

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

September 14, 2004 Board Meeting

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8-7

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**Subject**

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Appropriate \$1.57 million; and authorize seven rehabilitation projects within the Conveyance and Distribution System (Approp. 15377)

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**Description**

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The backbone of Metropolitan's distribution system was initially constructed in the 1940s and has been in continuous service ever since. Metropolitan's distribution system consists of approximately 780 miles of pipelines and related structures that convey treated water from the filtration plants to the member agencies' service connections. This system includes hydroelectric plants, pressure control facilities, reservoirs, control structures, turnouts, and sectionalizing valves totaling nearly 5,000 individual facilities. Metropolitan staff conducts regular maintenance of the system's structures, mechanical components, and electrical equipment. Although the distribution system continues to perform reliably today, portions of the system are exhibiting signs of normal wear and tear, as may be expected from over 60 years of operation.

A comprehensive risk-based assessment of the distribution system was approved by the Board in July 2004. Results of this assessment will be compiled and prioritized by early 2005. In the interim, staff has identified facilities in need of repair, refurbishment, or replacement and recommends proceeding to address these areas of known concern.

This action recommends seven repair projects. The recommended projects will protect Metropolitan's invested assets, increase the reliability of service to our customers, and reduce the risk of costly emergency repairs. Each of the projects has been evaluated and recommended by Metropolitan's Capital Investment Plan (CIP) Evaluation Team for inclusion in the CIP. Six of the seven projects have been included in the fiscal year 2004/05 capital budget. The seven budgeted projects are:

- (1) Box Springs Feeder Assessment (\$92,000) – The Box Springs Feeder is a 96-inch diameter prestressed concrete cylinder pipe (PCCP), originally installed in 1975. Electromagnetic inspections of the pipe sections have revealed anomalous readings at 14 locations that could indicate potential structural integrity issues. The extent of damage, if any, at these locations could not be interpreted by the electromagnetic inspections due to the presence of internal steel bands within the pipeline. This action authorizes a study to determine the condition of the anomalous sections. Metropolitan staff will remove the steel bands, perform an inspection, and excavate two pipe sections to determine if radial cracks are present in the exterior of the pipe.
- (2) Calabasas Feeder Repair (\$127,000) – The Calabasas Feeder is a 54-inch diameter PCCP built in 1975. Electromagnetic inspections revealed 14 distressed pipe sections. This action authorizes final design for repair of seven of these distressed pipe sections. The remaining seven sections have only five wire breaks each and will be monitored on a 5-10-year interval. Final design will be performed by Metropolitan staff.
- (3) Middle Feeder Cathodic Protection (\$60,000) – Constructed in 1957, the Middle Feeder is a 73-inch diameter mortar-coated welded steel pipeline. Corrosion surveys indicate that the pipeline is becoming increasingly more susceptible to corrosion. This action authorizes preliminary design of a cathodic protection system to be installed to protect the pipeline. Preliminary design will be performed by Metropolitan staff.

- (4) Middle Cross Feeder Cathodic Protection (\$171,000) – Constructed in 1955, the Middle Cross Feeder is a 78-inch diameter mortar-coated welded steel pipeline. Corrosion surveys indicate that the pipeline is experiencing corrosion damage as a result of its age and a significant amount of stray electrical current. This action authorizes final design and construction of a cathodic protection system via a competitively bid construction contract. It is anticipated that the construction contract will be less than \$250,000 and will be awarded under the CEO's authority. Final design and construction inspection will be performed by Metropolitan staff.
- (5) Rialto Feeder Repair (\$600,000) – The Rialto Feeder is a PCCP line originally installed in 1973. Electromagnetic inspections have revealed 36 distressed pipe sections and eleven sections with anomalous readings. In June 2004, the two most severely damaged pipe sections were repaired. This action authorizes investigations to determine the condition of the anomalous segments, and final design and construction of the most distressed pipe sections. Repair at this time will take advantage of a planned shutdown of the pipeline. Investigations and final design will be performed by Metropolitan staff. Construction will be performed by both Metropolitan forces and a contractor via a competitively bid construction contract. Staff will return to the Board at a later date for award of the construction contract.
- (6) San Diego Pipeline No. 5 and Lake Skinner Outlet Conduit: Preliminary Design of Repairs (\$50,000) – San Diego Pipeline No. 5 (SD5) and the Lake Skinner Outlet Conduit (LSOC) are both PCCP lines, built in 1981 and 1971, respectively. Electromagnetic inspections have revealed one distressed segment on SD5 and eight on the LSOC. This action authorizes initial studies and preliminary design for repair of the distressed pipe sections. Studies and preliminary design will be performed by Metropolitan staff.

