

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

February 8, 2005 Board Meeting

7-2

Subject

Appropriate \$840,000; and authorize three replacement and refurbishment projects within the Diemer Improvements Program (Approp. 15380)

Description

Washwater Reclamation Plant No. 2 Rehabilitation – Preliminary Design (\$290,000)

Washwater Reclamation Plant No. 2 (WWRP No. 2) at the Robert B. Diemer Water Treatment Plant was built in 1992 to process used filter backwash water. Submerged WWRP No. 2 equipment is continually subjected to abrasive and corrosive operating conditions caused by the solids in the used filter backwash water. The horizontal flocculators require excessive maintenance, and their submerged bearings are worn from exposure to anthracite coal and grit within the used filter backwash water. The WWRP No. 2 sedimentation basins use a chain-and-flight system to collect the settled solids. The drive gears are worn and the chains have stretched considerably.

WWRP No. 2 has two identical treatment trains that share a common influent channel. Anthracite coal and sand settling out in the common channel are only partially removed by the coal and sand removal system. When the influent channel is dewatered and cleaned, neither treatment train can process used washwater.

This action authorizes \$290,000 for preliminary design of the Diemer WWRP No. 2 Rehabilitation Project to investigate options to rehabilitate the deteriorated basin equipment and to upgrade the process to reduce maintenance requirements and provide operational flexibility. The preliminary design will be performed by Metropolitan staff, with process engineering support provided by a consultant, Richard Brady & Associates. Richard Brady & Associates will perform this work under an existing professional services agreement authorized by Metropolitan's Board in September 2003. This firm was selected through a competitive process (Request for Qualifications 575) to perform treatment process-related work.

Washwater Tank Pumps Replacement – Field Investigations and Final Design (\$304,000)

The Diemer plant has two 1.65-million-gallon tanks that store water for backwashing the filters. The east tank was placed into service in 1963 and the west tank was placed into service in 1969. The two tanks are identical in size, being 60 feet in diameter and 80 feet tall. Due to the hydraulic configuration of the Diemer plant, each tank is filled by pumping filtered water from the filter effluent channel into the tank. Water then flows by gravity to backwash the filter beds. Over the years, these pumps and their motors have been maintained and refurbished by Diemer plant personnel. Currently, two of the five existing pumps, motors and starters need to be replaced in order to ensure plant reliability and to have sufficient water for backwashing the filter beds. These pumps and motors are over 35 years old and have reached the end of their useful life; replacement parts are costly and difficult to find. Minor improvements are also recommended for the piping and instrumentation for all five pumps.

This action authorizes \$304,000 for field investigations and final design of the Diemer Washwater Tank Pumps Replacement Project. Metropolitan staff will perform field investigations to document existing conditions and will perform final design and prepare specifications for construction. The final design cost as a percentage of the estimated total construction cost is approximately 14 percent. The Engineering Services goal for design of projects with construction costs less than \$3 million is 12 to 15 percent.

Administration Building Roof Replacement – Design and Construction (\$246,000)

The Administration Building was built as part of the original Diemer plant construction in 1963. The Administration Building houses staff offices, a telecommunication room, a SCADA equipment room, a process control room, and maintenance shops. The Administration Building was constructed with three different roof levels: one large main roof serves as an observation deck, and two smaller roofs cover the building's main entry and stairwell. The building's roofs were recoated once, approximately 20 years ago. Over the last winter season, water leakage through the roofs occurred in several locations. The existing roofing materials need to be replaced in order to prevent further water damage to the building and to the equipment inside during wet-weather events. Under this project, Metropolitan staff will prepare the required specifications and bidding documents and will receive bids for the project. Since the amount of the reroofing contract is estimated to be less than \$200,000, it is planned that the Chief Executive Officer will award the roof replacement contract upon receipt and evaluation of competitive bids.

These projects have been evaluated and recommended by Metropolitan's Capital Investment Plan Evaluation Team and funds have been included within the fiscal year 2004/05 capital budget. See [Attachment 1](#) for the Detailed Report, [Attachment 2](#) for the Financial Statement, and [Attachment 3](#) for the Location Map.

