APPENDIX G
MITIGATION REPORTING PROGRAM

INTRODUCTION

The requirement for a mitigation monitoring or reporting program is introduced in Section 15091 of Title 14, California Code of Regulations, Chapter 3, Guidelines for Implementation of the California Environmental Quality Act. This section directs the public agency approving or carrying out the proposed project (San Joaquin River Group Authority) to make specific written findings for each significant impact identified in the Environmental Impact Report. When making the required findings, the agency shall also adopt a program for reporting on or monitoring the changes which it has either required in the project or made a condition of approval to avoid or substantially lessen significant environmental effects. These mitigation measures must be fully enforceable through permit conditions, agreements, or other measures.

Section 15097 was added to the CEQA Guidelines on October 23, 1998. It requires the public agency to adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects. Reporting or monitoring responsibilities may be delegated to another public agency or private entity. However, until mitigation measures have been completed, the lead agency (San Joaquin River Group Authority) remains responsible for ensuring that implementation of the mitigation measures occurs in accordance with the program.

The San Joaquin River Group Authority (SJRGA) may choose whether its program will monitor mitigation, report on mitigation, or both.

- Reporting generally consists of a written compliance review that is presented to the decision-making body or authorized staff person. A report may be required at various stages during project implementation or upon completion of the mitigation measure. It is suited to projects which have readily measurable or quantitative mitigation measures or which already involve regular review.

- Monitoring is generally an ongoing or periodic process of project oversight. It is suited to projects with complex mitigation measures which are expected to be implemented over a period of time.

This mitigation program report is comprised of a matrix followed by a description of the two principal mitigation measures: the annual Operations Plan and local conjunctive use, reclamation, and water efficiency projects. The mitigation program for the Final EIS/EIR is recommended to be a reporting program on the Operations Plan and the development of conjunctive use/water efficiency projects by members of the Authority.

G.1 MATRIX

The mitigation reporting program for meeting the flow objectives for the San Joaquin River Agreement is provided in the following matrix. The matrix includes all impacts in the EIS/EIR that were identified as significant (S) or potentially significant (PS). For impacts that are less than significant, mitigation is not required by CEQA. The text of each mitigation measure is taken from the Final EIS/EIR.

For each impact and mitigation measure, the matrix identifies the implementation action required, the timing requirements for implementation, and the agency responsible for ensuring that the action occurs. In most cases, the SJRGA and its member agencies and other signatories to the SJRA are responsible for ensuring that hydrologic and biologic data are utilized in the development and implementation of the annual Operations Plan and that conjunctive use and other water conservation projects are implemented by Merced and Oakdale Irrigation Districts.

G.2 ANNUAL OPERATIONS PLAN

The San Joaquin River Agreement (SJRA), Paragraph 6.6, states that by February 15 of each year of the Agreement, the U.S. Bureau of Reclamation (USBR) and California Department of Water Resources (CDWR) shall develop, in cooperation with the San Joaquin River Technical Committee (SJRTC), an operations plan that will describe how the VAMP will be implemented in that year. Appendix B of the SJRA, Planning and Operation Coordination for the Vernalis Adaptive Management Plan, describes the process for planning and implementing operations for implementing the VAMP flows. It is incorporated in its entirety into this mitigation reporting program by reference. The focus of Appendix B is the Spring Pulse Flow. A summary of the operations planning process and key participants is provided in Section 2.1 below.

Paragraph 11.1 of the SJRA also states that "the SJRTC will be an interagency effort to successfully implement the VAMP by undertaking the activities described in Paragraph 11.2 (and summarized here) and other technical activities that its members deem appropriate to meet the goals of this Agreement." Implementation of the October flow and use of the other environmental water provided by Oakdale Irrigation District comes under this category of other technical activities. The SJRTC is to annually coordinate flow releases, export and Old River barrier operations, and the use of hatchery fish to implement the VAMP study. Other duties are: to determine best management of flow releases during the Pulse Flow Period to achieve Target Flows; to plan and oversee monitoring activities in coordination with the Interagency Ecological Program and existing monitoring programs on the San Joaquin tributaries; and to develop annually the Existing Flow calculation protocols.

