



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

2/14/2017 Board Meeting

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**7-1**

**Subject**

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Adopt CEQA determination and appropriate \$1.79 million; and award \$1,109,254 contract to Kaveh Engineering & Construction, Inc. to repair expansion joints at the Colorado River Aqueduct pumping plants (Appropriation No. 15483)

**Executive Summary**

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This action awards a contract to repair 13 expansion joints located on the pump delivery lines at all five of Metropolitan's Colorado River Aqueduct (CRA) pumping plants.

**Timing and Urgency**

Each of the CRA pumping plants has nine main pumps that lift the water through a series of delivery lines to the downstream aqueduct. A scheduled inspection of the delivery lines in 2014 revealed corrosion with varying levels of metal loss in 16 expansion joints. There are a total of 57 joints at the five pumping plants. The three most severely corroded joints were repaired during a CRA shutdown in 2016. Staff recommends moving forward with repair of the other 13 deteriorated joints at this time. The remaining 41 expansion joints are presently in good condition and will continue to be monitored.

This project has been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria and is included in the CRA Reliability Program. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2016/17.

**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 in Riverside County. The CRA was placed into service in 1941. It consists of five pumping plants, 124 miles of tunnels, 63 miles of canals, and 55 miles of conduits, siphons, and reservoirs.

Each of the five CRA pumping plants has nine pump units within its pump house. Each pump discharges through a 6-foot-diameter steel pipe that contains one expansion joint. Three of these 6-foot-diameter pipelines then converge into a single 10-foot-diameter steel delivery line. Each pumping plant has three aboveground 10-foot-diameter delivery lines that convey water from the pump house to the head gate structure at the top of the adjacent hill. The pump delivery lines were installed in several phases. Delivery Line No. 1 was completed in 1941, while the other two lines were installed in the 1950s. The pump delivery lines vary in length from 500 feet to 2,000 feet, depending on location, and have two to four expansion joints. There are a total of 57 expansion joints at the five pumping plants. The expansion joints are approximately 2 feet long, 6 feet or 10 feet in diameter, and vary in wall thickness from 0.375 inches to 0.687 inches, depending on the internal pressure.

The expansion joints allow the pipelines to expand and contract due to temperature fluctuation. Allowing this movement prevents thermal stresses from damaging the pipelines. Each expansion joint contains a gap in the interior wall of the joint, which forms a location for turbulence, corrosion, and pitting. If not addressed, these conditions could lead to leakage of the delivery line.

In 2014, staff conducted ultrasonic testing to measure the local pipe wall thickness at the delivery line expansion joints. The testing identified three expansion joints (two at Intake and one at Hinds) with metal loss greater than 70 percent; nine joints with metal loss between 50 and 69 percent; and four with metal loss less than 49 percent. The remaining 41 expansion joints were found to have no apparent metal loss.

In November 2015, the Board authorized design to repair the 16 corroded expansion joints, and to perform repairs on the three most deteriorated joints. Those initial repairs were completed in February 2016. Final design to address the 13 remaining deteriorated joints is now complete, and staff recommends moving forward with construction at this time.

### **Delivery Line Expansion Joint Repairs – Construction (\$1,790,000)**

The planned work includes fabrication and installation of cylindrical steel reinforcement plates on the exterior of the joints at 13 locations. The exterior walls will be sandblasted and coated with an epoxy coating. Due to the location of the delivery lines high above steep, rocky slopes, the work will be logistically challenging, and will require Metropolitan support to establish access points, and guide the contractor during site visits and set-up. Metropolitan forces will also perform material testing and surveys to record all completed work. The expansion joints to be repaired include two at Intake Pumping Plant, five at Gene Pumping Plant, three at Iron Mountain Pumping Plant, one at Eagle Mountain Pumping Plant, and two at Hinds Pumping Plant.

Specifications No. 1870 for the CRA Expansion Joint Repairs was advertised for bids on November 1, 2016. As shown in [Attachment 2](#), six bids were received and opened on December 20, 2016. The low bid from Kaveh Engineering & Construction, Inc. in the amount of \$1,109,254 complies with the requirements of the specifications. The five higher bids ranged from \$1,124,000 to \$1,625,000, while the engineer's estimate was \$1,265,000. For this contract, Metropolitan established a Small Business Enterprise (SBE) participation level of at least 20 percent of the bid amount. Kaveh Engineering & Construction, Inc. is an SBE firm, and thus achieves 100 percent participation. The subcontractors for this contract are listed in [Attachment 3](#).

This action appropriates \$1.79 million and awards a \$1,109,254 construction contract to Kaveh Engineering & Construction, Inc. In addition to the amount of the contract, the requested funds include \$102,000 for the Metropolitan force activities described above; \$216,000 for construction inspection; \$68,000 for submittals review, responding to requests for information, and preparation of record drawings; \$76,000 for environmental monitoring and project management; and \$218,746 for remaining budget.

Construction inspection will be performed by Metropolitan staff. For this project, the anticipated cost of inspection is approximately 17.8 percent of the total construction cost. Engineering Services' goal for inspection of projects with construction cost less than \$3 million is 9 to 15 percent. Inspection costs for this project are expected to exceed the goal due to the multiple remote construction sites and periodic continuous inspection required. The total cost of construction to repair the 13 joints is \$1.21 million.

The total estimated cost to complete the repairs for the 16 expansion joints, including the amount appropriated to date and current funds requested, is approximately \$2.32 million.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2016/17 capital expenditure plan. See [Attachment 1](#) for the Financial Statement, [Attachment 2](#) for the Abstract of Bids, [Attachment 3](#) for the Listing of Subcontractors for Low Bidder, and [Attachment 4](#) for the Location Map.

