



- Board of Directors  
*Engineering and Operations Committee*

12/11/2012 Board Meeting

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**7-3**

## **Subject**

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Appropriate \$1.85 million and authorize: (1) final design of a pilot lining repair project on the Etiwanda Pipeline; and (2) professional services agreement with Helix Environmental Planning, Inc. for environmental documentation in an amount not to exceed \$400,000 (Approp. 15441)

## **Executive Summary**

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This action authorizes final design to replace the interior mortar lining on approximately 4,800 feet of the Etiwanda Pipeline. This replacement will serve as a pilot project to confirm the cost and application procedures for use of polyurethane as an internal pipe coating. This action also authorizes an agreement for preparation of environmental documentation for full-scale lining repairs on the pipeline.

### **Timing and Urgency**

Internal inspections of the Etiwanda Pipeline have identified that approximately 37 percent of the mortar lining has fallen off or become delaminated from the steel pipe cylinder. While the pipeline remains in service and the structural integrity of the line remains sound at present, the deteriorated condition of the mortar lining will expose the pipeline over time to accelerated rates of corrosion and eventual leakage. In order to maintain long-term reliability of the line, staff recommends that final design for a lining replacement pilot project move forward at this time.

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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### **Background**

The Etiwanda Pipeline was constructed in 1993 to convey untreated water from the Rialto Pipeline to the Upper Feeder. This 6.4-mile-long welded steel pipeline is 144 inches in diameter. The north portion of the pipeline, which is 5.4 miles long, conveys high-pressure water to the Etiwanda Power Plant. From that facility, the south portion of the pipeline continues for one mile to an interconnection with the Upper Feeder. The pipeline is located within the cities of Fontana and Rancho Cucamonga.

The Etiwanda Pipeline allows Metropolitan to generate power due to the high pressure available in the north portion of the line. Under peak flow conditions, annual revenues from the Etiwanda Power Plant have reached \$8.3 million. The Etiwanda Pipeline also provides flexibility in conveying untreated water from the East Branch of the State Water Project (SWP) to the F. E. Weymouth Water Treatment Plant.

The Etiwanda Pipeline was constructed with a ¾-inch-thick interior mortar lining to prevent corrosion of the steel pipe cylinder. During an internal inspection conducted in 2008, staff discovered that approximately 37 percent of the north portion of the line has missing or delaminated mortar lining. Although the internal lining has eroded, the structural integrity of the pipeline remains sound at present. Over time, however, the loss of mortar lining will expose the pipeline to accelerated rates of corrosion and eventual leakage.

In October 2009, Metropolitan's Board authorized preliminary design to repair the internal lining on the Etiwanda Pipeline. Since that time, staff and specialized consultants have conducted extensive investigations into the cause of the lining erosion. The primary cause is believed to be the cycling of high pressure within the pipeline as a result of the Etiwanda Power Plant being operated on- and off-peak. The daily internal pressure fluctuation likely produced stress cracking in the mortar lining. In addition, the seasonal variation in availability of SWP supplies resulted in prolonged periods where the pipeline was removed from service, creating drying and shrinkage cracks which exacerbated the situation. Repair of the Etiwanda Pipeline's damaged mortar lining presents several unique constructability challenges due to the widespread nature and size of the damaged areas.

Several options were evaluated to provide reliable long-term performance under the facility's unique operating conditions. These options include removal of the existing lining and recoating with reinforced mortar, insertion of a new steel liner, or application of specialized coatings such as epoxy or polyurethane. Staff's conclusion from this assessment is that a polyurethane coating would provide the best combination of long-term performance with the pipeline's fluctuating internal pressures, and lower installation cost. In comparison, installation of a steel liner would be extremely costly and would reduce the diameter of the line.

Polyurethane coatings have previously been used for internal corrosion protection of power plant penstocks because of their superior flexibility. However, despite this previous use, field application of polyurethane within an existing pipeline is not a common practice and presents several logistical issues for construction. Challenges include working in confined spaces, control of dust and moisture during field application, limited access points, and the proximity of residences to the work locations. In order to demonstrate the viability of large-scale field application of the polyurethane coating under challenging conditions, a pilot project is recommended to repair 4,800 feet of the Etiwanda Pipeline using the proposed repair method. Experience gained from the pilot repair will be used to determine the production rates, quality control procedures, phasing, and cost of the full-scale repair.

A third-party constructability review was conducted to assess the proposed repair method and the construction phasing. The review team validated the proposed repair method and concurred with the repair plan. Preliminary design has now been completed, and staff recommends proceeding with final design of the pilot repair project, which includes removal of the existing mortar lining and application of a flexible polyurethane coating system for 4,800 feet of pipeline.

