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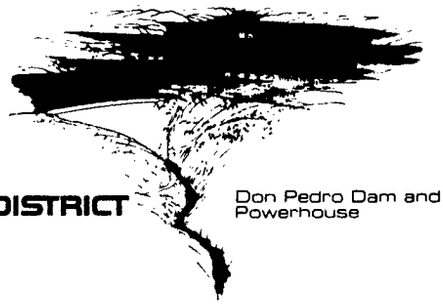

June 30, 1998

CALFED Bay-Program
1416 Ninth Street, suite 1155
Sacramento, CA 95814
ATTN: Rick Breitenbach - PEIS/EIR Comments

Dear Mr. Breitenbach,

The Turlock and Modesto Irrigation Districts appreciate the opportunity to review the CALFED Draft Programmatic Environmental Impact Statement/Environmental Impact Report (PEIS/EIR). Our specific comments to the PEIS/EIR and its technical appendices are enlosed as Attachment A. Our general comments are as follows:

- Overall the PEIS/EIR focusses on benefits and impacts to the State Water Project and Central Valley Project, without clearly identifying how the CALFED program will impact non-Project water users in the San Joaquin River basin.

- All alternatives include substantial increases in Delta diversions. While new screening facilities at the Tracy/CCF Intertie and an operable barrier at the head of Old River are included in most of the alternatives, it is not clear how these facilities will be adequate to protect Delta fish species. Current screening and salvage operations in place at the diversion facilities have not provided their anticipated or intended benefits. The PEIS/EIR should recognize this risk and should critically evaluate the potential success of these measures.

- Alternatives 2B, 2E, and 3B–I include 500,000 acre-feet of new surface water storage in the San Joaquin Basin. The PEIS/EIR does not provide adequate information to evaluate the feasibility of new storage in this basin or the potential impacts of new storage even at a programmatic level.

- In upstream areas, the CALFED Program intends to restore more natural hydrographs. In the Delta, however, the measures involved consist of *rearranging* flow and export schedules around the perceived needs of a few targeted species. Every increase in flow or reduction of exports (e.g., when Delta smelt are spawning) would be associated with decreased flow or increased export at some other time of year. While rescheduling diversions may benefit these targeted species, it may adversely impact other species or larger ecosystem processes. These issues are not discussed in the PEIS/EIR.

- A key premise of the CALFED PEIS is that only "irrecoverable" water that flows to a saline sink can be conserved thereby creating "new water". Any water that would eventually continue to the delta as return flows is "recoverable" and therefore NOT able to be conserved. Yet a significant expenditure is anticipated to implement conservation and conjunctive use measures that will allow this recoverable water to be reregulated for timing of instream flows, water quality needs, and "other"environmental benefits. However, recoverable water left in the stream is not considered to be a reallocation of water. From the east side tributaries of the San Joaquin River very limited irrecoverable water, 2-7 TAF, is anticipated, but on-farm application and district delivery efficiency improvements are anticipated to create 315 - 475 TAF of recoverable water (which we believe is an unrealistic number). It is not clear if this reregulated water would be subject to export as "new water" in the Delta after the desired instream flow changes had been met. Nor is it clear how this reregulated water would impact existing storage or if added storage is required to provide the reregulation capability.

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- The CALFED irrigation efficiency estimates of 85% are significantly higher than the 73% by DWR in Bulletin 160-98. The cost estimate to achieve this is $35 to $95 per acre foot on farm with $5 to $12 per acre additional district costs. There is an implied assumption that all the on-farm irrigation systems will be converted to pressurized systems, with no consideration of the benefits from continuing to use surface irrigation. This runs counter to the recharge needs for the extent of conjunctive water use CALFED anticipates. To achieve these levels of on farm irrigation efficiency within TID, most of the 1,660 miles of improvement district distribution pipelines would need to be converted to pressurized system along with a similar length of private pipelines. CALFED anticipates outside participation in planning, funding and implementation to make the conservation measures cost effective at the local level. The document is contradictory in stressing flexible incentives at the local district level to meet these efficiencies with outside funding sources controlling which practices are implemented.

- The CALFED desires that 2/3 of the agricultural water districts, by acreage, sign the AB 3616 MOU by January 1999 before CALFED will recognize this as a successful program. After that CALFED will ask for a legislative mandate with inflexible requirements. CALFED will require flow measurement with +\- 6% accuracy. No definition is provided for where the water is measured, but +/- 6% accuracy would indicate a propeller type flow meter at each parcel. This is not readily compatible with the basic delivery facilities used by most of the irrigation districts on the east side tributaries of the San Joaquin River.

