a source of contaminafion is identified and until it is controlled.

The following general conditions will be applied to all four watercourse crossings without potential for S-CCC ESU steelhead presence during the construction season utilizing open trench construction techniques:

- All trenching activities across waterways will be restricted to low-flow periods of August 15 through November 1. If the channel is dry, construction can occur as early as June 1. Restricting construction activities to this work window will minimize impacts to migrating adult and smolt steelhead.

The following general conditions will be applied to all three watercourse crossings with potential for S-CCC ESU steelhead presence utilizing open trench construction techniques:

- All trenching activities across waterways will be restricted to low-flow periods of August 15 through November 1. If the channel is dry, construction can occur as early as June 1. Restricting construction activities to this work window will minimize impacts to migrating adult and smolt steelhead.

- If the channel is not dry, water from around the section of trench within the actively flowing channels will be diverted. This will reduce the potential for sediment or other pollutants to enter the waterways and to impact downstream resources. The diversions will consist of sheet pile cofferdams installed in two phases. Each phase will result in the dewatering of approximately two-thirds the width of the channel, thus allowing for continued open channel fish passage during construction. Project engineers are uncertain if sheet piling is feasible at the Pajaro River crossing near Graniterock Property (Chittenden) due to the composition of riverbed material. If sheet piling cannot be used, then sandbags would be used to construct the cofferdam utilizing a similar design.

- Sediment curtains will be placed downstream of the Construction zone to prevent sediment disturbed during trenching activities from being transported and deposited outside of the construction zone.

- Prior to construction of the diversion and placement of the sediment curtains at Sargent and Pescadero Creeks, a qualified biologist will conduct fish relocation activities, and immediately release captured fish to a suitable habitat near the project site. At the Pajaro River near Graniterock Property (Chittenden) crossing, passive preconstruction surveys (e.g., snorkeling and/or streamside observations) for steelhead will be conducted no more than two weeks prior to the onset of construction activities. If, as expected, steelhead are not present, construction can

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occur. If steelhead are observed, construction activities will not occur and formal consultation will be reinitiated with NOAA Fisheries.

- If groundwater is encountered, or if water remains in the channel after flows are diverted, it will be pumped out of the construction area and into a retention basin constructed of hay bales lined with filter fabric. Pumps will be screened according to NOAA Fisheries screening criteria for anadromous salmonids (NMFS 1997). A biological monitor will be on-site during such pumping activities to ensure any fish in the construction area are relocated to suitable habitat near the project site.

- Silt fencing will be installed in all areas where construction occurs within 100 feet of known or potential *S-CCC* steelhead habitat.

- Spoil sites will be located so they do not drain directly into waterways. If a spoil site drains into a water body, catch basins will be constructed to intercept sediment before it reaches the stream channels. Spoil sites will be graded to reduce erosion potential.

- A spill prevention plan for potentially hazardous materials will be prepared and implemented. The plan will include the proper handling and storage of all potentially hazardous materials, as well as the proper procedures for cleaning up and reporting of any spills. If necessary, containment berms will be constructed to prevent spilled materials from reaching stream channels.

- Equipment and materials will be stored at least 50 feet from watercourses, but within the pipeline right-of-way. No debris such as trash and spoils will be deposited within 100 feet of wetlands. Staging and storage areas for equipment, materials, fuels, lubricants and solvents, will be located outside of the stream channel and banks. *Stationary* equipment such as motors, pumps, generators, compressors and welders, located within or adjacent to the stream will be positioned over drip pans. Any equipment or vehicles driven and/or operated within or adjacent to the stream will be checked and maintained daily, to prevent leaks of materials potentially deleterious to aquatic life. Vehicles will be moved away from the stream prior to refueling and lubrication.

- Proper and timely maintenance for vehicles and equipment used during construction will be provided to reduce the potential for mechanical breakdowns leading to a spill of materials into or around the creeks. Maintenance and fueling will be conducted in an area meeting criteria set forth in the spill prevention plan (i.e., at least *60* feet away fiom creeks).

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- A qualified biological monitor will be on site during all open trench crossing activities. The biological monitor will be authorized to halt construction if impacts to *S-CCC* ESU steelhead are evident.

- Project sites will be restored to preconstruction channel conditions, including streambed composition, compaction, and gradient. Channel banks will be returned to the original grade and appropriate bank stabilization techniques will be implemented to reduce the potential for erosion and sedimentation. A plan describing pre-project conditions and restoration methods will be prepared prior to construction and will include installing seeded or unseeded erosion control matting, as necessary, planting of seedlings and cuttings, use of a combination of silt fences and coir logs and straw and jute matting.

- Project sites shall be revegetated with an appropriate assemblage of native upland vegetation, and if necessary, riparian and wetland vegetation, suitable for the area. A plan describing pre-project conditions, restoration, and monitoring success criteria will be prepared prior to construction.

- Revegetation and habitat enhancement will be considered successful if, at the end of the five-year monitoring period, plantings, as a whole, exhibit at least 70 percent cumulative survival and plantings have attained 75 percent cover at the revegetation site.

- The success of the restoration effort will be evaluated using specific performance standards including the following criteria; a) at least 70 percent survival of the total number or originally installed plants over a five-year monitoring period, b) no excessive rills, gullies, or other erosional features are observed, c) no invasive nonnative plant species become established within or adjacent to the revegetation area, and d) properly functioning irrigation system in years one through three or until vegetation becomes established.

The following specific conditions will be applied to watercourse crossings with potential for S-CCC ESU steelhead presence utilizing open trench construction techniques:

- Sargent Creek Construction activities at this site will occur only during the first season of the anticipated two-year construction period if, and only if, the channel is *dry* during the construction window outlined above. If the channel remains wet during the entire construction window of the first year, construction will take place during the second year, regardless of whether the channel is *dry* or wet.

- Pescadero Creek Construction activities at this site can occur during the proposed construction windows regardless of whether the creek is wet or *dry*. However, if the Sargent Creek site discussed above is wet during the first year and is therefore

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deferred to the second year, the Pescadero Creek pipeline crossing must be constructed during the first year. This will minimize adverse effects of direct take to steelhead by distributing the adverse effects of relocation over a two-year period (if necessary).

- Mainstem Pajaro River near Graniterock Property (Chittenden): Construction can occur whether the channel is wet or *dry* and during either the first or second year of the construction period if the biological monitor fails to detect steelhead presence. If detected, Reclamation will reinitiate section 7 consultation with NOAA Fisheries.

C. Action Area

The action area is defined as all areas affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The action area for this project includes the areas impacted by the proposed stream crossings and areas where changes to water quality from open trench and underground pipe construction could adversely affect steelhead.

The action area is as follows:

1. Crossings Installed via Underground Pipe Construction

   Millers Canal: This portion of the action area extends from the proposed crossing downstream 1,000 feet. This distance is the maximum expected for potential water quality impacts to steelhead as described in the *Effects Analysis* section.

   Pajaro River West of Highway 1: This portion of the action area extends from the proposed crossing downstream 1,000 feet. This distance is the maximum expected for potential water quality impacts as described in the *Effects Analysis* section.

   Pajaro River West of Highway 101: This portion of the action area extends from the proposed crossing downstream 1,000 feet. This distance is the maximum expected for potential water quality impacts as described in the *Effects Analysis* section.

   No impacts to riparian vegetation are anticipated from underground pipeline construction.

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2. Crossing Installed via Open Trench Construction.

Sargent Creek A 30-foot wide construction corridor would be used through 30 LF of riparian zone and across 20 feet of stream channel. Thirty LF of stream channel will be dewatered (if water is present). Thus, 900 square feet (sq. ft.) of riparian zone and 600 sq. ft. of creek bed will be disturbed. Riparian vegetation will be disturbed. This portion of the action area also extends from the proposed crossing downstream 1,000 feet.

Pajaro River near Graniterock Property (Chittenden): A 30-foot wide construction corridor would be used through 160 LF of riparian zone and across 100 feet of river channel. Thus, 4,800 sq. ft. of riparian zone and 3,000 sq. ft. of river bed will be disturbed. In addition, a 40-foot construction corridor would be used where the pipeline parallels the south side of the Pajaro River. A 10-foot dirt road already is located on top of the southern bank of the river, but an additional 30-foot wide section of the riparian vegetation to the south of the gravel road may be removed. Thus, a 30-foot wide by 2,100-foot long (30,600 sq. ft.) section of the riparian vegetation may be disturbed.

Pescadero Creek A 30-foot wide construction corridor would be used through 180 LF of riparian zone and across 50 feet of stream channel. Thirty LF of channel will be dewatered (if water is present). Thus, 5,400 sq. ft. of riparian zone and 1,500 sq. ft. of creek bed will be disturbed. Riparian vegetation will be disturbed.

The action area for each of these crossings also includes 1,000 feet of stream downstream from each crossing. This distance is the maximum expected for potential water quality impacts as described in the *Effects Analysis* section.

III. DESCRIPTION AND STATUS OF THE SPECIES

This biological opinion analyzes the effects of the proposed project on threatened S-CCC steelhead (62 FR 43937).

A. Species Description and Life History

General life history information for steelhead (*Oncorhynchus mykiss*) is summarized below, followed by detailed information on the S-CCC steelhead ESU, including any unique life history traits as well as their population trends. Further detailed information on this steelhead ESU is available in the NOAA Fisheries Status Review of west coast steelhead from Washington, Idaho Oregon, and California (Busby *et al.* 1996), and the NOAA Fisheries final rule for listing steelhead (62 FR 43937), the NOAA Fisheries Status Review for Klamath Mountains Province

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Steelhead (Busby *et al.* 1994), and the NOAA Fisheries final rule listing the S-CCC steelhead ESU.

1. Adult Freshwater Migration and Spawning

The most widespread run type of steelhead is the winter (ocean-maturing) steelhead, while summer (stream-maturing) steelhead (including spring and fall steelhead in southern Oregon and northern Califomia) are less common. There is a high degree of overlap in spawn timing between populations, regardless of run-type. California steelhead generally spawn earlier than steelhead in northern areas. Both summer and winter steelhead in California generally begin spawning in December, whereas most populations in Washington begin spawning in February or March. Among inland steelhead populations, Columbia River populations from tributaries upstream of the Yakima River spawn later than most downstream populations.

The stream-maturing type enters fresh water in a sexually immature condition and requires several months in freshwater to mature and spawn. The ocean-maturing type enters fresh water with well-developed gonads and spawns shortly thereafter *(Barnhart* 1986).

Steelhead may spawn more than once before dying, in contrast to other species of the Oncorhynchus genus. It is relatively uncommon for steelhead populations north of Oregon to have repeat spawning, and more *than* two spawning migrations is rare. In California, the frequency of two spawning migrations is higher, but more than two is unusual (Shapovalov and Taft 1954).

2. Juvenile Rearing and Out-migration

Juvenile steelhead live in freshwater between one and four years (usually one to two years in the Pacific Southwest) and then become smolts and migrate to the sea from November through May with peaks in March, April, and May. The smolts can range from 14 to 27 centimeters (cm) in length. Steelhead spend between one and four years in the ocean (usually two years in the Pacific Southwest) (Barnhart 1986). Fish size appears to be positively correlated with water velocity and depth (Chapman and Bjomn 1969, Everest and Chapman 1972).

3. Ocean Migration

North American steelhead typically spend two years in the ocean before entering freshwater to spawn. The distribution of steelhead in the ocean is not well known. CWT recoveries indicate that most steelhead tend to migrate north and south along the Continental Shelf (Barnhart 1986). Steelhead stocks from the Klamath and Rogue rivers probably mix together in a nearshore ocean staging area along the northem California before they migrate upriver (Everest 1973).

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4. Biological Requirements

The timing of upstream migration is correlated with higher flow events, such as freshets or sand bar breaches, and associated lower water temperatures. Unusual stream temperatures during spawning migration periods can alter or delay migration timing, accelerate or retard mutations, and increase fish susceptibility to diseases. The minimum stream depth necessary for successful upstream migration is 18 cm (Thompson 1972). Reiser and Bjomn (1979) indicated that steelhead preferred a depth of 24 cm or more. The maximum velocity, beyond which upstream migration is not likely to occur, of 2.4 m/second (Thompson 1972).

Steelhead spawn in cool, clear streams featuring suitable gravel size, depth, and current velocity. Intermittent streams may be used for spawning (Barnhart 1986, Everest 1973). Reiser and Bjornn (1979) found that gravels of 1.3 cm to 11.7 cm in diameter and flows of approximately 40-90 cm/second (Smith 1973) were preferred by steelhead. The survival of embryos is reduced when fines of less than 6.4 millimeters (mm) comprise 20 - 25% of the substrate. Studies have shown a higher survival of embryos when intragravel velocities exceed 20 cm/hour (Phillips and Campbell 1961, Coble 1961). The number of days required for steelhead eggs to hatch varies from about 19 days at an average temperature of 60" Fahrenheit (F) to about 80 days at an average of 42° F. Fry typically emerge from the gravel two to three weeks after hatching (Barnhart 1986).

After emergence, steelhead fry usually inhabit shallow water along perennial stream banks. Older fry establish territories which they defend. Streamside vegetation and cover are essential. Steelhead juveniles are usually associated with the bottom of the stream. In smaller California streams, the water levels may drop so low during the summer that pools are the only viable rearing habitat. No passage between pools can occur until river levels rise with the onset of the rainy season. Therefore, juvenile steelhead rearing in isolated summer pools are extremely vulnerable to disturbance or water quality impacts. Daytime temperatures in summer rearing pools may also be near lethal levels; riparian shading and the presence of sub-surface, cold water seeps are often essential to maintain pool temperatures at tolerable levels. In winter, they become inactive and hide in any available cover, including gravel or woody debris.

The majority of steelhead in their first year of life occupy riffles, although some larger fish inhabit pools or deeper runs. Juvenile steelhead feed on a wide variety of aquatic and terrestrial insects, and emerging fry are sometimes preyed upon by older juveniles. Water temperatures influence the growth rate, population density, swimming ability, ability to capture and metabolize food, and ability to withstand disease of these rearing juveniles. Rearing steelhead juveniles prefer water temperatures of 45" to 58" F and have an upper lethal limit of 75° F.

