



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

3/10/2015 Board Meeting

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**7-1**

**Subject**

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Appropriate \$1.07 million; and authorize replacement of flow meters on the Casa Loma and San Diego Canals (Approp. 15480)

**Executive Summary**

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This action authorizes design and construction to replace acoustic flow meters at three locations on the Casa Loma Canal, Casa Loma Siphon, and the San Diego Canal. The existing meters need to be replaced to minimize the risk of spills from the canals and to maintain delivery reliability.

**Timing and Urgency**

The three existing acoustic meters on the Casa Loma and San Diego Canals provide the primary means to monitor flows in those conduits. These non-revenue meters have reached the end of their service life, and one of them functions only intermittently. While there have as yet been no adverse effects other than loss of accurate and timely flow information, failure of the meters could potentially result in spills that may damage the canal embankments. New flow meters are needed to maintain reliable water deliveries from the Colorado River Aqueduct (CRA) and minimize the risk of spills.

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 system was placed into service in 1941. It consists of five pumping plants, four reservoirs, 63 miles of canals, 55 miles of conduits, 28 miles of inverted siphons, and 92 miles of tunnels. Casa Loma Siphon No. 1 is part of the original CRA system. The Casa Loma Canal, Casa Loma Siphon No. 2, and the San Diego Canal were constructed when the CRA was expanded in the 1950s. The flow within these canals and siphons is measured by acoustic flow meters and controlled by radial gates remotely operated from the Operations Control Center (OCC) in Eagle Rock.

Casa Loma Siphons Nos. 1 and 2 are located downstream of the San Jacinto Diversion Structure. Siphon No. 1 conveys CRA flows westward to Lake Mathews, while Siphon No. 2 diverts flows southward to the Casa Loma Canal. The Casa Loma Canal runs parallel to the CRA and has a connection to the San Diego Canal. The San Diego Canal can transport either Colorado River water from the Casa Loma Canal, or water from the State Water Project via the Lakeview Pipeline, southward to the Robert A. Skinner Water Treatment Plant. (See [Attachment 2](#) for a detailed layout.)

The purpose of the three flow meters is to ensure that flows directed to the various destinations are within the rated design capacities of the individual conduits. The flow meters also monitor deliveries into Lake Mathews and the Skinner plant, transmitting this information to the OCC. The operators at the OCC and the Skinner plant rely on real-time meter readings to adjust the canals' radial gates in order to meet demands and avoid spilling or

rapid drawdown of the canals, which could damage the canal lining and embankments. The loss of any one of these meters requires time-consuming and less accurate monitoring methods, such as visual inspection, to commence immediately in order to monitor flows. The risk of spills from a canal increases when this occurs.

A typical installation for an acoustic flow meter includes multiple transducers which are mounted at specific elevations along opposite sides of a channel or pipeline, and which are connected via signal cables to one or more flow consoles. Flow information is then transmitted through Metropolitan's Supervisory Control and Data Acquisition (SCADA) system. At Casa Loma Siphon No. 1, eight transducers are mounted inside the siphon and can only be accessed when the siphon is dewatered during a shutdown. At the Casa Loma and San Diego Canals, 16 to 20 transducers are surface-mounted along opposite sides of the open channels. At all locations, varying lengths of signal cable connect the transducer arrays to flow meter consoles housed inside nearby enclosures.

After 15 to 18 years of continuous service, the three flow meters have reached the end of their service life and need to be replaced. The typical life expectancy for these meters is 15 years. In addition, the manufacturer no longer supports the units installed at these locations, and spare parts are difficult to obtain. Only two of the three meters function reliably. Staff recommends moving forward to replace the three meters to maintain reliable deliveries through the western portion of the CRA.

