

● **Board of Directors**
Engineering, Operations and Real Property Committee

March 13, 2001 Board Meeting

9-1

Subject

Authorize \$12.6 million for design and construction of chlorine containment and handling facilities at the Robert A. Skinner and Henry J. Mills filtration plants (Appn. 15346)

Description

The recommended chlorine containment and handling projects for the Skinner and Mills plants will ensure that the chlorine disinfection facilities are modified in a manner that is consistent with the chlorine industry's current practice. This Board action represents the third phase of the Chlorine Containment and Handling Facilities Program which originated with Board approval of similar projects at the Diemer and Weymouth plants in April 1999 and January 2000, respectively. These two projects were evaluated and recommended by the Capital Investment Plan (CIP) Evaluation Team as part of the Infrastructure Reliability and Protection Program, and are included in the Capital Budget for Fiscal Year 2000/01. A detailed report is provided in [Attachment 1](#) and the locations of the project sites at the Skinner and Mills plants are shown on [Attachment 2](#) and [Attachment 3](#). The estimated project costs are shown on [Attachment 4](#).

Policy

Metropolitan Water District Administrative Code Section 5108: Capital Project Appropriation, and Metropolitan Water District Administrative Code Section 8113: Construction Contract Award.

CEQA Compliance / Environmental Documentation

The proposed projects qualify for categorical exemption under the California Environmental Quality Act (CEQA) because they consist of: (a) the minor alteration of existing public facilities involving negligible use beyond that previously existing; (b) the replacement or reconstruction of existing facilities located on the same site and having substantially the same purpose; (c) the construction of limited number of new small facilities and; (d) construction of minor structures appurtenant to existing institutional facilities (State CEQA Guidelines, Sections 15301, 15302, 15303, and 15311).

Board Options/Fiscal Impacts

Option #1

- a. Determine that pursuant to CEQA, the proposed actions qualify for categorical exemption (Sections 15301, 15302, 15303 and 15311 of the State CEQA Guidelines).
- b. Appropriate \$12.6 million, authorize the General Manager to have all work performed and delegate to the General Manager the authority to award contracts for the two CIP projects described in this letter:
 - Construct sodium hypochlorite storage and feed facilities at the Mills plant for post-disinfection and as a standby disinfectant for the new ozone facilities.
 - Move the existing chlorinators and evaporators out of the Skinner administration building and construct new chlorine process, containment and handling facilities at the Skinner plant.

Fiscal Impact: \$12.6 million of budgeted CIP funds under existing Appropriation 15346.

Option #2

Do not move the existing chlorinators and evaporators out of the Skinner administration building, do not expand the chlorine storage and handling facilities and do not provide chlorine gas leak containment and

neutralization facilities. Do not convert the Mills plant disinfection facilities to a sodium hypochlorite system.

Fiscal Impact: No fiscal impact at this time, however, the chlorine disinfection facilities at these two plants will require modifications consistent with the chlorine industry practice when planned future plant modifications are undertaken. This will result in higher costs than Option #1 when undertaken in the future.

Staff Recommendation

Option #1



Roy L. Wolfe
Manager, Corporate Resources

2/23/2001

Date



Ronald R. Jester
General Manager

2/26/2001

Date

Attachment 1 – Detailed Report

Attachment 2 – Project Location, Skinner Plant

Attachment 3 – Project Location, Mills Plant

Attachment 4 – Financial Statement

BLA #712

Detailed Report

Purpose/Background. Chlorine is a highly toxic and corrosive chemical that Metropolitan must use in large quantities as the primary- and post-disinfectant in the water treatment process. The use of liquid chlorine will continue indefinitely at each of Metropolitan's filtration plants, even after ozone pre-disinfection is installed. This ongoing need for chlorine at each plant arises from the fact that chlorine, in the form of chloramines, is added to the finished water leaving the plant.

