

Comment Number	Page Number	Section, Figure, or Table No.	Commentor	Comment - Water Quality Program
1	48 (or 66?)	Section 2.6	Ray Tom	This section discusses bromide and organic carbon separately, with no discussion on the inter-relationship between the two constituents in the formation of disinfection byproducts (DBPs). It is unlikely that the amount of reductions in either constituents alone would provide source water quality sufficient to meet regulatory requirements. However, reductions in combinations of each constituent would provide a more practical discussion and a more feasible approach since many combinations of organic carbon and bromide concentrations would provide sufficient source water quality.
2	76?	Bromide Loadings	Ray Tom	This figure provides a graph of calculated bromide loadings at DMC and Vernalis. Unfortunately, this graph does not provide the concentrations and flows from which the loadings were calculated. Knowing the concentrations and flows would provide further insight on which of the two variables carried more weight on the loading calculations.
3	79?	Figure 7	Ray Tom	According to this figure, San Joaquin River Return Flow does not contribute significantly to Delta bromide levels. This seems inconsistent with the amount of discussion on bromide from SJR (pages 49-51 or 67-69?). Could this be because the flows in SJR are very low, while bromide concentrations in SJR are relatively high?
4	40 (58?)	2.5.4.a.1	Larry Joyce	The South Bay Aqueduct is largely enclosed pipeline. Drainage into the open section of canal (about 9 miles in length) is limited.

H - 0 0 1 7 0 9

				<p>There are no creeks or streams that enter the South Bay Aqueduct. The only drainage into the canal is from the service roads and the hillside immediately adjacent to the canal. Total drainage is probably not even one square mile. There is cattle grazing in the area and some potential for introduction of pathogens, however, no measurable impacts has been attributed to the local inflow.</p> <p>The Only inflow is during rain events, when Delta water quality is also likely to be impacted by high inflow and possibly increased pathogen loads. No increase in turbidity, TOC, or other water quality parameters can be attributed to local watershed inflow.</p>	
5	40 (58?)	2.5.4.a.2	Larry Joyce	<p>The Davis-Dolwig Act establishing the SWP required the SWP reservoirs to be multi-use facilities, which incorporate recreation. To eliminate all recreation would require legislative action. The East Bay Regional Parks District manages the recreation facilities at Lake Del Valle.</p> <p>Recreation in Lake Del Valle may contribute to pathogen levels in the reservoir during peak use periods and boating does account for levels of MTBE measured in the reservoir, however, impacts have not been seen in the water delivered to SBA Contractors. Water is usually only drawn out of Lake Del Valle during the fall, after the peak use period, which reduces any impact that recreation may have on the quality of delivered water. Highest levels of MTBE have been at the surface with much lower concentrations measured at the depth of the outlet. In addition, the primary source of SWP water, the Delta, is open to all forms of recreation and is susceptible to degradation</p>	

				by swimming and boating. Elimination of these activities in the Lake without eliminating them in the Delta would be of limited benefit.	
6	41 (59?)	2.5.4.a.3	Larry Joyce	<p>The watershed of Lake Del Valle is about 130 square miles and is used for grazing, recreation and various other activities. It is susceptible to the same types of contaminants as the Delta. During the rainy season inflow to Lake Del Valle can be significant. Monitoring of the watershed has been limited. Some pathogen monitoring of the inflow to the Lake has been conducted but monitoring for most other parameters has been in the lake itself. Monitoring to date has not indicated that the watershed contributes to significant water quality problems within the lake. Most water stored in the lake is pumped out of the Delta.</p> <p>The cost to develop and implement a watershed program for the Del Valle Arroyo watershed would be extensive and could not be justified based on the measured quality of the water in Lake Del Valle. The quality of water delivered to SWP contractors from Lake Del Valle is generally as good as Delta water. The cost to undertake a watershed program in the Lake Del Valle watershed would be many millions of dollars.</p>	
7	41 (59?)	2.5.4.b.1	Larry Joyce	<p>Reducing the use of Copper Sulfate on the South Bay Aqueduct will not improve the quality of drinking water. Copper Sulfate is used in the summer to control the growth of filamentous algae in the open section of canal, at the request of the operators of water treatment plants on the South Bay Aqueduct. The algae contribute to reduced filter run times, poor plant performance, and taste and odor problems in the treated water. At no time does the copper used for algae control cause levels in the drinking water that would be harmful to consumers.</p> <p>Extensive effort has gone into optimizing the copper treatment as a result of problems encountered with elevated levels of copper in the treatment plant sludge and waste water. The 1994 report, "Copper and Selenium in the Water Supply of the Santa Clara Valley" examined the</p>	