- There is a common presumption that the core ERPP will provide hundreds of thousands of acre-feet from the San Joaquin River Basin through the development of new supplies or purchased from "willing sellers". This is a highly speculative assumption which would raise the question of the validity of the environmental differences among the alternatives if or when these anticipated supplies of environmental water are not forth coming.

- The document indicates that there is considerable "speculation" in the CALFED demand estimates for transfer proposals. The transfer issues are identified, but not the recommended solutions. There is the implication that transfers involving groundwater substitution, as part of a conjunctive use program, require local control, yet the process describes the SWRCB as the most likely manager of such transfers. Each transfer will require detailed analysis, but it is not clear who will be responsible for the level of analysis described and how the "public input" is defined. There is reliance on DWR modeling in the CALFED analysis, but no explanation on how a district or agencies in a basin can review the DWR / CALFED modeling assumptions.

- The issue of water savings from rotational land fallowing in dry years, even if fallowing is only temporary for 1-3 years, assumes the grower would not use the water saved to make a crop on the remaining land being farmed.

If you have any questions regarding our review of the PEIS/EIR or potential Turlock and Modesto Irrigation District concerns regarding the CALFED Program, please contact Wilton Fryer at (209) 883-8316.

Sincerely,
TURLOCK IRRIGATION DISTRICT

Wilton B. Fryer, P.E.
Water Planning Department Manager

ATTACHMENT A.
SPECIFIC COMMENTS

PEIS/EIR MAIN VOLUME

p. 5-8 "Several representative storage sites were examined to provide a better perspective of the potential magnitude of land use changes as well as other storage-related impacts." The following storage sites were evaluated. (Storage alternatives are most thoroughly described in the Phase II Interim Report pp. 62–70.)

	Surface		Groundwater		Off-aqueduct	
	Site	**Capacity (disturbed area)**	**Site**	**Capacity (disturbed area)**	**Site**	**Capacity (disturbed area)**
Sacramento Basin	Sites-Colusa	3 MAF (16,700 acres)	not stated	250 TAF (1,500 acres)		
	Thomes Newville	3 MAF (29,600 acres)				
San Joaquin Basin	Montgomery	500 TAF (8,050 acres)	not stated	500 TAF (1,500 acres)	Los Vaqueros	1 MAF (7,000 acres)
Delta	Victoria, Bacon, and Woodward Islands	200 TAF (14,000–15,000 acres)				
	Holland Tract	200 TAF (4,000–5,000 acres)				

Comment: The storage alternatives are described only very generally. Maps indicating the location of the representative sites are not provided. Also, the potential sources of water (especially in the San Joaquin Basin) and potential reservoir operations are not identified. Lacking this basic information, it is not possible to complete even the coarsest level programmatic assessment of potential impacts to water supply and ecological resources. The PEIS/EIR should be revised to fully disclose the locations of all potential reservoir sites currently under consideration and should provide sufficient conceptual operational criteria to allow evaluation of the potential impacts of additional storage. For example, there has been initial information developed on a potential Montgomery Reservoir by the USFWS that identified many significant impacts to species and habitats.

p. 6.1-1 Assessment of hydraulic and hydrodynamic impacts was conducted using DWRSIM (for riverine hydraulics) and DWRSIM1 and DWRSIM2 for Bay-Delta hydrodynamics based on the 73-year period of record for estimated unimpaired flows. Anticipated changes in streamflow and Bay-Delta hydrodynamics are as follows:

- The No Action alternative would result in minor changes in streamflow in Central Valley rivers and the Bay-Delta resulting from increased demand.
- Small to moderate increases occur in mid-range Sacramento River flows due to increased releases from storage for alternatives that include new storage.
- For Alternatives 1A and 1B, little change in Delta circulation patterns occurs. For Alternative 1C, increased south Delta pumping results in small increases in the magnitude of reverse flows in the Delta.
- For Alternative 2, changes in channel geometry and distribution of inflow potentially reduce

through-Delta flow velocities (resulting in increased residence time) and the frequency of reverse flows.

- For Alternative 3, north Delta inflow would be reduced, the frequency of reverse flows in the San Joaquin River would be reduced, and the influence of the south Delta pumping plant on Delta circulation patterns would be substantially reduced.
- Pulse flows and Delta outflow targets implemented under the ERPP would potentially result in substantial short-term increases in Sacramento and San Joaquin river flow during selected periods from March through May.

Comment: There is no mechanism proposed that allows water suppliers to review the modeling assumptions and output to comment on how their operations are evaluated.

p. 6.1-7 The expected impacts to surface water resources are summarized in Table 6.1-1.

