

Water Quality Program

Type of Item: Information and Discussion

Issue Summary:

Through technical work groups, specific water quality parameters were identified as being of concern to agricultural, ecological and urban water supply. Also, potential actions were identified that, if taken, would be expected to reduce harmful effects of the water quality parameters of concern. Water quality problems in the Bay-Delta estuary result from a variety of factors:

- Sea water intrusion- During periods of low Delta outflow, saline water from San Francisco Bay may intrude into the interior of the Delta and increase the salt content of water used by agricultural interests and urban water agencies.
- Drainage from inactive and abandoned mines - Acid mine drainage resulting from oxidation of mine tailings and other wastes contribute a variety of toxic metals to Delta tributaries and adversely affect populations of fish and other aquatic organisms.
- Agricultural return flows - Particularly in the area around the San Joaquin River, recirculation of water used in the Delta-Mendota Canal service area and the drainage into the San Joaquin River significantly increases salt loads entering the Delta. Discharges from Delta islands add organic carbon that is important in production of unwanted byproducts of drinking water disinfection. Uncontrolled drainage from animal operations can contribute nutrients and pathogenic organisms to Delta waters.
- Municipal and industrial waste discharges - Municipal discharges from cities such as Sacramento and Stockton, and industrial discharges into Bay-Delta estuary waters contribute a number of constituents such as salts and metals, and increase the temperature of Delta waters.

To deal with these problems the CALFED process is developing a variety of actions which will mitigate the factors identified above.

The water quality problems and solutions being identified through the CALFED process largely fall into the technical realm. That is, both water quality problems and their solutions are generally subject to quantification. CALFED has organized a Water Quality Technical Work Group composed of experts representing agricultural, urban, industrial, and ecological interests who, collectively, have the capacity to locate, interpret, and utilize available information in the CALFED decision making process. However, the application of science has limitations that force the ultimate decision making into the policy arena.

In approaching the water quality problems of the Bay-Delta Estuary, CALFED must play a role in watershed management activities in the watersheds tributary to the Sacramento-San Joaquin

Delta. It is anticipated BDAC input will be important in developing and in defining the role of CALFED in this area of activity.

Background:

Water quality issues have been a factor in the Bay-Delta system even before the deliberations that preceded the 1978 State Water Resources Control Board Water Rights Decision D-1485 and the earlier decisions D-1275 and D-1379. Initially the only concerns expressed were by the agricultural interests concerning salt content; however, in the information submitted in preparation for D-1485, Contra Costa Water District also added language concerning total dissolved solids (TDS), and provisions were made for dealing with higher TDS that might be served to the industrial concerns along the Contra Costa Canal. As a result, provisions were added to D-1485 which deal with the higher TDS and chloride concentrations that periodically occur in the canal.

Salt enters Delta waters from two main sources: sea water intrusion, resulting from tidal interactions with outgoing freshwater flows and, in certain parts of the Delta, from agricultural drainage. Salinity from these sources is the most critical water quality concern experienced by agricultural users of Delta source waters, both within the defined area of the Delta and in the San Joaquin Valley. Salinity of the water applied to crops has a direct relationship to salt content in the soil which, in turn, affects crop yields and leaching requirements.

Urban water supplies taken from the Delta are also affected by water quality concerns. In 1979 the U.S. Environmental Protection Agency (USEPA) promulgated regulations to control the production of disinfection by-products in drinking water. Disinfection by-products are potential cancer causing substances, such as chloroform, that are formed when chlorine used for disinfection of drinking water reacts with organic substances, such as the peat soils from Delta islands. This regulation was established to control the most common of the disinfection by-products, trihalomethanes, at a level of 100 parts per billion (ppb) in drinking water. That regulation is still in place and a lower standard of 80 ppb has been proposed by the USEPA. The trihalomethane standard became an issue during the 1987 Bay-Delta Hearings because of the concerns of the water utilities, such as Contra Cost Water District and other urban Delta water users, and because of the discovery that organic material present in the Delta is being discharged from Delta islands through their drainage systems.

Environmental water quality concerns also became an issue during the 1987 Bay-Delta hearings because of the impact on wildlife and habitat in the entire Bay-Delta system. Since that time, significant concerns have arisen concerning toxic effects on the aquatic ecosystem resulting from metals such as copper, and from synthetic organic compounds such as pesticide residues found in the waters tributary to the Delta. Sources of these constituents are varied; their effects vary with species, with different life stages, and many other complex factors that are not well studied or known.

A great deal of scientific information has been collected in connection with the problems of the Bay-Delta estuary. It is also the case that many information gaps exist. The following are examples that illustrate some of the specific issues which the Water Quality Program must deal with at some point contend.