				<p>sources of copper in the water supply. It concluded that there is no effective alternative to the use of copper sulfate but efforts were made to reduce the amount of copper applied. Both frequency and concentration of copper application was reduced gradually until operational problems were again encountered in the summer of 1996. DWR will continue to monitor aqueduct conditions and algae growth to minimize the amount of copper sulfate treatment required in order to prevent treatment plant operational problems.</p> <p>Copper Sulfate has never been used in Clifton Court Forebay. Aquatic weed growth in Clifton Court at time severely restricts flow across Clifton Court forbay and restricts the ability to pump water at Banks Pumping Plant. Komeen an herbicide registered for aquatic use is applied to kill the weeds. This requires a complete shut down of SWP operations at Clifton Court and Banks Pumping Plant. This allows adequate contact time to kill the weeds and precaution is taken to be sure that the chemical dissipates to safe levels before deliveries are resumed. This activity does not adversely affect drinking water quality and is necessary for the SWP to meet high summer water demands.</p>	
8	42 (60?)	2.5.5.a.1	Larry Joyce	<p>There is no watershed at Clifton Court Forebay. Clifton Court is a constructed reservoir completely surrounded by impoundment dikes. The only runoff entering Clifton Court is from the top and side of the dikes. There are no activities on the dikes that would introduce nutrients or pathogens. Bethany Reservoir is a small regulating reservoir, only 5000 AF, and Banks Pumping Plant can pump more than twice that its capacity in a day. There is no local inflow and no watershed to alter the quality of water pumped from Banks Pumping Plant. It is only used for the regulation of delivery to the South Bay or California Aqueduct.</p>	
9	45 (63?)	2.5.9.1	Larry Joyce	<p>Side channel floodwater inflow occurs into the San Luis Canal section of the California Aqueduct from approximately milepost 71 to 172. This section of the San Luis Canal was designed to capture, instead of by passing, winter flow from streams and other drainage from the coastal mountains. By volume the largest contributing streams are the Arroyo Passajero, Salt and Cantua streams groups. Other smaller volume sources include unnamed stream channels, floodwater pumped from fields and</p>	

				<p>natural areas and road drainage. Agricultural tail water drainage is not allowed into the California Aqueduct as the aqueduct turn-in structures are closed except during winter months</p> <p>Flood water quality and impact on SWP was evaluated in DWR March 1995 report "Water Quality Assessment of Floodwater Inflows in the San Luis Canal, California Aqueduct". Major planning effort underway between DWR and Corp of Engineers to develop flood control alternative for Arroyo Passajero, which will likely consist of a dam and enlarged flood control storage basin. Feasibility studies underway to control floods and aqueduct inflow at Salt and Cantua Creeks.</p>	
10	45 (63?)	2.5.9.2	Larry Joyce	<p>If projects are developed to control flood water and minimize aqueduct inflow from Arroyo Passajero, Salt and Cantua Stream groups, then most of the possible inflow into the California Aqueduct in the San Luis Canal Section will be curtailed. All other inflow is minor and accounts for about 10 - 20% of all inflow to the San Luis Canal. A watershed management plan for Arroyo Passajero has been developed and is being implemented. Developing watershed management plans would not be necessary for the remaining small watersheds that drain into the California Aqueduct.</p>	
11	46 (64?)	2.5.10.a.1	Larry Joyce	<p>The Castaic Lake watershed is about 153 square mile and during significant storm events may influence the quality of water in the Lake. While the lake has storage capacity of 323,000 AF, in some years (with high runoff) local runoff and limnological dynamics in the lake can influence water quality. Salinity increases on the west branch of the California Aqueduct has been attributed to local inflow. There is livestock grazing, wildlife, and other factors in the watershed that can influence pathogen levels in Lake Castaic during runoff events. The significance of the local watershed on nutrients and pathogens in delivered water quality is the important consideration and any watershed management decisions should be made after careful analysis of treatment plant influent data and ICR data analysis.</p>	

