



- Board of Directors  
*Engineering and Operations Committee*

2/10/2015 Board Meeting

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**7-2**

## **Subject**

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Appropriate \$1.35 million; and authorize design to replace discharge valves at Copper Basin and Gene Wash Reservoirs (Approp. 15373)

## **Executive Summary**

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This action authorizes final design to replace the emergency discharge valves and rehabilitate the discharge structures at Copper Basin and Gene Wash Reservoirs on the Colorado River Aqueduct (CRA). This project will enhance reliability of the structures, which are used to draw down the reservoirs in the event of an emergency.

### **Timing and Urgency**

The Gene Wash and Copper Basin Reservoirs provide critical storage that enables flowrates along the CRA to be stabilized and controlled. If the reservoirs needed to be drained rapidly in the event of an emergency, the discharge valves located at the base of each dam would be opened to safely release the water. Following 70 years of continuous service, the valves have begun to leak and need to be replaced. Both dams are under the jurisdiction of the California Division of Safety of Dams (DSOD), which requires that the discharge valves be fully operational at all times. Staff recommends that design to rehabilitate the discharge structures and replace the valves move forward in order to maintain compliance with the dams' operating permits.

This project has been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria, and is categorized as an Infrastructure Reliability project. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2014/15.

## **Details**

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### **Background**

The CRA is a 242-mile-long conveyance system that transports water from the Colorado River to Lake Mathews. It consists of five pumping plants, 124 miles of tunnels, 63 miles of canals, and 55 miles of conduits, siphons and reservoirs. The aqueduct was constructed in the late 1930s and was placed into service in 1941.

The Gene Wash and Copper Basin Reservoirs were constructed in 1937 and 1938, respectively. Gene Wash holds 6,300 acre-feet of water, while Copper Basin holds 24,200 acre-feet. Both reservoirs are under the jurisdiction of DSOD. The reservoirs are used to store water and control flows along the CRA system. Each facility has a concrete-arch dam with a discharge structure at its base that contains a trash rack, a 4-foot diameter outlet pipe, a shutoff gate valve, and a fixed cone (Howell Bunger) valve. The discharge structure is used to draw the reservoir down in the event of an emergency.

Under normal operation, the two discharge valves at each dam are closed. On a semi-annual basis, staff exercises these valves during site inspections with DSOD. No permits are required for releases from the dams. Water discharged from Gene Wash Reservoir travels through natural water courses, and is ultimately returned to the Colorado River.

Following 70 years of continuous service, the fixed cone valves, gate valves, and electrical systems show signs of excessive wear and need to be replaced. The fixed cone valves are leaking and the gate valves have become unreliable.

In November 2006, Metropolitan's Board authorized preliminary design to rehabilitate the discharge structures at Copper Basin and Gene Wash Reservoirs. Staff has completed preliminary design and recommends proceeding with final design of the improvements at this time.

### **Copper Basin and Gene Wash Reservoirs Discharge Valve Rehabilitation – Final Design Phase (\$1,350,000)**

Planned improvements at the discharge structures include replacing the fixed cone valves and all components of the gate valves except for their embedded gate frames. The gate frames will be rehabilitated in place. Additional improvements will include upgrading the electrical systems and replacing corroded catwalks and ladders on the face of each dam. At Gene Wash Dam, a new electrical service and pad-mounted transformer will be installed at the top of the dam, while new cables will supply power to the discharge structure. In order for the rehabilitation work to proceed, isolation devices will be fabricated and installed to plug the outlet lines and isolate the reservoirs from their discharge structures. This work will require a specialty marine-type contractor to install the isolation devices within the reservoirs at depths of approximately 130 feet at Gene Wash and approximately 200 feet at Copper Basin. The reservoirs will remain in service during the construction in order to maintain deliveries through the CRA system.

Planned final design phase activities include detailed engineering design; preparation of prequalification and procurement packages for the valves, and receipt of multiple bids; preparation of drawings and specifications for the construction contract, and receipt of bids; development of a construction cost estimate; value engineering; and permitting with DSOD. The design phase activities will primarily be performed by Metropolitan staff, with technical assistance from a specialized consulting firm with marine construction experience, and a value engineering firm. For both of these firms, the work will be performed under professional services agreements awarded under the General Manager's Administrative Code authority.

This action appropriates \$1.35 million and authorizes design to rehabilitate the discharge structures at Copper Basin and Gene Wash Reservoirs. Requested funds include: \$845,000 for detailed design; \$100,000 for value engineering; \$170,000 for permitting, bidding, and project management; and \$235,000 for remaining budget. The final design cost as a percentage of the estimated construction cost is approximately 11.7 percent. Engineering Services' goal for design of projects with construction cost greater than \$3 million is 9 to 12 percent. The anticipated cost of construction for this project is expected to range from \$6.5 million to \$8 million.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2014/15 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. 15373, the CRA Conveyance Reliability Appropriation, which was initiated in fiscal year 2001/02. With the present action, the total funding for Appropriation No. 15373 will increase from \$85,708,000 to \$87,058,000. The total estimated cost to complete this project, including the amount expended to date, current funds requested, and future construction cost, will range from \$8.1 million to \$9.6 million.

