



● **Board of Directors**  
***Engineering and Operations Committee***

11/9/2010 Board Meeting

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**7-1**

**Subject**

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Appropriate \$610,000; and authorize final design for rehabilitation of sand traps for the Colorado River Aqueduct (Approp. 15373)

**Description**

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This action authorizes final design to refurbish the sand trap equipment located upstream of the Iron Mountain, Eagle Mountain, and Hinds Pumping Plants along the Colorado River Aqueduct (CRA).

**Timing and Urgency**

The existing CRA sand traps' cranes, mechanical equipment, and electrical systems have been in operation since original construction of the aqueduct. The traps remove water-borne sand to protect internal surfaces of the main CRA pumps from abrasion. If the sand is not removed on a regular basis, it would erode the main CRA pumps and piping systems, resulting in increased maintenance costs and reduced flow capacity of the CRA. The 70-year-old sand removal equipment has exceeded its useful life and components are beginning to fail, which has led to more frequent repairs.

This project has been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and is categorized as an Infrastructure Reliability project. It is budgeted within Metropolitan's CIP for fiscal year 2010/11.

**Background**

During construction of the CRA in the 1930s, three sand traps were placed upstream of the Iron Mountain, Eagle Mountain, and Hinds Pumping Plants. These rectangular sand traps are 40 feet wide and 420 feet long, and are located adjacent to the canal. CRA water passes through each of the three sand traps before reaching its adjacent pumping plant. The sand traps reduce water velocity and allow wind-blown desert sand to settle to the bottom of the basins. Each sand trap has a traveling bridge with crane, control cabin, pump hoist, and a dredge pump to remove the accumulated sand. Metropolitan staff removes sand from the sand traps on a one-to-three-month cycle to prevent excess sand from being conveyed to the downstream pumping plants. If sand reached the plants, it could damage the pump bearings and impellers, erode the piping systems, and cause a substantial decrease in pump efficiency. Failure to remove the sand would increase maintenance costs and could lead to a reduction of CRA flow capacity.

The sand traps' mechanical equipment and electrical systems, which have been in operation since original construction of the CRA, have reached the end of their useful life. The electric motors and pumps have become unreliable and require more frequent repairs. Repairs are often difficult because replacement parts are no longer available. Additionally, the traveling bridges' truss structures are experiencing corrosion and must be replaced. In April 2008, Metropolitan's Board authorized preliminary design for replacement of the sand trap equipment. Staff has completed preliminary design and recommends proceeding with final design at this time.

**CRA Sand Trap Equipment Replacement – Final Design Phase (\$610,000)**

Planned improvements to the sand traps include replacement of traveling bridge and control cabin equipment including the pump apparatus, electrical equipment, bridge rails, and chain link fence around the perimeter of the sand traps. Metropolitan staff investigated the possibility of refurbishing and recoating the existing corroded steel components. However, replacement of the bridge components was determined to be more cost-effective because the existing equipment contains hazardous materials that would be extremely expensive to mitigate. Additionally, replacement parts are no longer available for some of the existing equipment.

Final design phase activities will include engineering design; preparation of drawings and specifications; development of a construction cost estimate; and all other activities in advance of award of construction and procurement contracts. All final design activities will be performed by Metropolitan staff.

This action appropriates \$610,000 and authorizes final design phase activities for replacement of equipment at three CRA sand traps. Requested funds include \$437,500 for final design; \$23,600 for hazardous material testing; \$74,100 for project management and receipt of bids; \$22,300 for permitting and environmental documentation; and \$52,500 for remaining budget. The final design cost as a percentage of the total estimated construction cost is approximately 11 percent. 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 \$3 million to \$4 million. Staff will return to the Board at a later date for award of the construction contract.

**Summary**

This action appropriates \$610,000 and authorizes final design to rehabilitate sand traps for the CRA. This work will be performed under the CRA Conveyance Reliability Program (Appropriation No. 15373), which was initiated in FY 2001/02. Past work completed under Appropriation No. 15373 includes replacement of the CRA canal liner, installation of internal seals within the CRA siphons, replacement of flanges throughout the CRA system, and repairs to the Big Morongo Siphon. The total appropriated amount for this program will increase from \$73,388,000 to \$73,998,000.