Comment: The PEIS/EIR should specifically address potential impacts of new surface water storage to existing water supply deliveries within the San Joaquin Basin. The information in Table 6.1-1 is not adequate for analysis of the impacts. Due to the lack of information provided, potential impacts to the San Joaquin Basin water supply are unclear.

p. 6.1-50 "Each region contains a number of potential storage surface sites that may be further investigated at the project-specific level as candidates for implementing the storage components of the alternatives. While detailed analysis is not possible until specific sites are identified, general types of impacts may be identified at the program level."

Comment: From this statement, it is apparent that CALFED has identified several sites for further evaluation. However, no information is provided regarding any of these sites or their potential operation. The Montgomery site is the only site discussed in the San Joaquin Basin, but no map is provided and no operational criteria are discussed. From the information provided, it is not possible to determine where the Montgomery site or other potential sites are located or to make even a grossly general assessment of the potential impacts of new storage. The PEIS/EIR should fully disclose all sites that have been considered and should discuss potential conceptual operational criteria of the new surface storage facilities. The current information is inadequate and should be revised prior to completion of the Final PEIS/EIR.

p. 6.1-51 "The effects of the ERPP on the San Joaquin River [hydrology and hydraulics] would primarily result from pulse flows during late April and early May. ERPP flow targets for the San Joaquin River tributaries total 4,000 cfs in dry years, 9,000 cfs in below normal and above normal years, and 13,000 cfs in wet years. Based on these pulse flows, the ERPP would more than double the average monthly flow in the San Joaquin River at Vernalis during dry, below normal, and above normal years and would substantially increase average monthly flows during wet years."

Comment: The EIR/EIS should compare the proposed ERPP target flows to flows required by the VAMP Program.

p. 6.1-73 CALFED anticipates water supply benefits to result from increased deliveries to the SWP service areas under all program alternatives, with the greatest benefits occurring for alternatives that include new storage. The benefits would depend on the location and the volume of storage, which would also affect transfer feasibility.

Comment: Many potential benefits are attributed to increased storage. However, it is not clear that storage is feasible under current in-basin water supply and environmental constraints.

p. 6.3-22 "Any storage facilities sited on streams would have a significant adverse impact by trapping sediments, thereby reducing sediment **transport** (emphasis added) and potentially increasing stream erosion capabilities and altering geomorphic characteristics downstream of the storage facility.

Reductions in stream bedload would be highest during storm events. **Off-stream storage sites would not directly impact in-stream sediment transport, but may diminish flows in local stream channels due to their placement across minor drainages."** (emphasis added)

Comment: First, on-stream storage facilities would trap sediment, thereby reducing sediment ***supply.*** *Depending on how the facility is operated, there may or may not be a reduction in* ***transport.*** *Second, offstream storage facilities could impact stream sediment transport. Bedload is transported during high flow events. By reducing the magnitude of these high flow events, off-channel storage could reduce the frequency of bed mobilization, potentially resulting in channel narrowing and intrusion of fine sediments in the channel bed. The ERPP is intended to address some of these impacts.*

p. 7.1-34 "Alternative 3 would have a beneficial impact [to fisheries] through increased natural flow patterns and water residence time."

Comment: This statement contradicts other statements in the PEIS/EIR. The immediately preceding paragraph stated that "...Delta exports may increase, delta outflow may be reduced, and timing of delta inflow may be altered" under this alternative. This does not seem to reflect "more natural flow patterns and water residence time." Moreover the facilities will continue to pump San Joaquin water directly out of the South Delta under all variants of this Alternative, so the greatest impacts to natural flow patterns (reversed net flow in Old and Middle rivers) may continue.

p. 7.1-35 "Increased water residence attributable to reduced flow volume in the Sacramento River channel could increase productivity."

Comment: Although increased residence time may increase planktonic productivity, reduced inflow from the Sacramento River may result in significant adverse impacts to ecological restoration of the Sacramento/San Joaquin Delta.

p. 7.1-36 "Alternative 3 would provide beneficial impacts on the movement of Delta species. Fish species that spawn and rear in the central and south Delta, including delta smelt, striped bass, and Sacramento splittail, would benefit. The 15,000-cfs isolated facility associated with Configurations 3E and 3I would provide greater opportunities to improve conditions affecting movement compared to the 5,000-cfs facility."

Comment: This statement seems to be contradicted by other statements made in this section. The previous paragraph asserts that "...the installation of the Old River barrier [under Alternative 3] would increase net southerly flow toward the export facilities. This may increase entrainment of species rearing in the central and south Delta, such as delta smelt, striped bass, and splittail." Also, the next paragraph states that "[u]nder configuration 3I, the three unscreened intakes in the south Delta ...would be located closer to the center of distribution of many delta species, including larval and early juvenile striped bass and delta smelt."

p. 7.1-43 "[Mitigation measures could include] shift in timing of diversion to periods when species are less vulnerable, such as when the proportion of the population in the vicinity of the diversion is small or when individuals are relatively large and fish facilities are more efficient."

