



- Board of Directors  
*Engineering and Operations Committee*

4/12/2011 Board Meeting

**7-2**

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## **Subject**

Appropriate \$1.93 million; and authorize two Colorado River Aqueduct rehabilitation projects (Approps. 15374 and 15438)

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## **Description**

This action authorizes two Colorado River Aqueduct (CRA) rehabilitation projects: (1) award of a construction contract for replacement of the standby generator at Eagle Mountain Pumping Plant, and (2) final design to repair expansion joints on the delivery pipes at Hinds, Gene and Intake Pumping Plants.

### **Timing and Urgency**

The existing 50-year-old standby generator at Eagle Mountain Pumping Plant has reached the end of its service life and is no longer reliable. New support features for the generator are also required to meet current fire code and health and safety regulations, including a fuel unloading area and a generator spill containment structure. This project will improve the reliability of emergency power for critical auxiliary systems at the pumping plant, such as the fire water pumps and the potable water treatment and delivery system.

The Hinds, Gene and Intake Pumping Plants have three aboveground steel pipes that convey water from the pumping plants downstream to the aqueduct. These steel pipes have two or three expansion joints per pipe, depending on the length of the pipe at the plant. Since these pipes were installed 50 to 70 years ago, the pipe expansion joints have developed leaks which have resulted in accelerated rates of corrosion at the joints. This project will repair the corroded expansion joints at all three plants.

Staff recommends moving forward with these two rehabilitation projects to maintain reliable CRA water deliveries and to avoid service interruption and costly emergency repairs. These projects have been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria, and are categorized as Infrastructure Upgrade projects. Both projects are budgeted within Metropolitan's CIP for fiscal year 2010/11.

### **Background**

The CRA is a 242-mile-long conveyance system which conveys 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 Eagle Mountain Pumping Plant's auxiliary mechanical systems rely on a standby diesel generator to produce electricity in the event of loss of the plant power supply. Critical auxiliary systems powered by this generator include fire water pumps, the potable water treatment and delivery system, cooling water pumps, emergency lighting, sump pumps which prevent flooding of the pumping plant, and cooling water pumps servicing the main CRA pumps.

In June 2009, Metropolitan's Board authorized final design to replace the standby diesel generator at Eagle Mountain Pumping Plant. The existing standby generator was installed in the 1960s and has reached the end of its service life. Over the past two years, the 50-year-old generator has required numerous repairs, while replacement parts have become difficult to locate. Since reliability of the generator is problematic, a portable

generator is currently being rented as a back-up. In addition, unlike modern generators, the existing generator must be manually started in the event of a plant power loss. The manual start-up routine results in a relatively lengthy time delay between loss of primary power and availability of standby power. Until the standby power can be activated, many critical auxiliary systems are inoperable, which could result in overheating of the main CRA pumps or flooding of the pumping plant. Staff recommends proceeding with replacement of the existing standby generator and construction of ancillary facilities for Eagle Mountain Pumping Plant at this time.

Each of the five CRA pumping plants utilizes three aboveground steel delivery pipelines to convey water from the plant to the downstream aqueduct. These lines have been in continuous service for 50 to 70 years. Each delivery line is 10 feet in diameter with two or three expansion joints per pipe, depending on the length of the pipe at the plant. Typically, these joints are located at pipeline supports or anchors. The expansion joints are composed of steel plates, pipe and packing material that allow for thermal expansion and contraction of the pipeline as a result of ambient temperature changes.

Leaks have been detected at the expansion joints at all five CRA pumping plants for several years, and while the volume of leakage is low, the leakage has begun to corrode the pipe joints. Over time, corrosion of these expansion joints has increased. If left unabated, the corroded joints would eventually fail, resulting in an extended shutdown of the CRA for repairs. The expansion joints for Eagle Mountain and Iron Mountain Pumping Plants were repaired in February 2010 and 2011, respectively. Staff recommends proceeding with final design phase activities to repair the delivery line expansion joints for Hinds, Gene and Intake Pumping Plants at this time.

