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METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

9-7

March 11, 1998

To: Board of Directors (Engineering and Operations Committee--Information)

From: *for* General Manager

Submitted by: Chief of Operations

Subject: Abandonment of San Joaquin Reservoir Cover Project

Edward J. Meares III
for [Signature]

RECOMMENDATION

For information only.

EXECUTIVE SUMMARY

San Joaquin Reservoir in Orange County near Newport Beach was constructed between 1963 and 1966. The reservoir is co-owned by eight entities including Metropolitan. The reservoir has been plagued by water quality problems since it became operational. In order to solve the problem it had been planned to install a floating cover on the reservoir. An agreement entered into with the other owners provided for the covering of the reservoir and increased Metropolitan's ownership interest from 9.84 percent to 51 percent. The entire covering project cost was to be borne by Metropolitan in exchange for the increased ownership interest. The estimated cost for the cover has risen from \$17 million in 1992 to approximately \$35 million today, due mainly to the addition of a liner, upgrades to the existing chemical system, and additional improvements required for water quality. Because of the new SCADA system and other hydraulic improvements, staff reevaluated the benefits of the reservoir and has determined that Metropolitan's water service needs can be met without the reservoir. Metropolitan has notified the other owners that it will not be proceeding with the covering project. However, some local agencies have a need for both operating and emergency storage in the area. Staff will continue to work with the other owners to attempt to solve their storage needs. The cancellation of the cover project represents an immediate savings of more than \$32 million and an annual O&M savings of about \$500,000 per year.

DETAILED REPORT

The San Joaquin Reservoir was completed and placed in service in 1966. The cost of the reservoir was \$5.87 million. It was constructed as the terminal reservoir for the East Orange

County Feeder Number 2 and provides both regulating capacity and emergency storage to the owners. The reservoir is jointly owned by the Irvine Ranch Water District, Mesa Consolidated Water District, the City of Huntington Beach, The Irvine Company, Laguna Beach County Water District, South Coast Water District, the City of Newport Beach, and Metropolitan. Metropolitan operates the reservoir as a trustee.

The reservoir is located in the San Joaquin Hills in south Orange County. It has a 55 acre surface area when full, holds approximately one billion gallons of treated water, and is up to 100 feet deep. It is uncovered and has had a history of water quality problems associated with being open to the atmosphere. These problems have included algae growth, foreign matter dropped into the reservoir by birds, contamination by dust, infestations of African clawed frogs and midge fly larvae, coliform bacteria, and high trihalomethane levels associated with heavy doses of chlorine required to maintain acceptable water quality. These water quality problems eventually led to a request by the California Department of Health Services (DHS) to submit a plan to cover the reservoir. Installation of a floating cover was identified as the preferred option in an Environmental Impact Report prepared by Metropolitan in 1992. The cost of the floating cover was then estimated to be \$17 million. Work began on the floating cover design following your Board's approval of the project in December 1993.

In addition to water quality problems, the reservoir has a history of side slope failures dating back to 1967, only one year after the reservoir was placed in service. These failures are attributed to the steep side slopes, high groundwater levels, and other conditions not controlled by the owners. In 1972, major slope failures occurred which resulted in litigation between Metropolitan and some of the reservoir owners. As part of the litigation settlement a trust agreement was entered into by Metropolitan. Associated with the settlement, Metropolitan acquired a 9.84 percent ownership interest in the reservoir. Because of the history of side slope failures Metropolitan recommended the installation of an impermeable membrane liner to reduce the possibility of future side slope failures and the other reservoir owners agreed that this be added to the cover project.

Over the years, each time the reservoir has been shut down for cleaning or maintenance, substantial repairs to the lining have been necessary. Finally, in February 1994, ground surface cracking was observed below a newly constructed housing tract overlooking the reservoir. A geotechnical study was conducted while the reservoir continued to be dewatered for the floating cover installation. The study disclosed an ancient landslide underlying the area where cracking was observed. During the period of January through March 1995, after heavy rains, an extensive slope failure occurred. That failure required the construction of a stabilizing buttress within the reservoir comprising approximately 850,000 cubic yards of fill at a total shared cost of more than \$6 million. This buttress also required redesign of the floating cover. Due to increased regulations Metropolitan staff identified a need to upgrade the existing chemical feed system. Consequently, as part of the redesign effort, a new sodium hypochlorite unloading, storage and feed system was identified to replace the existing chemical feed system.

With the most recent slope failures, the required cover redesign, and the new chemical system, staff again reviewed the value of the reservoir to Metropolitan in light of the agreement that was entered into with the other owners to allow covering of the reservoir. That agreement provided that Metropolitan would buy a 51 percent share of the reservoir by purchasing it from the other owners for \$17 million, the initial cost of the original floating cover project. Also provided in that agreement was that Metropolitan would incur all costs of covering the reservoir over the \$17 million limit. A new cost estimate was prepared for the redesign including the liner and chemical system upgrades which indicated that the total cost would be about \$35 million. Additionally, by initiating the floating cover construction contract, Metropolitan would also assume 51 percent of all future operations and maintenance costs. That would increase Metropolitan's operations and maintenance cost from about \$80,000 a year as a 9.84 percent owner to more than \$500,000 per year.

Staff also reevaluated how Metropolitan's system has performed since the reservoir went out of service in 1994. The review concluded that, with our new SCADA system and other hydraulic modifications that had been accomplished over the years to accommodate numerous reservoir outages, Metropolitan's need for San Joaquin reservoir was greatly diminished. Construction of a small hydraulic relief structure may be required in the future to prevent over-pressurization and damage to Metropolitan's distribution system.

This information, coupled with the fact that any future slope failures might cause the floating cover and liner to be damaged enough to require early replacement, led staff to conclude that it was not in Metropolitan's best interest to pursue covering the reservoir. Staff informed the reservoir's other owners in the summer of 1997 that Metropolitan would not continue with the cover project. This also voided the agreement through which Metropolitan would acquire the 51 percent interest in the reservoir. Since that time the owners and Metropolitan staff have been evaluating other options. Those options range from building storage tanks with reduced capacity to a complete abandonment of the site. Some of the other owners have indicated a need for some local emergency and operational storage and have commissioned a study to review their options. Since Metropolitan is still a 9.84 percent owner in the reservoir, we have been participating in those studies. Future involvement by Metropolitan in any replacement project will be dependent on the benefit to Metropolitan and will be brought to your board for consideration.

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