Identified Impact	Mitigation Measures	Implementation Action	Timing Requirements	Reporting Responsibility
4.2.3.1 Water Deliveries Deliveries reduced to Merced Irrigation District during critically dry years and under below normal or dry hydrologic conditions under certain sequential hydrologic conditions. (PS)	**Implementation of a conjunctive use program to augment surface water supplies.**	**Construction of conjunctive use project by Merced ID.**	**Annual progress reports with financial audit report.**	**Merced ID progress reports to SJRGA.**
4.2.3.1 Water Deliveries Deliveries reduced to Oakdale Irrigation District during critically dry years. (PS)	**Implementation of a conjunctive use program to augment surface water supplies.**	**Construction of conjunctive use project by Oakdale ID.**	**Annual progress reports with financial audit report.**	**Oakdale ID progress reports to SJRGA.**
4.2.3.2 Water Storage Carryover water storage reduced for Lake McClure during all but wet hydrologic conditions. (PSU)	**Partially mitigated by conjunctive use program.**	**None**	**None**	**None**
4.3.3.1 Groundwater Overdrafting Goundwater could indirectly be used to replace surface water used for the flows from the Merced ID (up to 67,500 acre-feet, 12% of the typical annual production). (PS)	**Implementation of conjunctive use, reclamation, and increased efficiencies would augment groundwater supplies.**	**Construction of conjunctive use project by Merced ID. Reclamation and increases in efficiencies of water use are underway.**	**Annual progress reports with financial audit report.**	**Merced ID progress reports to SJRGA.**
4.3.3.2 Water Levels Groundwater from the Merced Groundwater Basin could be used to replace surface water for the flows (up to 67,500 acre-feet, 12% of the typical annual production).	**Implementation of conjunctive use, reclamation, and increased efficiencies would augment groundwater supples.**	**Construction of conjunctive use project by Merced ID.**	**Annual progress reports with financial audit report. Reclamation and increases in efficiencies of water**	**Merced ID progress reports to SJRGA.**

Identified Impact	Mitigation Measures	Implementation Action	Timing Requirements	Reporting Responsibility
(PS)			**use are underway.**	
4.3.3.4 Subsidence Groundwater (up to 67,500 acre-feet) from the Merced Groundwater Basin could indirectly be used to replace surface water flows; there could be an impact on subsidence. (PS)	**Limiting groundwater pumping in highly overdrafted areas, importing water, and developing or expanding recharge areas would reduce the impact.**	**Implement Water Supply Master Plan and AB3030 Groundwater Management Plan.**	**Annual progress reports with financial audit report. Projects are underway.**	**Merced ID progress reports to SJRGA.**
4.5.3.3 Chinook Salmon Rapid changes in flows in the spring and fall may affect juvenile salmon and salmon redds. (PS)	**Include ramping flows around the pulse and attraction flows.**	**SJRTC approves annual Operations Plan.**	**Implement in February-April of each year.**	**SJRTC reports to SJRGA, USBR, USFWS, and CDFG.**
4.6.3.1 Agricultural Land Use Potential reduction of 104,500 acre-feet of Authority members' water to irrigation customers could adversely impact cropping patterns and productivity. (PS)	**Replacement of surface water by groundwater, including conjunctive use water or carryover storage.**	**Irrigation customers would receive alternative water from Districts or operate own private wells.**	**Annually, and depending on hydrologic conditions. For SJRGA members, annual progress reports with financial audit report.**	**Individual districts monitor groundwater levels through AB 3030 plans. Progress reports to SJRGA.**
4.6.3.1 Agricultural Land Use Reduced deliveries by Merced ID could adversely affect agricultural production in the short term. (PS)	**Implementation of conjunctive use program and groundwater pumping by individual farmers.**	**Construction of conjunctive use project by Merced ID. Farmers may operate private wells.**	**For Merced ID, annual progress reports with financial audit report. Use of private well water would occur**	**Merced ID progress reports to SJRGA.**

Identified Impact	Mitigation Measures	Implementation Action	Timing Requirements	Reporting Responsibility
			annually depending on hydrologic conditions.	
4.9.3.1 Reservoirs **Storage capacity decreased greater than 10% at Lake McClure in critical, dry, and below normal years during power peak production months, thus decreasing potential for hydropower generation. (PSU)**	**Not available.**	**None.**	**None.**	**None.**
4.9.3.2 Rivers **Flows decreased by more than 10% on Merced River in above normal years in June, thus decreasing potential for hydropower generation. (PSU)**	**Not available.**	**None.**	**None.**	**None.**

G.2.1 PARTICIPANTS

The Hydrology Group of the SJRTC is responsible for the following tasks:

- Develop and exchange information concerning forecasted hydrologic conditions;
- Execute the protocols that establish the Test Flow Target and determine the San Joaquin River Group Supplemental Water (up to 110,000 acre-feet);
- Establish an operations plan for the coordination of flows; and
- Provide a post-analysis and report of operations.