#### **Etiwanda Pipeline Pilot Lining Repair – Final Design and Environmental Documentation (\$1.85 million)**

The lining repair project will be conducted in two phases. The first phase will feature a pilot project to confirm production rates and efficiencies of the lining process. Since the pilot project will repair less than one mile in length of pipeline, it will qualify for a statutory exemption under the California Environmental Quality Act (CEQA). The second phase of the project will involve full-scale lining of the remainder of the pipeline, which does not qualify for an exemption under CEQA. The second-phase repairs will require preparation of an environmental impact report (EIR) due to anticipated temporary environmental impacts to biological resources, noise, light, and air quality, some of which cannot be reduced to a level of less than significant. Since the project will require 24-hour-per-day construction activities, nearby residences will be subject to round-the-clock construction noise and lighting. In addition, construction emissions may exceed South Coast Air Quality Management District (AQMD) daily thresholds levels. Finally, the EIR will consider multiple repair options for the pipeline.

The planned scope of work for Phase I of the repairs includes preparation of drawings and specifications for the pilot project, development of a Request For Qualifications (RFQ) to prequalify the lining applicator, local agency permitting, acquisition of temporary easements for the contractor's staging and work areas, development of a construction cost estimate, and all other activities in advance of award of a construction contract. The planned scope of work to prepare environmental documentation for the full-scale project includes: performing biological and habitat surveys; identification of potential impacts; development of mitigation and monitoring plans; preparation and issuance of the document for public comment; and preparation of responses to comments received during the public review period.

This action appropriates \$1.85 million; authorizes final design to replace a portion of the lining in the Etiwanda Pipeline as a pilot project, and authorizes preparation of an EIR for the subsequent phases of work. All final design activities will be performed by Metropolitan staff. Requested funds include \$435,000 for final design of the pilot repair; \$400,000 for preparation of the environmental documentation, as discussed below; \$31,000 for review and distribution of the EIR for public comment, and for preparation of responses; \$74,000 for permitting and project management; \$765,000 for right-of-way appraisals and acquisition of contractor work and staging areas; and \$145,000 for remaining budget. The cost of final design is approximately 7.2 percent of the estimated construction cost. Engineering Services' goal for design of projects with construction cost greater than \$3 million is 9 to 12 percent. The construction cost for the pilot project is anticipated to range from \$5 million to \$6.5 million.

#### **Agreement for Preparation of Environmental Documentation – Helix Environmental Planning, Inc.**

Preparation of environmental documentation and technical assistance with acquisition of permits is recommended to be performed by a specialized consulting firm, Helix Environmental Planning, Inc., under a new professional services agreement. Helix was selected through a competitive process via RFQ No. 956. Helix has extensive experience with CEQA compliance and environmental clearances. For this agreement, Metropolitan has established a Small Business Enterprise participation level of 18 percent. The planned scope of work includes preparing the environmental documentation; performing biological and habitat surveys; and providing technical support such as identifying temporary construction impacts or environmental impacts such as air quality, noise, and traffic. The estimated cost for these services is \$400,000.

This action authorizes an agreement with Helix Environmental Planning, Inc., in an amount not to exceed \$400,000, to prepare environmental documentation for the Etiwanda Pipeline Lining Repair project.

#### **Summary**

This action appropriates \$1.85 million, authorizes final design of a pilot lining repair project for the Etiwanda Pipeline, and authorizes a professional services agreement for preparation of environmental documentation for the full-scale project. This work is included within capital Appropriation No. 15441, the Conveyance and Distribution System Rehabilitation Program – FY 2006/07 Through FY 2011/12, which was initiated in fiscal year 2006/07. Other projects authorized under Appropriation No. 15441 include the Santa Ana Bridge Seismic Upgrades, Upper Feeder Service Connection Rehabilitation, Sepulveda Canyon Control Facility Water Tanks Seismic Retrofit, and the Lake Skinner Outlet Conduit Repair. With the present action, the total funding for Appropriation No. 15441 will increase from \$41,009,000 to \$42,859,000.

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, and [Attachment 2](#) for the Location Map.

