



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

6/11/2013 Board Meeting

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**7-5**

**Subject**

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Appropriate \$1.63 million; and authorize construction for replacement of flow meters at the Colorado River Aqueduct pumping plants (Approp. 15438)

**Executive Summary**

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This action authorizes construction by Metropolitan forces for replacement of the existing flow meters on the delivery lines at Metropolitan's five Colorado River Aqueduct (CRA) pumping plants.

**Timing and Urgency**

Each of the five CRA pumping plants has three aboveground 10-foot-diameter delivery lines which lift water from the pump house to a headgate structure at the top of the hill. Acoustic flow meters are installed on each delivery line.

The flow meters have received regular maintenance since their original installation in 1996, but have gradually deteriorated over time, causing inaccurate flow measurements. If not addressed, these inaccuracies could lead to unsynchronized pumping rates, which could cause flooding at the pumping plants or overtopping of the aqueduct. The flow meters need to be replaced to maintain reliable water deliveries from the CRA.

This program 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 2012/13.

**Details**

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The CRA was constructed over an eight-year period from 1933 to 1941. Each of the five CRA pumping plants has nine main pumps that lift water from the pump house through a series of converging delivery lines that convey water to the downstream aqueduct. Depending on seasonal demands, pumping operations at each plant vary from one- to eight-pump flow, with a maximum capacity of approximately 1,800 cfs. Flow measurements are used to adjust pumping rates and balance the flows from plant to plant. Electronic flow meters installed on each plant's three 10-foot-diameter discharge lines continuously measure the water outflow into the aqueduct.

The existing acoustic flow meters have been in service for nearly 17 years. For this type of electronic equipment, the expected service life is approximately 15 to 20 years. The existing units have begun to deteriorate due to their age and exposure to harsh desert conditions. Continued loss of accuracy could lead to incorrect flow adjustments or unsynchronized pumping rates, which could cause flooding at the plants or overtopping of the aqueduct.

Currently, each delivery line has eight transducers (providing a total of 120 transducers at the five pumping plants). The transducers are connected to a flow meter console in the control room via approximately 1,500 feet of copper cable. Flow data is transmitted from the console to an RTU (Remote Terminal Unit) connection to Metropolitan's Supervisory Control and Data Acquisition (SCADA) system. The long 1,500-foot cable runs between the transducers and control room contribute to electromagnetic interference, which reduces the signal quality and accuracy in the existing installations.

In March 2010, Metropolitan's Board authorized final design to replace the flow meters and their appurtenant equipment. Final design has now been completed, and staff recommends proceeding with procurement and construction at this time. In the planned upgrades, the new transducers at the delivery lines will connect to nearby flow meter consoles housed inside new pre-fabricated equipment enclosures. The flow data will be transmitted from the new consoles to the SCADA system through new fiber-optic cable installations. These upgrades will improve meter accuracy, add local read-out capability, and improve the quality of the electronic signals by shortening the length of the transducer cables.

### **CRA Pumping Plant Flow Meter Replacement – Procurement and Construction (\$1.63 million)**

Specifications No. 1754 to furnish flow meters for the CRA pumping plants was advertised for bids on April 4, 2013. As shown in [Attachment 2](#), two bids were received and opened on April 30, 2013. The low bid from ADS LLC dba Accusonic Technologies, in the amount of \$194,197, complies with the requirements of the specifications. The contract amount includes all sales and use taxes imposed by the state of California. The higher bid was for \$288,410. The budgetary cost range for this equipment, based on previous purchases and a survey of vendors, was \$260,000 to \$320,000. Staff believes that the difference between the budgetary cost range and the low bid reflects the current competitive bidding environment and the large number of components in the bid package. The contract is planned to be awarded under the General Manager's Administrative Code authority to award contracts of \$250,000 or less. Due to the specialized nature of the equipment, no Small Business Enterprise (SBE) incentive credit was established for this contract.

Two additional procurement contracts for the purchase of fiber-optic cable and the electrical enclosures will also be advertised for competitive bid. These contracts are also planned to be awarded under the General Manager's Administrative Code authority.

This action appropriates \$1.63 million to replace flow meters for the CRA pumping plants. In addition to the amount of the meter components, the requested funds include \$190,000 for the two additional procurement contracts; \$7,000 for fabrication inspection; \$714,000 for Metropolitan force construction activities, as described below; \$213,000 for construction materials and supplies; \$59,000 for submittal reviews and preparation of record drawings; \$43,000 for project management and environmental monitoring; and \$209,803 for remaining budget. The total cost of construction for this project is estimated to be \$1,311,000.