The participants in the Hydrology Group are determined by the SJRTC and initially include, but are not limited to, the following: USBR, CDWR, and six members of the SJRGA (Modesto, Turlock, Merced, Oakdale, and South San Joaquin Irrigation Districts, and the Exchange Contractors). The Hydrology Group will coordinate with the SJRTC along with biologists and others involved in operations affecting San Joaquin River flows.

G.2.2 PLANNING PROCESS

G.2.2.1 Forecasting

No later than February 10, the Hydrology Group will develop a preliminary basin-wide Forecast Report of the San Joaquin River operations (without the effects of VAMP) for the February through June period. Forecasts will be provided for at least 90 percent and 50 percent probability of exceedence hydrologic runoff and water demand conditions. DWR runoff forecasts will be used as the basis of unimpaired runoff in the tributaries unless otherwise agreed. Each of the Hydrology Group participants is responsible for providing either reservoir operations plans or the information necessary to develop the appropriate reservoir operations plans for each affected tributary. Information regarding the planned operations of others affecting San Joaquin River flows to the Bay-Delta will also be acquired by the Hydrology Group.

The Forecast Report will be provided to the CALFED Operations Group, SJRA Biology Group, and local tributary groups. At a minimum, a revised Forecast Report will be provided the first week of March, mid-March, the first week of April and each week thereafter until the Operations Plan is employed. After the conclusion of the Spring Pulse Flows, the Hydrology Group will continue to share and update operations forecast information on a monthly basis so that the best available forecasts of San Joaquin River flows can be included in CVP/SWP operations plans.

G.2.2.2 Coordination with Biology Group

Although focused on test protocols that measure the survival of tagged hatchery salmon smolt, VAMP creates an opportunity to provide pulse flow conditions for smolts naturally spawned within

the San Joaquin River Basin. The Biology Group will heavily influence the scheduling of the Test Period. The VAMP Test Period of a continuous 31 days in April-May needs to coincide with the peak period of time when naturally spawned smolts are migrating out of the San Joaquin River Basin. Trade-offs in the scheduling of VAMP will be required to recognize the practicalities of hatchery operations, monitoring activities, barrier operation, and flow and export operational constraints.

The Biology Group is to provide its initial estimate of the preferred period for the VAMP flow beginning in February, coincident with the Hydrology Group's Forecast Report, and provide an updated estimate coincident with each revised Forecast Report. Coincident with the mid-March Forecast Report, the Hydrology and Biology Groups will jointly identify the Tentative Test Period for use in subsequent planning efforts.

Concerning the release of water on the Merced River for the fall attraction flow and the release of Oakdale Irrigation District water from New Melones on the Stanislaus River, the timing of these releases will be adjusted to hydrologic conditions including water temperature. The Hydrology Group will coordinate with the Biology Group and the U.S. Fish and Wildlife Service (USFWS), CDFG, and National Marine Fisheries Service (NMFS) to forecast releases around the Spring Test Flow Target for ramping and to forecast the fall attraction flow release. Table G-1 summarizes existing and proposed stations for flow and water quality monitoring in the lower San Joaquin River Basin. Data from these stations will be used to define the release schedule.

G.2.2.3 VAMP Study Results

The Operations Plan will be developed annually and over the February-April period based on the hydrology forecast reports. It will consider the previous year's fishery monitoring activities, including the results of the VAMP sampling activity during the 47-day April 15 - May 31 monitoring period and other results of the ongoing studies presented in Table G-2. VAMP not only documents the numbers of juvenile Chinook salmon but also other species collected. In addition, during the 47-day sampling period, temperature monitoring within the lower San Joaquin River from Mossdale to Chipps Island will be conducted. A documentation report will be prepared by December 1999 and in subsequent years.

G.2.3 OPERATIONS PLAN IMPLEMENTATION

The SJRGA members and USBR will carry out the Operations Plan using best efforts to make control point releases match the Operations Plan forecast of releases. Actual operations and hydrologic conditions will be tracked during the Test Period, and the information disseminated along with a projection of conditions anticipated for the remainder of the Test Period. The Hydrology Group will confer weekly to review schedules, beginning in late March. Storms, flood control, or other unforeseen events may require more frequent schedule changes. In order to maintain a stable flow,

an effort will be made to keep flows within a specified range above and below the target flows. In coordination with U.S. Fish and Wildlife Service (USFWS) and California Department of Fish