**Project No. 1 – Eagle Mountain Pumping Plant Standby Generator Replacement – Construction Phase (\$1,440,000)**

Replacement of the Eagle Mountain Pumping Plant's emergency standby diesel generator is needed to provide on-site power generation capabilities in the event of loss of primary power. Critical auxiliary systems powered by this generator include fire water pumps, the potable water treatment and delivery system, cooling water pumps, emergency lighting, sump pumps, and cooling water pumps servicing the main CRA pumps. Upgrades to ancillary facilities are required to meet current fire codes and to comply with health and safety regulations. The project will include a fuel unloading area with spill containment, and additional alarms, valves, and meters to meet current code requirements. The new diesel generator will include a control system capable of remotely and automatically starting the generator upon loss of primary power, as well as being capable of turning off the generator once the primary power is re-established. In addition, a step-up transformer will be constructed to increase the generator's voltage to meet that of the plant's driven equipment.

Specifications No. 1685 was advertised for bid on January 28, 2011. As shown on [Attachment 2](#), eight bids were received and opened on March 8, 2011. The low bid from Southern Contracting Company, in the amount of \$1,032,945, complies with the requirements of the specifications. The seven higher bids ranged from \$1,052,379 to \$1,691,023. The engineer's estimate was \$907,000. Staff investigated the difference between the low bid and the engineer's estimate and attributes the difference to logistical challenges due to the remoteness of the job site. For this contract, Metropolitan has established a Small Business Enterprise (SBE) participation level of at least 23 percent of the bid amount. Southern Contracting Company has committed to meet this level of participation.

This action appropriates \$1.44 million and awards a \$1,032,945 contract to Southern Contracting Company for replacement of the standby generator at Eagle Mountain Pumping Plant. In addition to the amount of the contract, the requested funds include \$96,000 for Metropolitan force construction, which includes provision of temporary power to critical auxiliary facilities like the fire protection pumps, and shutdown activities. The total amount of construction is \$1,278,945, which includes \$150,000 for the standby generator which has already been procured. The appropriated funds also include \$155,000 for construction inspection; \$60,000 for local agency permitting and project management; and \$96,055 for remaining budget.

Metropolitan will perform inspection of the construction contract. For this project, the anticipated cost of inspection is approximately 12.1 percent of the total construction cost. Engineering Services' goal for inspection of contracts less than \$3 million is 9 to 15 percent.

**Project No. 2 – Delivery Pipes Expansion Joint Repairs – Final Design Phase (\$490,000)**

Rehabilitation of the expansion joints on the 10-foot-diameter pump delivery pipes at Hinds, Gene and Intake Pumping Plants is needed to address the advancing stages of corrosion and to maintain reliable water deliveries from the CRA. Rehabilitation work will include disassembly, blast cleaning, recoating, repacking, and reassembly of the expansion joints on the 10-foot-diameter pump delivery pipes at the three pumping plants. The expansion joints for the other two CRA plants, Eagle Mountain and Iron Mountain, were repaired in February 2010 and 2011, respectively. These repairs validated the specialized process and coatings that will be used to rehabilitate the remaining joints. Repairs at the remaining three pumping plants will be phased over three future CRA shutdowns, via three construction contracts. This approach will allow the unique configurations and needs of each plant to be addressed individually, and will incorporate lessons learned from each earlier contract.

Planned activities include detailed shutdown planning; preparation of drawings and specifications; advertisement and receipt of multiple bids; development of construction cost estimates; and all other activities in advance of award of the three construction contracts. All final design activities will be performed by Metropolitan staff.

This action appropriates \$490,000 in budgeted funds and authorizes final design of repairs to the delivery pipe expansion joints at Hinds, Gene and Intake Pumping Plants. Requested funds include \$321,400 for final design; \$34,900 for hazardous material testing; \$98,700 for receipt of multiple bids and project management; and \$35,000 for remaining budget. The final design cost as a percentage of the total estimated construction cost is approximately 11.4 percent. Engineering Services' goal for design of projects with construction cost less than \$3 million is 9 to 15 percent. The construction cost for this project is anticipated to range from \$2 million to \$3 million. Staff will return to the Board at a later date for award of the construction contracts.

**Summary**

This action appropriates \$1.93 million, awards a construction contact to replace the existing standby diesel generator at the Eagle Mountain Pumping Plant, and authorizes final design of repairs to the delivery pipe expansion joints at the Hinds, Gene and Intake Pumping Plants. This work has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the fiscal year 2010/11 capital budget. See [Attachment 1](#) for the Financial Statements, and [Attachment 3](#) for the Location Map.