See [Attachment 1](#) for the Financial Statement and [Attachment 2](#) for the Location Map.

This project is consistent with Metropolitan's goals for sustainability by enhancing reliability of the existing conveyance and distribution system in order to maintain reliable water deliveries in the future.

***Project Milestone***

August 2011 – Completion of final design

**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 proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding, design, minor alterations and replacement of existing public facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment, and minor alterations of land that do not involve removal of mature trees. Accordingly, the proposed action qualifies under Class 1, Class 2, and Class 4 Categorical Exemptions (Sections 15301, 15302, and 15304 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 1, Section 15301, Class 2, Section 15302, and Class 4 Section 15304 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

## Board Options

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### Option #1

Adopt the CEQA determination and

- a. Appropriate \$610,000; and
- b. Authorize final design to rehabilitate three Colorado River Aqueduct sand traps.

**Fiscal Impact:** \$610,000 in budgeted funds under Approp. 15373

**Business Analysis:** This project will enhance Colorado River Aqueduct reliability and improve operational efficiency.

### Option #2

Do not authorize the project at this time.


**Fiscal Impact:** None

**Business Analysis:** This action will forgo an opportunity to replace deteriorated equipment at the sand traps. As a result, maintenance costs and down-time of sand trap equipment would increase. In addition, there is a greater risk of eroding the CRA pumps, along with reduced CRA flows.

## Staff Recommendation

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Option #1

  
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Roy L. Wolfe  
Manager, Corporate Resources

10/26/2010  
Date

  
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Jeffrey Kightlinger  
General Manager

10/26/2010  
Date

**Attachment 1 – Financial Statement**

**Attachment 2 – Location Map**

Ref# cr12607881

### Financial Statement for CRA Conveyance Reliability Program

A breakdown of Board Action No. 13 for Appropriation No. 15373 for the CRA Sand Trap Equipment Replacement project\* is as follows:

	<b>Previous Total Appropriated Amount (Apr. 2008)</b>	<b>Current Board Action No. 13 (Nov. 2010)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies and Investigations	\$ 3,182,300	\$ -	\$ 3,182,300
Final Design	3,347,700 ***	436,000	3,783,700
Owner Costs (Program mgmt., bidding process, hazardous material testing)	4,458,200 ***	116,500	4,574,700
Construction Inspection and Support	5,098,220 ***	-	5,098,220
Metropolitan Force Construction	7,210,118 **	-	7,210,118
Materials and Supplies	1,660,300	-	1,660,300
Incidental Expenses	387,800	5,000	392,800
Professional Services	3,820,400 ***	-	3,820,400
Right of Way	10,000	-	10,000
Equipment Use	101,450	-	101,450
Contracts	40,426,861 ***	-	40,426,861
Remaining Budget	3,684,651 **,***	52,500	3,737,151
<b>Total</b>	<b>\$ 73,388,000</b>	<b>\$ 610,000</b>	<b>\$ 73,998,000</b>

### Funding Request

<b>Program Name:</b>	CRA Conveyance Reliability Program		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15373	<b>Board Action No.:</b>	13
<b>Requested Amount:</b>	\$ 610,000	<b>Capital Program No.:</b>	15373
<b>Total Appropriated Amount:</b>	\$ 73,998,000	<b>Capital Program Page No.:</b>	278
<b>Total Program Estimate:</b>	\$ 113,500,000	<b>Program Goal:</b>	I-Infrastructure Reliability

\* The total amount expended to date on the CRA Sand Trap Equipment Replacement project is approximately \$136,341.

\*\* Includes previous allocation of \$273,752 from Blow-off Valve Flange Outlet Replacement project to remaining budget, due to completion under budget.

\*\*\* Includes previous allocation of \$427,000 from remaining budget to: Access Structure, Transition Structure and Manhole Covers Replacement project during final design for consolidating two projects into a single construction contract for greater efficiency during construction (\$56,000); and to San Jacinto Diversion Structure, Warren Road Gates and Service Connection DW-CV-4 Rehabilitation project for differing site conditions encountered during construction (\$371,000).

Location Map

