



- Board of Directors  
*Engineering and Operations Committee*

3/13/2012 Board Meeting

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7-9

## Subject

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Appropriate \$1.74 million; award \$519,825 contract to Cascade Pump Company for procurement of backwash return pumps and authorize (1) rehabilitation of the drive shaft assemblies for the washwater reclamation plant; and (2) final design of dry polymer system upgrades at the F. E. Weymouth Water Treatment Plant (Approps. 15369 and 15440)

## Description

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This action awards a procurement contract for three backwash return pumps for the Weymouth plant, authorizes upgrades at the plant's washwater reclamation plant (WWRP), and authorizes final design of upgrades to the plant's dry polymer feed system. These upgrades will enhance the Weymouth plant's reliability and its ability to treat high blends of water from the State Water Project (SWP).

## Timing and Urgency

The Weymouth plant's backwash return pumps convey used filter backwash water to the WWRP, where it is treated before being returned to the plant's inlet line for blending with incoming untreated water. Solids in the backwash water can cause corrosion and abrasion of backwash return pumps over long-term periods of operations. After over 70 years of continuous service, one backwash return pump recently failed and was replaced, while the three remaining backwash return pumps are significantly deteriorated. This action authorizes replacement of these three remaining backwash return pumps. In addition, upgrades to the dry polymer equipment are needed to allow the simultaneous feed of different polymers to the WWRP and to the filters. Typically, the addition of two polymers is required when treating high blends of water from the SWP.

Both projects have been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria. The rehabilitation of the WWRP is categorized as an Infrastructure Reliability project, while the upgrade of the Dry Polymer System Upgrade project is categorized as an Infrastructure Upgrade project. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2011/12.

## Background

The Weymouth plant was placed into service in 1941 with an initial capacity of 100 million gallons per day (mgd), and was expanded twice to its current capacity of 520 mgd. The Weymouth plant delivers a blend of waters from the Colorado River Aqueduct (CRA) and SWP to Metropolitan's Central Pool portion of the distribution system.

Metropolitan staff conducts regular maintenance of the Weymouth plant's mechanical and electrical equipment. Although the plant continues to perform reliably today, its systems are exhibiting signs of normal wear and tear, as may be expected from over 70 years of operation. Some of the plant's facilities have reached the end of their life expectancy and have become less reliable, while other facilities require improvements for compliance with water quality regulations. Two projects are recommended at this time to address needed upgrade work to maintain plant reliability.

**Project No. 1 - Weymouth Wastewater Reclamation Plant Rehabilitation – Procurement and Construction (\$1.15 million)**

The 22-mgd Weymouth WWRP commenced operation in 1991. It processes waste flows generated by the plant's treatment processes including used filter backwash water, filtrate from the filter belt presses, and supernatant from the gravity thickeners. The backwash return pumps discharge used filter backwash water to the inlet of the wastewater reclamation process. The treated water from the WWRP is then returned to the Weymouth plant's inlet conduit.

Solids in the used filter backwash water are both corrosive and abrasive. The reclamation plant equipment, including the backwash return pumps, has reached the end of its service life and requires frequent repairs. Upgrades are necessary to provide continued reliable operation of the reclamation plant.

In February 2011, Metropolitan's Board authorized construction to rehabilitate several WWRP components, along with procurement of three new pumps to replace the corroded backwash return pumps. The new pumps will be fabricated with upgraded materials to reduce erosion and corrosion, and will have variable speed capability to provide more stable flow control. This action awards a procurement contract for the new backwash return pumps and drives.

The flocculation process is intended to gently mix small particles and colloids in the water so that they agglomerate to form settleable or filterable particles. The flocculation drive shaft assembly drives the flocculation mixing paddles. The sedimentation drive shaft assembly operates the chain and flight system, which scrapes settled solids at the bottom of the sedimentation basins over to the collection troughs. Both existing drive shaft assemblies are constructed of carbon steel materials, which have led to frequent failures. Recently, a sedimentation shaft bearing within the WWRP seized, and a follow-up inspection identified that the shaft itself is severely corroded. The flocculation drive shaft is similarly corroded. The proposed new shaft assemblies will be constructed of stainless steel materials to provide more corrosion resistance and minimize failures. Both of these drive shaft assemblies need to be rehabilitated to maintain WWRP reliability. This action authorizes Metropolitan forces to rehabilitate this equipment in conjunction with the pump replacement work.

**Award of Pump Procurement Contract**

Request for Bids No. RFB-KK-242532 for three backwash return pumps was advertised for bids on January 23, 2012. As shown in [Attachment 2](#), three bids were received and opened on February 2, 2012. The low bid from Cascade Pump Company, in the amount of \$519,825, complies with the requirements of the specifications. The two higher bids were \$665,822 and \$717,750. The budgetary cost estimate for this equipment, based on previous purchases and a survey of vendors, ranged from \$600,000 to \$700,000. Staff believes the difference between the budgetary cost range and low bid reflects the current highly competitive bidding environment.