This work is included within capital Appropriation No. 15483, the CRA Reliability Appropriation – FY 2012/13 Through FY 2017/18, which was initiated in fiscal year 2012/13. With the present action, the total funding for Appropriation No. 15483 will increase from \$9.16 million to \$10.95 million.

### ***Project Milestone***

December 2017 – Completion of construction

## 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 action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve minor alterations and replacement of existing public facilities; and minor modifications in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees. In addition, these activities involve negligible or no expansion of use and no possibility of significantly impacting the physical environment. 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).

### CEQA determination for Option #2:

None required

## Board Options

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### Option #1

Adopt the CEQA determination that the proposed action is categorically exempt, and

- a. Appropriate \$1.79 million; and
- b. Award \$1,109,254 contract to Kaveh Engineering & Construction, Inc. to repair expansion joints on the pump delivery lines at the Colorado River Aqueduct pumping plants.

**Fiscal Impact:** \$1.79 million of capital funds under Appropriation No. 15483

**Business Analysis:** This option will enhance reliability of the CRA and reduce the potential for unplanned shutdowns.

### Option #2

Do not proceed with the repairs at this time.

**Fiscal Impact:** None

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

**Staff Recommendation**

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Option #1

  
\_\_\_\_\_  
Gordon Johnson  
Manager/Chief Engineer  
Engineering Services

1/23/2017  
Date

  
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Jeffrey Kightlinger  
General Manager

1/30/2017  
Date

- Attachment 1 – Financial Statement**
- Attachment 2 – Abstract of Bids**
- Attachment 3 – Subcontractors for Low Bidder**
- Attachment 4 – Location Map**

Ref# es12653881

### Financial Statement for CRA Reliability Appropriation – FY 2012/13 Through FY 2017/18

A breakdown of Board Action No. 5 for Appropriation No. 15483 for expansion joints on the pump delivery lines at the CRA pumping plants<sup>1</sup> is as follows:

	<b>Previous Total Appropriated Amount (Aug. 2016)</b>	<b>Current Board Action No. 5 (Feb. 2017)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies & Investigations	\$ 1,708,000	\$ -	\$ 1,708,000
Final Design	1,870,000	-	1,870,000
Owner Costs (Program mgmt. & envir. monitoring)	734,000	76,000	810,000
Submittals Review & Record Drwgs.	20,000	68,000	88,000
Construction Inspection & Support	375,000	216,000	591,000
Metropolitan Force Construction	845,000	102,000	947,000
Materials & Supplies	104,000	-	104,000
Incidental Expenses	2,000	-	2,000
Professional/Technical Services	640,000	-	640,000
Equipment Use	63,000	-	63,000
Contracts	1,866,000	1,109,254	2,975,254
Remaining Budget	933,000	218,746	1,151,746
<b>Total</b>	<b>\$ 9,160,000</b>	<b>\$ 1,790,000</b>	<b>\$ 10,950,000</b>

### Funding Request

<b>Appropriation Name:</b>	CRA Reliability Appropriation – FY 2012/13 Through FY 2017/18		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15483	<b>Board Action No.:</b>	5
<b>Requested Amount:</b>	\$ 1,790,000	<b>Budget Page No.:</b>	222
<b>Total Appropriated Amount:</b>	\$ 10,950,000	<b>Total Appropriation Estimate:</b>	\$ 67,600,000

<sup>1</sup> The total amount expended to date on the CRA Delivery Line Expansion Joint Repairs is approximately \$525,000. The total estimated cost to complete the repairs to 16 expansion joints, including the amount appropriated to date and current funds requested, is approximately \$2.32 million.

**The Metropolitan Water District of Southern California**  
**Abstract of Bids Received on December 20, 2016 at 2:00 P.M.**  
**Specifications No. 1870**  
**Colorado River Aqueduct Expansion Joint Repairs**

The project consists of repairing 13 expansion joints located on the pump delivery lines at all five of Metropolitan's Colorado River Aqueduct pumping plants.

Engineer's Estimate: \$1,265,000

<b>Bidder and Location</b>	<b>Total</b>	<b>SBE \$</b>	<b>SBE %</b>	<b>Met SBE<sup>1</sup></b>
<b>Kaveh Engineering &amp; Construction, Inc., Yorba Linda, CA</b>	<b>\$1,109,254</b>	<b>\$1,109,254</b>	<b>100</b>	<b>Yes</b>
Abhe & Svoboda, Inc., Alpine, CA	\$1,124,394	-	-	-
Innovative Engineering & Maintenance, Wilmington, CA	\$1,250,000	-	-	-
Hemet Manufacturing Company, DBA: Genesis Construction, Hemet, CA	\$1,475,154	-	-	-
Evans Industrial, Inc., Irvine, CA	\$1,590,000	-	-	-
Irwin Industries, Inc., Long Beach, CA	\$1,625,000	-	-	-

<sup>1</sup> SBE (Small Business Enterprise) participation level was established at 20% for this contract.

**The Metropolitan Water District of Southern California**

**Subcontractors for Low Bidder**

**Specifications No. 1870  
Colorado River Aqueduct Expansion Joint Repairs**

Low Bidder: Kaveh Engineering & Construction, Inc.

<b>Subcontractor and Location</b>
Premier Scaffold, Bakersfield, CA
Dean's Certified Welding, Temecula, CA
Techno Coating, Anaheim, CA

### Location Map