One recommended project was identified subsequent to preparation of the fiscal year 2004/05 capital budget. During a recent routine inspection, it was discovered that the Eagle Rock Lateral Interconnection is corroded. Although a temporary repair has been performed, a permanent repair is recommended during the upcoming shutdown season to ensure reliable operation of the pipeline. The new project is:

- (7) Eagle Rock Lateral Interconnection Repair (\$470,000) – The Eagle Rock Lateral/Palos Verdes Feeder Interconnection is a 24-inch diameter precast concrete pipe. Built in 1951, the interconnection provides flexibility in deliveries between the two pipelines. A routine inspection revealed a pipe section adjacent to the Eagle Rock Lateral exhibiting signs of corrosion. This action authorizes final design and construction to repair the damaged pipe section. Final design and construction will be performed by Metropolitan staff.

See [Attachment 1](#) for the Detailed Report, [Attachment 2](#) for the Financial Statement, and [Attachment 3](#) for a Location Map.

## **Policy**

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Metropolitan Water District Administrative Code § 5108: Capital Projects Appropriation

## **California Environmental Quality Act (CEQA)**

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CEQA determinations for Option #1:

### **Box Springs Feeder Assessment**

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve the funding and studying of damaged PCCP sections along the pipeline. The activities involve the minor modifications in the condition of land, water, and/or vegetation, which do not involve removal of healthy, mature, scenic trees. These activities also consist of basic data collection and resource evaluation activities that 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. In addition, the activities may involve an inspection to check for performance of an

operation, or quality, health, or safety of a project. Accordingly, the proposed action qualifies under Class 4, Class 6, and Class 9 Categorical Exemptions (Sections 15304, 15306, and 15309 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 4, Section 15304; Class 6, Section 15306; and Class 9, Section 15309 of the State CEQA Guidelines).

#### **Calabasas Feeder Repair and Eagle Rock Lateral Interconnection Repair**

The proposed actions for these two projects 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).

#### **Middle Feeder Cathodic Protection and San Diego Pipeline No. 5 and Lake Skinner Outlet Repairs**

The proposed actions for these two projects are categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities involve funding, conducting studies, and carrying out preliminary designs. In essence, such activities consist 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 actions qualify 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 Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

#### **Middle Cross Feeder Cathodic Protection**

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed project involves the funding and minor alterations of existing private or public facilities, along with the construction of minor appurtenant structures, with minor modifications in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees. These activities would result in negligible expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1, Class 3, and Class 4 Categorical Exemptions (Sections 15301, 15303, 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 3, Section 15303; and Class 4, Section 15304 of the State CEQA Guidelines).

#### **Rialto Feeder Repair**

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed project involves funding, final design, minor alterations, reconstruction or replacement of existing public facilities with no expansion of use and no possibility of significantly impacting the physical environment. The proposed project also involves minor modifications in the condition of land, water, and/or vegetation, which does not involve removal of healthy, mature, scenic trees. In addition, 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 under Class 1, Class 2, Class 4, and Class 6 Categorical Exemptions (Sections 15301, 15302, 15304, and 15306 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under four Categorical Exemptions (Class 1, Section 15301; Class 2, Section 15302; Class 4, Section 15304; and Class 6, Section 15306 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

