HCI HYDROLOGIC CONSULTANTS, INC.

Oct. 12 wksp comments

October 13, 1995

Mr. Victor Pacheco
Cal-Fed Bay-Delta Program
1416 Ninth Street, Suite 1155
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Dear Victor,

Thank you for your facilitation of the breakout discussion on system vulnerability and reliability at the last Cal-Fed workshop. I was unable to attend the afternoon session and I offer the following comments with respect to system vulnerability. My comments relate to land subsidence as this is my primary area of expertise in the delta. Prior to joining Hydrologic Consultants, Inc., I was the project leader for, and later oversaw, the study of carbon fluxes and processes affecting subsidence in the delta. I am currently serving as a consultant to the Department of Water Resources on subsidence and issues related to land use.

With respect to the objective statements, **reducing land subsidence will provide benefit for aquatic habitat, wetlands habitat and species population.** The data collected by myself and others at the U.S. Geological Survey clearly show the correlation between the subsidence and the oxidation of organic soils to carbon dioxide and temperature and moisture. The higher the moisture content and the lower the temperature, the lower the carbon flux and the lower the subsidence rate. Therefore, the primary mechanism for reducing subsidence is keeping the soil wet. Indeed, the most recent USGS data indicates that permanent flooding such as would occur in wetlands and aquatic habitats, leads to a net positive carbon mass balance and may lead to soil accretion.

Reducing land subsidence may contribute negatively to drinking water quality in the Delta and may contribute positively to agricultural and environmental water quality. Because reducing land subsidence in the Delta will probably mean that there will be some conversion of agricultural lands to wetlands or aquatic habitat, there may be a greater tendency to have higher trihalomethane (THM) precursers in the soil water and drainage water. This is because flooding will bring water into prolonged contact with the shallow soil layers which impart higher dissolved organic carbon loads to the interstitial water than the deeper, less decomposed layers. Under the prevalent drained agricultural conditions, irrigation water is in contact with the shallow layers for brief periods of time and the deeper soil layers contribute relatively low dissolved organic carbon loads to the drainage water. How the drainage water is managed will determine the effect on the THM concentrations in the channel water. The positive effect on the agricultural water quality may be the result of a reduction in the salinity of the channel water because of a lessened tendency to draw high salinity water from the west.

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If there is a decrease in agriculture in the Delta because of conversion to wetlands, there will be less discharge of pesticides to the Delta channel which may result in improved environmental quality. Recent USGS results have shown that there is discharge from Delta islands of the agricultural pesticides Carbonfuran and Diazinon and that the measured levels of these pesticides can cause toxicity in indicator species (*Cerodaphnia sp.*).

I believe it is obvious that decreasing land subsidence will reduce risk to land use and infrastructure, water supply facilities, water quality and the ecosystem. Likewise, reduction in land subsidence can reduce conflict among beneficial users and the uncertainty in the water supply by reducing the risk of levee breaks which will result in fewer disruptions of water deliveries to southern California. I hope these comments are helpful. Thanks for the opportunity to contribute.

Sincerely,

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