Comment: This idea recurs throughout the fisheries section and is not entirely understood. However, the idea that there are "safe" times to divert is based only on the superficial needs of a few individual species.

PEIS/EIR WATER USE EFFICIENCY COMPONENT TECHNICAL APPENDIX

The Turlock Irrigation District has an overall concern with the assumptions in the PEIS/EIR that 85%

irrigation efficiency can be achieved without completely rebuilding the on-farm distribution systems for the small sized farms that make up our entire customer base and significantly changing the current cropping systems that support the dairy industry in our service area. Over 90% of our system has lined ditches or is piped and we signed the AB 3616 MOU in good faith that the economic EWMPs would be implemented. The CALFED document does not appear to recognize these factors.

p. 1-5 The CALFED with-program estimate will be comparable to the options in the bulletin (DWR 160-98), but will include more water savings from implementation of more efficiency measures. This will reflect the sharp increase in funding and regulatory support that CALFED will propose for water use efficiency programs.

Comment: Later in the volume the issue of regulatory legislation is discussed, but there are no specific details other than measurement and volumetric water pricing on transfers.

p. 2-1 ... CALFED has defined efficiency somewhat differently: **efficient water use is characterized by the implementation of local water management actions that increase the achievement of CALFED goals and objectives.** This definition includes physical efficiency, but is not limited to this narrow definition.

Comment: This circular definition opens the path to the use of "economic efficiency" that could result in reallocation of water to the highest bidder, a point CALFED has not denied is on their agenda.

p. 2-5 **Improve local water use management to achieve multiple benefits** - Opportunities exist to manage local water for multiple benefits without adversely affecting any of the users. Examples of these opportunities include development of conjunctive use programs; coordination of releases to correspond with fishery, water quality, and agricultural needs; and changes in water management that help support wildlife habitat.

Comment: There is little discussion on how this will be carried out and what constitutes "adverse affects". The definition of "local" is critical in determining the area where benefits are created.

p. 2-6 Certain minimum levels of analysis, implementation, and demonstration of efficient use should be met by every water supplier in California, regardless of the supplier's desire to receive CALFED benefits. This is consistent with California public policy including constitutional provisions prohibiting waste and unreasonable use.

Comment: This is the underlying CALFED assurance assumption (and implied threat of action by SWRCB) that needs to be clearly defined, consistently applied, yet equitable and flexible enough to fit local conditions.

p. 2-9 to 2-12 **Agricultural Water Efficiency Approach**

Comment: We agree with the emphasis placed on the need for strong support of the AB 3616 MOU process and the need for all water suppliers to prepare water management plans that clearly identifies the local complexity in achieving water conservation goals.

p. 2-13,14 **Assurances for Agricultural Water Use Efficiency** ... The CALFED approach to agricultural water use efficiency is based on irrigation districts' cooperation with a voluntary program of planning, analysis, and implementation. While this is desirable from the perspective of water users, a voluntary program does not provide strong assurance that planning, analysis, and implementation of cost effective measures will be pursued. Therefore, two categories of assurances are proposed: general assurances and additional assurance mechanisms tailored to the proposed CALFED approach for agricultural water use efficiency.

Comment: The intent is to have the SWRCB investigate ALL agricultural water suppliers for waste and unreasonable use violations, if 2/3 of the acres are not signed into the AB 3616 MOU by January 1999. This punishes those districts that have signed with the intent to follow the MOU process.

p. 4-2 **Agricultural Water Use Management and Efficiency Improvements.**

Comment: The key assumption for the CALFED calculations is that "all agricultural water users within the CALFED solution area will achieve an 85% level of (on- farm) efficiency and irrigation distribution uniformity will increase to between 80 and 90 percent." This will require a significant infrastructure replacement expense to achieve these efficiencies.

p. 4-5 **General State-wide Assumptions**
Conservation of water in areas where water returns to the hydrological system in a usable form can potentially be credited with ecosystem or water quality benefits, but typically not water supply benefits. ...Water previously beneficially used that is conserved is assumed to remain under the control of the supplier or water for their discretionary use or reallocation.