## **Board Options/Fiscal Impacts**

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### **Option #1**

Adopt the CEQA determination and

- a. Appropriate \$1.57 million in Capital Investment Plan Funds; and
- b. Authorize seven projects under the Conveyance and Distribution System Rehabilitation Program:
  - Perform study, exploratory excavations, and preliminary design for repair of the Box Springs Feeder
  - Perform final design for repair of the Calabasas Feeder
  - Perform preliminary design of cathodic protection for the Middle Feeder
  - Perform final design, construction, and construction management of cathodic protection for the Middle Cross Feeder
  - Perform investigations, final design and construction for repair of the Rialto Feeder
  - Perform studies and preliminary design for repair of San Diego Pipeline No. 5 and the Lake Skinner Outlet Conduit
  - Perform final design and construction for repair of the Eagle Rock Lateral Interconnection

**Fiscal Impact:** \$1.1 million of budgeted and \$470,000 of unbudgeted Pay-As-You-Go Funds under Approp. 15377. Upon board approval of this option, the fiscal year 2004/05 CIP expenditure plan will be adjusted to reflect the additional work.

### **Option #2**

Do not authorize design and repairs to the conveyance and distribution system. The existing pipelines and facilities will continue to be monitored, and repairs will be made when problems occur.

**Fiscal Impact:** None

**Staff Recommendation**

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Option #1

  
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Roy L. Wolfe  
Manager, Corporate Resources

8/20/2004  
Date

  
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Ronald R. Gastelum  
Chief Executive Officer

8/23/2004  
Date

**Attachment 1 – Detailed Report**

**Attachment 2 – Financial Statement**

**Attachment 3 – Location Map**

BLA #3045

## **Detailed Report**

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### ***Purpose/Background***

Metropolitan's distribution system is comprised of 780 of miles of pipelines, in addition to its reservoirs, pressure control structures, flow meters, sectionalizing valves, and hydroelectric power plants. Under the Conveyance and Distribution System Rehabilitation Program, staff is conducting reconnaissance surveys of Metropolitan's entire conveyance, treatment and distribution system. The surveys are ongoing and are intended to be completed by 2005. In the interim, staff has identified numerous elements of the distribution system in need of repair, refurbishment or replacement, and are recommending that seven new projects proceed at this time.

The new projects are: (1) Box Springs Feeder Investigation; (2) Calabasas Feeder Repair; (3) Middle Feeder Cathodic Protection; (4) Middle Cross Feeder Cathodic Protection; (5) Rialto Feeder Repair; (6) San Diego Pipeline No. 5 and Lake Skinner Outlet Conduit Repairs; and (7) Eagle Rock Lateral Interconnection Repair.

### **Box Springs Feeder Assessment (\$92,000)**

This action authorizes a study to determine the condition of several sections of the Box Springs Feeder (BSF). Originally installed in 1975, the BSF is a prestressed concrete cylinder pipe (PCCP). Recent electromagnetic inspections have indicated anomalous readings at fourteen locations. The extent of damage, if any, at these locations could not be interpreted by the electromagnetic inspections due to the presence of internal steel bands within the pipeline. The internal bands were installed in 1989 to minimize leakage from cracks discovered within the pipeline during a routine inspection. The bands provide no structural support to prevent pipe rupture.

This study will determine the condition of the pipe at the fourteen anomalous pipe sections. Staff will excavate pipe sections at three locations to determine if radial cracks are present in the exterior of the pipe. The internal steel bands will also be removed for the inspection. Staff will evaluate these results, and if repairs are necessary, return to the Board at a later date for authorization of repairs.

#### *Actions and Milestones*

May 2005 – Exploratory excavations performed

### **Calabasas Feeder Repair (\$127,000)**

This action authorizes final design and repair of seven of the most severely distressed pipe sections along the Calabasas Feeder. The Calabasas Feeder is a 54-inch diameter PCCP built in 1975. Electromagnetic inspections performed in April 2002 revealed fourteen distressed pipe sections. One of the pipe sections had 15 wire breaks, three had 10 wire breaks, and the remaining ten had 5 wire breaks. While initial results indicated that urgent repair was not required for any of the pipe sections, it was recommended that repairs of the most distressed sections be planned and scheduled. Since the 15-wire break segment, the three 10-wire break sections, and three 5-wire break sections are all adjacent to each other, replacement of the seven pipe sections could be efficiently performed during the major shutdown of the Jensen Plant scheduled for February 2005. Repair of the seven most distressed pipe sections at this time will reduce the risk of pipe failure and disruption of member agency deliveries.