Regulatory Uncertainty

The time frame for CALFED decision making and problem correction is in the order of two decades. During that period, the existing regulatory framework is certain to change. For example, a number of new drinking water regulations are being considered and proposed. If very stringent regulations are adopted for disinfection byproducts, it may be difficult and very expensive to treat water taken from the Delta. If, on the other hand, less stringent regulations were to be adopted, flexibility for drinking water supply from the Delta would be significantly increased.

Similarly, Inland Surface Waters and Enclosed Bays and Estuaries plans are being developed to establish water quality criteria to support beneficial uses, with particular emphasis on ecological resources. Stringent criteria would restrict the range of Delta choices, while less stringent criteria would enable more solution options.

Scientific Uncertainty

Currently, because of concern over human pathogens in drinking water supplies, there is a widespread debate on the subject of source control versus treatment. Some experts contend that water treatment technology is capable of producing drinking water that is of adequate safety. Others believe, based on recent disease outbreaks even in well run, modern facilities, that treatment by itself offers insufficient insurance against public disease outbreaks. The picture is greatly complicated by the technical difficulties in evaluating the problem.

There is a very significant lack of data to document ecological effects of chemicals in the environment. For example, most toxicity data comes from testing only a few species. Scientists already know that it is risky to assume that all species will be affected the same as test species, but it would be prohibitively expensive and often technically impossible to evaluate each species that may be exposed.

It is the intention of the Water Quality Program to supply decision makers with as much scientific support as possible for the choices that must be made. We must all realize, however, that the scientists will leave many questions unanswered. It is important, therefore, for CALFED participants to develop approaches for moving from the limits of scientific support to the decision making that must be accomplished.

CALFED Role in Watershed Management

CALFED feels that given the uncertainty issues discussed previously, watershed management is an effective mechanism to deal with those issues. While watershed management might refer to

very broad ranging activities such as forest management practices and ecological restoration activities, watershed protection is an aspect of watershed management that relates closely to the CALFED Water Quality Program. *As used by CALFED, watershed protection refers to pollution prevention and pollution source control activities directed at water quality improvement.* The discussion presented here is specific to the watershed protection aspect of watershed management, but applies to broader aspects of watershed management as well.

Because of its watershed-wide focus, CALFED seem ideally suited to performing an overall coordination and integration role for watershed protection activities. CALFED might, for example, work with local agencies to assist in the formation of alliances and cooperative projects to improve water quality on a larger scale than might be possible with local agencies working alone or in more narrowly scoped programs. As another example, CALFED might assume a leadership role in coordinating water quality assessment activities throughout the watersheds tributary to the Bay-Delta to assure uniform data collection protocols, uniform application of quality control, standardized analyses, and compatible database structures. Standardization in these areas would enable water quality assessments to be made on a much larger scale than would otherwise be possible. The result should be an assessment system that is much more capable of establishing existing conditions and evaluating the effects of actions intended to improve water quality.

Many local agencies, regulatory agencies at various governmental levels, and other entities, have functional existing watershed protection programs. In the conduct of its watershed protection activities, it seems appropriate that CALFED work closely with these parties with the primary aim of helping them to be more successful in activities that will improve the quality of Bay-Delta waters. There are, however, areas in the CALFED geographic solution area where watershed protection programs do not exist, or are not vigorous. In these areas, an appropriate role for CALFED is more difficult to visualize.

Bay-Delta Advisory Council Considerations

In accomplishing its water quality mission, is it appropriate for CALFED to assume an overall coordination and integration role in watershed protection, including:

- Working with local agencies to assist in the formation of alliances and cooperative projects to improve water quality on a larger scale than might be possible with local agencies?
- Assuming a leadership role in coordinating water quality assessment activities throughout the watersheds tributary to the Bay-Delta to assure uniform data collection protocols, uniform application of quality control, standardized analyses, and compatible database structures?

Definitions

Watershed Management - Activities organized on a watershed-wide basis that are undertaken to manage resources in an organized, integrated fashion having the capacity to produce benefits on a large geographic scale. Examples might include, but are not limited to, forest management practices to enhance fisheries and enhance base flows, ecological restoration activities, levee maintenance work, and watershed protection activities.

Watershed Protection - Activities organized on a watershed-wide basis that are undertaken to control or prevent water quality degradation from point or non-point sources, having the capacity to produce benefit on a large geographic scale.

Next Steps

Following consideration by BDAC and receipt of the Council's recommendations, program staff will prepare and circulate a draft watershed protection policy describing the role of the CALFED Water Quality Program in this area of endeavor.