Comment: If some outside agency or state program pays incentives to make the water conservation cost effective for the supplier, it is not clearin the document what CALFED is recommending regarding who gets the credit or has control of the water for reallocation. The TID strongly believes that this credit and control must reside with the agency which holds the water right.

p. 4-7,8 **On-farm Irrigation Efficiency Improvement**

Comment: The section does recognize and use the terms and factors outlined by Dr. Burt from Cal Poly San Luis Obispo as the basis of the calculations. This is a good science foundation, and the assumptions of efficiency improvements at the on-farm level without the CALFED program appear realistic for statewide application, i.e. 80% irrigation, over a reasonably long time span.

p. 4-10 The CALFED Program's Water Use Efficiency component is expected to extend the level of on-farm efficiency up to 85%. ...Analysis of data indicates that an increase of DU (distribution uniformity) to this range (90%) for example, can result in applied water reduction of 8 to 12 percent without any reduction in crop water requirement or reduction in beneficial uses (DWR). Such improvements could occur through advances in the design and manufacturing of pressurized hardware along with increased awareness and implementation of irrigation system maintenance.

Comment: This assumption rules out the use of surface irrigation systems state wide to achieve the conservation levels anticipated. In many areas of the east side tributaries of the San Joaquin River the entire on-farm distribution infrastructure would need to be replaced. The impacts on groundwater recharge through deep percolation for conjunctive use programs in this region would be significant.

p. 4-31 ..., the Eastside San Joaquin River region is characterized as primarily having recoverable losses (315-475 TAF). The region has very limited potential water savings that can be reallocated to other beneficial water supply uses (2-7 TAF).

Comment: The recoverable losses are expected to be conserved and reregulated from the tributary reservoirs to meet in stream and water quality needs. There isCALFED acknowledgment of 200 TAF of groundwater overdraft in the area (San Joaquin & Madera counties), but the impacts from 60 TAF of overdraft experienced on the east side of the Turlock Irrigation District is not discussed. This over draft is created by pumping in adjacent water districts which have no supply of surface water to meet their needs.

p. 7-4,5 **Water Transfer Element** ...The successful implementation of components and elements of the

CALFED Bay Delta program depends on the existence of a rational, well regulated statewide water market.

Comment: The legal, policy, political and administrative water transfer issues appear to have been identified, but the process to be used to resolve them or recommended solutions have not been presented, except for groundwater transfers.

p. 7-9 In application of the "no injury" rule to a groundwater substitution transfer, the approving agency must consider whether the groundwater to be pumped satisfies the "real water" test. If the groundwater pumping would directly affect accretion to or depletion from a stream, there may not be any true increase in water supply and thus, no real water. Also, the potential injury to a downstream user must be analyzed.

*Comment: The **Solution Options** offered on pages 7-10 to 7-15 only outline what is being discussed, not what is recommended. The lack of recommendations does not allow adequate analysis of the impacts from the "no injury" rule.*

Supplement A: Water Transfers in context of the CALFED Bay-Delta Program

Comment: This section relies heavily on system modeling to look at transfer capacity in the delta system. There does not appear to be any mechanism that allows agencies or districts to review the modeling assumptions or output that CALFED is using.

p. A-8 **Sources of Transfer Water** ... include reservoir re-operation, ... conjunctive use/ groundwater banking, ... crop shifting/ land fallowing. The first two sources incorporate changes in the management and operation of existing facilities and aquifers to increase the available yield in the system.

Comment: Earlier discussions indicated that recoverable water is NOT new water, but when the available yield of a system is increased that is normally considered new water.

p. A-10 Is water dedicated for instream flow purposes also required for Delta outflow? If not, depending on the timing, available capacity, and demand, this water could be re-diverted once downstream of its area of need and be transferred to another beneficial user.

Comment: See the comments for p.4-5 General Statewide Assumptions.

p. A-11 Use of Economic Models for Transfer Policy Analysis

Comment: On page A-12 the ERM model and CVAPT model are described as used in the impact analysis of the CVPIA Programmatic EIR/EIS and the DWRSIM model discussed on page A-17 is a key input to the ERM model. What is the mechanism for a district to review the model inputs and assumptions to insure that their interests are fairly represented?

Supplement B: Agronomic Based Rotational Land Fallowing

p. B-1,2 As conceived, an agronomic based, rotational fallowing program would provide an incentive for landowners to temporarily fallow parcels of land that would otherwise be in production. ... In essence, this program would be a water transfer. ... In addition, the land temporarily fallowed would be 'rested' for one or more seasons to rejuvenate the soil and improve the soil's productive capabilities.

Comment: In dry, years with water supply curtailments, there is a high probability that water allotted to the fallow field would be used by the grower to provide added water to his remaining land to produce a crop rather than transferring this water to the Delta. Accounting for this water in a transfer would be difficult for all parties involved.

p. 402 "USFWS (1995) recommended an alternative flow schedule to achieve the goals of the Anadromous Fish Restoration Program (AFRP)."

