

- Low-salinity water from the Delta would increase the flexibility for meeting water needs by enabling blending with alternate supplies, such as groundwater (some of which is higher in dissolved minerals than surface waters), and with other surface water supplies of lower mineral quality. The effect of this increased flexibility would reduce dependency on importing water supplies from the Delta.

The vision for water quality also includes being able to provide the critical benefits of water quality at a cost that is affordable to Californians generally and to the individual beneficiaries of the water resources of the Delta estuary.

The CALFED vision can be realized only with the help of the involved agencies and stakeholders. Its attainment must be an evolutionary process. CALFED has chosen the term "adaptive management" to refer to the concepts that (1) much remains to be learned about the Bay-Delta estuary and about what can be done to correct its problems, and (2) decisions will need to be continuously made over the next 30 years as the program is implemented. The most important part of the water quality vision is that Continual improvement in water quality will be achieved by maintaining the Water Quality Technical Group (WQTG) as the primary vehicle through which the program is guided in the coming years. Therefore, although it is not possible to predict the exact directions of the program, maintaining close involvement of the interested parties will provide the best possible assurance that correct decisions will be made while CALFED solution principles are upheld.

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Though not applicable to every situation that the CALFED Water Quality Program will encounter, the program endorses the following solution methodology:

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- **Use existing regulatory water quality standards as goals where applicable**
- **Devote primary attention on defensible problem identification**
- **Implement comprehensive data collection and focused research to address water quality issues of concern**
- **Develop and implement analytical tools (mathematical models) to provide predictive capacity for management efforts**
- **Implement demonstration projects to validate management effectiveness**
- **Develop strategic plans through involvement and education of all affected parties**
- **Develop and implement management tools to address water quality problems**
- **Support other efforts to address identified problems**

1.4 WATER QUALITY PROGRAM ACTIONS

1.4.1 Introduction

The Water Quality Program has developed programmatic actions to address beneficial use impairments within its geographic scope. Implementing these actions will further the program's goal of providing good quality water for environmental, agricultural, drinking water, industrial, and recreational beneficial uses of water. The water quality impact analysis of the Programmatic EIS/EIR contains a comprehensive analysis of the impacts of CALFED actions on water quality and other components of the CALFED Program.

Determining impairment to a beneficial use is almost always a difficult and complicated matter. For some beneficial uses, such as drinking water use and agricultural water use, concentrations of parameters of concern in ambient water that may affect uses are well quantified. For other beneficial uses, such as ecosystem resources, concentrations of parameters of concern in ambient water that may affect the diverse assemblages of species in the Delta Region are less well understood. As a result, the Program has relied on the technical expertise of a variety of stakeholders representing beneficial uses. These stakeholders have worked with CALFED staff to identify parameters of concern to beneficial uses, the locations of beneficial use impairments, the types of water quality actions needed to address these impairments, and the ways to assess the effectiveness of actions.

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CALFED is a cooperative, interagency effort involving many state and federal agencies with management or regulatory responsibilities for the Bay-Delta. Each participating agency bears its respective authorities and responsibilities, independent of CALFED efforts. One primary purpose of CALFED is to facilitate the collaborative and cooperative use of these authorities and responsibilities, as well as CALFED resources, to better address the range of problems facing the Bay-Delta.

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CALFED does not possess independent, regulatory authority over water quality. However, CALFED does recognize the need for participating agencies to exercise their responsibilities with regard to water quality. CALFED will work with all entities in support of achieving its water quality goals.

CALFED's water quality program calls for implementation of a range of tools by participating agencies and interested parties to accomplish its goals. These tools include, but are not limited to, voluntary efforts, use of economic

incentives, and exercising regulatory authority by appropriate agencies. The appropriate mix of tools will vary depending on the problem, existing activities, and where CALFED's program can add value.

CALFED is a cooperative planning process, but is not assuming water quality regulation authority or superceding existing authority for water quality standards or enforcement. CALFED is not attempting to change area of origin water rights regulation. CALFED Studies and research and incentives for implementation of water quality actions directed toward a water quality agency would be to augment that agency's effectiveness in developing the appropriate levels of protection or methods by which reduction can be made in the most cost effective manner. Directed actions and individual projects are intended to support efforts already in progress. CALFED agencies participate in the CALFED consortium understanding that CALFED has no authority to direct an agency or private party.

1.4.2 Background

Stakeholders and CALFED staff have developed a list of parameters of concern to beneficial uses (Table 1). The list of parameters of concern may be updated as new information becomes available, consistent with the adaptive management policy of the CALFED Program.

Water quality problems associated with these parameters have been identified by the State in accordance with the CWA. The program used existing information from the CWA Section 303(d) list of impaired water bodies for California to identify the locations of beneficial use impairments associated with parameters of concern. The Section 303(d) list identifies water bodies with impaired beneficial uses, the parameters of concern within each water body that are thought to be responsible for the impairment, and the likely sources of the parameters of concern. Appendix B contains a list of the impaired water bodies within the Water Quality Program's geographic focus that were identified by the State in 1998, in accordance with the CWA Section 303(d).

Table 1. Water Quality Parameters of Concern to Beneficial Uses

Metals and Toxic Elements	Organics/ Pesticides	Disinfection By-Product Precursors	Other
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DWR has been sampling the San Joaquin River and the Turning Basin for several years and has compiled extensive data. Some oxygen depletion is emanating from the ship channel Turning Basin; however, the exact cause of such depletion is unknown. Studies are ongoing and expanding.

The U.S. Army Corps of Engineers (Corps) placed an aeration jet at the mouth of the Turning Basin as mitigation for DO effects from the ship channel. The aeration system has since been removed. Data may still be available regarding the efficacy of the aeration system. Any further studies should be coordinated with the Corps' efforts.