Dissolved oxygen levels of 6.5 to 7.0 milligrams (mg)/Liter (L) affected the migration and swimming performance of steelhead juveniles at all temperatures (Davis *et al.* 1963). Reiser and Bjomn (1979) recommended that dissolved oxygen (DO) concentrations remain at or near saturation levels with temporary reductions no lower than 5.0 mg/L for successful rearing of

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juvenile steelhead. Low DO levels decrease the rate of metabolism, swimming speed, growth rate, food consumption rate, efficiency of food utilization, affect normal behaviors, and ultimately reduce the survival rate of the juveniles.

During rearing, suspended and deposited fine sediments can directly affect salmonids by abrading and clogging gills, and indirectly cause reduced feeding, avoidance reactions, destruction of food supplies, reduced egg and alevin survival, and changed rearing habitat (Reiser and Bjomn 1979). Bell (1973) found that silt loads of less than 25 mg/L permit good rearing conditions for juvenile salmonids.

B. Range-wide (ESU) Status and **Trends of Species**

In this opinion, NOAA Fisheries assesses the status of S-CCC ESU steelhead by examining four types of information, all of which help us understand a population's ability to survive. These population viability parameters are: abundance, (population) growth rate, spatial structure, and diversity (McElhaney *et al.* 2000).

Abundance is a measure of the population size and is generally expressed as the number of spawning adults or the number of rearing juveniles. Small populations are generally at greater risk of extinction because as their numbers vary in response to environmental changes, the population can dip to critically low numbers more easily than larger populations (Gilpin and Soule 1986, Pimm *et al.* 1988).

The growth rate of a population is a function of the species' intrinsic ability to reproduce and the capacity of their environment to support the population. Life stage specific survival rates and long term trends in abundance are both indications of a population's performance in response to its environment. If a population is consistently failing to replace itself, as indicated by low survival rates and/or long term population declines, then it is at an increased risk of extinction.

A population's spatial structure refers to the geographic distribution of individuals in the population. This structure depends in part on habitat quality and the species dispersal characteristics. Species range constriction and fragmentation are likely to interfere with the population structure and are indications of reduced viability.

Species diversity is manifested genotypically (genetic variation among individuals in a population) and phenotypically (morphological and behavioral variation among individuals in a population). These forms of diversity allow species to better survive the challenges of environmental variations. A diverse population is more likely to contain combinations of traits that prove successful in coping with a given environment. Conversely, a lack of diversity, as happens when populations are diminished, decreases the species likelihood of surviving environmental adversity.

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1. Abundance

In the mid-1960s, total spawning populations of steelhead in the rivers in this ESU were estimated as 27,750 (CDFG 1965). Recent estimates for those rivers show a substantial decline during the past 30 years. Other estimates of steelhead include 1,000 to 2,000 in the Pajaro River in the early 1960s (McEwan and Jackson 1996), and about 3,200 steelhead for the Carmel River for the 1964-1975 period (Snider 1983). No recent estimates for total run size exist for this ESU. However, fairly recent run-size estimates are available for five streams (Pajaro River, Salinas River, Carmel River, Little Sur River, and Big Sur River). The total of these estimates is less than 500 fish (Nehlsen *et al.* 1991) and was considered at high risk, compared with a total of 4,750 fish for the same streams in 1965. Total number of adult steelhead in the ESU may be larger due to recent increases in number of steelhead recorded on the Carmel River.

Adequate adult escapement information was available to compute a trend for only one sub population within *this* ESU (Carmel River above San Clemente Dam). About one half (55 percent) of the adults that enter the Camel River move upstream of the San Clemente Dam (Dettman and Kelly 1986). An estimate of the total steelhead run in the Carmel River in 1984 was 860 adults (Jones and Stokes 1998). Between 1987 and 1991 a drought occurred in the region and no outflow through the river mouth occurred in 1988, 1989, and 1990. Nehlsen *et al.* (1991) determined the steelhead population was at high risk in the Carmel River during this drought period and a reevaluation for this stock may be necessary in light of additional information (Jones and Stokes 1998, Entrix 2000, MPWMD 2003). The 1997 and 1998 totals were the highest counts at San Clemente Dam since 1975 (775 and 856, respectively) (Jones and Stokes 1998). From 1999-2002, steelhead adults returning to the San Clemente Dam numbered 405,432 (Entrix 2000), 804, and 642 (MPWMD 2003). As of April 21, 2003, ladder counts recorded 491 adults (McKeon, NOAA Fisheries, per. comm., 2003).

2. Population Growth Rate

Available information indicates total steelhead abundance is low and most stocks in the ESU, for which there are data, show a substantial decline during the last 40 years (Busby *et al.* 1996). Their decline is attributed to long-standing human induced factors (e.g., blocked access to historic spawning and rearing areas due to dams and extensive water diversions) that exacerbate the adverse effects of natural environmental variability (61 FR 56138, 62 FR 43937, Titus *et al.* 2002).

Adequate adult escapement information was available to compute a trend for only one stock within the ESU (Carmel River above San Clemente Dam) (Titus *et al.* 2002). These data series show a significant decline of 22% per year from 1963 to 1993, with a five-year total count of only 16 adult steelhead at the San Clemente Dam between 1988-1992. Since 1994, the stock has partially recovered with a recent six-year average (1997-2002) of 652 fish passing the ladder at San Clemente Dam (Jones and Stokes 1998, Entrix 2000, MPWMD 2003, McKeon, NOAA Fisheries, pers. comm., 2003).

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Although it is difficult to assess the sustainability of natural populations in these river basins because of a general lack of information about naturally spawning populations, available information suggests recent total abundance in five of the larger rivers in the ESU is less than 11 percent of their abundance in the mid 1960s. In the mid 1960s, the CDF&G (1965) estimated the ESU-wide run size was about 17,750 adults. No comparable recent, ESU wide, information exists'. In these five major S-CCC ESU river systems (Pajaro, Salinas, Camel, Little Sur, and Big Sur), available information indicates runs of fewer than 500 adults (Nehlsen *et al.* 1991) where previously runs had been on the order of 4,750 adults (CDF&G 1965). This 89 percent decline in the population of steelhead spawning indicates an overall negative trend in growth rate for the population in the ESU.

3. Spatial Structure

S-CCC ESU steelhead have not maintained a wide distribution throughout the ESU. A 2003, NOAA Fisheries GIS (Geographic Information System) analysis of historic habitat loss within the ESU indicates approximately 79 percent of the habitat is no longer suitable or accessible to steelhead. In general, two ecological habitat types occur in this ESU, coastal basins, and inland basins. Habitat loss has been acute in the two inland basins (Salinas and Pajaro systems), where conditions are more arid and in-stream conditions are less resilient to adverse perturbation than the wetter coastal basins (Carmel, Big Sur, and Little Sur systems). Habitat loss has been less dramatic in the coastal basins and a status review update (Schiewe 1997) listed numerous reports of juvenile *O. mykiss* present in many coastal streams.

Habitat loss in the inland basins is a cause for concern as unique local behavioral and physiological adaptations for these areas may be lost. While habitat loss is ongoing, the species remains fairly well distributed from the southern part of the ESU through the northern part of the coastal streams. A wide coastal distribution is a positive indicator as species with broad distributions are more likely to survive environmental fluctuations and stochastic events, even if they suffer local extirpations (Pimm *et al.* 1988). Whether-or-not steelhead presence in the coastal streams provides the ESU with sufficient resiliency to persist in the face of environmental fluctuations and stochastic events is unknown.

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[1] Run size was estimated post-completion of many of the major dams in the ESU, including Nacimiento, Uvas, Chesbro, Hernandez, Pacheco, San Clemente, Salinas, and San Antonio dams. Thus, population levels were likely substantially greater prior to CDF&G's 1965 estimate. San Clemente dam is the only one of these dams constructed prior to 1965 with any fish passage facility. The last major dam constructed in this ESU was completed in the late 1960s and now forms Lopez Lake on Arroyo Grande Creek, San Luis Obispo County, California. This dam also has no fish passage facilities.

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4. Diversity

The genetic integrity (including fitness and genetic diversity) of wild populations may be affected primarily through interbreeding with genetically divergent hatchery fish (MacCall and Wainwright 2003). Interbreeding has the potential to reorganize the natural intra- and inter-populational distribution of genetic diversity and to change heritable survival-related characteristics. Interbreeding reduces the genetic diversity among populations currently thought to be critical for long-term persistence and to decreased fitness for rearing in the natural environment in the short-term (MacCall and Wainwright 2003). The interbasin transfer of hatchery steelhead has persisted in various locations and at various times within the S-CCC ESU (Sundermeyer 1999, Titus *et al.* 2002). This has adversely affected the genetic composition of existing stocks in at least one major watershed in the S-CCC ESU. Sundermeyer (1999) found steelhead in many of the tributaries of the Pajaro River indistinguishable from steelhead in the San Lorenzo River (Central California Coast ESU) due to the long history of hatchery supplementation. Remnant native populations are probably only present in areas above natural and anthropogenic barriers to anadromy (Sundermeyer 1999). Other basins in the ESU have also had interbasin transfers but little other genetic information is available to assess the effects of these practices. Interbasin transfer still continues in the Nacimiento River, a tributary to the Salinas River (CDF&G 1999), for the purpose of operating an easily accessible recreational trout fishery.

5. Conclusions

Total steelhead abundance is extremely low and most stocks in the ESU, for which there are data, show a substantial decline during the past 30 years (Busby *et al.*, 1996). Their decline has been attributed to long-standing human induced factors (e.g., blocked access to historic spawning and rearing areas upstream of dams, extensive water diversions) exacerbating the adverse effects of natural environmental variability (61 FR 56138, 62 FR 43937, Titus *et al.* 1999). This species is generally more resilient to perturbation than other salmonids due to their ability to tolerate a wider range of habitat conditions. However, the poor condition of their habitat in many areas remains, and compromised genetic integrity of some stocks poses a serious risk to their survival and recovery. Furthermore, steelhead are not evenly distributed throughout the ESU. Distribution of steelhead within many watersheds across the ESU is very patchy, with better distribution in the coastal basins and poor distribution in the interior basins.

C. Factors Responsible for Stock Declines: Changes to Habitat and Other Impacts

Threats to naturally reproducing steelhead are numerous and varied. Among the most serious and ongoing threats to the survival of steelhead in the S-CCC ESU are changes to natural hydrology, habitat degradation, and complete habitat loss. The following discussion provides an overview of the types of activities and conditions adversely affecting steelhead ESUs in California watersheds in general with some specific examples of impacts in the S-CCC ESU.

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1. Habitat Demadation and Destruction

A major cause of the decline of salmon and steelhead is the loss or severe decrease in quality and function of essential habitat features. Most of this habitat loss and degradation has resulted from anthropogenic watershed disturbances caused by agriculture, logging, urban development, water diversion, wetlands loss and management, off-road vehicle use, confined animal facilities, road construction, erosion and flood control, dam building, and grazing. Most of this habitat degradation is associated with the loss of essential habitat components necessary for salmon and steelhead survival. For example, the loss of deep pool habitats from sedimentation and stream flow reductions has reduced rearing and holding habitat for juvenile and adult salmonids.

These factors alter habitat conditions and have exacerbated the adverse effects of natural environmental variability from such factors as drought, poor ocean conditions, and predation The alteration of the estuaries in conjunction with increased sediment loads in the watersheds from land use activities and lower stream flows due to water diversions and other watershed changes have delayed sandbar breaching in the fall, delayed adult steelhead migration into streams, reduced and degraded estuary rearing habitat for juvenile steelhead, and created a poor freshwater-saltwater transition zone for steelhead smolts (CDF&G 1998).

Four large dams on the Pajaro River, one on Arroyo Grande Creek, and three on the Salinas River completely blocks steelhead access to historical spawning areas. Two dams on the Carmel River reduce access. Furthermore, dam water management operations have reduced migration and/or rearing opportunities in downstream areas. Numerous small dams (summer recreation and diversion dams) also reduce anadromous access throughout the ESU including Little Arthur Creek (Pajaro River), Little Sur, Corralitos Creek (Pajaro River), Arroyo de la Cruz, Chorro Creek, Old Creek, and Malpaso Creek.

2. Natural Stochastic Events

Natural events such as droughts, landslides, floods, and other catastrophes have adversely affected steelhead populations throughout their evolutionary history and yet they have persisted due in large part to a flexible life history. The effects of these natural events are often exacerbated by anthropogenic changes to watersheds such as logging, road building, and water diversion. Additionally, the ability of species to rebound from natural stochastic events may be limited as a result of other existing anthropogenic factors or depressed populations.

3. Ocean Conditions

Variability in ocean productivity has been shown to affect salmon production both positively and negatively. Beamish and Bouillion (1993) showed a strong correlation between North Pacific salmon production from 1925 to 1989 and their marine environment. Beamish *et al.* (1997) noted decadal-scale changes in the production of Fraser River sockeye salmon that they attributed to changes in the productivity of the marine environment. They also reported the dramatic

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change in marine conditions occurring in 1976-77 (an el Niño year), when an oceanic warming trend began. These el Niño conditions, which occur every 3-5 years, negatively affect ocean productivity. Johnson (1988) noted increased adult mortality and decreased average size for Oregon's Chinook (*Oncorhynchus tshawytscha*) and coho salmon (*Oncorhynchus kisutch*) during the strong 1982-83 El Niño. It is unclear to what extent ocean conditions have played a role in the decline of S-CCC ESU steelhead; however, ocean conditions have likely affected populations throughout their evolutionary history and thus, the species has likely adapted to these events.

4. Flows

Depletion and storage of natural flows have drastically altered natural hydrological cycles in many California rivers and streams in general, and within streams providing habitat to S-CCC ESU steelhead in particular. Alteration of streamflows has increased juvenile salmonid mortality for a variety of reasons: migration delay resulting from insufficient flows or habitat blockages; loss of usable habitats due to dewatering and blockage; stranding of fish resulting from rapid flow fluctuations; entrainment of juveniles into unscreened or poorly screened diversions; and increased juvenile mortality resulting from increased water temperatures (Chapman and Bjomn 1969, Berggren and Filardo 1993, 61 FR 56138).