Comment: The USFWS (Stockton) has previously agreed the U.S. Fish and Wildlife Service Working Paper on Restoration Needs (USFWS 1995) should not be used for any purpose. The Restoration Plan for the Anadromous Fish Restoration Program (USFWS 1997) recommends implementation of the flow schedule specified in the 1995 FERC Settlement Agreement and 1996 FERC Order, with supplemental flows acquired from willing sellers as needed.

p. 402 "Results of the stream temperature modeling study on the lower Tuolumne River indicate that in recent years temperature limits for salmon spawning were commonly exceeded in a portion of the spawning reach in October. In recent drought years, the first fish have returned to the Tuolumne River in early November, rather than in October as in previous years, because high water temperatures blocked their upstream migration. As with other San Joaquin Basin tributaries, high water temperatures in the San Joaquin Basin during the spring emigration period may be a significant factor affecting smolt survival. Results of the stream temperature modeling study indicate that in May, and at times in late April, smolts emigrating from the Tuolumne River encounter stressful or lethal water temperatures. Temperature was a consideration in formulating the FERC and AFRP revised flow schedules. However, these new schedules will not ease the temperature problems under all ambient conditions, especially in the lower portion of the river during low flows."

Comment: Because no references are cited, it is difficult to evaluate the ERPP assessment of temperature in the Tuolumne River. Similarly, the USFWS Working Paper on Restoration Needs (USFWS 1995), from which much of this discussion appears to be drawn, does not cite references or studies upon which its conclusions are based.

Only in one year were salmon first observed at La Grange in November. No analysis is presented to support the authors' conclusion that delayed adult arrival during drought years was a result of elevated stream temperatures. Although adults typically begin arriving in late September and October, adult numbers in the Tuolumne River typically peak in November in all years. Later arrival during the drought years (when relatively few adults were returning) may be the result of low population numbers. Low numbers may truncate the temporal distribution of adult arrivals. Peak arrival is probably more indicative of adult migration conditions, especially during low population years.

Since 1987, the Districts have monitored water temperature at a minimum of five sites in the Tuolumne River, at limited locations on Dry Creek (which enters the Tuolumne River at RM 16.5), and in the San Joaquin River. Temperature data are reported in TID/MID (1998) Report 97-4. In addition, the U.S. Geological Survey operates two gauges which provide temperature data on the Tuolumne River – Tuolumne River below La Grange Dam near La Grange (number 11289650) and Tuolumne River at Modesto (number 11290000).

From these data, the Districts developed a model to predict temperature throughout the year at any location in the Tuolumne River. This model indicates that CALFED target temperatures are exceeded in late spring at some locations during some years. However, the Districts also assessed the effects of water temperature on fry and juvenile salmon based on sampling of juvenile chinook salmon (using seine hauls) in areas of potentially high temperature (EA 1991, Appendix 21). These analyses indicate that, although temperatures in the San Joaquin River during chinook salmon emigration can be relatively high and transiently exceed the probable upper incipient lethal temperature, there is no evidence that either recruitment or escapement are limited by existing water temperatures. Additional studies (such as examination of blood and tissue for biochemical evidence of thermal stress) might provide more conclusive information regarding the suitability of existing

water temperatures for rearing and emigration. Also, although high recruitment has been related to high spring flows during emigration, regression analyses indicate that escapement is not related to lower water temperatures resulting from high spring flows (EA 1991, Appendix 21). Rather, it is likely that such flows reduce predation by black bass as the smolts migrate through the river or reduce the smolts' exposure to the Delta pumps.

p. 403 "The river now supports fall-run chinook salmon and perhaps late-fall-run chinook salmon and steelhead. As with the Stanislaus River, the presence of distinct late-fall-run chinook salmon and steelhead is not confirmed."

Comment: There is no scientific evidence that late-fall-run chinook salmon or steelhead occur in the Tuolumne River.

p. 403 "Smolt appears to be the critical bottleneck in the life cycle, because smolt production determines adult run size."

Comment: There can be other "critical bottlenecks" that may occur with other life stages. For example, harvest and Delta export mortality have a very direct effect on run size.

p. 403 "Unnaturally high summer flows in the salmon spawning and rearing areas below dams from storage releases for irrigation sustain large populations of predatory fish. These predators are then present in other months and can cause significant young salmon losses."

Comment: "Unnaturally high summer flows" may improve habitat suitability for some predatory fish (such as trout and black bass) in rivers where summer irrigation flows are released and conveyed down the river channel (such as the Sacramento River) to the Delta for export. However, in the Tuolumne River, primary irrigation flows are diverted upstream of La Grange Dam and are conveyed through off-channel canal systems. This statement, therefore, is not applicable to the Tuolumne or Stanislaus River. The Districts do, however, recognize bass predation as a major factor limiting juvenile salmon survival in the Tuolumne River and are currently undertaking habitat rehabilitation projects to reduce habitat suitability for black bass.

p. 409 "Managing flow releases to provide suitable habitat and water temperatures for salmon will be essential for restoring the ecosystem. Flow improvements in the revised agreement [1996 FSA] and FERC license should be implemented and monitored for effectiveness. Streamflow management in the Tuolumne River will need to be integrated with flow management on other San Joaquin tributaries and the lower San Joaquin River to obtain the greatest benefits."

