
impacts of copper in the Delta, and determine the feasibility of copper load reduction.

- **Turbidity and Sedimentation (predominantly in the upper watershed) -** Reduce turbidity and sedimentation which affect several hydraulic areas in the Bay Delta and its tributaries. Study ecological impacts of sedimentation. Control sedimentation in several watersheds to protect spawning beds and maintain capacity of streams.
- **Toxicity of Unknown Origin (predominantly in the Delta) -** Through research and monitoring, identify parameters of concern in the water and sediment within the Delta, Bay, Sacramento River and San Joaquin River regions and implement actions to reduce their toxicity to aquatic organisms.

Drinking Water Quality Improvement Strategy

Drinking water supplies from the Delta contain higher bromide concentrations than are found in the drinking water supplies of about 90% of the nation. Bromide reacts with disinfection chemicals to form harmful chemical byproducts that have increasingly raised health concerns for consumers. Most of this bromide comes from the ocean as a result of its connection with the Sacramento-San Joaquin Bay-Delta estuary. Additional pollutants of concern for drinking water include organic carbon, which also has disinfection byproduct ramifications, and pathogens.

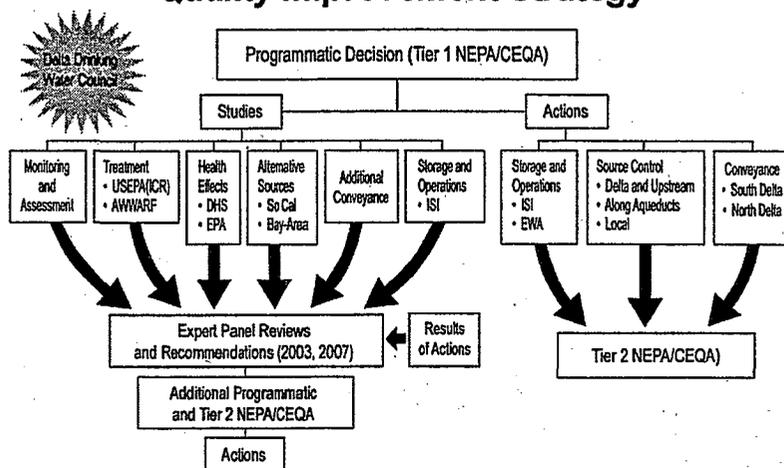
The CALFED drinking water quality objective is to continuously improve source water quality that allows for municipal water suppliers to deliver safe, reliable, and affordable drinking water that meets, and where feasible, exceeds applicable drinking water standards. The CALFED strategy for improving drinking water quality is to reduce the loads and/or impacts of bromide, total organic carbon, pathogens, nutrients, salinity, and turbidity through a combination of measures including source reduction, alternative sources of water, treatment, and storage and conveyance improvements.

CALFED's specific target for providing safe, reliable, and affordable drinking water in a cost effective way is to achieve either: a) average concentrations at Clifton Court Forebay and other south and central Delta drinking water intakes of 50 ug/L bromide and 3.0 mg/L total organic carbon; or b) an equivalent level of public health protection using a cost effective combination of alternative source waters, source control, and treatment technologies. CALFED has not adopted a specific numeric target for salinity (other than meeting existing Delta standards) but does have a preliminary objective of reducing the salinity of Delta supplies. Such reduction will increase the capability for blending of supplies from Delta and non-Delta sources, increase opportunities

for recycling and conjunctive use, and reduce the need for additional treatment of industrial process water.

The adjacent figure lays out the drinking water quality improvement strategy to achieve this target. The strategy is composed of a combination of actions and studies developed and performed under the scrutiny of a public advisory group (the Delta Drinking Water Council, comprised of urban water agency, environmental group, business, Delta, and public health agency representatives). Interim milestones will be developed to help measure progress toward CALFED's public health

Drinking Water Quality Improvement Strategy



protection objectives. The information generated by these actions and studies will serve as the basis of reviews by panels of independent experts in 2003 and 2007. These panels will be convened to assess the results of drinking water studies, to assess the continued appropriateness of the water quality targets, and to make recommendations on future actions to improve drinking water quality. The results of the expert panel reviews will be reported to CALFED and the State legislature for their use in adaptive management decisions. Based on the recommendations of the expert panels and other available information, CALFED and the Legislature will make decisions on which additional measures or set of measures are most appropriate to implement to meet CALFED's public health protection objectives.