5. Harvest

There are few good historical accounts of the abundance of steelhead harvested along the California coast (Jensen and Swartzell 1967). Early records did not contain quantitative data by species until the early 1950s. In addition, the confounding effects of habitat deterioration, drought, and poor ocean conditions on salmon and steelhead survival make it difficult to assess the degree to which recreational and commercial harvests have contributed to the overall decline of salmonids in West Coast rivers.

6. Artificial Provaeation

Releasing large numbers of hatchery fish can pose a threat to steelhead stocks through genetic impacts, competition for food and other resources, predation of hatchery fish on wild fish, and increased fishing pressure on wild stocks as a result of hatchery production (Waples 1991). The genetic impacts of artificial propagation programs are primarily caused by the straying of hatchery fish and the subsequent hybridization of hatchery and wild fish. Artificial propagation threatens the genetic integrity and diversity that protect overall productivity against changes in the environment (61 FR 56138). The potential adverse impacts of artificial propagation programs are well documented (reviewed in Waples 1991, National Research Council 1995, National Research Council 1996, Waples 1999).

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7. Marine Mammal Predation

Predation is not believed to be a major factor contributing to the decline of West Coast steelhead populations relative to the effects of fishing, habitat degradation, and hatchery practices. Predation may have substantial impacts in localized areas. Harbor seal (*Phoca vitulina*) and California sea lion (*Zalophus californianus*) numbers have increased along the Pacific Coast (NOAA Fisheries 1999). However, at the mouth of the Russian River, Hanson (1993) reported foraging behavior of California sea lions and harbor seals with respect to anadromous salmonids was minimal. Hanson (1993) also stated predation on salmonids appeared to be coincidental with the salmonid migrations rather than dependent upon them.

8. Reduced Marine-Derived Nutrient Transport

Reduced marine-derived nutrient (MDN) transport to watersheds is another consequence of the past century of decline in salmon abundance (Gresh *et al.* 2000). MDN are nutrients accumulated in biomass by salmonids while in the ocean and transported back to their freshwater spawning sites. Salmon may play a critical role in the survival of their own species MDN (from salmon carcasses) has been shown to be vital for the growth of juvenile salmonids (Bilby *et al.* 1996, Bilby *et al.* 1998). The return of salmon to rivers makes a significant contribution to the flora and fauna of both terrestrial and riverine ecosystems (Gresh *et al.* 2000). Evidence of the role of MDN and energy in ecosystems suggests this deficit may result in an ecosystem failure that has contributed to the downward spiral of salmonid abundance (Bilby *et al.* 1996). The loss of this nutrient source may thus perpetuate salmonid declines in an increasing synergistic fashion.

D. Status in the Pajaro River

Current status of the population is, for all practical purposes, unknown. However, relatively detailed information on historical distribution of *Oncorhynchus mykiss* in the basin in available due to *surveys* conducted by Snyder (1913), CDF&G (Lollock 1968), Moyle *et al.* (1982), and Smith (1982). Smith *et al.* (1982) estimated smolt size steelhead abundance for streams in the Santa Cruz County portion of the Pajaro River. Busby *et al.* (1996) estimated adult steelhead escapement at less than 100; Nehlsen estimated adult steelhead escapement at less than 200. No other quantitative information on juvenile or adult lifestages is available.

The recent estimates of steelhead population size (Busby *et al.* 1996, Nehlsen *et al.* 1991) indicate the Pajaro River population has declined significantly. If the decline of a stock is unchecked, a threshold is reached at which the probability of extinction form genetic, demographic, or environmental stochasticity increases sharply (Nehlsen *et al.* 1991).

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1. Factors Affecting Steelhead and Their Habitat in the Pajaro River

Historically, the mainstem Pajaro River possessed spawning and rearing habitats (Snyder 1913) but habitat conditions have deteriorated significantly and today no longer supports these habitats (Moyle *et al.* 1982, **AMBAG** 1983, Smith 2002). Nehlsen *et al.* (1991) cited steelhead populations have been depleted primarily by habitat damage. Many of the tributaries in the Pajaro River historically accessible to steelhead no longer are due to large dams (upper Llagas Creek, upper Uvas Creek, upper Pacheco Creek), summer dams (Little **Arthur** Creek), inadequate flows (Llagas Creek), or other anthropogenicbarriers (Green Valley Creek, Coward Creek). Inadequate flow releases from the four reservoirs on the Pajaro River have likely resulted in significant alteration of habitats in the Pajaro River. Of the large dams, **only** Uvas Reservoir **has** a water right specifying minimum winter and summer releases (Smith 2002). Water management in these reservoirs has lead to decreases in rearing and spawning habitat due to lack **of** adequate scouring flows, attraction flows, and flows necessary to maintain summer rearing conditions. Portions of the upper tributaries now dewater during the summer due to groundwater pumping or inadequate flow releases from the upper dams.

The lower Pajaro River has been channelized, leveed, and heavily altered. Virtually no riparian vegetation **has** been allowed to become established (except for a narrow strip on the Santa Cruz County side of the River below Highway 1) since 1995 due to ongoing maintenance activities. **The** channelization of the lower river **has** resulted in a loss of channel sinuosity and **a** head cut (from channel straightening) is now present **at** Murphy's Crossing which presents a barrier to smolt out-migration.

Present land use practices within the Pajam River Watershed have and continue to degrade wate quality of the Pajaro River and many of its tributaries. Production from imgated croplands located on highly erodible lands in the lower Pajaro River and Watsonville Slough Complex areas have accelerated erosion, resulting in excessive sedimentation and associated **transport** of potentially toxic pesticide residues **(AMBAG** 1999) that can exceed water quality objectives to protect aquatic **life** (SCCRCD 2001).

Grazing practices in *the* Pacheco, Tres Pinos and San Benito watersheds, and encroachment of croplands and urban development in the valley regions, has reduced the coverage of riparian habitat along many of these **stream** courses and wetlands throughout the watershed **(AMBAG** 1999). **The** loss of the riparian vegetation has left many streambanks unvegetated, which **is** resulting in accelerated erosion from steep and unstable banks, significantly degrading aquatic habitats for salmonids **(AMBAG** 1999).

2. Importance of the Paiaro River Population ***to*** the S-CCC ESU

The Pajaro River is the second largest river in the S-CCC ESU, and its tributaries originate from ***dry*** inland pine and scrub habitats in the San Benito and Diablo Mountains and mesic coastal redwood habitats in the Santa Cruz Mountains. Both the Pajaro River and Salinas River (largest

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river in the ESU) are drier than the coastal streams in the ESU. Steelhead in the Pajaro River basin were likely adapted to these drier conditions and remnant populations likely maintain an important component to the overall genetic diversity within the S-CCC ESU.

3. Trends

The trend of habitat degradation is anticipated to continue due to; (1) current water management practices from the four Pajaro River reservoirs; (2) agricultural practices in the watershed; (3) overdraft of ground water resources; (4) instream gravel mining practices; (5) increasing urbanization on the Highway 101 comdor valley floor; and, (6) construction, reconstruction, and maintenance of levees on the Pajam River and its tributaries.

IV. ENVIRONMENTAL BASELINE

A. Status of the Species and Habitat in the Action Area

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of the species, its habitat, and ecosystem within the action area. The environmental baseline does not include the effects of the action under review in the consultation.

Information on the status of the species within the footprint of the proposed action is nonexistent. Therefore, it is necessary to utilize information from species surveys above and below the construction footprint of the proposed action and observations from the project proponent both within, and upstream and downstream of the action area. This information was used to determine the approximate number of steelhead likely present in the action.area. Additionally, when site specific information is unavailable, it is necessary and prudent to utilize relevant information from other similar species and habitats for determination of potential effects that may occur from the proposed action. The status of steelhead and their habitat are broken out by the various reaches affected by the proposed project.

1. Pajaro River

At the proposed crossing west of Highway 1 and 1000 feet downstream, the riparian vegetation consists of a sparse stand of cottonwood (*Populus* sp.) and willow (*Salix* sp.) on the Monterey County side of the River. On the Santa Cruz County side of the River the vegetation consists of mature cottonwood and willow in a relatively thick, but narrow (less than 70 feet), comdor. Streambed substrates consists of sand and silt. This area is the upper limit of tidal influence for the Pajaro River lagoon.

At the proposed crossing near Graniterock Property (Chittenden) and 1000 feet downstream, the riparian vegetation is dominated by willow but also contains redwood (*Sequoia sempervirens*),

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cottonwood, and elderberry (*Sambucus* sp.). Some of the riparian vegetation was recently disturbed from installation of a pipe bridge. Streambed substrate is primarily comprised of bedrock.

At the proposed crossing west of Highway 101, the riparian vegetation is dominated by cottonwood and willow. Streambed substrate is primarily comprised of silt with banks primarily comprised of sand.

In the mainstem Pajaro River, habitat has been adversely affected within the action area and today serves only as a migration corridor. Snyder (1913) collected juvenile steelhead in 1908 at four of five locations sampled between Highway 101 and the Pajaro River Lagoon. According to Moyle *et al.* (1982) these areas on lower mainstem Pajaro were originally important summer nursery areas for juvenile steelhead. By 1960, juvenile steelhead use of the lower Pajaro River as rearing habitat may have ceased, as none were captured at the Highway 101 crossing or in the lagoon when sampled in 1959 (Titus *et al.* 1999). Moyle *et al.* (1982), in an effort to replicate Snyder (1913), surveyed the same general areas between 1972-1975 and failed to detected steelhead presence.

2. Pescadero Creek

At the location of the proposed crossing and downstream to the confluence of the Pajaro River, riparian vegetation is comprised of a well vegetated corridor of mature willow and cottonwood trees. The understory is comprised of blackberry and other riparian obligate species. Streambed substrates are comprised of relatively clean and well distributed gravels and cobbles. The riparian vegetation along the Pajaro River portion of the action area is generally comprised of mature willow and cottonwood.

Steelhead use Pescadero Creek year round. It one of the least impacted steelhead streams in the Pajaro River watershed. The best available data regarding steelhead use of this creek is by Smith (1982) who presented data on observed smolt-sized steelhead densities. Smith (1982) sampled two sites and reported densities of 5.0 smolts rearing in Pescadero Creek per ten feet of channel length. There is no information to suggest habitat conditions will change in the near-future.

3. Sareent Creek

At the location of the proposed crossing downstream to the Pajaro River confluence, riparian vegetation is comprised of a well vegetated corridor of mature willow and cottonwood trees. The understory is comprised of elderberry and other riparian obligate species. Streambed substrates are comprised of relatively clean and well distributed gravels and cobbles. The riparian vegetation along the Pajaro River portion of the action area is generally comprised of mature willow and cottonwood.

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The PVWMA (2003) did not discover any steelhead survey information for this creek. It is reported as ephemeral and therefore, unlikely to provide steelhead rearing habitat. It may provide opportunities for spawning in wet years. The trend of habitat conditions is unknown.

4. Millers Canal

At the location of the proposed crossing and 1000 feet downstream, overstory riparian vegetation generally consists of a narrow corridor (between five and ten feet wide) of willow trees. Vegetation is comprised of non-native grasses and weeds. Streambed substrates are comprised of fine silt.

Millers Canal is a channelized watercourse draining San Felipe Lake. Smith (2002) reported this canal as *dry* during most of the year but serves as the primary steelhead migration corridor into Pacheco Creek. PVWMA (2003) reported the lower portion of the canal, near the proposed crossing, adjacent to its confluence, may provide marginal steelhead rearing habitat. Moyle (1982) and Snyder (1913) failed to detect steelhead presence at sample locations in proximity to Millers Canal. Millers Canal acts as a complete bypass for flows from the upper Pajaro River. Habitat conditions for rearing are poor and are not anticipated to improve or worsen. Smith (2002) reported the Canal provides good fish passage when San Felipe Lake spills. Flows of approximately two to four-cubic feet per second are adequate for smolt passage. Migration opportunities have improved with the removal of a bridge apron at Frazer Lake Road in the late 1980's (Smith 2002).

B. Factors Affecting Species and Habitats Within the Action Area

The action area is located in the Pajaro River watershed, a 1300 square-mile watershed, encompassing the Counties of Santa Clara, San Benito, Monterey, and Santa Cruz. The factors affecting steelhead and their habitat are broken out by the various reaches to facilitate review.

1. Pajaro River

Deterioration of stream bottom and water quality, as well as increased instream summer temperatures, due to riparian forest alteration and removal, is likely responsible for the loss of steelhead rearing habitat and spawning habitat on the mainstem Pajaro River, including the stream crossing action areas for the proposed crossings at Graniterock Property (Chittenden), west of Highway 101, and areas downstream of the Pescadero Creek and Sargent Creek confluences.

At the proposed crossing west of Highway 1, the Pajaro River has been impacted by flood control project, vegetation maintenance project, channelization, and agriculture. The lower twelve miles of river were straightened and confined between levees due to a U.S. Army Corps of Engineers flood control project authorized in 1948. This flood control project and associated maintenance have resulted in habitat simplification, increased summer water temperatures, and a

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smolt out-migration barrier at Murphy's Crossing (due to channel headcutting). An extensive riparian forest within the confines of the levee was removed following flooding of the lower Pajaro in 1995, leading to increased erosion and sedimentation problems in the lower Pajaro River. Runoff from croplands directed to aged, failing, and poorly maintained infrastructure (drainage ditches, culverts, and roads) has caused severe erosion problems throughout the lower watershed (SCCRCD 2001). Sediment from runoff has buried larger substrates associated with typical riffle habitats (AMBAG 1999) important for steelhead feeding. These conditions are expected to continue into the foreseeable future.