### **Flow Meter Replacement at Casa Loma and San Diego Canals – Design and Construction (\$1,070,000)**

The planned construction activities at the three locations include: removal of existing equipment and replacement of mounting assemblies; procurement and installation of the meters; installation of electrical conduits, transducers and cables; detailed survey and alignment of transducer faces; programming of the flow meter consoles; SCADA integration and start-up; and installation of security features. In addition to the construction, planned work includes conducting field surveys; preparing installation and record drawings; shutdown planning with member agencies; and witness testing and certification by the flow meter manufacturer and Metropolitan staff. To ensure the accuracy of the meters, this project will follow a newly developed commissioning procedure and will verify that the installation conforms to the manufacturer's certified assembly drawings. Once verified, the manufacturer will provide a calibration certification. The construction is planned to be completed during a 2016 shutdown.

This action appropriates \$1.07 million and authorizes design and construction to replace flow meters at the Casa Loma and San Diego Canals. The requested funds include \$109,000 for field investigations, preparation of environmental documentation and record drawings, and project management; \$86,000 for final design and procurement documents; \$740,000 for installation by Metropolitan forces; and \$135,000 for remaining budget.

This project is included within capital Appropriation No. 15480, the Conveyance and Distribution System Rehabilitation Appropriation – FY 2012/13 Through 2017/18. With the present action, the total funding for this appropriation will increase from \$20.67 million to \$21.74 million. The total estimated cost to complete this project is \$1.07 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 Maps.

## **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 funding, design, 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 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 the proposed action is categorically exempt, and

- a. Appropriate \$1.07 million; and
- b. Authorize replacement of flow meters on the Casa Loma and San Diego Canals.

**Fiscal Impact:** \$1.07 million of capital funds under Approp. 15480

**Business Analysis:** This project will enhance delivery reliability and reduce the risk of spills.

**Option #2**

Do not proceed with the project at this time.

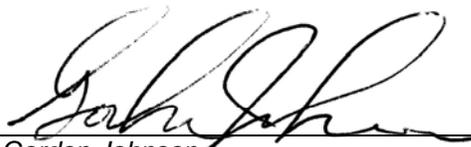
**Fiscal Impact:** None

**Business Analysis:** Deferral of the flow meter replacement project may result in occasional water spills as the existing flow meters continue to degrade. Staff will make repairs and adjustments as needed, which could result in higher repair costs.

**Staff Recommendation**

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Option #1

  
 \_\_\_\_\_ 2/12/2015  
 Gordon Johnson Date  
 Manager/Chief Engineer,  
 Engineering Services

  
 \_\_\_\_\_ 2/23/2015  
 Jeffrey Kightlinger Date  
 General Manager

**Attachment 1 – Financial Statement**

**Attachment 2 – Location Maps**

**Financial Statement for Conveyance and Distribution System Rehabilitation Appropriation – FY 2012/13 Through FY 2017/18**

A breakdown of Board Action No. 11 for Appropriation No. 15480 for replacement of flow meters on the Casa Loma and San Diego Canals<sup>1</sup> is as follows:

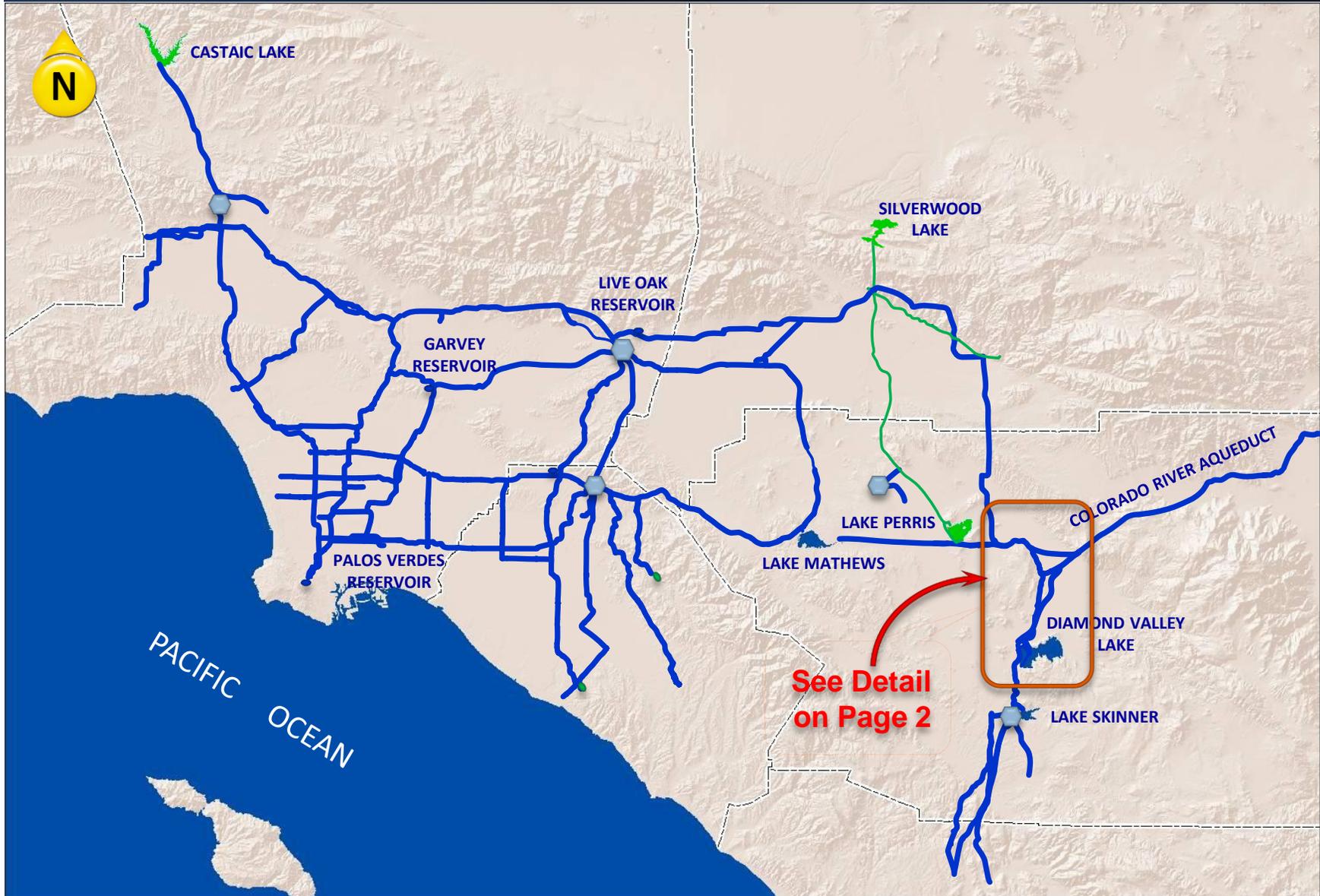
	<b>Previous Total Appropriated Amount (Jan. 2015)</b>	<b>Current Board Action No. 11 (Mar. 2015)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies & Investigations	\$ 712,000	\$ 28,000	\$ 740,000
Final Design	1,260,000	86,000	1,346,000
Owner Costs (Program mgmt., envir. doc.)	1,363,779	59,000	1,422,779
Submittal Review & Record Drawings	406,000	17,000	423,000
Construction Inspection	1,503,000	-	1,503,000
Metropolitan Force Construction	1,399,000	391,000	1,790,000
Materials & Supplies	255,000	349,000	604,000
Incidental Expenses	37,000	5,000	42,000
Professional/Technical Services	1,483,000	-	1,483,000
Right-of-Way	11,000	-	11,000
Equipment Use	-	-	-
Contracts	10,082,555	-	10,082,555
Remaining Budget	2,157,666	135,000	2,292,666
<b>Total</b>	<b>\$ 20,670,000</b>	<b>\$ 1,070,000</b>	<b>\$ 21,740,000</b>

