Proposal to Science Program: Development of Water Quality Indices: A set of Qualitative and Quantitative Indicators
University of Colorado Boulder
Subcontractors Brown and Caldwell and CONCUR
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Abstract:

This project proposes to develop a set of Water Quality Indices/Indicators (WQI), a clearly defined and communicable set of performance measures that target the top priorities of drinking and ecosystem water quality protection for the CALFED Bay-Delta Program (implemented by the California Bay-Delta Authority). The WQI will build on the established CALFED performance measure context, to consider the whole of water quality – as a municipal and agricultural water supply system, an aquatic environment, a discharge recipient, and a dynamic, variable yet highly managed hydrologic system – and communicate the existing state of water quality and the progress of the CALFED program in achieving its water quality goals.

There has been a great deal of historical data and research collected on the Delta and its tributaries, but there has not yet been a comprehensive tool or set of tools (i.e., complete "portfolios of performance measures") to apply to data/information and effectively assess overall progress in improving water quality, particularly to meet CALFED objectives. The proposed assessment tools are needed to bridge the existing gap between assessments of water quality for drinking water supply and aquatic ecosystem health. Such integrative tools can help assess the effects of various CALFED programs and projects on water quality in a more holistic, sustainable, and results-oriented manner.

The concept of the WQI was first identified in a Nominal Group Technique workshop conducted in July 2003 called the "Public Health Index" and was given high priority by the Drinking Water Subcommittee (DWS) in its strategic planning discussions in 2004. The Drinking Water Quality Program's (DWQP) goal is to integrate this concept with its development of programmatic performance measures. Preliminary functions and approaches to develop the WQI are currently being discussed with an established stakeholder workgroup (DWS Workgroup).

To develop a sound scientific basis for the WQI, a panel of expert scientists and engineers in the fields of drinking water treatment, watershed management, ecosystem restoration, public health, epidemiology, and aquatic chemistry will be convened as a Science Advisory Panel for the project. The Science Advisory Panel will guide the work of Drs. R. Scott Summers and Gary Amy of the University of Colorado, Brown and Caldwell, and CONCUR, Inc., who each bring extensive experience working on water quality issues in the Delta. Development of the WQI will proceed in two phases starting with the delineation of a qualitative framework followed by quantitative assessment tools. The WQI Qualitative Framework will identify the types of indices or indicators to be applied to various components of the overall water quality system. Four components will be addressed in the WQI: surface water, conveyance, treatment and distribution. Each component of the WQI will be considered individually and will be integrated to create a comprehensive and informative set of indices. Methods will be developed to normalize indices for disparate system components and allow for integration and summation of all factors.

Products: Two final documents will be prepared for this project:
1) Final Report including a detailed description of the WQI development process, basis, and results
2) Shorter WQI User Document that allows decision-makers, ecosystem managers, water suppliers, and/or the public to work through the assessment process and apply the WQI directly.