The actions and studies to be performed as components of the strategy are described below:

Actions

- Source Control** - CALFED will establish an effective source control program for activities in the Delta and upstream. This includes treatment or relocation of agricultural drains in the Delta, management or further treatment of upstream agricultural drainage, control of urban runoff and municipal wastewater treatment discharges in the Delta and upstream, and watershed activities above the reservoirs on the Sacramento and San Joaquin Rivers and their tributaries. Water that is conveyed to municipal water agencies via open aqueducts such as the California Aqueduct, the South Bay Aqueduct, and the Delta-Mendota Canal needs to be protected from degradation in those conveyance facilities by

controlling sources of pollution along the aqueducts. Source control is also necessary in the watersheds that drain to local reservoirs that receive water exported from the Delta or are blended with export waters to insure that high quality is maintained.

- **Conveyance Improvements** - CALFED has proposed a broad array of actions for the lower San Joaquin River and south Delta region to address ecosystem, water quality, and water supply availability concerns, including operable barriers in strategic locations to maintain adequate water quality and stages to facilitate local water supply availability.
- **Storage and Operations** - CALFED is considering flexible management of water operations that may achieve fish protection and ecosystem benefits more efficiently than a completely prescriptive regulatory approach. These management operations may have ancillary benefits for source water quality.
- **Monitoring and Assessment** - Monitoring and assessment as part of CMARP are needed to provide relevant information to scientists, the public and decision makers to ensure that drinking water quality is being improved in an efficient and cost-effective manner.

Studies

- **Treatment** - EPA is engaged nationally in collecting information from water utilities regarding the effectiveness of source control and treatment. This effort is known as the Information Collection Rule. It will provide a basis for considering improvements to existing drinking water treatment technology. The American Water Works Association Research Foundation (AWWARF) is engaged in ongoing research regarding methods to improve drinking water quality. CALFED will work with water utilities to ensure that EPA's and AWWARF's efforts continue to be useful to water suppliers dependent on Delta supplies.
- **Health Effects** - CALFED will work with the California Department of Health Services and EPA to ensure that there is adequate ongoing research on the health effects of drinking water, in particular brominated compounds that are prevalent in drinking water that comes from the Delta.
- **Alternative Sources** - For both Southern California and the San Francisco Bay Area, opportunities exist to engage in water exchanges with agricultural water users and among urban users to shift higher quality supplies to urban users for drinking water while ensuring that agricultural users retain a reliable supply of water. The development of these opportunities depends heavily on the

cooperation of urban users in the two identified regions with each other and with agricultural users in the San Joaquin Valley. Enabling Delta water users to substitute higher quality source water for current Delta water offers important opportunities to improve drinking water supplies. At the same time, however, CALFED will continue its commitment to assure continuous improvement in the quality of Delta water for all uses.

- **Conveyance** - In the north Delta, CALFED has proposed study and evaluation of a screened diversion structure on the Sacramento River (or equivalent water quality actions). Appropriate studies of how additional conveyance improvements, including but not limited to an isolated facility, can be developed and operated need to continue so that CALFED can pursue these conveyance improvement options in a timely manner should it prove necessary to do so.
- **Storage and Operations** - CALFED agencies will conduct an Integrated Storage Investigation to evaluate the relationship between various types and locations of storage and the overall role of storage in water quality improvement as part of the CALFED Water Management Strategy.
- **Monitoring and Assessment** - Again, monitoring and assessment are absolutely necessary to continue to provide relevant information to scientists, the public and decision makers to ensure that drinking water quality is being improved in an efficient and cost-effective manner.

Relation to Other Program Elements

CALFED's strategy is founded on reducing or eliminating parameters that degrade water quality at their sources. However, other components of the CALFED Program can affect water quality. Watershed activities can improve water quality in the Bay-Delta system by helping to identify and control non-point sources of pollution and identify and implement methods to control or treat contaminants in the upper watersheds. CALFED has developed a Watershed Program that has strong linkages to both the water quality improvement strategy and the ecosystem restoration strategy.

The two main components of the Watershed Program are to provide assistance - both financial and technical - to local watershed programs, and to aid in the coordination and integration of local watershed programs with the CALFED Program. CALFED supports and encourages locally-led watershed activities that benefit the Bay-Delta system. Emphasis is placed on local leadership, recognizing that local watershed approaches may vary and that community involvement and support are essential. CALFED strives to strengthen the partnerships and relationships between the public, local watershed organizations, and governments at all levels.