Liquid chlorine is shipped to Metropolitan's Jensen and Weymouth plants in bulk 90-ton capacity rail cars and to Mills, Diemer and Skinner plants in 17-ton capacity truck trailers. Metropolitan has maintained an excellent safety record considering the enormous quantities used over the years and the potential consequences of an accidental release of chlorine gas. Because the potential consequences of an accident are serious, Metropolitan continues to be proactive in upgrading its facilities and procedures. A thorough review has been conducted to determine current industry practice and regulations pertaining to the construction of chlorine-related facilities. In April 1999, the Board authorized the first phase of the Chlorine Containment and Handling Facilities Program which will upgrade all of Metropolitan's filtration plants.

Multi-phased Program. The first two phases of this multi-phased program are underway at the Diemer and Weymouth plants. In April 1999 the Board approved the Chlorine Containment and Handling Facilities Project at the Diemer plant. Implementation of the Diemer project ensures the plant complies with the Uniform Fire Code (UFC) requirements actively enforced by the Orange County Fire Authority (OCFA). In January 2000 the Board approved the Chlorine Containment and Handling Facilities Project at the Weymouth plant, which included moving the chlorinators and evaporators out of the plant administration building in addition to providing new chlorine containment and neutralization facilities.

Chlorine System Upgrades. For the Skinner plant, two separate issues have precipitated the need to make significant modification to the plant's existing chlorine storage and handling facilities. First, chlorine feed rates have increased significantly since 1998. These increases are primarily due to the increased demands in the Skinner service area and more stringent post-disinfection requirements. As a result of these process changes, the plant's existing chlorine storage and unloading capacities no longer match the current chlorine usage rates. The California Department of Health Services (DHS) is presently requiring Metropolitan to provide on-site storage/unloading capabilities for seven continuous days of chlorine usage. This equates to an on-site chlorine storage capacity of approximately six 17-ton chlorine trailers. Presently, the plant has the capability to store and unload a maximum of four 17-ton chlorine trailers. Consequently, the existing storage/unloading facility must be upgraded to comply with this DHS requirement.

A second significant issue at the Skinner plant is the location of the existing chlorine evaporators and chlorinators inside the plant's administration building. The location of this equipment presents a potential hazard to personnel working in the adjacent control center and administration offices. Following a chlorine leak at the Weymouth plant in 1997, a decision was made to relocate existing chlorine equipment out of the Weymouth administrative building due to ongoing safety concerns. The relocation of the Weymouth chlorine equipment was approved by the Board in January 2000 as the second phase of the Chlorine Containment and Handling Facilities Program. Despite having a variety of safety equipment and procedures, a chlorine leak at the Skinner plant could cause a release of chlorine into the building, or an uncontrolled release of chlorine outside of the building. As the aforementioned significant modifications to the existing Skinner chlorine storage and handling facilities are implemented, the resulting work will fall under the jurisdiction of the UFC which requires construction of containment and neutralization for modified chlorine facilities.

Life-cycle Costs. For the Mills plant, staff evaluated the life-cycle costs of continuing the use of liquid chlorine usage versus conversion to sodium hypochlorite. The purchased cost of liquid chlorine is about seventy percent less than the cost of sodium hypochlorite. However, continued use of liquid chlorine requires Metropolitan to staff and maintain a First Responder program at each filtration plant, develop a comprehensive risk management program which addresses liquid chlorine, and eventual addition of chlorine containment and handling (neutralization) facilities. An economic analysis of these factors was conducted for each of Metropolitan's five filtration plants. At the Mills plant, the analysis clearly showed that Metropolitan could realize significant cost

savings by converting from the use of liquid chlorine to sodium hypochlorite (total saving of \$4.2 million over the lifetime of the project). Primarily, these favorable economics are derived from the ability to eliminate First Responder staffing and the relatively low chlorine consumption rates at the Mills plant. At the remaining four filtration plants, Diemer, Weymouth, Skinner and Jensen, the lower costs of liquid chlorine coupled with the relatively high chlorine consumption rates at each plant favor the continued usage of liquid chlorine and the construction of new chlorine storage and handling facilities.