2. Pescadero Creek

Pescadero Creek has a drainage area of ten square miles and is one of the better creeks for steelhead in the lower Pajam watershed. The only land use activity in this watershed is cattle grazing. Grazing impacts to this stream and the action area are unknown. **AMBAG** (1983) reported that Pescadero Creek is the only valley-type riparian community in the Santa Cruz County portion of the Pajaro River system which has not been artificially constricted by agriculture and other clearing. Instream macroinvertebrate sampling at eight sites in the Pajaro River **(AMBAG** 1999) suggests the biotic condition of Pescadero (and middle Corralitos Creek) were of considerably higher quality than the other reaches. AMBAG (1999) reported that physical habitat assessments indicated habitat quality probably contributed heavily to the relatively good biotic condition of Pescadero Creek. These general conditions are expected to occur throughout the action area in Pescadero Creek. The mouth of Pescadero Creek, like all tributaries to the Pajaro River, goes dry during the summer months **(AMBAG** 1983). The lower one mile (which includes the area of the proposed crossing) of Pescadero Creek was dry in 1981 **(AMBAG** 1983).

3. Sargent Creek

Sargent Creek is an ephemeral stream and no steelhead survey data or habitat data are known for this creek. The action area within Sargent Creek may provide marginal steelhead habitat during the wet season (PVWMA 2003).

4. Millers Canal

The head of the Pajaro River was originally wetlands associated with San Felipe Lake, a Calaveras Fault sag pond located near Highway 152 east of Gilroy in San Benito County. When the valley flooded, the lake and wetlands drained into the river. To facilitate agricultural development, Millers Canal was constructed, early in the 20th Century, from San Felipe Lake directly to a downstream portion of the Pajaro River near its confluence with Llagas Creek, totally bypassing the upper river (Smith 2002). The majority of the leveed canal traverses agricultural land, however the lower reaches provide marginal steelhead habitat (PVWMA 2003). Other than the lower portion (which includes the action area) the canal is devoid of riparian trees and shrubs and is dry in most summers (AMBAG 1983). The ongoing management of the

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riparian zone along Millers Canal and water management at Pacheco Reservoir has resulted in degraded habitat conditions in the action area. However, this canal serves as the primary steelhead migration route into Pacheco Creek. The remnant Pajaro River Channel receives only local runoff from agricultural fields and pastures, and is often dry (above the action area) during summer (Smith 2002).

V. EFFECTS OF THE PROPOSED ACTION

A. Temporary Loss, Alteration, and Reduction of Aquatic Habitat

Streamflow diversion and workspace dewatering are expected to cause temporary loss, alteration, and reduction of aquatic habitat within the action area. The areal extent of effects will likely be limited to a total of 5,100 sq. ft. of habitat (*600* sq. ft. at Sargent, 1,500 sq. ft. at Pescadero, and **3,000 sq.** ft. at Pajaro River at Graniterock Property (Chittenden)) at the location of the proposed open trench crossings. Stream flow diversions could harm individual S-CCC ESU steelhead by concentrating or stranding them in residual wetted areas (Cushman 1985) or causing them to move to adjacent habitats (Clothier 1953, Clothier 1954, Kraft 1972, Campbell and Scott 1984).

Dewatering the workspace may cause harm, injury, and mortality to S-CCC ESU steelhead by temporarily confining them to areas predisposed to dewatering or desiccation, increased water temperature, decreased dissolved *oxygen* concentration, and predation (Cushman 1985). NOAA Fisheries anticipates juvenile steelhead will be captured and a subset will be harmed because of the proposed action. The specific effects of the proposed action on juvenile S-CCC ESU steelhead are uncertain and depend, in part, on the number of individuals present within the individual action areas. S-CCC ESU steelhead will be moved from workspaces. Direct effects will be largely confined *to* activities associated with physically installing and removing the diversion due to capture and relocation activities.

1. Pajaro River near Graniterock Property (Chittenden)

The majority of the lower Pajaro River serves as a migratory corridor (HRG 1997, Titus *et al.* 2002) for adult steelhead returning to spawn in the river system, and for steelhead smolts emigrating to the ocean. NOAA Fisheries anticipates the likelihood of steelhead presence in the area of the proposed crossing as low, but nonetheless conceivable. If undetected fish are present during dewatering, all of the steelhead juveniles within the project sites at Pajaro River near Graniterock Property (Chittenden; estimated as 3,000 sq. ft. of river bed) will be injured or killed.

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2. Pescadero Creek and Sargent Creek

S-CCC ESU steelhead trout are assumed to be present at both proposed crossings. Individual level of take is quantified below in *Fish **Relocation.*** NOAA Fisheries expects that all juvenile steelhead located within these work areas will be captured and relocated. Therefore, no additional direct impact to individual steelhead is expected.

B. Loss of Aquatic Macroinvertebrates

The benthic (bottom dwelling) aquatic macroinvertebrate assemblage of most waterways comprises numerous species. Aquatic macroinvertebrates provide a source of food for *stream* fish populations and may represent a substantial portion of food items consumed **by** juvenile steelhead at various times of year. Some species of macroinvertebrates **are** found in swift-water habitats such as **runs** and riffles. Riffles are **an** important salmonid food-producing habitat in streams. Any **activity** that affects instream habitats could be expected to affect these food resources.

Benthic aquatic macroinvertebrates may be temporarily lost or their abundance reduced when individual organisms are stranded or when creek habitats are dewatered (Cushman 1985) due to streamflow diversion or workspace or equipment access site dewatering in the action **areas.** Effects to aquatic macroinvertebrates resulting from streamflow diversions and dewatering will be temporary because construction activities will be relatively short-lived, and rapid recolonization (about one to two months) of disturbed areas by macroinvertebrates (Cushman 1985, Thomas 1985, Harvey 1986) is expected following rewatering.

Due to the silty nature of the streambeds within the construction footprints, macroinvertebrate production in the **areas** scheduled for dewatering is l i e l y lower than sites with pool/riffle features where more cobbles and gravels are present. In addition, the effect of macroinvertebrate loss on juvenile steelhead is likely to be negligible because food **from** upstream sources (via **drift)** would be available downstream of the dewatered areas **through** the **creek** diversion devices; and the small area of dewatering is expected to be recolonized by aquatic invertebrates relatively quickly following rewatering. Further, due to the **high** likelihood the proposed pipeline ***crossings*** on Pescadero Creek and Sargent Creek will be ***dry*** during the construction period, adverse impacts are unlikely. Based on the foregoing, the value of the resource is not expected to be diminished by dewatering impacts to the extent that **this** reduction will have a detectable effect to steelhead.

For the sites where underground trenching will be used, a bentonite[2] spill may embed instream substrates to the extent that aquatic macroinvertebrate production in the area would be **reduced** or precluded for several months until flows increase enough to flush the sediment ***out*** of the area.

'Bentonite is a fine sediment mixture used as a lubricant on drilling devices.

Depending on the volume and extent of the bentonite spill, this decrease in localized production would reduce juvenile steelhead feeding success and subsequent growth rates.

1. Millers Crossing: Paiaro River West of Highway 1: Paiaro River West of Highway 101

While underground pipeline construction avoids the potential impacts associated with open trench construction, steelhead and their habitat may nevertheless, be impacted by potential releases of bentonite, into the water course. NOAA Fisheries anticipates the likelihood of steelhead presence in the area of the three proposed underground crossings as low. However, if an accidental spill of bentonite occurs, it is anticipated that up to 1,000 feet of habitat may be embedded for each location for a total of 3,000 feet. NOAA Fisheries anticipates no more than one spill of bentonite will occur for each location, and the likelihood of a spill occumng at all is low. All juvenile steelhead migrating through and rearing within those areas affected by any possible spill are expected to have lowered feeding rates and increased energy expenditures as they search for other instream food sources.

C. Loss of Riparian Habitat

Riparian areas are an essential feature steelhead habitat. The functional values of riparian corridors and the benefits they provide to aquatic systems overall and *stream* fish populations in particular are well documented (Hall and Lantz 1969, Karr and Schlosser 1978, Lowrance *et al.* 1985, Wesche *et al.* 1987, Gregory *et al.* 1991, Platts 1991, Welsch 1991, Castelle *et al.* 1994, Lowrance *et al.* 1995, Wang *et al.* 1997). Loss of riparian vegetation might increase solar radiation and fine sediment input into the creeks, reduce insect drop, and decrease wood debris input to the creeks. The overall detectable effect of riparian removal and alteration on steelhead could be significant with the anticipated loss of 35,400 sq. ft. of riparian habitat. Most of this loss will occur at the Pajaro River at Graniterock Property (Chittenden) crossing due to access road construction.

However, effects from increased sediment input are expected to be minimal due to extensive erosion control measures designated for the action area including planting of riparian vegetation and installation of erosion control devices at all locations where the likelihood of sediment input exists. Effects due to loss of wood recruitment will likely be minimal due to the current paucity of vegetation capable of supplying wood of sufficient size to supply channel forming features such as pools and/or provide persistant instream cover. The potential for insect drop will likely be reduced in the short term, however, due to the relatively small area affected directly adjacent to the stream crossings, this impact is expected to be negligible. The potential effect of increased solar radiation is expected to be negligible due to the flat topography of the action areas and the relatively small amount of vegetation that will be removed directly adjacent to the crossings. The applicant will replace vegetation affected by the proposed action with fast-growing native vegetation using liner seedlings. Thus, the value of *this* habitat is not expected to be diminished to the extent that the reduction will have a long-term negative effect to steelhead.

D. Chemical **Spills**

Equipment refueling, fluid leakage, and maintenance activities within the dry stream channel pose some risk of contamination and potential take. Double containment of fuel and oil reservoirs provide increased protection to the aquatic environment from the risk of accidental spills. However, industry estimates indicate that 75 to 85 percent of all hydraulic fluids eventually leave their systems through slow leaks, catastrophic breaks, or failures of fittings and seals (Midwest Research Institute 1979, Foszcz 1996). Many commonly used hydraulic fluids contain organophosphate ester additives toxic to anadromous salmonids. Acute lethal and sublethal effects are documented in several salmonid species (USGS 2001, Moore and Waring 1996, Sholtz *et al.* 2000) which are particularly sensitive (vs. warmwater fish) to organophosphates due to differential metabolic and detoxification mechanisms (Mayer *et al.* 1976).

Accidental failure of a hydraulic fluid hose from mechanized equipment may likely result in direct adverse effects to steelhead downstream of the dewatered portion of the stream. As hydraulic fluid hoses are pressurized and have no secondary containment features, it is conceivable a broken hose could squirt its contents into the wetted stream areas. Minimization measures included in the project proposal address a substantial portion of this risk, however, some adverse affects are still possible due to accidents.

1. Pescadero and Sargent Creek Stream Crossings

NOAA Fisheries anticipates steelhead will be present downstream of the proposed crossings on Pescadero and Sargent Creeks. Harm or death may occur to steelhead downstream of the proposed crossing, should an accidental hydraulic fluid spill occur. If a hydraulic fluid hose breaks, NOAA Fisheries anticipates that all juvenile steelhead in the affected areas could be killed or suffer other physiological harm that could reduce growth and future reproductive and survival rates. If an accidental spill of hydraulic fluid occurs, it is anticipated that up to 1,000 feet of habitat below each crossing may be contaminated by levels of fluid concentrated enough to cause lethal and sublethal responses in affected steelhead. NOAA Fisheries anticipates no more than one spill of hydraulic fluid will happen for each location and the likelihood of a spill is low.

2. Paiaro River at Graniterock Property (Chittenden)

If an accidental spill of hydraulic fluid occurs, NOAA Fisheries anticipates that up to 1,000 feet of habitat below each crossing may be contaminated by levels of fluid concentrated enough to cause lethal and sublethal responses in affected steelhead. NOAA Fisheries anticipates no more than one spill of hydraulic fluid will happen for each location and the likelihood of a spill is low. NOAA Fisheries does not expect steelhead to be present within the areas downstream of this project site during the construction phase, although based on habitat and flow conditions, a few

juvenile steelhead may be present. As a result, individual fish affected by a spill may be killed or seriously injured, however there are likely to be few fish so affected.

E. Sedimentation

Increased sedimentation rates could result if fine sediment is contributed to the creeks, or mobilized, during the proposed action. This, in turn, could affect water quality and the channel bed. Specific sedimentation rates would depend on the duration, volume, and frequency sediment is contributed to the creeks. Substantial sedimentation rates could bury less mobile organisms (Ellis **1936,** Cordone and Kelley 1961) that serve as a food source for many fish species, degrade instream habitat conditions (Cordone and Kelly **1961,** Eaglin and Hubert **1993),** infiltrate redds resulting in progressively lower egg survival (Tappel and Bjomn **1983,** McNeil and Ahnell **1964,** Reiser and White **1988,** Tagart **1984),** and cause reductions in fish abundance (Alexander and Hansen **1986,** Berkman and Rabeni **1987)** and growth (Crouse ***et al.* 1991).**

The extent steelhead are harmed by sedimentation depends partially on the extent that post-project action substrate conditions differ from pre-project action conditions. Although specific sedimentation rates have not been estimated, they are expected to be low and temporary because the project proponent proposes to isolate the workspace from flowing water, install erosion control devices (sediment curtains) and implement sediment control measures at the time of the proposed action and throughout the winter period, and limit the in-channel work window. Beyond the effects to steelhead resulting from loss of macroinvertebrate production discussed above, no fiuther adverse effects to individual steelhead are expected from project sediment impacts.

F. Turbidity

Turbidity refers to the amount of light scattered or absorbed by a fluid. Turbidity due to suspended particulate matter (sediment) is likely low in the creeks throughout most of a given year. Suspended sediment produces little or no direct mortality on adult fish at levels observed in natural, relatively unpolluted streams (Waters 1995). High concentrations of suspended sediment can result in direct mortality (Lloyd **1987,** Sigler ***et al.* 1984,** McLeay ***et al.* 1984,** McLeay ***et al.* 1983)** or deleterious sublethal effects to fish (Bisson and Bilby **1982,** Cleary **1956,** Reynolds ***et al.* 1989,** Herbert and Merken **1961,** Newcomb and Flagg 1983).

Elevated levels of turbidity may result when fine sediment is contributed to the creek, or mobilized, during the proposed action. This could result in increased gill abrasion and decreased feeding activity. The duration and concentration of the turbidity would depend partially on the length of time required to construct the proposed action, and the volume and rate that sediment is contributed to the creek, or mobilized, during construction activities.

