THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- Board of Directors
  *Engineering and Operations Committee*

6/14/2011 Board Meeting

**8-4**

## Subject

Appropriate $4.86 million; and award $3,599,284.68 contract to ERS Industrial Services, Inc. for replacement of filter media at the Robert B. Diemer Water Treatment Plant (Approp. 15436)

## Description

This action awards a construction contract to replace filter media at the Robert B. Diemer Water Treatment Plant (Diemer). Replacement of the existing media is needed prior to startup of the ozonation facilities under the Diemer Oxidation Retrofit Program (ORP).

**Timing and Urgency**

The existing anthracite coal media in the Diemer plant's filters is coated with high levels of manganese from the previous use of ferric chloride as a coagulant, which contained manganese as a trace constituent. If the media is not replaced, the manganese will be released into the treated water after the Diemer ozonation system is placed into service in 2012, and biological filtration commences. High levels of manganese in treated water can produce elevated color and turbidity, likely resulting in complaints from member agencies and consumers. This situation occurred at the Mills plant following the switchover to biological filtration in 2003. Staff recommends replacement of the Diemer filter media at this time to avoid potential manganese release.

This project has been reviewed with Metropolitan's updated Capital Investment Plan (CIP) prioritization criteria and is categorized as a Water Quality project. The project is budgeted within Metropolitan's CIP for fiscal year 2010/11.

**Background**

The Diemer plant was placed into service in 1963 with an initial capacity of 200 million gallons per day (mgd). In 1969, the plant was expanded to its present capacity of 520 mgd. The plant delivers a blend of waters from the Colorado River and the State Water Project to Orange County and to Metropolitan's Central Pool portion of the distribution system.

Construction of the Diemer ozonation facilities is scheduled to be completed in mid-2012. When ozone becomes the primary disinfectant, all filters will be operated in a biological filtration mode. Biological filtration will be initiated by halting the continuous application of chlorine onto the filters downstream of the ozonation process. These biological filters will reduce the levels of disinfection by-product (DBP) precursors and nutrients, which could lead to bacterial re-growth in the distribution system.

Following the commencement of ozonation and biological filtration at the Mills plant in 2003, the discontinuation of chlorination upstream of the filters resulted in an unexpected release of manganese from the filters. Testing determined that the ferric chloride coagulant used at the Mills plant contained manganese as a trace constituent, which had accumulated over time on the filter media. Due to the practice of filter inlet chlorination, soluble manganese from the ferric chloride coagulant had been absorbed onto the filter media and then slowly oxidized and accumulated. When filter inlet chlorination was halted at the Mills plant, insoluble manganese within the filters changed into its soluble form and was released from the filters. This manganese release resulted in increased turbidity levels, colored (yellowish or brownish) water, and complaints from consumers. Although manganese levels did not exceed any health-based primary drinking water standard, the levels exceeded the

aesthetic-based secondary drinking water standard. Resumption of filter inlet chlorination stopped both the release of manganese from the filters and the associated consumer complaints, but resulted in elevated halogenated DBPs. A number of tests were conducted to evaluate methods to either remove the manganese from the filter media or to control the manganese release to acceptable levels. Replacement of the filter media coupled with switching the coagulant from ferric chloride to alum was determined to be the best method to remove the manganese and prevent reoccurrence. As a result, the existing filter media at the Mills plant was replaced with new media.

Following the successful outcome of this approach at Mills, the existing filter media at the Jensen plant was subsequently replaced prior to startup of ozonation at that plant. At the Skinner plant, a higher purity ferric chloride product had been used since September 2004. Based on extensive filter media testing, the replacement of media prior to startup of the Skinner ozonation process in May 2010 was not necessary because much less manganese had accumulated on the Skinner filter media than at the other plants. At the Weymouth plant, staff anticipates that replacement of the filter media will be necessary. This work will be incorporated into a future filter rehabilitation project.