Project Description. The recommended Chlorine Containment and Handling Facilities Project at the Skinner plant (Option #1) consists of the following components: 1) construction of a new chlorine process building which will allow for the existing chlorinators and evaporators to be removed from the Skinner plant administration building; 2) construction of a new chlorine storage building to house a sufficient number of 17-ton chlorine cargo trailers to meet DHS on-site storage requirements; 3) chlorine scrubbing systems to neutralize chlorine released in the storage building or evaporator and chlorinator building during a leak; and 4) provisions within the new process building of a fail-safe backup disinfection system in the event that a significant chlorine release shuts down the primary chlorine feed system.

In order to streamline award of this contract, this letter seeks the Board's delegation of authority to the General Manager to award the contract immediately following competitive bids in accordance with Section 8113 of the Metropolitan Water District Administrative Code.

The proposed sodium hypochlorite facilities at the Mills plant consist of: 1) a new chemical storage tank farm; and 2) new chemical metering, feed equipment and piping. Due to site restrictions, overlapping work areas and overlapping construction schedules, staff recommends that the sodium hypochlorite tank farm be constructed under the competitively-bid Mills Oxidation Retrofit Program (ORP) general construction contract. Following the Board's approval of the recommended option (Option #1), this work will be charged to the chlorine containment program, as appropriate. District forces will procure and install equipment and piping to enable sodium hypochlorite feed once the tank farm is constructed by the Mills ORP contractor.

Cost Estimate. Attachment 4 shows the breakdown of the total estimated costs of \$12.6 million.

CEQA Compliance / Environmental Documentation

The proposed project qualifies for a Categorical Exemption under the California Environmental Quality Act (CEQA) because it consists of: (a) the minor alteration of existing public facilities involving negligible use beyond that previously existing; (b) the replacement or reconstruction of existing facilities located on the same site and having substantially the same purpose; (c) the construction of limited number of new small facilities; and (d) construction of minor structures appurtenant to existing institutional facilities (State CEQA Guidelines, Sections 15301, 15302, 15303, and 15311).

