**Attachment A:**
**Preliminary Comments on CALFED Water Quality Component Report**
**August 1997 Draft**
**Prepared by Inge Werner, Ph.D., for the Environmental Water Caucus**
Submitted October 28, 1997

The comments that follow are preliminary in nature and are submitted now so that these issues may be addressed as early as possible. These comments are in draft form and may be missing relevant reference citations. We will be happy to provide these as requested. Additional comments will be submitted following the Oct 31 draft.

Comments loosely follow Section 7 outline:

I. Mine Drainage

The performance measure to reduce toxic effects of Cd, Cu and Zn is planned to be measured as a reduction in annual copper loadings. How do (if so) correlate Cd and Zn loadings to Cu loadings? Wouldn't it be better to monitor for all three compounds of concern?

II. Urban and Industrial Runoff

What are the existing source control regulations? How is enforcement going to be improved?

What are the incentives for additional source control of urban and industrial runoff?

This section addresses 3 heavy metals (Cu, Cd, Zn) and only 2 pesticides (chlorpyrifos, diazinon) as primary chemical pollutants of concern. Whereas action should certainly be taken concerning the above compounds, loading and effects of other chemicals such as the gasoline additive MTBE, unburned gasoline from 2-stroke engines and many additional pesticides commonly applied in urban areas (e.g. by Caltrans) must be investigated and addressed.

Besides education and incentives, emphasis should be put on programs to promote sales restrictions on pesticides (e.g. diazinon), promote regulations to make car and engine manufacturers terminate production and sale of 2-stroke engines, restrict usage of e.g. copper in brake pads, and encourage use of more energy efficient cars (e.g. higher registration fees for strong polluters and/or more powerful cars like in some European countries).

In addition to source control to reduce turbidity in the Delta and its tributaries, action strategies should include creation and restoration of riparian corridors, wetlands and other buffer zones. Not only will these reduce runoff and sediment loading but they will also improve source water quality for urban water users.



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Logging activity in the upper watersheds has not been addressed. Road construction by logging companies and deforestation contribute considerably to siltation and increased turbidity in creeks and rivers. A healthy upper watershed is indispensable for a healthy ecosystem.

III. Wastewater and Industrial Discharges

Boats in the Delta and major tributaries not only discharge sewage into the waterways, but also contribute considerably to chemical pollution through their two-stroke engines. The two-stroke outboard motor, found on most boats and personal watercraft (such as jet skis) is one of America's largest source of toxic pollution. Twentyfive percent of all the fuel and oil that these motors use is emitted unburned. The EPA estimates that three hours of operation by a 70-horsepower two-stroke outboard motor at cruising speed will discharge one quart of unburned oil into the water. One quart of oil dumped into 250,000 gallons of water causes 50% mortality in Dungeness crab larvae (CA Dept. of Fish and Game). Almost no toxicologic information is available on the gasoline additive MTBE, which is being detected in most Californian waterbodies. Production and sale of two-stroke engines should be restricted.

How will enforcement of boat domestic waste discharge regulations be improved?

Are industrial plants required to declare the constituents of their wastewater? This information accessible to CALFED, and included as part of the report.

Selenium is the only compound CALFED addresses concerning industrial discharges the lower Delta/upper San Francisco Bay area. Other compounds of concern need to be identified and their toxicological impact(s) evaluated.

Chemical plants? Methamphetamine labs on delta (hazardous waste)?

Improve existing bioassay protocols and develop bioassays (besides EPA three species test) using resident species to assess toxicity of treatment plant effluents and Delta waters. Priority should be given to use sensitive species and/or lifestages as bioassay organisms. More emphasis should be placed on sublethal effects in organisms.

Sediment toxicity in the Delta should be assessed using existing standard sediment bioassays.

IV. Agricultural Drainage

Selenium is present in the environment in various forms (selenite, selenate), which differ in their toxicity to aquatic organisms, and their effects are potentially additive. This should be taken into consideration when selenium is monitored in tissues of aquatic organisms. Selection of the organism is important: fish move around and are therefore less indicative for pollution at one particular site than e.g. molluscs, whereas molluscs may bioaccumulate differently. In addition, metals and toxic elements bioaccumulate in biological tissues and biomagnify in the



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food chain.