The effect of any elevated turbidity level on juvenile salmonids is difficult to evaluate, because the amount of sediment contributed and the resulting turbidity level is speculative. An increase

is likely to be temporary and minor because Reclamation proposes to isolate the workspace from flowing water, to install erosion control devices at the time of the proposed action, have monitors in place for open trench and trenchless crossings, and to detain sediment laden water on-site. Nevertheless, NOAA Fisheries anticipates that turbidity levels may increase, albeit briefly, over background levels due to the nature of the proposed action, rewatering of areas dewatered for construction, or accidental releases of bentonite for trenchless construction activities. Increased turbidity could further degrade already degraded habitat conditions at Millers Crossing, Pajaro River west of Highway 1, Pajaro River West of Highway 101, and Pajaro River at Graniterock Property (Chittenden). All juvenile steelhead within the affected areas may be injured by gill abrasion or harmed when turbid conditions reduce their feeding success and lower growth rates.

1. Millers Crossing: Pajaro River West of Highway 1: Pajaro River West of Highway 101

While underground pipeline construction avoids the potential impacts associated with open trench construction, steelhead and their habitat may nevertheless, be impacted by accidental releases of bentonite into the water course. NOAA Fisheries anticipates the likelihood of steelhead presence in the area of the three proposed underground crossings as low. However, if an accidental spill of bentonite occurs, it is anticipated that up to 1,000 feet of habitat may be embedded for each location for a total of 3,000 feet. NOAA Fisheries anticipates no more than one spill of bentonite will occur for each location, and the likelihood of a spill occurring at all is low. All juvenile steelhead migrating through and rearing within those areas affected by any possible spill are expected to experience gill abrasion dependent upon the amount of bentonite spilled and have lowered feeding rates and increased energy expenditures as they search for other instream food sources.

2. Paiaro River at Graniterock Property (Chittenden)

Turbidity levels may increase at this crossing due to the nature of the proposed action and rewatering of areas dewatered for construction. Turbidity levels high enough to cause gill abrasion or reduce feeding success may occur up to 1,000 feet of habitat downstream of the proposed crossing. If turbidity levels do increase when the site is rewatered, all juvenile steelhead within this area are expected to be injured or harmed by the increase in turbidity. Based on habitat conditions and the timing of construction, NOAA Fisheries anticipates the likelihood of steelhead presence in the area of this crossing as low .

3. Sargent Creek and Pescadero Creek

Turbidity levels may increase at this crossing due to the nature of the proposed action and rewatering of areas dewatered for construction. NOAA Fisheries anticipates steelhead presence downstream of these proposed crossing for both creeks down to their confluence with the Pajaro River. Turbidity levels high enough to cause gill abrasion or reduce feeding success could occur up to 1,000 feet of habitat downstream of each proposed crossing for a total distance of 2,000 feet. However, the number of S-CCC ESU steelhead that may be injured or harmed in these

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action areas is likely minimal due to the minimization and avoidance measures Reclamation has proposed to implement which should keep turbidity level increases low.

G. **Fish** Relocation

Any fish collection gear, whether passive (Hubert 1983) or active (Hayes 1983) has some associated risk to the fish, including stress, disease transmission, injury, or death. Electrofishing *can* kill both juvenile and adult fish (Reynolds 1983, Zeigenfuss 1995, Habera ***et al.*** 1999, Nordwall 1999). The amount of unintentional mortality attributable to electroshocking may vary widely depending on the equipment used, the settings on the equipment, ambient conditions, and the expertise and experience of the personnel. The effects to fish from electroshocking *can* be severe, and may include death, spinal injuries, bums, hemorrhaging, and physiological stress. Sharber and Carothers (1988) reported that electroshocking caused a 50-percent mortality level in adult rainbow trout. Habera ***et al.*** (1996) reported overall mortality rates of 20 percent for rainbow trout less than 100 mm in length and six percent for those more than 100 mm using a three-pass depletion method. Habera ***et al.*** (1996) also reported an overall injury rate of six percent. Long-term effects of electroshocking on both juveniles and adult salmonids are not well understood; although chronic effects may occur, it is assumed that most impacts from electroshocking occur at the time of sampling.

Thus, the possibility of harm and mortality to steelhead smolts captured and moved through relocation activities does exist. With implementation of protocols used in capturing fish for relocation, unintentional mortality of listed juvenile steelhead expected from capture and handling procedures is not likely to exceed three percent (according to a NOAA Fisheries Southwest Region review of **ESA** section 10 permit salmonid mortality rates) of the fish handled, and may be reduced to approximately one percent with increased skill and experience of the fish relocation personnel.

The applicant proposes to relocate fish from the areas to be dewatered by stunning them with backpack electroshockers, netting them, placing the fish in buckets, and moving them to adjacent suitable habitats. NOAA Fisheries anticipates that approximately 300 juvenile steelhead could be relocated as a result of *this* proposed action. Assuming a worse case scenario of three percent mortality from electrofishing, nine of the 300 steelhead may be killed.

1. Pescadero Creek

The best available data regarding steeihead use of Pescadero Creek is presented in Smith (1982). Two sites in the upper watershed, located at channel miles 4.7 and 6.4, were surveyed during the fall of 1981. Unfortunately, the report only presents data on observed smolt densities. Both sites contained 5.0 smolts per ten feet of channel length. Assuming a conservative juvenile-to-smolt rate of ten percent NOAA Fisheries estimates that the surveyed reaches of Pescadero Creek would support approximately 50 juvenile steelhead per 10 feet of channel. Based on Smith's

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(1982) estimates, a total of 150 steelhead (50 fish per 10 feet of channel length by 30 LF of dewatering and subsequent construction) are expected to occur within the construction corridor.

The proposed location of the pipeline crossing is located immediately north of the Union Pacific Railroad tracks, 400 feet upstream of the creek's confluence with the Pajaro River. In the absence of survey data from this stream location, NOAA Fisheries assumes juvenile densities are the same at those observed by Smith (1982). This presents a conservative estimate considering habitat conditions at the proposed crossing site are less favorable than in the upper watershed. Furthermore, Pescadero Creek is known to dry out in the vicinity of the proposed construction area during all but the wettest years. NOAA Fisheries reasons that estimating take based on the above conservative estimates of incidental take from this project is prudent because it allows an analysis of a "worse case scenario" of potential adverse affects to S-CCC ESU steelhead. NOAA Fisheries expects that all S-CCC ESU present in the area proposed for dewatering will be captured and removed.

2. Sargent Creek

The proposed pipeline crossing for this drainage is located approximately one mile east of the proposed Pescadero Creek crossing. No steelhead survey data appears to be available for this creek. Although this is an ephemeral stream and is even more likely to be dry during the proposed construction period than Pescadero Creek, it may provide marginal steelhead spawning habitat during the winter and early spring. Therefore, under the conservative assumption if the channel should remain wetted during the summer and fall, it would support the same juvenile steelhead densities of 50 fish per ten feet of channel length as Pescadero Creek. Based on Smith's (1982) estimates, a total of 150 steelhead (50 fish per 10 feet of channel length by 30 LF of dewatering and subsequent construction) are expected to occur within the construction corridor. NOAA Fisheries reasons that estimating take based on the above conservative estimates of incidental take from this project is prudent because it allows an analysis of a "worse case scenario" of potential adverse affects to S-CCC ESU steelhead. NOAA Fisheries expects that all S-CCC ESU present in the area proposed for dewatering will be captured and removed.

H. Effects of Pipeline Operation

Delivery of CVP water will alleviate problems associated with groundwater overdraft and subsequent seawater intrusion into the groundwater aquifer stemming from agricultural pumping in the lower Pajaro Valley. Irrigated agricultural land constitutes 30,200 acres of the 79,600-acre service area and the PVWMA has no plans to extend service beyond areas currently irrigated.

The availability of a reliable water supply is anticipated to provide a positive incentive to maintaining long-term agriculture in the Pajaro Valley and may increase surface water elevations in fish bearing streams due to a reduction in groundwater pumping. However, it is conceivable additional water may facilitate conversion of native lands to agriculture. However, assessing these effects is speculative as the Pajaro Valley has been almost completely developed for

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agriculture already. A reliable water supply may also facilitate the rate of conversion of agricultural land to urban/suburban uses. Again, this impact is speculative as the stated goal of the project is to maintain agricultural lands for agriculture rather than for future urban development. No information is presently available to assess the likelihood of agriculture to urban. conversion.

Water from Reclamation will come from existing Central Valley Project (CVP) water assignments. No new CVP diversions from the Delta or from Reclamation's other points of diversion have been authorized by the State of California Water Resources Control Board (SWRCB) for this project. The SWRCB authorization of Reclamation's CVP Place of Use made this a condition of Reclamation's water rights permit. The PVWMA has purchased a contract assignment from the Mercy Springs Water District for 6,260 AF and will be seeking to purchase other assignment from other sources (the stated goal of PVWMA is 13,400 AF). As these contracts are not yet complete, any attempt to assess interrelated and interdependent effects to listed salmonids is speculative. Some water from the Mercy Springs Water District is currently being used by the County of San Benito and the County of Santa Clara, however some of the water may not be used currently. The effects of this water use to listed species from its point of origin is unknown, however, according to consultants to PVWMA, reduced flows to Central Valley streams were not identified as an impact from the Mercy Springs contract assignment, while increased use of groundwater was. Impacts to listed salmonids from increased groundwater use is unknown.

In the Pajaro Valley, the long-term effect of the proposed project would be an increase in groundwater elevations of five feet in the Pinto Lake area and 15 feet in the Pajaro Lagoon area Modeling of changes to groundwater resulting fiom water importation has suggested streamflows into the Pajaro Lagoon will increase, on a long-term average basis, by six cubic feet per second (PVWMA 2003). Surface water diversions, and the associated reductions of streamflows, have long been understood to adversely affect the natural function of lagoon systems (Smith 1987, Moyle 2002). Thus, the proposed project may have an overall beneficial impact on the natural hydrology and ecosystem of the Pajaro Lagoon by increasing freshwater input.

While the project provides water only to agricultural uses, the PVWMA has accounted for projected future (2040) urban water demands in order to plan long-term groundwater basin management. The PVWMA has advocated that not implementing the proposed project could result in urban growth (PVWMA 2003). Continued pumping under current groundwater pumping practices, absent a supplemental water supply, would worsen seawater intrusion conditions and thus, preclude cultivation throughout an increasingly larger area within the Pajaro Valley. Under these circumstances it is likely pumping restrictions would be imposed throughout the lower Pajaro River basin. To stop seawater intrusion, water for agriculture would be reduced by 80 percent while urban supplies would remain at current levels. A subsequent decline in property values would likely create pressure for conversion of fallowed farmland to urban or other uses that require less water than agriculture. NOAA Fisheries expects maintenance of agriculture in the Pajaro Valley at current levels will not create additional

adverse effects nor additional beneficial effects to S-CCC ESU steelhead beyond current conditions described in the ***Status of the Species*** and ***Environmental Baseline.***

V. CUMULATIVE EFFECTS

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

Both Santa Clara and San Benito Counties reported no major development projects are occurring in the upper Pajam River watershed **(PVWMA 2003).** The City of Gilroy reported a large residential development known as the Glen Loma Ranch development has been proposed. This development project would be located on approximately **392** acres southwest of the City of Gilroy. This project will likely involve a number of adverse effects to steelhead including; new sources of sedimentation, depletion of ground waterresources, **and** increased ***run-off*** from non-permeable surfaces. Increased run-off and sedimentation could further degrade instream habitat on the action areas in the mainstem Pajaro River.

VI. INTEGRATION AND SYNTHESIS OF EFFECTS

The construction of the pipeline to deliver CVP water into the lower Pajaro Valley will capture, harm, injure, and kill juvenile S-CCC ESU steelhead. Steelhead present in areas to be dewatered will be captured and relocated, and a small percentage may die or be injured as a result. ***All*** of these fish would be killed if ***they*** remained within areas to be dewatered, however. Steelhead present in the action area may be disturbed, displaced, injured, or killed by project activities. NOAA Fisheries expects that all S-CCC ESU present in the areas proposed for dewatering will be captured and removed, except those fish on the Pajaro River mainstem that are undetected within the area to be dewatered. Up to 1000 feet of habitat below the trenchless crossings on Millers Canal, Pajam River west of Highway 1, and Pajaro River west of Highway **101** may have increased turbidity and sedimentation levels if an accidental release of bentonite occurs, for a total of **3,000** feet. Up to 1000 feet of habitat below each of the crossings at Pajam River at Graniterock Property (Chittenden), Pescadero, and Sargent Creeks may have increased turbidity levels from construction activities and rewatering of the crossing location, or become contaminated by high levels of hydraulic fluid if an accidental spill occurs, for a total of 3,000 feet. ***As a*** result of these sediment and contaminant impacts, steelhead within these areas will be killed or injured. In addition, NOAA Fisheries estimates that a total of 5,100 sq. ft. or river and streambed will be impacted due to temporary loss on instream habitat from open trench pipe construction.

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The proposed project minimization and conservation measures avoid and minimize short-term risks to steelhead. Additionally, the use of trenchless construction techniques for some of the stream crossings significantly minimizes adverse effects to steelhead and their habitat.

Most of the open trench pipeline construction activities will occur when the smaller creeks are dry or, on the mainstem Pajaro River (Chittenden Pass), when steelhead are not likely to be present. However, if the Sargent Creek and Pescadero Creek crossings are not dry during the time of construction, capture and relocation efforts will be necessary to minimize the possible adverse effects of work within the wetted channel.

The mainstem Pajaro River currently does not appear to provide juvenile rearing habitats during the summer and fall, primarily due to high water temperatures, sandy substrates, and limited food supplies. Surveys conducted over the past decades (Smith 1982) have failed to detect juvenile presence in the mainstem. However, the survey effort has been inconsistent (Titus *et al.* 1999) and no recent survey information is available. NOAA Fisheries believes that a small number of juvenile steelhead may be present in the action areas on the mainstem Pajaro and Millers Canal. Fish exposed to elevated turbidity levels, sedimentation, or accidental bentonite spills are expected to experience gill abrasion, reduced feeding success, and possibly death depending on the amount and duration of the impacts.