Comment: The Districts have implemented the flow schedule specified in the 1995 FERC Settlement Agreement and the 1996 FERC Order, and continue to monitor its effectiveness in improving chinook salmon habitat and in increasing chinook salmon population levels.

p. 409 "Also important will be restoring more natural channel configurations; restoring gravel recruitment, transport, and cleansing processes; and restoring a balanced fine sediment budget. This will be accomplished by implementing land use and livestock grazing practices, reducing non-native fish populations and habitats that support them, reducing young salmon losses at water diversions, reducing input of contaminants, and reducing illegal salmon harvest."

Comment: The Districts, California Department of Fish and Game, US Fish & Wildlife Service, Natural Resources Conservation Service, and Tuolumne River Technical Advisory Committee are currently planning and/or implementing several projects that address these issues. These projects are briefly described below:

<u>Special Run-Pools 9 and 10</u> – The Districts are currently in the early phases of reconstructing two abandoned in-channel mining pits, referred to as Special Run-Pools (SRPs 9 and 10). These SRPs

resulted from large pits created for extensive in-channel aggregate mining, which began as early as 1937. SRP 9 is 400 feet wide and 6 to 19 feet deep, and SRP 10 is 400 feet wide and 10 to 36 feet deep pit. Due to the large size of these pits; interception of sediment supply by upstream dams; and greatly reduced magnitude, duration, and frequency of sediment-transporting flows, these SRPs have not appreciably filled since they were created.

These in-channel aggregate extraction pits have a significant impact on chinook salmon production on the Tuolumne River by increasing salmon predator habitat, which has increased predator abundance (largemouth bass, smallmouth bass, and squawfish) and reduced smolt outmigration success (EA 1991). Nearly all salmon spawning in the Tuolumne River occurs upstream of this location, so most juveniles and smolts must migrate through these pits and risk predation. Due to the large size of these pools, the potential for migration delay and increased exposure to predators, and predator abundance, both SRP 9 and SRP 10 are ranked among the highest priority restoration sites on the Tuolumne River.

The project will construct a geomorphically functional system by recreating a channel and floodplain that is scaled to the contemporary flow regime. The project has been partially funded by AFRP and CALFED and is being implemented by TID. It is currently undergoing environmental review. Construction at SRP 9 is scheduled to begin in 1999. Construction at SRP 10 may begin in 2000. Assessment of baseline biological conditions at these sites will began in the spring of 1998, as required by the adaptive management and monitoring program.

Gravel Mining Reach Restoration – This project will set back gravel pit embankments (widening the floodway to 500 feet), construct an appropriately scaled bankfull channel and floodplain within the widened floodway, and establish native riparian vegetation on the newly constructed floodplain in a six-mile reach of the Tuolumne River. The Gravel Mining Reach Restoration project will be undertaken in phases, requiring four years to complete construction.

The project has been partially funded by CALFED/AFRP and is being implemented by TID as project manager. It is currently undergoing environmental review. Construction for Phase I is scheduled to begin in 1999. Implementation of subsequent phases is scheduled over an additional three-year period but is dependent on the availability of additional funds. Assessment of baseline biological conditions at this site will begin in the summer of 1998, as required by the adaptive management and monitoring program.

Gravel Augmentation – The DFG is currently implementing the early phases of a gravel augmentation project funded by CALFED. The purpose of this project is to increase the supply of coarse sediment to the lower Tuolumne River by introducing clean gravel to the channel between the La Grange Dam (RM 52) and Basso Bridge (RM 47.5). The gravel mixture, which will consist of smaller gravel than that currently occurring on the bed surface, will be suitable for chinook salmon spawning and will be mobilized under the river's current flow regime. The project gravels placed in the channel will be mobilized and redeposited downstream, mimicking natural coarse sediment transport processes. Implementation will be in two phases, with the first phase introducing 10,000 cubic yards of gravel in the upstream portion of the project reach in 1999 and phase two, if funded, will introduce 10,000 cubic yards of gravel at the downstream portion in 2000.