Table G-2: FISHERIES MONITORING ACTIVITIES IN THE SAN JOAQUIN RIVER BASIN

Stanislaus River	
Spawning	Annual spawning surveys by CDFG to provide escapement estimates of fall-run chinook salmon. Weekly counts from October thru December (variable number of weeks per year). Includes estimates of redd counts and live fish counts
Seining	No seine sampling currently being done.
Smolts	Rotary screw traps used to monitor fall-run salmon and steelhead smolt migration and survival. Up to three sampling locations; upper, middle, and lower river. Began in 1993 with lower river trap only. Expanded to three traps in 1995. Traps operated January thru June (if possible) by OID/SSJID and USFWS.
Steelhead	No specific sampling for steelhead is done in addition to rotary screw traps. However, CDFG initiated sampling in 1997 to collect steelhead for genetic analysis
CWT	No CWT releases of fall-run chinook salmon have been made in the Stanislaus since approximately 1989.
Other Species	No specific sampling for other species done on a regular basis. Some snorkeling observations may be available. A predator population study may be proposed by USFWS.
IFIM	Most recent IFIM conducted by USFWS in 1993.
Temperature Model	Temperature model developed by USBR. Model has been designed to incorporate chinook salmon biological data to predict impacts to early life stages of salmon in the Stanislaus. Thermographs were placed at six locations along the river in January 1998 by S.P. Cramer & Associates. A new temperature model is being developed by OID, SSJID, and others.

Table G-2: FISHERIES MONITORING ACTIVITIES IN THE SAN JOAQUIN

RIVER BASIN (Cont.)

Tuolumne River	
Spawning	Annual spawning surveys by CDFG to provide escapement estimates of fall-run chinook salmon. Weekly counts from October thru December (variable number of weeks per year). Includes estimates of redd counts and live fish counts. Surveys conducted annually since 1971.
Seining	Annual seine sampling at seven locations (five on Tuolumne River, two on San Joaquin River, above and below confluence) to determine density of fall-run salmon fry and smolts. Bi-weekly sampling from January to June. Sampling conducted by EA for TMID since 1986.
Smolts	Rotary screw traps used to monitor fall-run salmon smolt migration and survival. Up to three sampling locations; upper, middle, and lower river. Began in 1995 with lower river traps only. Traps operated by TMID and CDFG.
Steelhead	No specific sampling for steelhead, however annual spawning surveys, seining, and screw traps results provide some indirect monitoring during October to June.
CWT	Annual CWT releases of fall-run chinook from Merced River Fish Facility (occasional releases from out of basin hatcheries) by CDFG in spring, since 1986.
Other Species	No specific sampling for other species since summer flow studies conducted by EA for TMID from 1988-1994. Predator population study conducted by EA for TMID in 1989-1990. Seining provides some indirect monitoring during January to June
IFIM	Most recent IFIM conducted by USFWS in 1992.
Temperature Model	SNTEMP model developed by EA for TMID; operates on a 5-day time step.

Table G-2: FISHERIES MONITORING ACTIVITIES IN THE SAN JOAQUIN RIVER BASIN (Cont.)

Merced River	
Spawning	Annual spawning surveys by CDFG to provide escapement estimates of fall-run chinook salmon. Weekly counts from October thru December (variable number of weeks per year). Includes estimates of redd counts and

	live fish counts. In addition, approximately 50% of adult spawners are used annually by the Merced River Fish Facility for hatchery production of smolts. The hatchery has been in use since 1970 with a current production capacity of up to 1 million smolts.
Seining	No seine sampling currently being done.
Smolts	A single rotary screw trap near the mouth of the river is used to monitor fall-run salmon smolt migration and survival. Trap is operated by CDFG during spring months and began sampling in 1995.
Steelhead	No specific sampling for steelhead, however annual spawning surveys, hatchery observations, and screw trap results provide some indirect monitoring during October to June.
CWT	Annual CWT releases of fall-run chinook from Merced River Fish Facility (occasional releases from out of basin hatcheries) by CDFG in spring
Other Species	No known sampling for other species done on a regular basis
IFIM	Most recent IFIM conducted by USFWS in 1995.
Temperature Model	Data for temperature model collected by Jones & Stokes for CDFG. Calibration and verification of model results not yet available.
San Joaquin River above Vernalis	
Seining	USFWS has conducted seining in the river. Monitoring also is done for the river from Stockton to Highway 132 as part of the Interagency Ecological Program.

and Game (CDFG), the Operations Group should develop and adopt a Best Management Practice (BMP) for supplying ramping guidelines (both up and down ramp) governing the release of attraction and pulse flows to ensure and maximize the protection of salmon.

G.3 CONJUNCTIVE USE AND WATER RECLAMATION/EFFICIENCY PROJECTS

The SJRGA is to be paid $4,000,000 annually (escalated annually by the Consumer Price Index) by the USBR and CDWR so long as the SJRGA and its members perform under the terms of the San Joaquin River Agreement (SJRA). The funds paid to the SJRGA are intended to be substantially used to enhance efficient water management within the districts including, but not limited to, water reclamation, conservation, conjunctive use, and system improvements. Use of these funds by the public agencies will be documented in each agency's annual financial audit report. The funding is established for implementation of conjunctive use and other water efficiency projects that will mitigate potentially significant impacts to agricultural water users and to groundwater conditions.