Long-term effects from this project to steelhead may be beneficial due to potential increases in surface flows and potential reduction in urban development pressure in the lower Pajaro River. At worse, long-term impacts associated with this project are anticipated to neither improve nor further degrade conditions for steelhead in the action area-

Temporary impacts will be localized and sufficient contingency measures are proposed to minimize adverse impacts. At the Sargent and Pescadero Creek crossings, impacts to the sub-population will be minimal and temporary, because the action occurs one time at each site and juvenile steelhead will be relocated with minimal associated death and injury. Impacts to the sub-population due to adverse habitat modification are expected to be low due to the low likelihood steelhead will be present at the mainstem Pajaro River crossings or Millers Canal during construction.

Steelhead reproductive strategy results in thousands of fertiliied eggs per adult per year and, in both natural and degraded settings (i.e., the Pajaro River), most eggs do not survive to become adults. Given the naturally low survival chances per individual, the small amount of expected mortality during project construction is unlikely to have a detectable effect on population abundance or viability. The effects of the project are not expected to appreciably reduce the number, distribution, or reproduction of the Pajaro River sub-population of steelhead. This conclusion is based, in large part, on the conservation and minimization measures proposed by the PVWMA to reduce impacts from construction to S-CCC ESU steelhead. Most project-related impacts will be of limited scope and duration, and therefore are not expected to have long term effects on the survival of the species within the action area or at the ESU level.

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VII. CONCLUSION

After reviewing the best available scientific and commercial information, the current status of S-CCC ESU steelhead, the environmental baseline for the action area, the effects of the proposed projects and the cumulative effects, it is NOAA Fisheries' biological opinion that the proposed project is not likely to jeopardize the continued existence of S-CCC ESU steelhead.

VIII. INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by NOAA Fisheries as an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are nondiscretionary, and must be undertaken by Reclamation for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation (1) fails to assume and implement the terms and conditions or (2) fails to require its designees to adhere io the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Reclamation must report the progress of the actions and its impact on the species to NOAA Fisheries as specified in the incidental take statement. (50 CFR §402.14(I)(3)).

A. Amount or Extent of Take

NOAA Fisheries anticipates that juvenile steelhead will be captured, harmed, wounded and killed as a result of the proposed action. All capture of juvenile steelhead for relocation purposes is exempted. NOAA Fisheries estimates that approximately 300 juvenile steelhead are liiely to be captured and relocated as a result of this proposed project. Three percent of these captured fish are anticipated to be killed. Thus, NOAA Fisheries estimates that nine of the 300 juvenile steelhead would be killed as a result of relocation activities at the Sargent Creek and Pescadero Creek crossings. As no relocation efforts will be conducted at the Pajaro River crossing at

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Graniterock due to the expected absence of steelhead juveniles in this area during the construction period, all undetected steelhead juveniles at this site will be killed by dewatering.

In addition, juvenile steelhead are likely to be harmed and killed downstream of some of the project sites by increases in sediment and turbidity and accidental releases of bentonite or hydraulic fluid. The number of S-CCC ESU steelhead that may be incidentally taken at Pajaro River near Graniterock Property (Chittenden), Pajaro River West of Highway 1, Pajaro River West of Highway 101, and Millers Canal during project activities has been determined to be minimal, but cannot be accurately quantified due to (1) the unknown level of harm or mortality that might occur when juvenile fish are displaced to other habitat areas of the stream; (2) the uncertainty of steelhead presence in the action areas; and (3) the unknown level of harassment, harm, or mortality resulting from rewatering of the construction areas, accidental releases of bentonite, and/or accidental releases of hydraulic fluid. In instances where NOAA Fisheries can not quantify the amount of incidental take, surrogates such as the extent of habitat affected or modified by the proposed action are used. Impacts to steelhead at these locations were analyzed in the ***Effects of the Proposed Action*** using habitat as a surrogate.

1. Paiaro River near Graniterock Property (Chittenden)

A total of 1,000 LF of instream habitat downstream of the proposed crossing due to turbidity from construction and accidental chemical spills. A total of 3,000 sq. ft. of riverbed due to temporary loss of habitat resulting from open trench pipeline construction.

2. Pescadero

A total of 150 steelhead are expected to be captured and relocated within the construction corridor. A total of 1,000 LF of instream habitat downstream of the proposed crossing due to turbidity from construction and accidental chemical spills.

3. Sargent Creek

A total of 150 steelhead are expected to be captured and relocated within the construction corridor. A total of 1,000 LF of instream habitat downstream of the proposed crossing due to turbidity from construction and accidental chemical spills.

4. Millers Crossing: Paiaro River West of Highway 1; Paiaro River West of Highway 101

NOAA Fisheries anticipates the likelihood of steelhead presence in the area of three proposed crossings as low, but nonetheless possible due to the presence of useable habitat. A total of 1000 LF of instream habitat downstream of the proposed crossings for each site, due to turbidity, accidental chemical spills, and sedimentation, for a total distance of 3000 LF.

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B. Effect of the Take

Within this biological opinion, NOAA Fisheries determined this level of anticipated take is not likely to result in jeopardy to the species.

This incidental take statement is based on full implementation of the proposed pipeline construction project as described in the Description of the Proposed Action section of this biological opinion, including impact minimization and conservation measures incorporated into the project design, Failure to implement the project as proposed (including relevant conservation measures) or implementation of the project in a manner that causes an effect *to* listed species not adequately considered in this opinion may cause coverage of section 7(o)(2) to lapse and require reinitiation of consultation to ensure compliance with section 7(a)(2) of the ESA.

C. Reasonable and Prudent Measures

Pursuant to section 7(b)(4) of the ESA, the following reasonable and prudent measures are necessary and appropriate to minimize take of S-CCC ESU steelhead

1. Impacts to salmonids will be minimized during and after pipeline construction.

2. Implementation of proper procedures for the capture, handling, transport, and placement of juvenile salmonids will be used during fish relocation efforts.

3. The project site will be monitored during construction to prevent adverse effects to listed salmonids. Project documentation will be forwarded to NOAA Fisheries.

4. A spill prevention plan will be in place prior to construction.

D. Terms and Conditions

In order to be exempt from the take prohibitions of the ESA, Reclamation and the PVWMA must comply with the following Terms and Conditions, which implement the Reasonable and Prudent Measures described above and outline reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following Terms and Conditions implement Reasonable and Prudent Measure No. 1.

1. Additional (to those described in the project description) erosion control measures and sediment detention devices shall be implemented at the time of construction. These devices shall be in place during and after construction activities for the purposes of minimizing fine sediment and sediment/water slurry input to flowing water and of detaining sediment-laden water on site. The devices shall be properly installed at all locations where the likelihood of sediment input exists.

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The following procedures shall apply for erosion control measures associated with open trench pipeline construction, road construction in riparian areas, and riparian vegetation removal.

a. Revegetate all soil exposed as a result of the proposed action before 1 November of each construction year.

b. **Possess** 125 percent of the necessary erosion control material on site at all times during construction for all erosion and water pollution control needs.

c. Inspect and repair/maintain all erosion control practices prior to and after any rainfall event exceeding ½ inch, at **24-hour** intervals during extended **storm** events, and a minimum of every two weeks the first winter following completion.

d. During the winter period (defined **as** October 15 **through** May 15), **all** inactive areas (defined **as** no construction for **a** five-day period) shall have all the necessary soil stabilization practices put in place two days after identification of inactivity or before a rain event, whichever comes first.

e. Remove all artificial erosion control devices after the project area **has** fully stabilized.

f. If the thalweg of the stream **has** been altered due to construction activities, efforts will be undertaken to reestablish it to its original configuration.

The following **Terms** and Condition implement Reasonable and Prudent Measure No. 2.

1. The biological monitor shall capture and relocate listed salmonids prior to construction of the streamflow diversion. The biological monitor **shall** note the number of salmonids observed in the affected area, the number and *species* of salmonids relocated, **and** the date and time of collection and relocation.

The following procedures shall be followed for relocating fish:

a. Notify **NOAA Fisheries** one week prior to capture and relocation of salmonids to provide NOAA Fisheries an opportunity to attend (call Jonathan Ambrose at 707-575-6091 or via email at **jonathan.ambrose@noaa.gov).**

b. Block nets shall be placed at the upper and lower extent of the areas to be electrofished. Block net mesh will be sized to ensure salmonids **upstream** or downstream do not enter the areas proposed for dewatering between

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passes with the electrofisher. Block nets will extend across the entire wetted channel.

c. Block nets will not be removed until successful construction of the coffer dams and pipeline installations are complete.

d. The backpack electrofisher will be set as follows when capturing fish

A) Voltage: 100V (IN) - 300V (MX)
B) Duration: 500s (IN)- 5ms (MX)
C) Frequency: 30 Hz (IN) - 70 Hz (MX)

e. A minimum of three passes with the electrofisher will be utilized to ensure maximum capture probability of steelhead within the area proposed for dewatering.

f. No electrofishing shall occur if water conductivity is greater than 350 s/cm or when instream water temperatures exceed 18" Celsius. *Only* direct current (DC) shall be used.

g. All captured fish will be processed and released prior to each subsequent pass with the electrofisher in the area to be dewatered.

h. All captured fish will be allowed to recover from electrofishing before being returned to the stream.

i. Captured fish shall be kept in cool, shaded, aerated water protected from noise or jostling any time they are not in the stream. Fish shall not be removed from this water except for (1) collection of genetic material and *(2)* upon release.

j. A minimum of one assistant will aid the biological monitor during electrofishing (and dewatering) by netting stunned fish and other aquatic vertebrates.

k. Fish shall not be overcrowded into buckets; allowing approximately six cubic inches per 0+ individual and more for larger/older fish.

l. Make every effort not to *mix* 0+ with larger steelhead, or other potential predators, that may consume the smaller salmonids.

m. All non-salmonid aquatic vertebrates will be collected and relocated during electrofishing activities. Sculpins (*Cottus sp.*) and Pacific-giant

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salamanders (Dicamptodon *ensatus)* should not be relocated so as to concentrate them in one area. Particular emphasis shall be placed on avoiding the steelhead trout relocation pools. To minimize predation on salmonids these species should be distributed throughout the wetted portion of the stream.

a. All steelhead shall be relocated upstream of the pipeline construction project and placed in suitable habitat. Captured fish will be placed into a pool, preferably with a depth of greater than two feet with available instream cover.

2. All steelhead in areas proposed for dewatering may be captured and relocated. If nine or more listed salmonids (> three percent mortality) are found dead or injnred as a result of relocation activities, the project permitee shall contact NOAA Fisheries' biologist Jonathan Ambrose by phone ((707)-575-6091) immediately. If Mr. Ambrose cannot be reached, the Santa Rosa NOAA Fisheries Office will be contacted at (707)-575-6050. The purpose of the contact is to review the activities resulting in take and to determine if additional protective measures are required. All Federally listed species mortalities must be retained, placed in an appropriately sized whirl-pak or zip-lock bag, labeled with the date and time of collection, fork length, location of capture, and frozen as soon as possible. Frozen samples must be retained until specific instructions are provided by NOAA Fisheries.

3. The biological monitor will possess a valid State of California Scientific Collection Permit as issued by the California Department of Fish and Game.

4. Although not expected to occur in the project area, any coho salmon collected will be photographed and immediately, upon collection of genetic material (per collection protocols outlined in #5 below), placed upstream of the dewatered area in pool habitat. Photographs will emphasize documenting physical attributes unique to this species including dorsal fins, parr marks, eyes, and anal fin. All photographs will include references for scale to allow accurate estimation of each individuals length. The biological monitor will inform Mr. Jonathan Ambrose of the NOAA Fisheries ((707) 575-6091) at the earliest possible opportunity. Reclamation will be required to reinitiate consultation.

5. For all salmonids captured, genetic tissue shall be collected according to the following methods:

a. Live fish: Cut a three millimeter (mm) square clip from tail fin using clean scissors and place the clip in a piece of *dry* blotter/filter paper (e.g.,

Whatman brand). Fold blotter paper over for temporary storage. Samples must be air-dried as soon as possible (don't wait more than eight hours). Air-drying inside takes about 24 hours; air-drying in the sun is much quicker. When tissue/paper is dry to the touch, place both into a clean envelope labeled with Sample ID Number. Seal envelope.

b. Live fish (alternate method): Cut a 3 mm square clip from tail fin using clean scissors and store the clip in a small (e.g., 2 ml) vial filled with pure ethanol. Sample must be fully immersed in ethanol. Ethanol dissolves all inks, so make sure vials are well sealed and outside is dry. Label with Sample ID Number.

c. Carcasses: Either a 1 cm square clip from the operculum or tail fin, or alternately, complete scales (20-30) should be removed and placed on a piece of dry blotter/filter paper (e.g., Whatman brand). Fold blotter paper over for temporary storage. Samples must be air-dried as soon as possible (don't wait more than eight hours). When tissue/paper is dry to the touch, place into a clean envelope labeled with Sample ID Number. Seal envelope.

Additional guidelines:

Never cut adipose fin.
Each sample must be stored in a separate tube or envelope.
Each sample must be clearly labeled with the Sample ID Number.
Samples may be sent surface mail.
Samples are for scientific research. Please take care in their collection.

d. Genetic material shall be provided to the Salmonid Genetic Repository, NOAA Fisheries Science Center, 110 Shaffer Road, Santa Cruz, California, 95060. Please contact Dr. Carlos Garza at (831) 420-3903 with questions or for additional instructions. The following information shall be part of the Genetic Tissue Collection Data:

Collection Date;
Collection Location (County, River, Exact location on river);
Collector Name;
Collector Affiliation/Phone;
Sample ID Number;
Species;
Species Tissue Type;
Condition;
Fork Length (mm);

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Sex (M, F, Unk.);
Adipose Fin Clip? (Y or N);
Tag? (Y or N);
Notes/Comments.

The following Terms and Conditions implement Reasonable and Prudent Measure 3.

2. The biological monitor shall monitor work activities and instream habitat a minimum of two times per week for the purpose of identifying and reconciling any condition that could adversely affect salmonids or their habitat.