#### **Project Milestones**

July 2013 – Completion of final design of the pilot lining repair project on the Etiwanda Pipeline

June 2014 – Completion of environmental documentation for full-scale 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 action to repair a pipeline less than one-mile in length is statutorily exempt under the provisions of CEQA and the State CEQA Guidelines (Section 15282(k)). The proposed project involves a pilot project for the repair of an existing pipeline as set forth in Section 21080.21 of the Public Resources Code, as long as the project

does not exceed one mile in length. Accordingly, the proposed action qualifies for a statutory exemption under Section 21080.21 of the Public Resources Code. Additionally, the proposed action to enter into a new agreement with Helix Environmental Planning, Inc. for preparation of environmental documentation is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action consists of basic data collection and resource evaluation activities, which do not result in a serious or major disturbance to an environmental resource. This may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded. Accordingly, the proposed action qualifies as a Class 6 Categorical Exemption (Section 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed actions qualify under a statutory exemption and a Categorical Exemption (Section 21080.21 of the Public Resources Code and Section 15306, Class 6 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

## Board Options

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### Option #1

Adopt the CEQA determination and

- a. Appropriate \$1.85 million;
- b. Authorize final design of a pilot lining repair project on the Etiwanda Pipeline; and
- c. Authorize agreement with Helix Environmental Planning, Inc., in an amount not to exceed \$400,000, for preparation of environmental documentation for the full-scale repairs.

**Fiscal Impact:** \$1.85 million in capital funds under Approp. 15441

**Business Analysis:** This option will allow needed repairs to proceed on a damaged portion of the Etiwanda Pipeline, which will protect Metropolitan assets and reduce the risk of costly emergency repairs.

### Option #2

Do not authorize a pilot lining repair project on the Etiwanda Pipeline at this time.

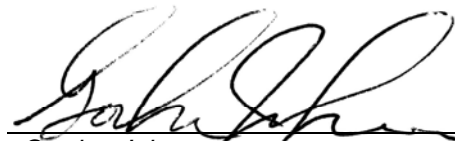
**Fiscal Impact:** None

**Business Analysis:** This option would defer needed repairs to a damaged portion of the Etiwanda Pipeline. Staff would continue to periodically perform visual inspections of the pipeline and would perform urgent repairs, as required. Urgent repairs could result in unplanned disruption of water deliveries to member agencies and higher emergency repair costs.

## Staff Recommendation

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Option #1

  
 Gordon Johnson  
 Manager/Chief Engineer,  
 Engineering Services

11/16/2012  
 Date

  
 Jeffrey Lightlinger  
 General Manager

11/28/2012  
 Date

[Attachment 1 – Financial Statement](#)

[Attachment 2 – Location Map](#)

### Financial Statement for Conveyance and Distribution System Rehabilitation Program – FY 2006/07 Through 2011/12

A breakdown of Board Action No. 48 for Appropriation No. 15441 for a pilot lining repair on the Etiwanda Pipeline <sup>1</sup> is as follows:

	<b>Previous Total Appropriated Amount (Nov. 2012)</b>	<b>Current Board Action No. 48 (Dec. 2012)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies & Investigations	\$ 2,716,000	\$ -	\$ 2,716,000
Final Design	3,287,293	435,000	3,722,293
Owner Costs (Program mgmt., permitting, envir. doc.)	4,843,400	280,000	5,123,400
Submittals Review & Record Drwgs	233,250	-	233,250
Construction Inspection & Support	1,929,550	-	1,929,550
Metropolitan Force Construction	8,783,710	-	8,783,710
Materials & Supplies	2,296,400	-	2,296,400
Incidental Expenses	876,900	5,000	881,900
Professional/Technical Services	2,100,000	-	2,100,000
Helix Envir. Planning, Inc.	-	400,000	400,000
Appraisal/Right-of-Way Consultant	-	35,000	35,000
Right-of-Way	-	550,000	550,000
Equipment Use	325,200	-	325,200
Contracts	11,657,944	-	11,657,944
Remaining Budget	1,959,353 <sup>2</sup>	145,000	2,104,355
<b>Total</b>	<b>\$ 41,009,000</b>	<b>\$ 1,850,000</b>	<b>\$ 42,859,002</b>

### Funding Request

<b>Program Name:</b>	Conveyance and Distribution System Rehabilitation Program – FY 2006/07 Through 2011/12		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15441	<b>Board Action No.:</b>	48
<b>Requested Amount:</b>	\$ 1,850,000	<b>Capital Program No.:</b>	15441-I
<b>Total Appropriated Amount:</b>	\$ 42,859,000	<b>Capital Program Page No.:</b>	284
<b>Total Program Estimate:</b>	\$ 114,849,000	<b>Program Goal:</b>	I-Infrastructure Reliability

<sup>1</sup> The total amount expended to date for Etiwanda Pipeline lining repairs is approximately \$900,000.

<sup>2</sup> Includes a previous reallocation of \$118,000 from Remaining Budget for the Sepulveda Canyon Control Facility Water Storage Tanks Seismic Upgrades.

# Distribution System