Due to the limited number of bidders for this manufactured product, no Small Business Enterprise (SBE) participation level was established for the procurement contract. However, for bid evaluation purposes, a \$25,000-bid-price reduction credit was provided to each of the bidders who qualified both as an SBE and a Regional Business Enterprise. Cascade Pump Company is an SBE firm based in Santa Fe Springs, California, and therefore received a \$25,000 bid-price reduction credit during the bid evaluation.

This action appropriates \$1.15 million and awards a \$519,825 procurement contract to Cascade Pump Company to furnish three backwash return pumps for the Weymouth WWRP. The contract amount includes all sales and use taxes imposed by the state of California. In addition to the amount of the contract, the appropriated funds include \$190,000 for materials and supplies, including the flocculation and sedimentation drive shaft assemblies; and \$300,000 for Metropolitan forces to install the drive shaft assemblies, pumps, and pump drives. The total cost of construction is \$1,009,825. The appropriated funds also include \$48,000 for factory fabrication inspection and submittals review during construction; \$52,000 for project management and preparation of record drawings; and \$40,175 for remaining budget.

**Project No. 2 - Weymouth Dry Polymer System Upgrade – Final Design Phase (\$590,000)**

The Weymouth plant's dry polymer system was constructed in 1991 and consists of a single dry polymer mixing system, which is used to liquefy the dry polymer with water; liquid polymer storage tanks; and liquid polymer feed and injection equipment. Two different types of polymers are used at the plant: a cationic polyacrylamide polymer which is used as a coagulant aid at the WWRP and thickeners, and a nonionic polyacrylamide polymer (also called filter aid) which is used to improve filter performance when treating high blends of water from the SWP. The cationic polymer and filter aid polymer are incompatible and must be liquefied separately to avoid mixer clogging. When high blends of SWP water are treated, the two different types of polymer solutions must be prepared in batches, and the mixing system and piping must be thoroughly cleaned before switching between the two polymer types.

The batch mixing system is not fully automated and does not have sufficient capacity to produce the number of batches required when high blends of SWP water are treated. Components of the mixing equipment and the feed and injection equipment have failed repeatedly, and the system clogs easily. When maintenance is required, all polymer production must cease. In addition, since the dry polymer bags and the mixing system are housed within a non-insulated, corrugated sheet metal building, excessive humidity inside the building degrades the polymer.

In March 2010, Metropolitan's Board authorized preliminary design of the Weymouth Dry Polymer System Upgrade project to increase the reliability and capacity of the system. Preliminary design has been completed and staff recommends proceeding with final design to:

- Provide two automated trains of new dry polymer mixing equipment to allow simultaneous mixing of both polymer types to improve reliability and efficiency;
- Refurbish the existing feed and injection equipment to restore operational flexibility; and
- Insulate the Dry Polymer Building and install new air conditioning ducts to prevent excessive humidity in the building.

This action appropriates \$590,000 and authorizes final design phase activities for upgrades to the existing dry polymer system at the Weymouth plant. Planned activities include detailed design analyses; preparation of drawings and specifications; receipt of bids; and development of a construction cost estimate. All final design activities will be performed by Metropolitan staff. The appropriated funds include \$384,000 for final design; \$129,000 for advertisement and receipt of bids, value engineering, and project management; and \$77,000 for remaining budget.

The anticipated cost of final design is approximately 15 percent of the estimated total construction cost. Engineering Services' goal for design of projects with construction cost less than \$3 million is 9 to 15 percent. For this project, the design cost is at the upper end of the range because the work involves upgrades to an existing, operating facility. The construction cost for this project is anticipated to range from \$2.6 million to \$3 million.

**Summary**

This action appropriates \$1.74 million, awards a \$519,825 contract to Cascade Pump Company to furnish backwash return pumps, authorizes rehabilitation of the Weymouth WWRP flocculation and sedimentation drive shaft assemblies, and authorizes final design to upgrade the Weymouth dry polymer system. Both projects have been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2011/12 capital expenditure plan. See [Attachment 1](#) for the Financial Statements, [Attachment 2](#) for the Abstract of Bids, and [Attachment 3](#) for the Location Map.

The Washwater Reclamation Plant Rehabilitation project is included within capital Appropriation No. 15369, the Weymouth Improvements Program, which was initiated in fiscal year 2001/02. Other projects authorized under Appropriation No. 15369 include the Coagulant Tank Farm Modifications; Junction Structure Seismic Upgrades; new Rapid Mix System; and Electrical Upgrades. With the present action, the total funding for Appropriation No. 15369 will increase from \$161,832,000 to \$162,982,000.