The existing media at the Diemer plant was originally placed in the west filters in 1969 and in the east filters in 1979. Based on media sampling conducted in 2004, high levels of manganese have also accumulated over time on the Diemer filters' anthracite coal media. In addition, the smaller size sand media, which is located beneath the anthracite media, has been washed out over time. The present filter sand media is larger than the ideal size for optimal filter performance. To prevent further accumulation of manganese in the filters, Diemer staff switched from ferric chloride to alum coagulation in late 2004.

To avoid manganese release problems and to improve filter performance at the Diemer plant, staff recommends replacing the existing anthracite and sand filter media in all 48 filters with new anthracite coal and sand. This action will also provide the benefit of replacing older, out-of-specification media with new media, which meets desired size and uniformity specifications. Media will be replaced in stages to avoid interfering with the plant operations, limiting plant capacity, or impacting the ongoing Diemer ORP construction activities.

In August 2009, Metropolitan's Board authorized final design to replace the filter media at the Diemer plant. Final design has been completed, and staff recommends proceeding with the media replacement in all 48 filters at this time.

**Diemer Filter Media Replacement – Construction ($4,860,000)**

Specifications No. 1672 for the Diemer Filter Media Replacement project was advertised for bids on March 2, 2011. The contract includes removal and disposal of existing anthracite and sand from 48 filters, cleaning of the filter beds, and installation of new anthracite coal and silica sand. Approximately 5,000 cubic yards of anthracite coal and 2,300 cubic yards of silica sand will be placed into the 48 filters. As shown in **Attachment 2**, ten bids were received on April 14, 2011. The low bid from ERS Industrial Services, Inc., in the amount of $3,599,284.68, complies with the requirements of the specifications. The nine other bids ranged from approximately $3.71 million to $5.36 million. The engineer's estimate was $4.78 million. Staff believes the difference between the engineer's estimate and the group of low bids reflects the current highly competitive bidding environment. For this contract, Metropolitan has established a Small Business Enterprise (SBE) participation level of at least 20 percent of the total bid amount. ERS Industrial Services, Inc. is an SBE firm, and thus achieves 100 percent participation.

This action appropriates $4.86 million and awards a construction contract to replace filter media in the Diemer plant's 48 filters. In addition to the amount of the contract, the requested funds include $247,300 for Metropolitan force construction to install pumps and piping to convey used washwater to the reclamation plant, perform filter media washing, and disinfect the filters. The total cost of construction is $3.85 million. The requested funds also include $458,600 for construction inspection; $22,700 for Metropolitan staff to review submittals received from the contractor, respond to requests for information, and advise inspection staff on technical issues; $128,500 for project management and preparation of record drawings; and $403,615 for remaining budget.

Metropolitan staff will perform inspection of the construction contract. For this project, the anticipated cost of inspection and support is approximately 11.9 percent of the total construction cost. Engineering Services' goal for inspection of projects with construction cost greater than $3 million is 9 to 12 percent.

This work has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds have been included in the fiscal year 2010/11 capital budget. See **Attachment 1** for the Financial Statement, **Attachment 2** for the Abstract of Bids, and **Attachment 3** for the Location Map.

This project is included within capital Appropriation No. 15436, the Diemer Improvements Program Phase II, which was initiated in fiscal year 2006/07. Appropriation No. 15436 also includes the Diemer Hatch Covers Replacement, Lower Maintenance Road Rehabilitation, and East Washwater Tank Roof Refurbishment. With the present action for the Diemer Filter Media Replacement project, the total funding for Appropriation No. 15436 will increase from $18,259,000 to $23,119,000.

This project is consistent with Metropolitan's goal for sustainability by enhancing the reliability of the Diemer plant, in order to maintain reliable water deliveries in the future.

***Project Milestone***

August 2012 – Completion of construction of the Diemer Filter Media Replacement

## Policy

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)

CEQA determination for Option #1:

The environmental effects from the funding, design, construction, and operation of the Diemer Filter Media Replacement Project were evaluated in Addendum No. 5 the Final Environmental Impact Report (Final EIR) for the Robert B. Diemer Treatment Plant Improvements Project certified by the Board on August 18, 2009. The current board action does not involve 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 Addendum No. 5 to the certified Final EIR for the Robert B. Diemer Treatment Plant Improvements Project and that no further environmental analysis or documentation is required.