#### ***Project Milestones***

May 2015 – Completion of procurement packages for fixed cone valves and gate valves

December 2015 – 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 proposed project involves the funding; final design; and minor alterations, reconstruction or replacement of existing public facilities with no expansion of use and no possibility of significantly impacting the physical environment. In addition, the proposed project involves minor modifications in the condition of land, water, and/or vegetation which does not involve removal of healthy, mature, scenic 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 four 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 that this action is categorically exempt, and

- a. Appropriate \$1.35 million; and
- b. Authorize final design to rehabilitate the discharge structures at Copper Basin and Gene Wash Reservoirs.

**Fiscal Impact:** \$1.35 million in capital funds under Approp. 15373

**Business Analysis:** This option will enhance CRA reliability and maintain compliance with the dams' operating permits.

**Option #2**

Do not proceed with rehabilitation of the discharge structures at this time.

**Fiscal Impact:** None

**Business Analysis:** This option would forgo an opportunity to enhance reliability of the CRA, and may lead to operating restrictions for the reservoirs.

**Staff Recommendation**

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Option #1

  
 \_\_\_\_\_ 1/27/2015  
 Gordon Johnson Date  
 Manager/Chief Engineer  
 Engineering Services

  
 \_\_\_\_\_ 1/28/2015  
 Jeffrey Kightlinger Date  
 General Manager

[Attachment 1 – Financial Statement](#)

[Attachment 2 – Location Map](#)

**Financial Statement for CRA Conveyance Reliability Appropriation**

A breakdown of Board Action No. 19 for Appropriation No. 15373 for the Copper Basin and Gene Wash Reservoirs Discharge Valve Rehabilitation<sup>1</sup> is as follows:

|                                                  | <b>Previous Total<br/>Appropriated<br/>Amount<br/>(Jul. 2013)</b> | <b>Current Board<br/>Action No. 19<br/>(Feb. 2015)</b> | <b>New Total<br/>Appropriated<br/>Amount</b> |
|--------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------|
| Labor                                            |                                                                   |                                                        |                                              |
| Studies & Investigations                         | \$ 3,584,900                                                      | \$ -                                                   | \$ 3,584,900                                 |
| Final Design                                     | 4,409,687                                                         | 799,000                                                | 5,208,687                                    |
| Owner Costs (Program mgmt, envir.<br>monitoring) | 5,183,600                                                         | 193,000                                                | 5,376,600                                    |
| Submittal Reviews & Record Dwgs.                 | 261,000                                                           | -                                                      | 261,000                                      |
| Construction Inspection & Support                | 6,239,220                                                         | -                                                      | 6,239,220                                    |
| Metropolitan Force Construction                  | 8,111,620                                                         | -                                                      | 8,111,620                                    |
| Materials & Supplies                             | 1,710,300                                                         | -                                                      | 1,710,300                                    |
| Incidental Expenses                              | 392,800                                                           | 2,000                                                  | 394,800                                      |
| Professional/Technical Services                  | 4,218,000                                                         | -                                                      | 4,218,000                                    |
| Value engineering firm                           | -                                                                 | 75,000                                                 | 75,000                                       |
| Marine engineering firm                          | -                                                                 | 46,000                                                 | 46,000                                       |
| Right of Way                                     | 10,000                                                            | -                                                      | 10,000                                       |
| Equipment Use                                    | 211,450                                                           | -                                                      | 211,450                                      |
| Contracts                                        | 48,510,190                                                        | -                                                      | 48,510,190                                   |
| Remaining Budget                                 | 2,865,233 <sup>2</sup>                                            | 235,000                                                | 3,100,233                                    |
| <b>Total</b>                                     | <b>\$ 85,708,000</b>                                              | <b>\$ 1,350,000</b>                                    | <b>\$ 87,058,000</b>                         |

**Funding Request**

|                                   |                                                               |                                      |               |
|-----------------------------------|---------------------------------------------------------------|--------------------------------------|---------------|
| <b>Program Name:</b>              | CRA Conveyance Reliability Appropriation                      |                                      |               |
| <b>Source of Funds:</b>           | Revenue Bonds, Replacement and Refurbishment or General Funds |                                      |               |
| <b>Appropriation No.:</b>         | 15373                                                         | <b>Board Action No.:</b>             | 19            |
| <b>Requested Amount:</b>          | \$ 1,350,000                                                  | <b>Budget Page No.:</b>              | 276           |
| <b>Total Appropriated Amount:</b> | \$ 87,058,000                                                 | <b>Total Appropriation Estimate:</b> | \$128,400,000 |

<sup>1</sup> The total amount expended to date on the Copper Basin and Gene Wash Reservoirs Discharge Valve Rehabilitation project is approximately \$250,000. The total estimated cost to complete this project, including the amount expended to date, current funds requested, and future construction cost, is \$8.1 million to \$9.6 million.

<sup>2</sup> Includes previous allocation of \$130,000 from Remaining Budget to the Iron Mountain Tunnel Rehabilitation to assess additional tunnel rehabilitation alternatives; \$104,000 from Remaining Budget to the Aqueduct, Reservoir and Discharge Line Isolation Gates for design modifications as a result of aqueduct operational changes; \$161,600 from Remaining Budget to CRA Investigations for evaluating the susceptibility of the CRA conveyance system to seismic-induced vertical ground deformations in the San Gorgonio Pass area.

### Location Map