The Dry Polymer System Upgrade project is included within capital Appropriation No. 15440, the Weymouth Improvements Program - Phase II, which was initiated in fiscal year 2006/07. Other projects authorized under Appropriation No. 15440 include the Filter Outlet Chemical Trench; Filter Outlet Conduit Repairs; and Filter Rehabilitation. With the present action, the total funding for Appropriation No. 15440 will increase from \$7,382,000 to \$7,972,000.

### ***Project Milestones***

December 2012 – Completion of final design of the Dry Polymer System Upgrades

June 2013 – Completion of construction to rehabilitate the Washwater Reclamation Plant

### **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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#### **Project No. 1 - Weymouth Washwater Reclamation Plant Rehabilitation - Procurement and Construction**

CEQA determination for Option #1:

The environmental effects of the Weymouth Washwater Reclamation Rehabilitation Project were evaluated in the F. E. Weymouth Filtration Plant Ozonation Facilities and Site Improvements Program Final Environmental Impact Report (Final EIR), which was certified by the Board on April 12, 2005. The Board also approved the Findings of Fact (Findings), the Statement of Overriding Considerations (SOC), the Mitigation Monitoring and Reporting Program (MMRP), and the project itself. The current board actions are solely based on authorization of procurement and construction and not on any changes to the approved project itself. Hence, the previous environmental documentation acted on by the Board in conjunction with the proposed action fully complies with CEQA and the State CEQA Guidelines. Accordingly, no further CEQA documentation is necessary for the Board to act on the proposed action.

The CEQA determination is: Determine that the proposed action has been previously addressed in the certified 2005 Final EIR, Findings, SOC, and MMRP and that no further environmental analysis or documentation is required.

CEQA determination for Options #2 and #3

None required

#### **Project No. 2 - Weymouth Dry Polymer System Upgrade - Final Design Phase**

CEQA determination for Options #1 and #2:

The proposed action 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 action qualifies under a Categorical Exemption (Class 6, Section 15306 of the State CEQA Guidelines).

CEQA determination for Option #3:

None required

**Board Options**

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**Option #1**

Adopt the CEQA determinations and

- a. Appropriate \$1.74 million;
- b. Award \$519,825 procurement contract to Cascade Pump Company for backwash return pumps;
- c. Authorize Metropolitan force construction to rehabilitate drive shaft assemblies at the Weymouth washwater reclamation plant; and
- d. Authorize final design of the Weymouth Dry Polymer System Upgrade project.

Fiscal Impact: \$1.15 million of budgeted funds under Approp.15369 and \$590,000 of budgeted funds under Approp. 15440

**Business Analysis:** This option will be critical in maintaining operational reliability of the Weymouth plant and in meeting Metropolitan’s water quality goals.

**Option #2**

Adopt the CEQA determination and

- a. Appropriate \$590,000;
- b. Do not award the pump procurement contract and re-advertise in an attempt to receive more favorable bids; and
- c. Authorize final design of the Weymouth Dry Polymer System Upgrade project.

**Fiscal Impact:** \$590,000 of budgeted funds under Approp. 15440

**Business Analysis:** This option may or may not result in a lower bid, and would delay the completion of the WWRP Rehabilitation project.

**Option #3**

Do not proceed with the two projects at this time.

**Fiscal Impact:** None

**Business Analysis:** This option would forego an opportunity to maintain reliability of the Weymouth plant, to meet Metropolitan’s water quality goals, and to enhance the plant’s ability to treat water with varying source-water quality.

**Staff Recommendation**

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Option #1

  
 \_\_\_\_\_ 2/21/2012  
 Gordon Johnson Date  
 Manager/Chief Engineer,  
 Engineering Services

  
 \_\_\_\_\_ 2/29/2012  
 Jeffrey Kightlinger Date  
 General Manager

[Attachment 1 – Financial Statements](#)

[Attachment 2 – Abstract of Bids](#)

[Attachment 3 – Location Map](#)

## Financial Statement for Weymouth Improvements Program

A breakdown of Board Action No. 37 for Appropriation No. 15369 for the Weymouth Washwater Reclamation Plant Rehabilitation project<sup>1</sup> is as follows:

	<b>Previous Total Appropriated Amount<sup>2</sup> (Sep. 2011)</b>	<b>Current Board Action No. 37 (Mar. 2012)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies & Investigations	\$ 2,254,477	\$ -	\$ 2,254,477
Final Design	8,990,141	-	8,990,141
Owner Costs (Program mgmt )	7,284,424	38,000	7,322,424
Submittals Review & Record Drwgs	2,722,723	30,000	2,752,723
Construction Inspection & Support	11,498,704	32,000	11,530,704
Metropolitan Force Construction	6,906,280	300,000	7,206,280
Materials & Supplies	3,425,848	180,000	3,605,848
Incidental Expenses	374,900	10,000	384,900
Professional/Technical Services	12,506,032	-	12,506,032
Contracts	99,052,013	519,825	99,571,838
Remaining Budget	6,816,458	40,175	6,856,633
<b>Total</b>	<b>\$ 161,832,000</b>	<b>\$ 1,150,000</b>	<b>\$ 162,982,000</b>

### Funding Request

<b>Program Name:</b>	Weymouth Improvements Program		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment, or General Funds		
<b>Appropriation No.:</b>	15369	<b>Board Action No.:</b>	37
<b>Requested Amount:</b>	\$ 1,150,000	<b>Capital Program No.:</b>	15369-I
<b>Total Appropriated Amount:</b>	\$ 162,982,000	<b>Capital Program Page No.:</b>	329
<b>Total Program Estimate:</b>	\$ 237,725,000	<b>Program Goal:</b>	I-Infrastructure & Reliability

<sup>1</sup> The total amount expended to date on the Weymouth Washwater Reclamation Plant Rehabilitation project is approximately \$1.1 million.

<sup>2</sup> Includes previous allocation of \$183,000 to contracts for the Incoming Electrical Service project with S.C. Edison, \$184,068 to contracts for Junction Structure Seismic Upgrade project, and \$105,000 to professional/technical services, and \$167,000 to studies & investigations for the Weymouth Structural Integrity project.

**Financial Statement for Weymouth Improvements Program – Phase II**

A breakdown of Board Action No. 13 for Appropriation No. 15440 for the Weymouth Dry Polymer System Upgrade project<sup>1</sup> is as follows:

	<b>Previous Total Appropriated Amount (Sep. 2011)</b>	<b>Current Board Action No. 13 (Mar. 2012)</b>	<b>New Total Appropriated Amount</b>
Labor			
Studies & Investigations	\$ 905,500 <sup>2</sup>	-	\$ 905,500
Final Design	794,500	384,000	\$ 1,178,500
Owner Costs (Program mgmt)	1,018,500	123,000	1,141,500
Submittals Review & Record Drwgs	-	-	-
Construction Inspection & Support	359,300	-	359,300
Metropolitan Force Construction	361,700	-	361,700
Materials & Supplies	463,000	-	463,000
Incidental Expenses	50,800	6,000	56,800
Professional/Technical Services	889,000	-	889,000
Equipment Use	2,500	-	2,500
Contracts	2,015,691	-	2,015,691
Remaining Budget	521,509 <sup>2</sup>	77,000	598,509
<b>Total</b>	<b>\$ 7,382,000</b>	<b>\$ 590,000</b>	<b>\$ 7,972,000</b>

**Funding Request**

<b>Program Name:</b>	Weymouth Improvements Program - Phase II		
<b>Source of Funds:</b>	Revenue Bonds, Replacement and Refurbishment or General Funds		
<b>Appropriation No.:</b>	15440	<b>Board Action No.:</b>	13
<b>Requested Amount:</b>	\$ 590,000	<b>Capital Program No.:</b>	15440-I
<b>Total Appropriated Amount:</b>	\$ 7,972,000	<b>Capital Program Page No.:</b>	330
<b>Total Program Estimate:</b>	\$ 139,772,000	<b>Program Goal:</b>	I-Infrastructure & Reliability

<sup>1</sup>The total amount expended to date on the Weymouth Dry Polymer System Upgrade project is approximately \$400,000.

<sup>2</sup>Includes previous reallocation of \$50,000 from Remaining Budget to Studies and Investigations for the Weymouth Dry Polymer System Upgrade project.

**The Metropolitan Water District of Southern California**  
**Abstract of Bids Received on February 2, 2012 at 11:00 A.M.**  
**Request for Bids No. RFB-KK-242532**  
**Backwash Return Pumps /Components and Accessories**

This contract consists of furnishing three backwash return pumps with variable frequency drives for the Weymouth plant.

**Estimated range of cost: \$600,000 to \$700,000**

<b>Bidder and Location</b>	<b>Total<sup>1</sup></b>
Cascade Pump Company, Santa Fe Springs, California	\$519,825.00
Sulzer Pumps, Inc., Brookshire, Texas	\$665,821.88
Cortech Engineering, Inc., Anaheim, California	\$717,750.00

<sup>1</sup> Includes sales and use taxes of 8.75 percent imposed by the state of California

# F.E. Weymouth Water Treatment Plant