The EIS/EIR identified two districts that may experience potentially significant reductions in water deliveries to their customers under below normal or dry/critically dry hydrologic conditions: Merced Irrigation District (Merced ID) and Oakdale Irrigation District (OID). The maximum amount of groundwater that could be pumped directly to ensure that each district meets it water obligation under the SJRA is 67,500 acre-feet for Merced ID and 15,000 acre-feet for OID. Because groundwater is typically used to replace much of the shortfall in surface water supplies, water delivery reductions resulting from the proposed project could result indirectly in an increase in groundwater pumping with subsequent potential impacts on overdraft, water levels, and subsidence in portions of the project area as discussed in Section 4.3 of the final EIS/EIR. Merced ID and OID service areas are the principally affected areas for which mitigation is required to reduce the impacts to water deliveries and groundwater conditions to less-than-significant levels. Their projects are described below.

In addition, the other willing sellers involved in the proposed project have implemented and/or are planning to implement water efficiency projects consistent with AB 3616 and in coordination with groundwater management plans (AB 3030) and current water supply plans (Modesto Irrigation District, Turlock Irrigation District, South San Joaquin Irrigation District, and San Joaquin River Exchange Contractors Water Authority).

G.3.1 MERCED IRRIGATION DISTRICT

The Merced Water Supply Plan (1995) calls for the stabilization of groundwater at 1992 levels. This is being accomplished by constructing and operating direct recharge facilities including a new conjunctive use project by the District. A pilot project for groundwater recharge involves three test basins. One recharge basin has been completed on City of Merced property near Farhen's Park. For the conjunctive use project, a groundwater aquifer will be selected to act as a reservoir. In dry years, groundwater will be used to make up for the shortfall in surface water deliveries, and the aquifer will

be replenished during wet years with surface water from the Merced River. Studies to select a site have been completed with completion of the entire conjunctive use project within ten years. Most of the recharge of the Merced Groundwater Basin occurs from irrigation water diverted from the Merced River. Implementation of recharge facilities will replenish depleted groundwater supplies from ongoing activities as well as the direct and indirect impacts from the proposed project. Also, canal seepage contributes to recharging the Basin's aquifers.

To reduce reliance on groundwater, Merced ID has implemented three programs to encourage groundwater pumpers to convert their systems to surface water: In-Canal Surface Water Incentive Program, On-Farm Low-Volume Incentive Program, and the Highlands Pilot Project (an agricultural water treatment plant). Expansion of these programs will also contribute to reductions in groundwater usage.

G.3.2 OAKDALE IRRIGATION DISTRICT

OID has several water efficiency projects underway and planned (OID/SSJID 1997).

- In conformance with the *Memorandum of Understanding Regarding Efficient Water Management Practices by Agricultural Suppliers in California*, OID is developing a Water Management Plan (WMP) which includes implementation of Efficient Water Management Practices (EWMPs). EWMPs include, but are not limited to: designation of a Water Conservation Coordinator, provision of water management services to water users, evaluation of institutional policies, and evaluation of groundwater pumps to improve efficiency.

- OID has already upgraded its tailwater recovery system so that captured return flows are available for use. The District is coordinating the operation of its tailwater reclamation pumps to increase the efficiency of the system and to further maximize the recovery system yield.

- OID is implementing a Supervisory Control and Data Acquisition system to closely monitor water delivery operations on a real time basis. Installation of the system began in 1996 and the District is currently adding approximately five monitoring/control sites per year.

- The District trains its Ditchtenders on the proper operation of its delivery system which includes training in water measurement as well as the proper documentation of where the water is being delivered.

- OID has purchased land for the installation of one regulating reservoir and is in the process of acquiring land for a second reservoir at the end of each main canal. These reservoirs will be used not only as re-regulating points but also for groundwater recharge.

- OID operates under its AB3030 Groundwater Management Plan (1996) which includes implementation of groundwater recharge and deep well pumping. The District has a conjunctive use plan that will allow for increases in groundwater use from surface water stored in aquifers.

Contacts:
Stanislaus River - Doug Demko, SP. Cramer and Associates
Tuolumne River - Tim Ford, Turlock Irrigation District
Merced River - Dave Vogel, Natural Resource Scientists
IFIM - Craig Fleming, U.S. Fish and Wildlife Service

APPENDIX G