These projects are included within capital Appropriations Nos. 15374 and 15438, the CRA Pumping Plant Program and CRA Reliability – Phase II Program. The CRA Pumping Plant Program was initiated in fiscal year 2001/02 and the CRA Reliability – Phase II Program was initiated in fiscal year 2006/07. Past work completed under Appropriation No. 15374 includes the Intake Pumping Plant Automation, Circulating Water Systems Rehabilitation, and Expansion Joint Rehabilitation at Iron and Eagle Mountain Pumping Plants. The total appropriated amount for this program will increase from \$20,507,000 to \$20,997,000.

Past work authorized under Appropriation No. 15438 includes the CRA 6.9 kV Fault Current Protection Upgrades, Iron Mountain Standby Generator Replacements, and the CRA 230 kV Disconnect Switches Replacement Project. The total appropriated amount for this program will increase from \$17,011,000 to \$18,451,000.

These projects are 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 Milestones***

March 2012 – Completion of construction of the Eagle Mountain Pumping Plant Standby Generator Replacement

June 2012 – Completion of final design of the Delivery Pipe Expansion Joint Repairs

## Policy

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Metropolitan Water District Administrative Code Section 5108: Appropriations

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

## California Environmental Quality Act (CEQA)

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CEQA determination for Option #1:

The proposed actions (award of a construction contract for replacement of the standby generator at Eagle Mountain Pumping Plant and final design to repair expansion joints on the delivery pipes at Hinds, Gene and Intake Pumping Plants) are 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. Accordingly, the proposed actions qualify under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed actions qualify under two Categorical Exemptions (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).

CEQA determination for Option #2:

The proposed action (award of a construction contract for replacement of the standby generator at Eagle Mountain Pumping Plant) 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. Accordingly, the proposed action qualifies under Class 1 and Class 2 Categorical Exemptions (Sections 15301 and 15302 of the State CEQA Guidelines).

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

CEQA determination for Option #3:

None required

## Board Options

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### Option #1

Adopt the CEQA determinations and

- a. Appropriate \$1.93 million;
- b. Award \$1,032,945 contract to Southern Contracting Company for replacement of the standby generator at Eagle Mountain Pumping Plant; and
- c. Authorize final design of repairs to the delivery pipe expansion joints at Hinds, Gene and Intake Pumping Plants.

**Fiscal Impact:** \$1.93 million in budgeted funds under Approps. 15374 and 15438

**Business Analysis:** This option will enhance reliability of water deliveries through the CRA.

### Option #2

Adopt the CEQA determinations and

- a. Appropriate \$1.44 million;
- b. Award \$1,032,945 contract to Southern Contracting Company for replacement of the standby generator at Eagle Mountain Pumping Plant; and
- c. Do not authorize final design of repairs to the delivery pipe expansion joints.

**Fiscal Impact:** \$1.44 million in budgeted funds under Approp. 15438

**Business Analysis:** This option would forego an opportunity to enhance reliability of CRA deliveries, and could lead to more extensive repairs in the future.

**Option #3**

Do not proceed with the two projects at this time.


**Fiscal Impact:** None

**Business Analysis:** This option could result in the inability to operate critical auxiliary systems in the event of a power loss at Eagle Mountain Pumping Plant. In addition, this option would forego an opportunity to enhance reliability of CRA deliveries, and could lead to more extensive repairs in the future.

**Staff Recommendation**

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Option #1

  
\_\_\_\_\_  
Gordon Johnson 3/21/2011  
Manager/Chief Engineer, Engineering Services Date

  
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Jeffrey Kightlinger 3/29/2011  
General Manager Date

**Attachment 1 – Financial Statements**

**Attachment 2 – Abstract of Bids**

**Attachment 3 – Location Map**

Ref# es12609806

### Financial Statement for CRA Pumping Plant Reliability Program

A breakdown of Board Action No. 12 for Appropriation No. 15374 for the Delivery Pipes Expansion Joint Repairs project\* is as follows:

	<b>Previous Total Appropriated Amount (Sept. 2010)</b>	<b>Current Board Action No. 12 (Apr. 2011)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies and Investigations	\$ 889,000	\$ -	\$ 889,000
Final Design	1,129,800	320,300	1,450,100
Owner Costs (Program mgmt., bidding process)	2,284,700	98,700	2,383,400
Construction Inspection and Support	1,465,000	-	1,465,000
Metropolitan Force Construction	3,267,700	31,400	3,299,100
Materials and Supplies	2,666,000	-	2,666,000
Incidental Expenses	185,900	4,600	190,500
Professional Services	763,000	-	763,000
Equipment Use	82,700	-	82,700
Contracts	5,587,358	-	5,587,358
Remaining Budget	2,185,842	35,000	2,220,842
<b>Total</b>	<b>\$ 20,507,000</b>	<b>\$ 490,000</b>	<b>\$ 20,997,000</b>