Final design will be performed by Metropolitan staff. Staff will return to the Board at a later date for the award of the construction contract.

#### *Actions and Milestones*

November 2004 – Award of construction contract

February 2005 – Completion of construction

### **Middle Feeder Cathodic Protection (\$60,000)**

This action authorizes preliminary design of a cathodic protection system to be installed on the Middle Feeder.

Constructed in 1957, the Middle Feeder is a mortar-coated welded steel pipeline with a diameter of 73 inches and is approximately 21 miles long. Mortar coating typically provides superior corrosion protection to steel pipe. However, over time, the mortar on this line has lost its protective properties and the steel has become increasingly susceptible to corrosion. A corrosion survey has indicated that the pipeline is experiencing corrosion damage associated with the age of the pipeline and its environment.

For this project, Metropolitan staff will perform preliminary design to determine the number and locations of cathodic protection stations required.

*Actions and Milestones*

June 2005 – Completion of preliminary design

**Middle Cross Feeder Cathodic Protection (\$171,000)**

This action authorizes final design and construction of a cathodic protection system for the Middle Cross Feeder. Constructed in 1955, the Middle Cross Feeder is a mortar-coated welded steel pipeline with a diameter of 55 inches and is approximately 7 miles long. As a result of its age and a significant amount of stray electrical current interference, the Middle Cross Feeder is becoming increasingly susceptible to corrosion. The interference results from electrical current being impressed onto a buried structure from an outside source, typically another utility operator's cathodic protection system. Interference mitigation is extremely important since direct current discharge can consume significant amounts of metal in one year.

This action authorizes final design and construction. Design drawings will be prepared by Metropolitan staff and advertised for bids. It is anticipated that the construction contract will be less than \$250,000 and will be awarded under the CEO's authority. Metropolitan staff will perform construction inspection and support.

*Actions and Milestones*

May 2005 – Completion of final design

December 2005 – Completion of construction

**Rialto Feeder Repair (\$600,000)**

This action authorizes a study to determine the condition of the Rialto Feeder, and final design and construction to repair three of the most distressed pipe sections. Portions of the Rialto Feeder are PCCP, originally installed in 1973. Electromagnetic inspections performed in February 2004 revealed 36 distressed pipe sections. In June 2004, the two most severely damaged pipe segments were repaired.

Electromagnetic inspections revealed one pipe section with 20-wire breaks and two pipe sections with 15-wire breaks. While initial results indicated that immediate repair was not required for any of the subject pipe sections, it was recommended that repairs of the most distressed sections be planned and scheduled. This pipeline is scheduled to be shut down in February 2005 for a visual inspection of the welded steel portion of the pipeline, providing an opportunity to remove two pipe sections and replace them with welded steel pipes, and to perform carbon fiber repairs on the third pipe segment. Of the remaining pipe sections which show distress, future monitoring will be scheduled to track their condition over time.

The February 2004 electromagnetic inspections also revealed eleven sections with anomalous readings. The extent of damage, if any, at these locations could not be interpreted by the electromagnetic inspections due to the presence of internal steel bands within the pipeline. The internal bands were installed in 1989 to minimize leakage from cracks discovered within the pipeline during a routine inspection. The bands provide no structural support to prevent pipe rupture. This study will determine the condition of the pipe at the eleven anomalous pipe sections. Staff will excavate pipe sections at the selected locations to determine if radial cracks are present in the exterior of the pipe. The internal steel bands will also be removed for the inspection. Staff will evaluate these results, and if repairs are necessary, return to the Board at a later date for authorization of repairs.