**Funding Request**

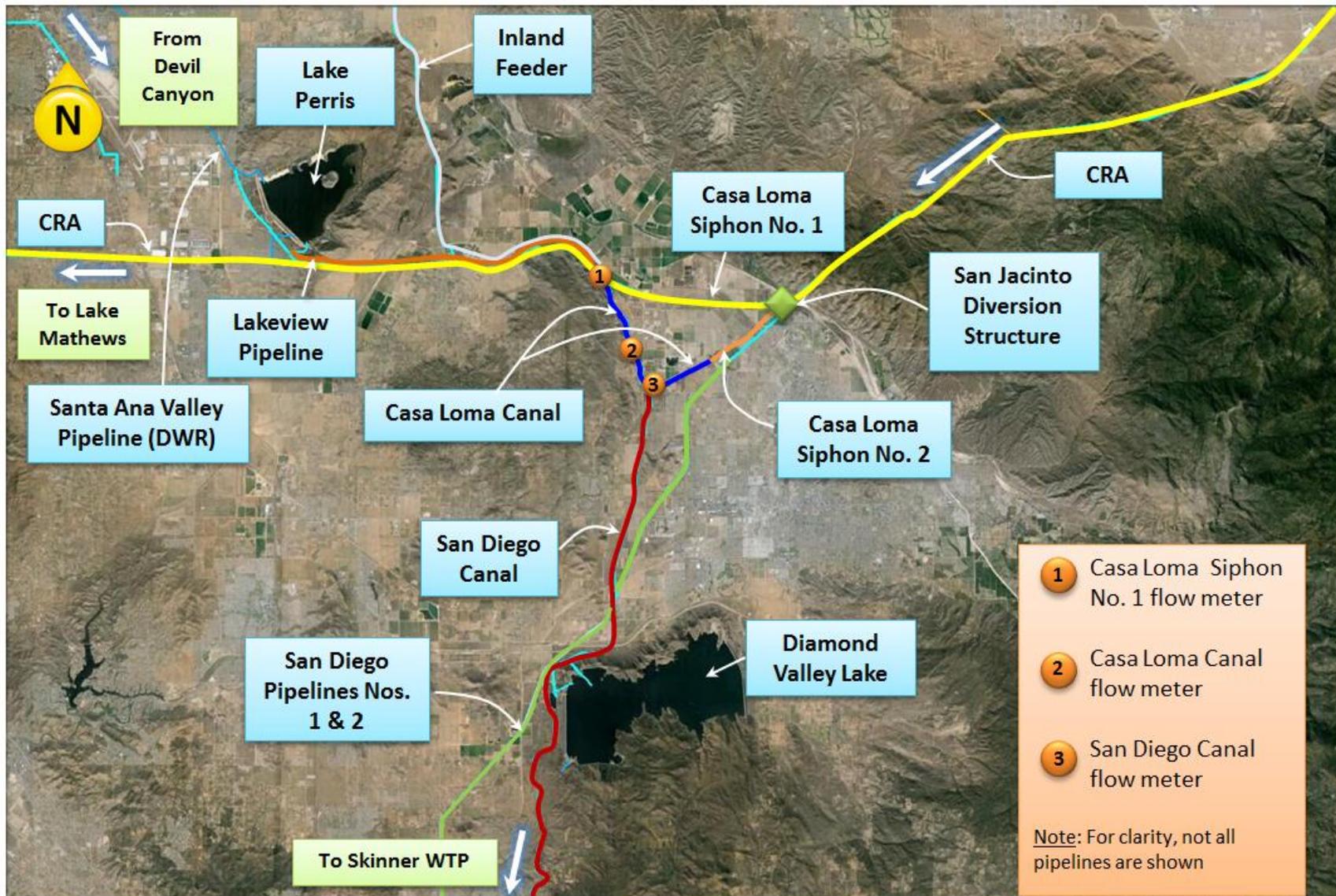
<b>Appropriation Name:</b>	Conveyance and Distribution System Rehabilitation Appropriation – FY 2012/13 Through FY 2017/18		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15480	<b>Board Action No.:</b>	11
<b>Requested Amount:</b>	\$ 1,070,000	<b>Budget Page No.:</b>	286
<b>Total Appropriated Amount:</b>	\$ 21,740,000	<b>Total Appropriation Estimate:</b>	\$ 255,000,000

<sup>1</sup> This is the initial appropriation for replacement of flow meters on the Casa Loma and San Diego Canals. The total estimated cost to complete this project is \$1.07 million.

# Distribution System



Location Map



Location Map