Planned construction activities at each pumping plant by Metropolitan forces include replacing and relocating the transducers, flow meter indicators, and transducer cables; installing new fiber-optic communication and power lines to serve the flow meter enclosures; start-up testing; and integration with Metropolitan's SCADA system.

This project 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, [Attachment 2](#) for the Abstract of Bids, and [Attachment 3](#) for the Location Map.

This work is included within capital Appropriation No. 15438, the CRA Reliability Program – FY 2006/07 Through FY 2011/12, which was initiated in fiscal year 2006/07. Other projects authorized under Appropriation No. 15438 include the CRA 6.9 kV Fault Current Protection Upgrades; CRA 230 kV Disconnect Switches Replacement; and the Eagle Mountain, Iron Mountain, and Hinds Standby Generator Replacements. With the present action, the total funding for Appropriation No. 15438 will increase from \$32,724,000 to \$34,354,000.

### **Project Milestone**

January 2015 – 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

Metropolitan Water District Administrative Code Section 4700: General Authorizations

## 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 funding, design, minor alterations and replacement of existing public facilities. 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, 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).

CEQA determination for Option #2:

None required

## Board Options

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### Option #1

Adopt the CEQA determination and

- a. Appropriate \$1.63 million; and
- b. Authorize construction to replace flow meters at the five Colorado River Aqueduct pumping plants.

**Fiscal Impact:** \$1.63 million in capital funds under Approp. 15438

**Business Analysis:** This option will maintain reliability of water deliveries from the CRA.

### Option #2

Do not authorize construction at this time.



**Fiscal Impact:** None

**Business Analysis:** Under this option, staff would continue to manually monitor the accuracy of the flow readings and would make repairs as needed. Over time, the risk of flooding at the pumping plants or overtopping of the aqueduct would increase.

## Staff Recommendation

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Option #1

	5/20/2013
Gordon Johnson Manager/Chief Engineer, Engineering Services	Date
	5/30/2013
Jeffrey Kightlinger General Manager	Date

[Attachment 1 – Financial Statement](#)

[Attachment 2 – Abstract of Bids](#)

[Attachment 3 – Location Map](#)

**Financial Statement for CRA Reliability Program – FY 2006/07 Through FY 2011/12**

A breakdown of Board Action No. 23 for Appropriation No. 15438 to replace flow meters for the CRA pumping plants <sup>1</sup> is as follows:

	<b>Previous Total Appropriated Amount (Apr. 2013)</b>	<b>Current Board Action No. 23 (June 2013)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies & Investigations	\$ 2,221,800	\$ -	\$ 2,221,800
Final Design	2,496,900	-	2,496,900
Owner Costs (Program mgmt. & envir. monitoring)	2,734,090	42,000	2,776,090
Submittals Review & Record Drwgs	501,600	59,000	560,600
Construction Inspection & Support	2,122,000	7,000	2,129,000
Metropolitan Force Construction	3,218,700	714,000	3,932,700
Materials & Supplies	2,592,405	403,000	2,995,405
Incidental Expenses	136,800	1,000	137,800
Professional/Technical Services	1,912,000	-	1,912,000
Equipment Use	25,505	-	25,505
Contracts	14,155,340	194,197	14,349,537
Remaining Budget	606,860	209,803	816,663
<b>Total</b>	<b>\$ 32,724,000</b>	<b>\$ 1,630,000</b>	<b>\$ 34,354,000</b>

Funding Requests

<b>Program Name:</b>	CRA Reliability Program – FY 2006/07 Through FY 2011/12		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15438	<b>Board Action No.:</b>	23
<b>Requested Amount:</b>	\$ 1,630,000	<b>Budget Page No.:</b>	292
<b>Total Appropriated Amount:</b>	\$ 34,354,000	<b>Total Program Estimate:</b>	\$ 64,826,000

<sup>1</sup> The total amount expended to date on the CRA Pumping Plants Flow Meter Replacement project is approximately \$356,000.

**The Metropolitan Water District of Southern California****Abstract of Bids Received on April 30, 2013 at 2:00 P.M.****Specifications No. 1754****Furnish Ultrasonic Flowmeters for Colorado River Aqueduct Pumping Plants**

The work consists of furnishing 15 flowmeters consisting of transmitters, transducers, interconnecting cables, and related equipment, and providing installation support services.

**Anticipated cost range: \$260,000 - \$320,000**

<b>Bidder and Location</b>	<b>Total<sup>1</sup></b>
<b>ADS LLC dba Accusonic Technologies, West Wareham, MA</b>	<b>\$ 194,197</b>
Accurate Measurement Systems, Inc., San Juan Capistrano, CA	\$ 288,410

<sup>1</sup> Due to the specialized nature of the equipment, no Small Business Enterprise incentive credit was identified for this procurement contract.

### Location Map