Basso Bridge Property Acquisition – DFG has received funding from CALFED to purchase 41.6 acres bordering the Tuolumne River. The purpose of this acquisition is to (1) acquire and protect valley foothill riparian habitat along an important spawning reach of the Tuolumne River and (2) to establish a publicly-owned "in-holding" within a three mile reach of riparian habitat and salmon spawning habitat. The properties harbor riparian vegetation (such as valley oak, willow, and cottonwood), and the river channel to which these properties are adjacent provides prime chinook salmon spawning habitat. The three parcels were the only remaining private properties on the south bank of the Tuolumne River between La Grange Road (RM 50) and Basso Bridge (RM 47.5) and provide a critical link between more than 350 acres of County-owned property to the west and more

145 acres of County-owned property to the east. CALFED and the California Wildlife Conservation Board are currently proceeding with contract requirements.

Grayson River Ranch Easement Acquisition and Riparian Restoration – The Natural Resources Conservation Service (NRCS) is working to acquire additional funds needed to purchase a conservation easement on a 140-acre property known as the Grayson River Ranch. This property, which extends from RM 5.1 to RM 6.3, formerly harbored a riparian forest. Much of this forest is shown in 1937 aerial photographs, although approximately one third of the property had already been cleared by that time. The property is isolated from the river by a privately owned levee, which was breeched during the January 1997 flood. The downstream portion of the property is inundated under even moderate flow conditions. NRCS has reserved $254,700 (the maximum finding allowable under the Wetlands Reserve Program) toward this project and is seeking additional funds to purchase the easement, and complete restoration.

Other Near-term Projects – In addition to projects that are currently funded, conceptual designs have been completed for several projects, including a sedimentation basin on Gasburg Creek and channel reconstruction at SRPs 5 and 6 (RM 30–31 and RM 33–33.5) and in the Dredger Tailings Reach (RM 42–47.5). Gasburg Creek flows through an active sand mine. This creek has been identified as a primary source of sand input to the Tuolumne River spawning reach. Fine sediment input to this reach, in combination with the lack of bed mobilization, has resulted in the intrusion of sand into spawning gravels which has degraded salmon incubation conditions. Completion of the sedimentation basin would reduce the input of sand from Gasburg Creek to the spawning reach. Channel reconstruction at SRPs 5 and 6 and the Dredger Tailings Reach will be similar to that currently being implemented at SRPs 9 and 10 and in the Mining Reach.

p. 407 "The [Merced River] hatchery has been valuable in augmenting and sustaining salmon runs in the lower Merced River and in the Stanislaus and Tuolumne rivers and providing fish for study purposes throughout the San Joaquin Basin."

Comment: The Merced River Hatchery has not been used to directly augment the Tuolumne River salmon population. While hatchery-reared smolts have been released in the Tuolumne River, these releases were for the purposes of smolt survival studies and not for stock augmentation. Recently, most of the members of the Tuolumne River Technical Advisory Committee have become increasingly concerned about the impacts of these releases on the genetic resources of the Tuolumne River chinook salmon population and have developed a pilot study intended to greatly reduce the numbers of hatchery fish released in the Tuolumne River. Primary goals of the FERC Settlement Agreement are to increase the naturally occurring salmon population and to protect any remaining genetic distinction of the Tuolumne River chinook salmon population. Many participants of the 1995 FSA are concerned that large hatchery releases are contrary to this goal.

p. 410 "Streamflows should be enhanced below Don Pedro Dam by providing base flows recommended by DFG, In addition to the DFG recommendation, a spring flow event in late April or early May in dry, normal, and wet years would be provided to support downstream emigration of juvenile salmon and steelhead and to benefit stream channel and riparian habitat."

Comment: DFG developed flow recommendations for critical, dry, below normal, above normal, and wet years (Reynolds et al. 1993). The flow recommendations for dry, below normal, above normal were incorporated into the 1995 FERC Settlement Agreement flow schedule. The FERC Settlement Agreement adopted higher flows than recommended by DFG for critical years and lower flows for wet years. The FERC Settlement Agreement flow schedule also requires fall attraction flows in year types ranging from intermediate to wet and spring pulse flows in all year types. The DFG has approved and signed the FERC Settlement Agreement.

p. 410 "If future baseline chinook salmon populations do not respond favorably to improved flow and habitat conditions in the Tuolumne River, San Joaquin River, and Delta, a comprehensive evaluation

will be made of the need for additional artificial propagation of chinook salmon in the basin.

Comment: Currently, there is no hatchery on the Tuolumne River. A small rearing facility (Tuolumne River Rearing Facility or TRFF) exists in a converted section of MID canal near La Grange Dam that has been used in 1988-94 by DFG. The facility has been used to rear hatchery salmon from the Merced River and wild fry from the Tuolumne River; nearly 1 million hatchery smolts were produced one year at this facility. DFG has not used the facility in recent years even though there is a 1993 agreement between the Districts and DFG in which the DFG agreed to use its best efforts to make the rearing project successful through the year 2001.

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