Policy

Metropolitan Water District Administrative Code Section 5108: Capital Project Appropriation
Metropolitan Water District Administrative Code Section 8113: Construction Contract Award

California Environmental Quality Act (CEQA)

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 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 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 action qualifies under two Categorical Exemptions (Class 1, Section 15301 and Class 2, Section 15302 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options/Fiscal Impacts

Option #1

Adopt the CEQA determination and

- a. Appropriate \$840,000 in budgeted funds;
- b. Authorize preliminary design of the Diemer Wastewater Reclamation Plant No. 2 Rehabilitation Project;
- c. Authorize preliminary and final design of the Diemer Wastewater Tank Pumps Replacement Project; and
- d. Authorize the Chief Executive Officer to have all work performed to replace the Diemer Administration Building roofs.

Fiscal Impact: \$840,000 of budgeted funds under Approp. 15380 (Diemer Improvements Program)

Option #2

Do not authorize the work described in this letter. This option will forego an opportunity to reduce the risk of unplanned plant outages.

Fiscal Impact: None

Staff Recommendation

Option #1



Roy L. Wolfe
Manager, Corporate Resources

1/5/2005

Date



Gilbert F. Ivey
Interim Chief Executive Officer

1/16/2005

Date

Attachment 1 – Detailed Report

Attachment 2 – Financial Statement

Attachment 3 – Location Map

BLA #3216

Detailed Report

The Robert B. Diemer Water Treatment Plant was placed into service in 1963 with an initial capacity of 200 million gallons per day (mgd). The plant was expanded in 1969 and now has a design capacity of 520 mgd. The plant delivers treated water to Orange County and parts of Metropolitan's Central Pool portion of the distribution system.

The Diemer Improvements Program was established to ensure plant reliability, comply with drinking water quality regulations, and increase the efficiency and safety of the Diemer plant operations.

Washwater Reclamation Plant No. 2 Rehabilitation – Preliminary Design (\$290,000)

Purpose/Background

Washwater Reclamation Plant No. 2 (WWRP No. 2) was built in 1992 to process up to 25 million gallons per day of water. WWRP No. 2 receives and processes used filter backwash water, decant water from the sludge thickeners, drainage water from the main plant sedimentation basins when those basins are dewatered and taken out of service for maintenance, and gray water (such as discharge flows from analyzers and turbidity meters). WWRP No. 2 has two identical treatment trains that share a common influent channel. Presently, anthracite coal and sand settling out in the common channel are only partially removed by the coal and sand removal system. When the influent channel is dewatered and cleaned, neither treatment train can process used washwater.

Each WWRP No. 2 process train consists of a flocculation and sedimentation basin. Mechanical equipment in the flocculation section of each basin serves to mix and distribute the coagulants and promote flocculation. Chain-and-flight equipment in the WWRP No. 2 sedimentation basins collects settled solids for pumping to the solids thickeners. Clarified water flowing over WWRP No. 2 basin effluent launders is then pumped to the head of the main Diemer plant.

Submerged WWRP No. 2 equipment is continually subjected to abrasive and corrosive operating conditions caused by the solids in the used filter backwash water. The horizontal flocculators require excessive maintenance, and their submerged bearings are worn from exposure to anthracite coal and grit within the used filter backwash water. The WWRP No. 2 sedimentation basins use a chain-and-flight system to collect the settled solids. The drive gears are worn and the chains have stretched considerably.

Project Description

Preliminary design for the WWRP No. 2 Rehabilitation Project will include the following activities to refine the scope of work: conduct field investigations to confirm the extent of needed equipment repairs and/or replacement; evaluate alternatives to modify the influent channel by adding isolation valves or gates so that one basin can be operated while the influent channel is being cleaned; evaluate alternatives to improve the coal and sand removal system; evaluate process hydraulics; and investigate the potential and need for adding a third treatment train.

The work will be performed by Metropolitan staff with process engineering support provided by a consultant, Richard Brady & Associates. Richard Brady & Associates' work will be performed under an existing professional services agreement which was authorized by Metropolitan's Board in September 2003. Richard Brady & Associates was selected through a competitive process (Request for Qualifications 575) to perform this type of work. Metropolitan staff will perform project management and coordinate work with other projects underway at the Diemer plant to minimize operational impacts.