In this project phase, Metropolitan staff will perform the final design and a portion of the construction, and will advertise the carbon fiber repairs for competitive bids. Staff will return to the Board at a later date for award of the construction contract for the carbon fiber work.

*Actions and Milestones*

October 2004 – Completion of final design for pipe removal and replacement

February 2005 – Completion of construction

**San Diego Pipeline No. 5 and Lake Skinner Outlet Conduit: Preliminary Design of Repairs (\$50,000)**

This action authorizes initial studies and preliminary design for repair of distressed pipe sections on the San Diego Pipeline No. 5 (SD5) and the Lake Skinner Outlet Conduit (LSOC). San Diego Pipeline No. 5 and the Lake Skinner Outlet Conduit are PCCP pipelines, built in 1981 and 1971, respectively. Electromagnetic inspections performed in February 2002 revealed one distressed pipe section on the SD5 and eight on the LSOC. While initial results indicated that immediate repairs were not required for any of the subject pipe sections, it was recommended that repairs of the most distressed sections be planned and scheduled. This pipeline is scheduled to be shut down in January 2006 based on a request by San Diego Water County Authority. This shutdown will provide an opportunity to repair distressed sections of the PCCP.

In this project phase, Metropolitan staff will perform a study and preliminary design to determine the most appropriate level of repair, if warranted.

*Actions and Milestones*

April 2005 – Completion of study

August 2005 – Completion of preliminary design

**Eagle Rock Lateral Interconnection Repair (\$470,000)**

This action authorizes final design and construction to repair a corroded pipe at the Eagle Rock Lateral Interconnection. The Eagle Rock Lateral/Palos Verdes Feeder Interconnection is a 24-inch diameter precast concrete pipe. Built in 1951, the interconnection connects the Eagle Rock Lateral and Palos Verdes Feeder and provides operational flexibility by allowing water to be transferred between the pipelines. During a recent routine inspection, staff discovered that the interconnection pipeline adjacent to the Eagle Rock Lateral was corroded. A temporary repair has been completed in anticipation of a permanent repair to be performed during a winter 2004/05 shutdown. Metropolitan forces will perform final design and construction to repair the damaged pipe.

*Actions and Milestones*

December 2004 – Completion of design

March 2005 – Completion of construction

**Financial Statement for Conveyance and Distribution System Rehabilitation Program**

A breakdown of Board Action No. 8 for Appropriation No. 15377 for seven repair projects within the Conveyance and Distribution System Rehabilitation Program is as follows:

	<b>Previous Board Action No. 7 (July 2004)</b>	<b>Current Board Action No. 8 (Sept. 2004)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies and Investigations	\$ 870,000	\$ 149,000	\$ 1,019,000
Final Design	1,622,500	168,920	1,791,420
Owner Costs (Program management, permitting, bid process)	1,736,500	134,000	1,870,500
Construction Inspection and Support	453,300	12,000	465,300
Water System Operations (Metropolitan force construction)	6,178,000	540,250	6,718,250
Materials and Supplies	2,447,000	170,100	2,617,100
Incidental Expenses	792,000	33,500	825,500
Professional/Technical Services	432,000	11,000	443,000
Equipment Use	597,000	41,000	638,000
Contracts	4,317,400	109,000	4,426,400
Remaining Budget	2,392,000	201,230	2,593,230
<b>Total</b>	<b>\$ 23,022,700</b>	<b>\$ 1,570,000</b>	<b>\$ 24,592,700</b>

**Funding Request**

<b>Program Name:</b>	Distribution System Rehabilitation Program		
<b>Source of Funds:</b>	Construction Funds (Pay-As-You-Go Fund)		
<b>Appropriation No.:</b>	15377	<b>Board Action No.:</b>	8
<b>Requested Amount</b>	\$1,570,000	<b>Capital Program No.:</b>	15377-I
<b>Total Appropriated Amount:</b>	\$24,592,700	<b>Capital Program Page No.:</b>	E-35
<b>Total Program Estimate:</b>	\$43,540,000	<b>Program Goal:</b>	R-Reliability