				<p>The Silverwood Lake watershed is much smaller, only 29 square miles with fewer potential sources of contamination. The primary concern in the Silverwood watershed is human activity (there is no grazing at this time). Average annual local in flow to Silverwood Lake has been estimated at 30,000 AF and the Lake capacity is nearly 75,000 AF. During runoff events there is potential for short-term local influences on water quality in the lake. The most significant factor influencing water quality in Silverwood Lake is SWP water delivery, which typically exceeds 1,000,000 AF per year. The Local watershed usually has little influence on the nutrient and pathogen loading in Silverwood Lake outside of the winter storm period. Nutrient and salt loads from streams are a relatively insignificant contribution to silverwood Lake relative to SWP inflow. As with Castaic Lake, the significance of the local watershed on nutrients and pathogens in delivered water quality is the important consideration and any watershed management decisions should be made after careful analysis of treatment plant influent data and ICR data analysis.</p> <p>MWD has conducted the most extensive study of pathogen levels in stream inflow to both Castaic and Silverwood lakes. That study conducted in the winter of 1996 and 1997 found higher levels of pathogens in the streams entering Castaic Lake than Silverwood Lake. Levels of pathogens reported at the MWD water treatment plants have been considerably lower than levels found in the stream inflow.</p> <p>The significance of local watershed influences must be carefully evaluated in terms of water quality delivered to the treatment plants. The cost of a watershed management program can be substantial. The cost to undertake a watershed management program in the Castaic Lake watershed would be many millions of dollars.</p>	
12	46 (64?)	2.5.10.a.2	Larry Joyce	<p>The Davis-Dolwig Act establishing the SWP required the SWP reservoirs to be multi-use facilities, which incorporate recreation. To eliminate all recreation would require legislative action. The Department of Parks and Recreation manages recreation at most SWP facilities. Some SWP reservoirs, such as Silverwood Lake, are required to provide recreation under Federal Energy Regulatory Commission orders.</p> <p>Recreation has not been shown to be significant sources of pathogens at Castaic Lake and Silverwood Lake. There is no swimming at Castaic Lake. The swimming beach at Castaic Lagoon is below the dam and isolated from the water supply reservoir. Human contact with the Castaic Lake itself is limited to boating water skiing, fishing and the like. The potential risk</p>	

				<p>of contamination from these activities is small at Castaic Lake.</p> <p>The recreational use of Silverwood Lake is much more limited than at Castaic Lake. There is some body contact recreation at Silverwood but no problem with contamination in the lake has been attributed to this. The volume of water that passes through the lake each year is far greater than the volume of the reservoir itself. Water quality in Silverwood is determined more by the quality of water passing through the East Branch of the SWP than any activity on the Lake.</p> <p>Pathogen monitoring has been conducted at both lakes and while pathogens have been found the levels are usually low relative to other locations in the SWP and its source water in the Delta. Higher levels of pathogens have been found in local stream inflow.</p>	
13	47 (65?)	2.5.10.a.5	Larry Joyce	<p>The Davis-Dolwig Act establishing the SWP required the SWP reservoirs to be multi-use facilities, which incorporate recreation. To eliminate all recreation would require legislative action. The Department of Parks and Recreation manages recreation at most SWP facilities. Some SWP reservoirs, such as Silverwood Lake, are required to provide recreation under Federal Energy Regulatory Commission orders.</p> <p>MTBE has been found in both lakes. The concentrations of MTBE tend to be highest around launch ramps and in areas of high boat traffic. Measured concentrations at the lakes outlets and down stream delivery points have not been at levels that pose a threat to drinking water.</p> <p>MTBE contamination of drinking water is a much larger issue than recreational boating in SWP reservoirs. MTBE is being found in many other lakes and waterways (including the Delta) as well as ground water wells. Many State and Federal agencies and the state legislature are actively</p>	

			<p>investigating ways to resolve this problem. A universal solution preventing MTBE from getting into all drinking water sources would have much greater benefits than a piece meal approach which only addresses SWP reservoirs.</p> <p>DWR monitors water quality Castaic Lake and Silverwood Lake as part of the routine SWP monitoring program. A special monitoring study was carried out to assess MTBE in SWP reservoirs and MTBE is now part of the routine scan for organic chemicals.</p> <p>A concerted statewide effort is needed to identify the best solution to the MTBE contamination of drinking water. Presently the Air Resources Control Board and Department of Health Services are conducting most of the work in this area. All drinking water interests should carefully assess the ultimate solution that is proposed.</p>	
--	--	--	---	--