#### Funding Request

<b>Program Name:</b>	CRA Pumping Plant Reliability Program		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15374	<b>Board Action No.:</b>	12
<b>Requested Amount:</b>	\$ 490,000	<b>Capital Program No.:</b>	15374
<b>Total Appropriated Amount:</b>	\$ 20,997,000	<b>Capital Program Page No.:</b>	281
<b>Total Program Estimate:</b>	\$ 42,961,600	<b>Program Goal:</b>	I-Infrastructure Reliability

\* The total amount expended to date on the delivery pipe expansion joint repair project is approximately \$1,053,701.

## Financial Statement for CRA Reliability Program – Phase II

A breakdown of Board Action No. 13 for Appropriation No. 15438 for the Eagle Mountain Pumping Plant Standby Generator Replacement project \* is as follows:

	<b>Previous Total Appropriated Amount (Feb. 2011)</b>	<b>Current Board Action No. 13 (Apr. 2011)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies and Investigations	\$ 1,261,800	\$ -	\$ 1,261,800
Final Design	1,477,900	-	1,477,900
Owner Costs (Program mgmt, permitting)	2,022,390	60,000	2,082,390
Submittal Review	180,100	36,000	216,100
Construction Inspection and Support	633,000	155,000	788,000
Metropolitan Force Construction	1,301,700	50,000	1,351,700
Materials and Supplies	2,222,405	-	2,222,405
Incidental Expenses	92,800	10,000	102,800
Professional Services	1,527,000	-	1,527,000
Equipment Use	-	-	-
Contracts	5,301,000	1,032,945	6,333,945
Remaining Budget	990,905	96,055	1,086,960
<b>Total</b>	<b>\$ 17,011,000</b>	<b>\$ 1,440,000</b>	<b>\$ 18,451,000</b>

### Funding Request

<b>Program Name:</b>	CRA Reliability Program – Phase II		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15438	<b>Board Action No.:</b>	13
<b>Requested Amount:</b>	\$ 1,440,000	<b>Capital Program No.:</b>	15438
<b>Total Appropriated Amount:</b>	\$ 18,451,000	<b>Capital Program Page No.:</b>	283
<b>Total Program Estimate:</b>	\$ 47,184,000	<b>Program Goal:</b>	I-Infrastructure Reliability

\*The total amount expended to date on the Eagle Mountain Standby Generator Replacement project is approximately \$775,000.

**The Metropolitan Water District of Southern California**

**Abstract of Bids Received on March 8, 2011 at 2:00 P.M.**

**Specifications No. 1685**

**Eagle Mountain Pumping Plant  
Standby Diesel Engine Generator Replacement Project**

The Eagle Mountain Pumping Plant Standby Diesel Generator Replacement Project consists of removal and disposal of the existing generator, fuel tank, and accessories, and replacment with a new generator. The project will also add a fuel unloading area with spill containment, alarms, valves and meters.

**Engineer's Estimate: \$907,000**

<b>Bidder and Location</b>	<b>Total</b>	<b>SBE \$</b>	<b>SBE %</b>	<b>Met SBE**</b>
<b>Southern Contracting Company, San Marcos, CA</b>	<b>\$ 1,032,945</b>	<b>\$237,578</b>	<b>23%</b>	<b>Yes</b>
Dahl, Taylor & Associates, Inc., Santa Ana, CA	\$ 1,052,379	N/A	N/A	N/A
Stronghold Engineering, Inc., Riverside, CA	\$ 1,067,127	N/A	N/A	N/A
Western Group, Inc., Woodland Hills, CA	\$ 1,083,000	N/A	N/A	N/A
PCL Construction, Inc., San Marcos, CA	\$ 1,301,833	N/A	N/A	N/A
J. F. Shea Construction, Inc., Walnut, CA	\$ 1,370,754	N/A	N/A	N/A
Adams Mallory Construction Co., Inc., Placentia, CA	\$ 1,568,258	N/A	N/A	N/A
Broughton Construction, Inc., Rancho Cucamonga, CA	\$ 1,691,023	N/A	N/A	N/A

\*SBE (Small Business Enterprise) participation was established at 23% for this contract



### Location Map