3. A written report shall be provided to NOAA Fisheries (Jonathan Ambrose) within 90 working days following the completion of the proposed action. The report shall include the number of S-CCC ESU steelhead; the number and size (in' millimeters) of S-CCC ESU steelhead captured and removed; any effect of the proposed action on S-CCC ESU steelhead; and, photographs taken before, during, and after the activity from photo reference points.

4. The applicant shall provide a yearly written report to Mr. Jonathan Ambrose at 777 Sonoma Avenue, Rm. 325, Santa Rosa, California, 95404, describing results of the revegetation project for a minimum of two calender years upon completion of the proposed project.

5. If plantings do not successfully establish themselves after one calender year of project completion, additional revegetation efforts will be required. Success is determined as 70 percent survival after five years (per Project Description).

The following Terms and Condition implement Reasonable and Prudent Measure 4.

1. Oil absorbent and spill containment materials will be located on site when 'mechanical equipment is in operation with 100 feet of the proposed watercourse crossings. If a spill occurs, (1) no additional work will occur in-channel until the mechanical equipment is inspected by the contractor and PVWMA and the leak has been repaired, (2) the spill has been contained, and (3) the California Department of Fish and Game and NOAA Fisheries are contacted and have evaluated the impacts of the spill. Prior to construction, all mechanical equipment shall be thoroughly inspected and evaluated for the potential of fluid leakage. All questionable motor oil, coolant, transmission fluid, and hydraulic fluid hoses, fitting, and seals will be replaced. The contractor will document in writing all hoses, fittings, and seals replaced and shall keep this documentation until the completion of operations. All mechanical equipment used for the stream course crossings will be inspected on a daily basis to ensure there are no motor oil, transmission fluid, hydraulic fluid, or coolant leaks. All leaks will be repaired in

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the equipment staging area or other suitable location prior to resumption of construction activity.

2. Hydraulic fluids in mechanical equipment working within the stream channel shall not contain organophosphate esters.

3. If sandbags are used for cofferdam construction, rather than sheetpiles, visqueen will be placed over the sandbags to minimize water seepage into the construction areas.

4. Monitors will be on site during trenchless stream crossings at Millers Canal, Pajaro River west of Highway 1, Pajaro River west of Highway 101, and any other wetted stream channel to monitor for potential bentonite spills.

   a. If bentonite is observed entering the water column, construction will stop immediately.

   b. Pressurized grout will be injected into the streambed through pre-drilled holes in order to seal fissures in bedrock strata.

   c. Construction will not resume until grout has cured.

NOAA Fisheries expects that approximately 300 S-CCC ESU steelhead (of which nine may be mortalities) will be taken and; 3,500 linear feet and 38,400 sq. ft. of steelhead habitat will be adversely affected as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal action agency must immediately provide an explanation of the causes of the taking and review with NOAA Fisheries the need for possible modification of the reasonable and prudent measures.

IX. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA *directs* Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

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NOAA Fisheries recommends Reclamation promote establishment of effective erosion control measures for all CVP water contractors in the Pajaro basin. The fish bearing streams have been heavily degraded due to excess input of fine sediment due in large part to past and current agricultural practices in the basin. Promotion of riparian cover in stream and ditches draining many of the agricultural lands in the Pajaro basin would reduce erosion rates and promote recovery of S-CCC ESU habitat.

In order for NOAA Fisheries to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NOAA Fisheries requests notification of the implementation of any conservation recommendations.

X. REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request. 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 retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the action that may affect listed species in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species not considered in the biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, formal consultation shall be reinitiated immediately.

XI. LITERATURE CITED

Alexander, G. R., and E. A. Hansen. 1986. Sand bed load in a brook trout stream. N. Am. J. of Fish. Man. 69-23.

AMBAG (Association of Monterey Bay Area Governments). 1983. Detailed field study report. Pajaro River habitat management study. Marina, CA.

AMBAG (Association of Monterey Bay Area Governments). 1999. Draft - Water quality management plan for the Pajaro River watershed. Marina, CA.

Barnhart, R.A. 1986. Species Profiles: life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest), steelhead. U.S. Fish Wildl. Serv. Biol. Rep. 82(11.60), 21 p.

Beamish, R .J., and D. R. Bouillion. 1993. Pacific salmon production trends in relation to climate. Canadian Journal of Fisheries and Aquatic Sciences 50:1002-1016.

EXHIBIT M

312

Beamish, R. J., C. M. Neville, and A. J. Cass. 1997. Production of Fraser River sockeye salmon (Oncorhynchus nerka) in relation to decadal-scale changes in the climate and the ocean. Canadian Journal of Fisheries and Aquatic Sciences 54543-554.

Bell, M.C. 1973. Fisheries Handbook of Engineering Requirements and Biological Criteria U.S. Army Corps of Engineers, Portland, OR. Contract No. DACW57-68-C-006.

Berg, L., and T. G. Northcote. 1985. Changes in territorial, gill-flaring, and feeding behavior in juvenile coho salmon *(Oncorhynchuskisutch)* following short-term pulses of suspended sediment. Can. J. of Fish. and Aq. Sci. 42:1410-1417.

Berggren, T. J. and M. J. Filardo. 1993. An analysis of variables influencing the migration of juvenile salmonidsin the Columbia River Basin. North American Journal of Fisheries Management 13:48-63.

Berkman, H. E., and C. F. Rabeni. 1987. Effect of siltation on stream fish communities. Env. Bio. of Fishes 18:285-294.

Bilby, R. E., B. R. Fransen, and P. A. Bisson. 1996. Incorporation of nitrogen and carbon from spawning coho salmon into the trophic system of small streams: evidence from stable isotopes. Canadian Journal of Fisheries and Aquatic Sciences 53:164-173.

Bilby, R. E., B. R. Fransen, P. A. Bisson and J. K. Walter. 1998. Response of juvenile coho salmon (*Onchorynchus kisutch*) and steelhead (*Onchorynchus mykiss)* to the addition of salmon carcasses to two streams in southwestern Washington, USA. Canadian Journal of Fisheries and Aquatic Sciences 55:1909-1918.

Bisson, P. A., and R E. Bilby. 1982. Avoidance of suspended sediment by juvenile coho salmon. N. Am. J. of Fish. Man. 4:371-374.

Busby, P.J., T.C. Wainwright and RS. Waples. 1994. Status review for Klamath Mountain Province steelhead. U.S. Dep. Comm., NOAA Tech. Memo. NMFS-NWFSC-19. 130 p.

Busby, P. J., T. C. Wainwright, G. J. Bryant, L. J. Lierheimer, R. S. Waples, F. W. Waknitz, and I. V. Lagomarsino. 1996. Status review of West Coast steelhead from Washington, Idaho, Oregon, and California. NMFS, August 1996.

CDF&G (California Department of Fish and Game). 1965. California fish and wildlife plan. Vol III supporting data: part B, inventory salmon-steelhead and marine resources. California Department of Fish and Game, Sacramento, California. 679 p.

CDF&G (California Department of Fish and Game). 1998. Draft strategic plan for restoration of the endangered coho salmon south of San Francisco Bay. September 1998.189 p.

313

EXHIBIT M

CDF&G (California Department of Fish and Game). 1999. Fish & Game Code, 2nd ed. Policies Adopted by the California Fish and Game Commission pursuant to section 703 of the Fish and Game Code. LawTech Pub. Co., Ltd. San Clemente, CA. 524 p.

Campbell, R. N. B., and D. Scott. 1984. The determination of minimum discharge for 0+ brown trout (*Salmo trutta* L.) using a velocity response. New Zealand J. of Marine and Freshwater Res. 18:1-11.

Castelle, A. J., A. W. Johnson, and C. Conolly. 1994. Wetland and stream buffer size requirements-a review. J. of Environmental Quality 23:878-882.

Chapman, D.W., and T.C. Bjomn. 1969. Distribution of salmonids in streams, with special reference to food and feeding. Pages 153-176. in: T.G. Northcote, editor. Symposium on Salmon and Trout in Streams. H.R. Macmillan Lectures in Fisheries. Institute of Fisheries, University of British Columbia, Vancouver, British Columbia.

Cleary, R. E. 1956. Observations of factors affecting smallmouth bass production in Iowa. J. o Wildl. Man. 20353-359.

Clothier, W. D. 1953. Fish loss and movement in irrigation diversions from the west Gallatin River, Montana. J. Wildl. Man. 17:144-158.

Clothier, W. D. 1954. Effect of water reductions on fish movement in irrigation diversions. J. Wildl. Man. 18:150-160.

Coble, D.W. 1961. Influence of water exchange and dissolved oxygen in redds on survival of steelhead trout embryos. Trans. Am. Fish. Soc. 90(4):469-474.

Cordone, A. J., and D. W. Kelley. 1961. The influences of inorganic sediment of the aquatic life of streams. California Fish and Game pp. 189-228.

Crouse, M. R., C. A. Callahan, K. W. Malueg, and S. E. Dominguez. 1991. Effects of fine sediments on growth of juvenile coho salmon in laboratory streams. Trans. of the Am. Fish. Soc. 110281-286.

Cushman, R M. 1985. Review of ecological effects of rapidly varying flows downstream from hydroelectric facilities. N. Am. J. Fish. Man. 5:330-339.

Davis, G.E., J. Foster, C.E. Warren, and P. Doudoroff. 1963. The influence of oxygen concentration on the swimming performance of juvenile Pacific salmon at various temperatures. Trans. Am. Fish. Soc. 92(2):111-124.

314

EXHIBIT M

Dettman, D. H., and D. M. Kelley. 1986. Assessment of the Carmel River steelhead resource, vol. 1. Biological investigations. Final. September. Prepared for the Monterey Peninsula Water Management District.

Eaglin, G. S., and W. A. Hubert. 1993. Effects of logging and roads on substrate and trout in streams of the Medicine Bow National Forest, Wyoming. N. Am. J. Fish. Man. 13:844-846.

Ellis, M. M. 1936. Erosion silt as a factor in aquatic environments. Ecology 17:29-42.

Entrix, Inc. 2000. Final biological assessment for the seismic retrofit of San Clemente Dam. Prepared for U.S. Army Corps of Engineers, San Francisco District on behalf on California-American Water Service Company. January 7.

Everest, F.H. 1973. Ecology and management of summer steelhead in the Rogue River. Oregon State Game Commission. Fishery Research Report 7. 48p.

Everest, F.H., and D.W. Chapman. 1972. Habitat selection and spatial interaction by juvenile chinook salmon and steelhead trout in two Idaho streams. J. Fish. Res. Board Can. 29:91-100.

Foszcz. J. L. 1996. "Hydraulic fluid choices: Operating conditions and the environment have created a greater need for nonpetroleum-based fluids." Plant Engineering Magazine http://manufacturing.net/magazine/planting/archives/1996/ple0401.96/042015htm. In Tatara, C. 2001. Guidelines for Choosing Hydraulic Fluids for Use in Environmentally Sensitive Areas and Application. Draft 27 August, 2001. NOAA Fisheries, Santa Rosa, CA.

Gilpin, M. E. and M. E. Soule. 1986. Minimum viable populations: Processes of species extinction. *In:* Conservation Biology. M.E. Soule, Ed. Sinauer Associates, Massachusetts.

Gregory, R. S., and T. G. Northcote. 1993. Surface, planktonic, and benthic foraging by juvenile chinook salmon (*Oncorhynchus tshawytscha*) in turbid laboratory conditions. Can. J. of Fish. and Aq. Sci. 50:233-240.

Gregory, S. V., F. J. Swanson, W. A. McKee, and K. W. Cummins. 1991. Anecosystem perspective of riparian zones. Bioscience 41:540-551.

Gresh, T., J. Lichatowich, and P. Schoonmaker. 2000. An estimation of historic and current levels of salmon production in the northeast pacific ecosystem. Fisheries 15(1):15-21.

EXHIBIT M

315

Habera, J. W., R. J. Strange, B. D. Carter, and S. E. Moore. 1996. Short-term mortality and injury of rainbow trout caused by three pass AC electrofishing in a southern Appalachian stream. N. Am. J. Fish. Man. 11:192-200.

Habera, J. W., R. J. Strange, and A. M. Saxton. 1999. AC electrofishing injury of large brown trout in low-conductivity streams. N. Am. J. of Fish. Man. 19120-126.

HRG (Habitat Restoration Group). 1997. Fisheries Report for the Pajaro Valley Water Management Agency Water Supply Project. Prepared for Environmental Science Associates, San Francisco, California. Appendix D.

Hanson, L.C. 1993. The foraging ecology of Harbor Seals, Phoca vitulina, and California Sea Lions, Zalophus califomianus, at the mouth of the Russian River, California. Master of Science thesis. Sonoma State University, Rohnert Park, California.

Hall, J. D., and R. L. Lantz. 1969. Effects of logging on the habitat of coho salmon and cutthroat trout in coastal streams. Pgs. 355 to 376 in Northcote (ed.) Symposium on salmon and trout in streams, Institute of Fisheries, Univ. of British Columbia, Vancouver.

Harvey, B. C. 1986. Effects of suction gold dredging on fish and invertebrates in two California streams. N. Am. J. Fish. Man. 6:401-409.

Hayes, M.L. 1983. Active Capture Techniques. Pages 123-146 in L.A. Nielsen and D.L. Johnson, eds. Fisheries Techniques. American Fisheries Society. Bethesda, Maryland. 468 pages.

Herbert, D. W. M., and J. C. Merkens. 1961. The effect of suspended mineral solids on the survival of trout. Int. J. Air and Water Pollution 5:46-55.

Hubert, W.A. 1983. Passive Capture Techniques. Pages 95-122 in L.A. Nielsen and D.L. Johnson, eds. Fisheries Techniques. American Fisheries Society. Bethesda, Maryland. 468 pages.

Jensen, P.T., and P.G. Swartzell. 1967. California salmon landings 1952 through 1965. California Department of Fish and Game, Fish Bulletin 135:1-57.

Johnson, S. L. 1988. The effects of the 1983 El Niño on Oregon's coho (*Oncorhynchus kisutch*) and Chinook (O. tshawytscha) salmon. Fisheries Research 6:105-123.