Project Milestone

- August 2005 – Complete preliminary design for WWRP No. 2 Rehabilitation Project

Washwater Tank Pumps Replacement – Field Investigations and Final Design (\$304,000)***Purpose/Background***

The Diemer plant has two 1.65-million-gallon tanks that store water for backwashing the filters. The east tank was placed into service in 1963 and the west tank was placed into service in 1969. The two washwater tanks are identical in size, being 60 feet in diameter and 80 feet tall. Due to the hydraulic configuration of the Diemer plant, each tank is filled by pumping filtered water from the filter effluent channel into the tank. Water then flows by gravity to backwash the filter beds. Over the years, these pumps and their motors have been maintained and refurbished by Diemer plant personnel. Currently, two of the five existing pumps, motors and starters need to be replaced in order to ensure plant reliability and to have sufficient water for backwashing the filter beds. These pumps and motors are over 35 years old and have reached the end of their useful life; replacement parts are costly and difficult to find. Minor improvements will also be made to the piping and instrumentation for all five pumps. Metropolitan staff has completed a scoping study for the project.

Project Description

The project consists of field investigations and final design to replace the two pumps, motors and starters, and to replace minor piping, check valves and pressure gages for all five pumps. Metropolitan staff will perform the design work.

Project Milestone

- June 2005 – Complete final design for Washwater Tank Pumps Replacement Project

Administration Building Roof Replacement – Design and Construction (\$246,000)***Purpose/Background***

The Administration Building was built as part of the original Diemer plant construction in 1963. The Administration Building houses staff offices, a telecommunication room, a SCADA equipment room, a process control room, and maintenance shops. The building was constructed with three different roof levels, one large main roof that also serves as an observation deck and two smaller roofs that cover the building's main entry (clerestory roof) and the stairwell that leads up to the main roof area (penthouse roof). Because the main roof also serves as an observation deck, a traffic bearing elastomeric coating was used to accommodate people walking on it. The other two roofs, the clerestory and penthouse roofs, do not see foot traffic and are therefore constructed with a bituminous membrane roofing system.

The building's roofs were recoated once, approximately 20 years ago. The existing roofing materials have now deteriorated to the point where they leak in several locations and need to be replaced in order to prevent water damage to the interior building and to the equipment inside during wet-weather events.

Project Description

The project consists of removing all the existing roofing materials on the building and installing new roofing materials in their place. All three roofs will be replaced with roofing systems similar to the existing roofs.

Under this project, Metropolitan staff will prepare the required specifications and bidding documents and will receive bids for the project. Since the amount of the reroofing contract is estimated to be less than \$200,000, it is planned that the Chief Executive Officer will award the roof replacement contract upon receipt and evaluation of competitive bids.

Project Milestone

August 2005 – Complete installation of new roofs

Financial Statement for Diemer Improvements Program

A breakdown of Board Action No. 5 for preliminary design of rehabilitation of the Washwater Reclamation Plant No. 2, field investigations and final design of the Washwater Tank Pumps Replacement, and the Diemer Administration Building roof replacement for the Diemer Improvements Program is as follows:

	Previous Total Appropriated Amount (Aug. 2004)	Current Action No. 5 (Feb. 2005)	New Total Appropriated Amount
Labor			
Studies and Investigations	\$ 870,000	\$ 206,000	\$1,076,000
Owner Costs (Program management, bidding process)	457,500	121,350	578,850
Final Design	387,000	104,900	491,900
Construction Inspection and Support	30,000	19,250	49,250
Metropolitan Force Construction	210,000	2,000	212,000
Materials and Supplies	447,000	0	447,000
Incidental Expenses	52,000	14,500	66,500
Operating Equipment	15,000	0	15,000
Professional/Technical Services	1,230,000	101,000	1,331,000
Contracts	300,000	160,000	460,000
Remaining Budget	626,500	111,000	737,500
Total	\$ 4,625,000	\$ 840,000	\$ 5,465,000

Funding Request

Program Name:	Diemer Improvements Program		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15380	Board Action No.:	5
Requested Amount:	\$ 840,000	Capital Program No.:	15380-I
Total Appropriated Amount:	\$ 5,465,000	Capital Program Page No.:	E-24
Total Program Estimate:	\$ 29,880,000	Project Goal:	I- Infrastructure Reliability