Accumulation of compounds of concern and pathogens in fish poses danger to subsistence and recreational fishers. (See CBE attachment)

Agricultural drainage and runoff contains hundreds of pesticides applied within the CALFED problem and solution areas. CALFED addresses only 3 in its action strategies; these three have already been studied and their toxicity is known. Naturally, this opens the door for intensive monitoring and attempts to reduce their input into the system. It should, however, not be neglected to identify other pesticides of concern and investigate their effects on the environment. In 1992, for example, 2.7 million lb of the fungicides Ziram and Maneb were applied to agricultural fields in California alone (CalEPA, 1992).

Selecting crops according to climatic (water use) and soil conditions could reduce the number and quantities of pesticides used. Dairy and feedlot management is of major importance: 60% of the dairy farms in the San Joaquin Valley are out of compliance (7/20 SF Chron). They constitute a significant source of pathogens and nutrients. Better enforcement of current laws and closing the loopholes for these sources is crucial.

V. Water Treatment
Performance measures should be based on CURRENT standards not future standards.

Relocation of water supply intakes is a storage and conveyance issue, represented by several of the CALFED alternatives. It has no place as such in a common program. (Also see comments in our letter)

Problem compounds should be reduced to a minimum by source control measures.

Cost calculation of alternative disinfection treatment methods should be included.

EPA regulations for disinfection byproducts (DBPs) have not been worked out yet. Future standards should be met by future treatment technologies and source protection measures!!

The timing of water withdrawals (low tide) can be important to avoid water quality problems such as increased salinity and high concentrations of bromide. With a concurrent reduction of salts in agricultural drainage the problem compounds could be reduced to a minimum.

Water conservation measures, crop selection and other measures should also be included here which will increase potential freshwater flow into the Estuary. Apart from beneficial effects such as a reduction in agricultural drainage water this will potentially result in a reduction of seawater intrusion. It is difficult to determine a 'healthy' limit for seawater intrusion since historic levels were much higher and have been evened out by water management practices, aimed at keeping salinity at the pumps to a minimum.

Ag drainage into California Aqueduct (1995 DWR report)

What about selected treatment of ag wastewater from in delta farms near intakes to improve water quality?

VI. Water Management

Urban and agricultural water conservation should be given high priority. Incentives are good, especially if the price for water is adjusted to more realistic levels (i.e. higher). See comments provided to CALFED on Water Use Efficiency program.

VII. Water Quality Criteria/ Unknown Toxicity -- comments to be developed further
For determination of criteria for water quality parameters of concern CALFED target ranges should distinguish between freshwater and saltwater (or rather brakish water), since many compounds form complexes in saltwater that are less bioavailable.

CALFED 1 hour maximum criteria are too high. How would monitoring programs during which samples are often taken on a monthly basis determine 4 dayaverage concentrations? The potential inability to do so opens the door to the much less stringent 1 hour maximum values. These are up to more than 100.000 higher (Toxaphene) than 4 day average concentrations:
Chlordane: 2.4 g/L (4 day average) vs. 0.0043 g/L (1 hour maximum),
Selenium: 20 g/L vs. 5 g/L; DDT 1.1 g/L vs. 0.001 g/L, Toxaphene: 0.73 g/L vs. 0.0002 g/L.

Lowest observed effect concentrations (LOEC) rather than LC50 data should be used to set criteria. The measured carbofuran LOEC for juveniles of mysid shrimp (Mysidopsis bahia) is 0.004 g/L (ref!)!

Bioaccumulation potential of compounds of concern should be taken into account where data is available. Where no data is available, CALFED should promote research to obtain it.

As suggested by Deltakeeper: Should study aquatic life toxicity in the Delta (water , sediments):establish Delta monitoring program similar to the SF Bay program, runoff studies, pesticide monitoring.....

Compounds of concern: not comprehensive enough

Problem identification: Calculated total loads of compounds of concern:
spikes are very impoartant - lost.

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Inge Werner
VM:APC
University of California
Davis, CA 95616, USA.