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2.4.2

The CVRWQCB ~~is initiating~~ has established a watershed-based stakeholder group to assist in developing technically based comprehensive total maximum daily load (TMDL) evaluation and allocation for sources of BOD and nutrients. CALFED has awarded an \$860,000 grant to determine causes and loads contributing to causes of low dissolved oxygen in the lower San Joaquin River. Study plans are being finalized and work is expected to begin in various stages during the first half of 2000. The Stakeholder group has representatives from municipalities, state and federal agencies, agricultural interests, environmental interests, local industry, and academic institutions. This ongoing effort will help to identify management actions that will best achieve the established water quality objectives.

Stockton Tributaries

Priority Actions

5. Assess the current water quality impairment due to high BOD in these creeks.
6. Develop new strategies to assist farmers in containing wastes on the fields, including financial incentives such as low-interest loans to upgrade their systems.
7. Undertake further efforts to enforce the WDRs of permitted and unpermitted dischargers.

The goals of these actions are to maintain DO concentrations above the 5-mg/l standard, maintain BOD concentrations below 30 mg/l, and restore natural ecosystem processes and functions in the creeks.

Information Needed

Section 6.4.3 is existing actions.
The suggested changes for 6.4.3 were
made in 6.4.2.

6.4.2 Information Needed

Projects that provide information needed should be supported based on priorities set by CALFED workgroups and administration. Governmental and private efforts should be sought for contributions in this effort to control OC pesticide laden sediment. Some potential projects include the following.

1. Data from continued monitoring efforts.

Scientific and technical needs associated with the problem of OC pesticides in the Bay-Delta and watershed include the need for continued monitoring of levels in biota and of sources in the basins. More data are needed on sources of OC pesticides in the Sacramento River Basin, similar to the information developed for the San Joaquin River Basin.

The TSMP continues to be one of the few overviews of the impacts of toxic substances in the environment. Regional elevations can be detected and put in perspective, although the TSMP is limited in detecting quickly changing types of contaminants or acutely toxic materials. Predatory fish are long lived and may travel considerable distances. A single fish with an elevated tissue concentration of a particular toxic substance cannot be linked with certainty to

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a potential source. However, repeated detections over many years in the same watershed can be revealing. Only through sustained monitoring can significant problems be distinguished from an isolated and highly contaminated individual specimen.

The CMARP's support for the TSMP sampling site at Vernalis would offer the opportunity to examine fish whose body burdens of toxic substances integrate contaminants in all of the San Joaquin River tributaries. Whenever elevated levels of toxicants appear at Vernalis, additional samples from upstream of the San Joaquin River and its tributaries could be taken to trace the contaminant to a source region. Once a source region was determined, watershed-based source control efforts could be initiated.

2. Design and assessment of various BMPs to reduce OC pesticides.

A better understanding is needed of the effectiveness of various proposed BMPs to control sediment losses during the irrigation season. Some BMPs also need to be developed to reduce sediment losses during winter storm runoff.

3. Relationship between soil fertility and pest management.

Additional research is needed on the relationship between soil fertility, pest management, and water use. Farmers in case studies found that soil fertility was key to reducing chemical inputs. Some also found that an extensive soil-building program could reduce water use.

4. Efficient irrigation technologies.

Additional research dollars should be directed toward improving efficient irrigation technologies. Continued advances in technology are possible and should be aggressively pursued.

5. Agricultural runoff and water quality stressors.

Continued research and technology transfer is needed to respond to increasing concerns related to surface water runoff from agricultural lands and their contribution to water quality stressors in the Delta.

6. Winter flood control and control of OC pesticide laden sediment.

control measures also control off-site migration of OC pesticides.

pricing, low-interest loans, and other economic incentives have contributed to these increased efficiencies by Grassland Area Farmers. These increased efficiencies have greatly reduced and, in some cases, eliminated surface return flows but have only slightly reduced subsurface drainage.

The Grassland Bypass Project is a successful example of a program that has improved water quality. The Grassland Bypass Project authorizes the discharge of subsurface drainage from a 97,000-acre area within the Grassland Authority to the San Joaquin River. This discharge is governed by a Use Agreement between the Authority and Reclamation and by is subject to Waste Discharge Requirements issued by the Regional Board which set limits on selenium discharges. The local water districts affected by the project formed a regional drainage district which has enabled the growers to work together to reduce drainage and collectively manage an reduce selenium loads. While the primary emphasis of the project has been on selenium management, the efforts of the Grassland Area Farmers have also lead to reductions in the discharge of slats and boran from the area. that require a reduction in the amount of drainage that is discharged.

As a result of this Project, the amount of salt, boron and selenium discharged by Authority members within the Grasslands area has been significantly reduced. In fact, in the 1999 water year, salinity has been reduced by 32%, boron has been reduced by 14% and selenium has been reduced 48% of the historic levels of similar water-year types. These reductions should be discussed in the Water Quality Program, and the Grassland Bypass Project may be further developed as an element of the Water Quality Program Plan. (1211.37-WQ)

Drainage management in the Grassland area has been significantly improved during the past 2 years.

Opportunities for drainage management in the Delta should also be explored. Improvement in water use efficiencies in agriculture has been accomplished in various areas. More opportunities still exist.

Reuse

Reuse is a key element of the SJVPP recommendations for drainage management. The intent of drainage reuse is to improve irrigation water use efficiency, hence reducing the volume of drainage requiring disposal. A simple drainage reuse increases soil salinity, however, and it prevents creating sustainable environmental and agricultural systems. In some cases, reuse of drainage cannot be accomplished without installation of tile drains. This action requires the installation of subsurface recirculation systems which can require substantial plumbing of the existing system. Reducing drainage water by reuse requires the