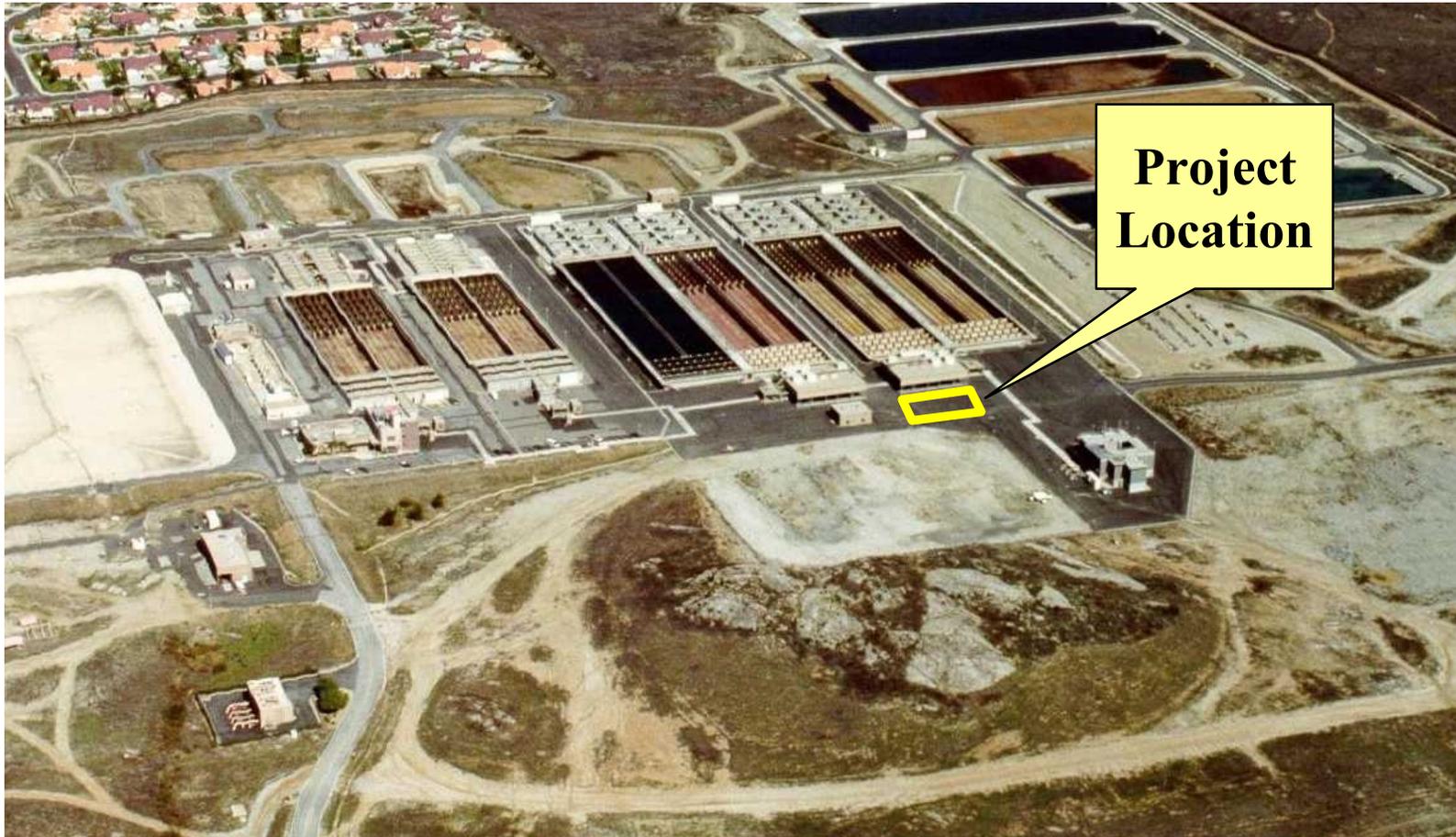
Actions and Milestones

- November 2001 - Complete final design for Mills plant
- June 2002 - Complete final design for Skinner plant
- December 2002 – Complete construction at Mills plant
- January 2004 - Complete construction for Skinner plant

Skinner Filtration Plant



Mills Sodium Hypochlorite Retrofit



Financial Statement

A breakdown of Board Action No. 3 for Appropriation No. 15346 to finance design and construction to provide chlorine containment and handling facilities at the Skinner plant and conversion of the Mills plant to sodium hypochlorite is as follows:

	MULTI-PHASE PROGRAM	
	BOARD ACTION NO. 2 (Includes Diemer and Weymouth <u>Jan. 2000</u>)	BOARD ACTION NO. 3 (Adds Skinner and Mills <u>March 2001</u>)
Preliminary Studies	\$ 317,000	\$ 532,000
Final Design	1,631,800	2,741,650
Owner Costs (Program Management, Bidding Process, etc.)	376,200	625,200
District Forces Construction	225,500	815,500
Construction Management and Inspection	1,702,800	2,808,800
Control Systems	50,000	50,000
Materials and Supplies	187,000	818,000
Incidental Expenses	91,000	216,000
Professional/Technical Services	235,700	415,700
Equipment Use	118,000	243,000
Contracts	9,365,000	15,818,000
Remaining Budget	1,500,000	3,316,150
Total	<u>\$ 15,800,000</u>	<u>\$ 28,400,000</u>

Funding Request

Program Name:	Chlorine Containment and Handling Facilities Program		
Source of Funds:	Construction Funds (possibly General Obligation, Revenue Bonds, Pay-As-You-Go Fund)		
Appropriation No.:	15346	Board Action No.:	3
Requested Amount:	\$12,600,000	Capital Program No.:	15346-R
Total Appropriated Amount:	\$28,400,000	Capital Program Page No.:	E-8
Total Program Estimate:	\$34,400,000	Project Goal:	R-Regulatory (Non-Water Quality)