



- Board of Directors  
*Engineering and Operations Committee*

11/5/2012 Board Meeting

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**8-2**

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## **Subject**

Appropriate \$2.58 million; and authorize final design of solids handling improvements at the Henry J. Mills Water Treatment Plant (Approp. 15479)

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## **Executive Summary**

This action authorizes final design of new solids thickeners and improvements to the existing solids transfer system at the Henry J. Mills Water Treatment Plant. These improvements are needed to address long-term changes in water quality of the untreated water delivered from the East Branch of the State Water Project (SWP).

### **Timing and Urgency**

The Mills plant currently relies on six concrete-lined lagoons for both washwater reclamation and dewatering of residual solids. Over the past ten years, the Mills plant has needed to significantly increase the level of coagulant added during the water treatment process due to increased levels of total organic carbon (TOC) and decreased levels of alkalinity in the East Branch of the SWP. This higher coagulant dosage has created an increase in residual solids and has escalated the occurrence of turbidity spikes and elevated soluble manganese levels in the water returned from the lagoons to the plant's inlet control structure, which in turn disrupts the ozonation process. These conditions occur independently from the flow rate being treated by the plant. The addition of a solids handling system at the Mills plant is needed to improve the quality of water returned to the plant inlet, and to reliably dewater solids for off-site disposal.

This project has been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria, and is categorized as a Water Quality/System Reliability project. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2012/13.

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## **Details**

### **Background**

The Mills plant was placed into service in 1978 with an initial capacity of 75 million gallons per day (mgd). The plant was expanded twice to provide a total treatment capacity of 326 mgd using four conventional treatment modules. Due to low treated water demands within the Mills service area, Modules Nos. 1 and 2 were removed from service in 1997. The plant is currently rated to treat 220 mgd, which is the design capacity of the two treatment modules (Modules Nos. 3 and 4) that remain in operation. The Mills plant exclusively treats water from the East Branch of the SWP and is located within the city of Riverside. Its treatment process presently consists of pre-ozonation, flocculation, sedimentation, biological filtration, and final disinfection using chlorine and chloramines.

The Mills facility is Metropolitan's only water treatment plant which does not have an on-site washwater reclamation plant to treat used filter backwash water, or solids thickeners to dewater the residual solids removed from the sedimentation basins. The plant instead relies on six concrete-lined lagoons which were constructed as part of the plant's second expansion. These lagoons are used to reclaim water from the residual solids in the

sedimentation basins and from the filter backwashing process. The reclaimed water is then pumped back to the plant's inlet control structure for blending with incoming untreated water.

Due to the limited detention time within the East Branch of the SWP, the incoming water quality at the Mills plant can vary significantly. Two important parameters which affect the treatment process (TOC and alkalinity) have varied widely in recent years. Due to this variability, elevated coagulant dosages are needed at times for the removal of disinfection by-product precursors. This elevated coagulant dosage at the Mills plant has generated a greater volume of residual solids to be managed in the lagoons, and has increased the occurrence of turbidity spikes in the water returned from the lagoons to the plant inlet control structure. These turbidity spikes disrupt the ozonation process and further increase chemical dosages.

In addition to increased coagulant dosages, the storage of solids in the lagoons has led to other water quality impacts. For example, the soluble manganese concentrations measured within the concrete-lined lagoons increased in 2009 to levels up to 20 times higher than that chemical's secondary Maximum Contaminant Level. When reclaimed water is pumped from the lagoons back to the plant's inlet control structure, the manganese can pass through the normal treatment process, resulting in turbidity spikes within the plant and the potential release of manganese into the treated water.

In March 2005, Metropolitan's Board authorized preliminary design to enhance the solids handling facilities at the Mills plant as part of a program to restore the plant's full 326 mgd capacity. Due to reduced treated water demands in recent years within the Mills' service area, this overall program has been deferred.

Metropolitan's long-term plan for washwater reclamation and solids handling at the Mills plant is to reclaim used filter backwash water via a new washwater reclamation plant, and to dewater all residual solids via a combination of solids thickeners, lagoons, and an on-site mechanical dewatering facility. Due to the current need for solids handling improvements to address the variable incoming water quality, staff recommends that the solids handling improvements move forward in two stages. Under Stage 1, the solids transfer system will be upgraded and two solids thickeners will be constructed to improve the quality of water returned to the inlet of the plant and to increase solids density in the lagoons. These improvements will support near-term plant water production and solids disposal needs. The Stage 2 improvements will support the plant's solids handling needs when its capacity is restored to 326 mgd in the future. Preliminary design of the Stage 1 facilities has been completed, and staff recommends proceeding with final design of the improvements at this time.

#### **Mills Solids Handling Facilities, Stage 1 – Final Design Phase (\$2,580,000)**

The planned scope of the Stage 1 project includes improvement of the solids transfer system and the addition of two new thickeners, a solids pumping station, a motor control center, and a staging area for a temporary belt press. The thickeners will improve the reclaimed water quality and allow utilization of contract-operated belt presses to increase solids handling capacity during high-turbidity and high-plant-flow events. The staging area will be equipped with a containment area to collect solids that fall during the belt press operation or during routine belt press cleaning and maintenance; utility and power outlets for the belt presses and support equipment; lighting; and an access road.