Jones & Stokes Associates, Inc. 1998. Draft supplemental environmental impact report for the Carmel River Dam and Reservoir project. November 13. Prepared for the Monterey Peninsula Water Management District.

316

EXHIBIT M

Karr, J.R. and I.J. Schlosser. 1978. Water resources and the land-water interface. Science 201:229-234.

Kraft, M.E. 1972. Effects of controlled flow reduction on a trout stream. J. Fish. Res. Board of Canada 29:1405-1411.

Lloyd, D.S. 1987. Turbidity as a water quality standard for salmonid habitats in Alaska N. Am. J. Fish. Man. 7:34-45.

Lollock, D.L. 1968. An evaluation of the fishery resources of the Pajaro River basin. Calif. Dept. Fish & Game. 37 pages plus apps.

Lowrance, R., and twelve co-authors. 1995. Water quality functions of riparian forest buffer systems in the Chesapeake Bay Watershed. U.S. Environmental Protection Agency, EPA 903-R-95-004.

MacCall, A.D. and T.C. Wainwrigts (eds.). 2003. Assessing extinction risk for West Coast salmon. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-56. 198pp.

Mayer, F. L., P. M. Mehrle, and R. A. Schoettger. 1976. Collagen metabolism in fish exposed to organic chemicals. Ecol. Res. Series. EPA 600/3-77-085, U.S. Environmental Protection Agency, Corvallis, OR. In Tatara, C. 2001. Guidelines for Choosing Hydraulic Fluids for Use in Environmentally Sensitive Areas and Application. Draft 27 August, 2001. NOAA Fisheries, Santa Rosa, CA.

Mayer, F. L., *et al.* 1981. Phosphate ester hydraulic fluids: An aquatic environmental assessment of Pydrauls 50E and 115E. Aquatic Toxicology and Hazard Assessment: Fourth Conf., ASTM STP 737. D. R. Branson and D. L. Dickson, Am. Soc. for Test. and Materials: 103-123. In Tatara, C. 2001. Guidelines for Choosing Hydraulic Fluids for Use in Environmentally Sensitive *Areas* and Application. Draft 27 August, 2001. NOAA Fisheries, Santa Rosa, CA.

McElhany P., M.H. Rucklelshaus, M.J. Ford, T.C. Wainwright, and E.P. Bjorkstedt. 2000. Viable salmonid populations and the recovery of evolutionarily significant units. NOAA Fisheries Technical Memorandum NMFS-NWFSC-42, Seattle, Washington.

McEwan, D. and T.A. Jackson. 1996. Steelhead Restoration and Management Plan for California California Dep. Fish Game, 234 p.

McKeon, J. 2003. Personal communication. National Marine Fisheries Service.

EXHIBIT M

317

McLeay, D.J., A.J. Knox, J.G. Malick, I.K. Birtwell, G. Hartman, and G.L. Ennis. 1983. Effects on Arctic grayling (*Thymallus arcticus*) of short-term exposure to Yukon placer mining sediments: laboratory and field studies. Can. Tech. Rep. of Fish. and Aq. Sci. 1171.

McLeay, D.J., G.L. Ennis, I.K. Birtwell, and G.F. Hartman. 1984. Effects on Arctic grayliig (*Thymallus arcticus*) of prolonged exposure to Yukon placer mining sediment. *Can.* J. of Fish. and Aq. Sci. 1241.

McNeil, W.J., and W.H. Ahnell. 1964. Success of pink salmon spawning relative to size of spawning bed materials. U.S. Fish and Wildlife Service Special Scientific Report Fisheries 469.

Midwest Research Institute. 1979. Assessment of the need for limitation on triaryl and trialkyl/aryl phosphates. EPA Contract No. 68-01-4313. Washington, DC. In Tatara, C. 2001. Guidelines for Choosing Hydraulic Fluids for Use in Environmentally Sensitive Areas and Application. Draft 27 August, 2001.

MPWMD (Monterey Peninsula Water Management District). 2003. 2001-2002 Annual Report Lethal take of 18 of the 300 steelhead, assuming a worse case scenario of six percent mortality from electrofishing, may result from this action. for MPWMD mitigation program.

Moore, A. and C.P. Waring. 1996. Sublethal effects of the pesticide diazinon on olfactory function in mature male Atlantic salmon parr. J. of Fish Biol. 48: 758-775. In Tatara, C. 2001. Guidelines for Choosing Hydraulic Fluids for Use in Environmentally Sensitive Areas and Application. Draft 27 August, 2001. NOAA Fisheries, Santa Rosa, CA.

Moyle, P.B. *et al.* 1982. Distribution and Ecology of Stream Fishes of the Sacramento-San Joaquin Drainage System, California. Univ. of Californiapublications in zoology; v. 115.

Moyle, P.B. 2002. Inland Fishes of California. Revised and Expanded Editions. Univ. of California Press. 502 pp.

NOAA Fisheries (National Marine Fisheries Service). 1997. Fish screening criteria for anadromous salmonids. NOAA Fisheries Southwest Region, January.

NOAA Fisheries (National Marine Fisheries Service). 1999. Impacts of California sea lions and Pacific harbor seals on salmonids and West Coast ecosystems. Report to Congress. Available from National Marine Fisheries Service, Protected Resources Division, 777 Sonoma Avenue, Room 325, Santa Rosa, California 95404.

318

EXHIBIT M

National Research Council. 1995. Science and the Endangered Species Act. National Research Council Committee on Scientific Issues in the Endangered Species Act. National Academy Press, Washington, D.C.

National Research Council. 1996. Upstream: Salmon and Society in the Pacific Northwest. National Research Council Committee on Protection and Management of Pacific Northwest Anadromous Salmonids. National Academy Press, Washington, D.C.

Nehlsen, W., **J.E.** Williams, and **J.A.** Lichatowich 1991. Pacific salmon at the crossroads: stocks at risk from California, Oregon, Idaho, and Washington. Fisheries 16:4-21.

Newcomb, T.W. and T.A. Flagg. 1983. Some effects of Mt. St. Helens volcanic ash on juvenile salmon smolts. Marine Fish. Rev. 45:8-12.

Nordwall, F. 1999. Movement of brown trout in a small stream: effects of electrofishing and consequence for populations estimates. N. *Am.* J. **Fish.** Man. 19:462-469.

Phillips, R.W. and H.J. Campbell. 1961. The embryonic survival of coho salmon and steelhead trout **as** influenced by some environmental conditions in gravel beds. Annual Rep. Pac. Mar. Fish. Comm. 14:60-73.

Pimm, S.L., **H.L.** Jones, and J. Diamond. 1988. On the **risk** of extinction. American Naturalist 132(6):757-785.

Platts, W.S. 1991. Livestock grazing. Pages 389 ***to*** 423 in W. R. Meehan (ed.) Influences of Forest and Rangeland Management on Salmonid Fishes and their Habitats. **Am. Fish.** Soc. Spec. Pub. 19.

PVWMA **(Pajaro** Valley Water Management Agency). 2003. PVWMA revised basin management plan projects. Biological assessment. Environmental Science Assoc., **San** Francisco, CA.

Reiser, D.W. T.C. Bjomn. 1979. Habitat requirements of anadromous salmonids. In: Influence **of** Forest and Rangeland Management on Anadromous Fish Habitat in the Western United States and Canada. W.R. Meehan, editor. **U.S.** Department of **Agriculture Forest** Service General Technical Report PNW-96.

Reiser, D. W. and R. G. White. 1988. Effects of two sediment size-classes on survival of steelhead **and** chinook salmon eggs. N. Am. J. **Fish.** Man. 8:432-437.

Reynolds, J. B. 1983. Electrofishing. Pages 147-164 in L. **A.** Nielsen **and** D. L. Johnson, eds. Fisheries Techniques. Am. Fish. Soc. Bethesda, Maryland. 468 pp.

319

EXHIBIT M

Reynolds, J. B., R. C. Simmons, and A. R. Burkholder. 1989. Effects of placer mining discharge on health and food of Arctic grayling. Water Res. Bull. 25:625-635.

SCCRCD (Santa Cruz County Resource Conservation District). 2001. Lower Pajaro River Enhancement Plan for Green Valley, Casserly, Hughes, Tynan, Coward, and Thompson Creeks. Santa Cruz Co., CA. Part 1-Watershed Assessment Report. SCCRCD, Capitola, CA.

Schiewe, M.H. 1997. Memorandum to William Stelle and William Hogarth: status review update for West Coast steelhead from Washington, Idaho, Oregon, and California. U.S. Dep. Commer., National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, WA.

Scholz, N.L. *et al.* 2000. Diazinon disrupts antipreditor and homing behaviors in chinook salmon (Oncorhynchus tshawytscha). The Can. J. of Fish. and Aq. Sci. 57: 1911-1918. In Tatara, C. 2001. Guidelines for Choosing Hydraulic Fluids for Use in Environmentally Sensitive Areas and Application. Draft 27 August, 2001. NOAA Fisheries, Santa Rosa, CA.

Shapovalov, L. and A.C. Taft. 1954. The life histories of the steelhead rainbow trout (*Salmo guirdneri gairdneri*) and silver salmon (*Oncorhynchus kisutch*) with special reference to Waddell Creek, California, and recommendations regarding their management California Department of Fish and Game. Fish Bulletin No. 98.

Sharber, N. G., and S. W. Carothers. 1988. Influence of electrofishing pulse shape on spinal injuries in adult rainbow trout. N. Am. J. Fish. Man. 8:117-122.

Sigler, J.W., T.C. Bjornn, and F.H. Everest. 1984. Effects of chronic turbidity on density and growth of steelhead and coho salmon. Trans. Am. Fish. Soc. 113:142-150.

Smith, A.K. 1973. Development and application of spawning velocity and depth criteria for Oregon salmonids. Trans. Am. Fish. Soc. 10(2):312-316.

Smith, J.J. 1982. Fish habitat assessment for Santa Cruz County streams. Harvey & Stanley Assoc., Inc. and John Gilchrist & Assoc. Prepared for Santa Cruz County Planning Dept. 74 pp.

Smith, J.J. 1987. Aquatic habitat and fish utilization of Pescadero, San Gregorio, Waddell and Pomponio Creek estuary/lagoon systems. Prepared for California Dept. of Parks and Rec, May 31.

Smith, J.J. 2002. Steelhead distribution and ecology in the upper Pajaro River system. South Valley Streams for Tomorrow. San Martin, CA.

320

EXHIBIT M

Snyder, J.O. 1913. The fishes of the streams tributary to Monterey Bay, California. Bull. U.S. Bur. Fish. 32:47-72.

Snider, W.M. 1983. Reconnaissance of the steelhead resource of the Carmel River drainage, Monterey County. Calif. Dep. Fish Game, Environmental Services Branch Admin. Rep. 83-3 (Available from California Department of Fish and Game, Inland Fisheries Division, 1416 Ninth Street, Sacramento, CA 95814). 41 pp.

Sundermeyer, D.R. 1999. Hatchery influence on Pajaro River steelhead analyzed with microsatellite DNA. MS Thesis. Dept. of Bio. Sci. San Jose State University, San Jose, CA.

Tagart, J.V. 1984. Coho salmon survival from egg deposition to fry emergence. Pages 173-182 in J. M. Walton and D. B. Houston, editors. Proceedings of the Olympic Wild Fish Conference. Peninsula College, Port Angeles, Washington.

Tappel, P.D., and T.C. Bjornn. 1983. A new method of relating size of spawning gravel to salmonid embryo survival. N. Am. J. Fish. Man. 3:123-135.

Thomas, V.G. 1985. Experimentally determined impacts of a small, suction gold dredge on a Montana stream. N. Am. J. Fish. Man. 5:480-488.

Thompson, K. 1972. Determining stream flows for fish life. In Proceedings, Instream Flow Requirement Workshop. Pacific Northwest River Basin Commission, Vancouver, WA. Pp. 31-50.

Titus, R. G., D. C. Erman, and W. M. Snider. July 21, 1999. History and status of steelhead in California coastal drainages south of San Francisco Bay. In preparation.

Titus, R. G., D. C. Erman, and W. M. Snider. July 5, 2002. History and status of steelhead in California coastal drainages south of San Francisco Bay. *In preparation.*

United States Geological Survey 2001. Acute Toxicity Database, available at http://www.cerc.cr.ugs.gov/data/acute/acute.html. In Tatara, C. 2001. Guidelines for Choosing Hydraulic Fluids for Use in Environmentally Sensitive Areas and Application. Draft 27 August, 2001. NOAA Fisheries, Santa Rosa, CA.

Velagic, E. 1995. Turbidity study: a literature review. Prepared for Delta planning branch, California Department of Water Resources by Centers for Water and Wildland Resources, University of California, Davis.

Wang, L., J. Lyons, P. Kanehl, and R. Gratti. 1997. Influences of watershed land use on habitat quality and biotic integrity in Wisconsin streams. Fisheries 66-12.

EXHIBIT M.

321

Waples, **R.S. 1991.** Genetic interactions between hatchery and wild salmonids: lessons from the Pacific **Northwest.** Canadian Journal of Fisheries and Aquatic Sciences **48** (supplement 1):124-133.

Waples, R.S. 1999. Dispelling some **myths** about hatcheries. Fisheries 24(2):12-21.

Waters, T.F. **1995.** Sediment in streams: sources, biological effects, **and** control. ***Am.*** Fish. Soc. Mon. **7.**

Welsch, D.J. 1991. Riparian forest buffers: functions and design for protection and enhancement of water resources. USDA Forest Service, **NA-PR-07-91,** Radnor, Pennsylvania.

Wesche, T.A., C.M. Goertler, and **C.B.** Frye. 1987. Contributions of riparian vegetation to **trout** cover *in* small streams. N. ***Am.*** J. Fish. **Man.** 7:151-153.

Zeigenfuss, L.F. 1995. The effects **of** electrofishing and electrofishing induced injuries on the return and growth of rainbow trout MS Thesis. Colorado State University. Ft. **Collins,** Colorado. **53** pp.

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EXHIBIT M