Final design phase activities will include detailed field investigations, preparation of drawings and specifications, development of a construction cost estimate, value engineering, receipt of competitive bids, and all other activities in advance of award of a construction contract. The detailed field investigations will include geotechnical investigations, site survey, and utility potholing.

This action appropriates \$2.58 million and authorizes final design phase activities for the addition of solids thickeners at the Mills plant. Final design will be performed by Metropolitan staff. The requested funds include: \$104,000 for field investigations; \$1.87 million for final design; \$320,000 for receipt of bids, value engineering, permitting, and project management; and \$286,000 for remaining budget.

The anticipated cost of final design is approximately 12 percent of the estimated total construction cost. Engineering Services' goal for design of projects with construction cost greater than \$3 million is 9 to 12 percent. The construction cost for this project is anticipated to range from \$15 million to \$18 million.

**Specialized Support – No Actions Required**

Geotechnical investigations are recommended to be performed by URS under an existing professional services agreement. URS was selected through a competitive process via Request for Qualifications No. 931; no amendment to the existing agreement is required. For this agreement, Metropolitan has established a Small Business Enterprise participation level of 18 percent. The estimated cost for these services is \$60,000.

The value engineering review will address design-related issues and constructability of the project. The work will be performed by a value engineering consultant to be selected through a competitive process. The estimated cost for these services is \$50,000.

This work has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2012/13 capital expenditure plan. See [Attachment 1](#) for the Financial Statement and [Attachment 2](#) for the Location Map.

This project is included within capital Appropriation No. 15479, the Mills Improvements Program – FY 2012/13 Through FY 2017/18. This is the initial action for this appropriation.

***Project Milestone***

February 2014 – Completion of final design of Mills solids handling improvements

**Policy**

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Metropolitan Water District Administrative Code Section 5108: Appropriations

**California Environmental Quality Act (CEQA)**

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CEQA determination for Option #1:

The environmental effects from the construction of the proposed Solids Handling Facilities, Stage 1 Project at the Henry J. Mills Water Treatment Plant were evaluated in the Henry J. Mills Water Filtration Plant Expansion Final Environmental Impact Report (Final EIR), which was certified by the Board February 12, 1991. The Board also approved the Findings of Fact (findings), the Mitigation Monitoring and Reporting Program (MMRP), and the Solids Handling Facilities, Stage 1 Project itself. The proposed board action is solely based on preparation of the final design and not on any changes to the approved project itself. Hence, the previous environmental documentation acted on by the Board in conjunction with the proposed action fully complies with CEQA and the State CEQA Guidelines. Accordingly, no further CEQA documentation is necessary for the Board to act on the proposed action.

The CEQA determination is: Determine that the proposed action has been previously addressed in the certified 1991 Final EIR, findings, and MMRP, and that no further environmental analysis or documentation is required.

CEQA determination for Option #2:

None required

**Board Options**

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**Option #1**

Adopt the CEQA determination and

- a. Appropriate \$2.58 million; and
- b. Authorize final design of solids handling improvements for the Mills plant.

**Fiscal Impact:** \$2.58 million in capital funds under Approp. 15479

**Business Analysis:** This option will support near-term treated water demands and will enhance reliability of the Mills plant.

**Option #2**

Do not authorize the improvement project at this time.


**Fiscal Impact:** None

**Business Analysis:** Under this option, during adverse incoming water quality conditions, the Mills plant's capacity may be reduced due to solids handling limitations.

**Staff Recommendation**

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Option #1

  
 \_\_\_\_\_ 10/24/2012  
 Gordon Johnson Date  
 Manager/Chief Engineer  
 Engineering Services

  
 \_\_\_\_\_ 10/24/2012  
 Jeffrey Nightlinger Date  
 General Manager

**Attachment 1 – Financial Statement**

**Attachment 2 – Location Map**

**Financial Statement for Mills Improvements Program - FY 2012/13 Through FY2017/18**

A breakdown of Board Action No. 1 for Appropriation No. 15479 for the Mills Solids Handling Facilities<sup>1</sup> is as follows:

	<b>Current Board Action No. 1 (Nov. 2012)</b>
Labor	
Studies & Investigations	\$ 14,000
Final Design	1,870,000
Owner Costs (Program mgmt., permitting)	265,000
Submittals Review & Record Drwgs.	-
Construction Inspection & Support	-
Metropolitan Force Construction	-
Materials & Supplies	-
Incidental Expenses	5,000
Professional/Technical Services	140,000
Equipment Use	-
Contracts	-
Remaining Budget	286,000
<b>Total</b>	<b>\$ 2,580,000</b>

**Funding Request**

<b>Program Name:</b>	Mills Improvements Program - FY 2012/13 Through FY 2017/18		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15479	<b>Board Action No.:</b>	1
<b>Requested Amount:</b>	\$ 2,580,000	<b>Capital Program No.:</b>	15479-I
<b>Total Appropriated Amount:</b>	\$ 2,580,000	<b>Capital Program Page No.:</b>	74
<b>Total Program Estimate:</b>	\$ 44,925,000	<b>Program Goal:</b>	I- Infrastructure Upgrade

<sup>1</sup> This action is the initial appropriation for the Mills Solids Handling Facilities project.

# Henry J. Mills Water Treatment Plant