CEQA determination for Option #2:

None required

## Board Options

**Option #1**

Adopt the CEQA determination and

a. Appropriate $4.86 million; and
b. Award $3,599,284.68 contract to ERS Industrial Services, Inc. to replace filter media at the Diemer plant.

**Fiscal Impact:** $4.86 million in budgeted funds under Approp. 15436

**Business Analysis:** This option will allow delivery of high-quality, manganese-free water to customers and reduce the potential for consumer complaints.

**Option #2**

Do not award the contract and re-advertise in an attempt to receive more favorable bids.

**Fiscal Impact:** Unknown
**Business Analysis:** This option may or may not result in lower bids, and would compress the time available for media replacement, which would impact plant operations and delay startup of the Diemer ozonation facilities.

## Staff Recommendation

Option #1

5/20/2011
*Gordon Johnson* *Date*
*Manager/Chief Engineer,*
*Engineering Services*

5/31/2011
*Jeffrey Kightlinger* *Date*
*General Manager*

**Attachment 1 – Financial Statement**

**Attachment 2 – Abstract of Bids**

**Attachment 3 – Location Map**

Ref# es12611126

## Financial Statement for Diemer Improvements Program – Phase II

A breakdown of Board Action No. 13 for Appropriation No. 15436 for the Diemer Filter Media Replacement project* is as follows:

| | Previous Total Appropriated Amount (May 2011) | Current Board Action No. 13 (June 2011) | New Total Appropriated Amount |
|---|---|---|---|
| Labor | | | |
| Studies and Preliminary Design | $ 749,600 | $ - | $ 749,600 |
| Final Design | 2,389,300 | - | 2,389,300 |
| Owner Costs (Program mgmt., record drwgs) | 1,886,438 | 128,500 | 2,014,938 |
| Submittals Review | 396,400 | 22,700 | 419,100 |
| Construction Inspection & Support | 1,135,191 | 458,600 | 1,593,791 |
| Metropolitan Force Construction | 1,733,500 | 207,000 | 1,940,500 |
| Materials and Supplies | 880,258 | 38,300 | 918,558 |
| Incidental Expenses | 100,693 | 2,000 | 102,693 |
| Professional/Technical Services | 1,001,943 | - | 1,001,943 |
| Equipment Use | 43,155 | - | 43,155 |
| Contracts | 6,663,366 | 3,599,285 | 10,262,651 |
| Remaining Budget | 1,279,156 | 403,615 | 1,682,771 |
| **Total** | **$ 18,259,000** | **$ 4,860,000** | **$ 23,119,000** |

## Funding Request

| | | | |
|---|---|---|---|
| **Program Name:** | Diemer Improvements Program – Phase II | | |
| **Source of Funds:** | Revenue Bonds, Replacement and Refurbishment or General Funds | | |
| **Appropriation No.:** | 15436 | **Board Action No.:** | 13 |
| **Requested Amount:** | **$** 4,860,000 | **Capital Program No.:** | 15436-I |
| **Total Appropriated Amount:** | **$** 23,119,000 | **Capital Program Page No.:** | 283 |
| **Total Program Estimate:** | **$** 155,182,000 | **Program Goal:** | I- Infrastructure Reliability |

* The total amount expended to date on the Diemer Filter Media Replacement project is approximately $200,000.

**The Metropolitan Water District of Southern California**

**Abstract of Bids Received on April 14, 2011 at 2:00 P.M.**

**Specifications No. 1672**

**Diemer Filter Media Replacement**

The project consists of removal and disposal of the existing anthracite and sand from 48 filters, cleaning of the filter beds, and installation of new anthracite coal and silica sand in all 48 filters at the Diemer plant.

**Engineer's Estimate: $4,780,000**

| Bidder and Location | Total | SBE $ | SBE % | Met SBE* |
|---|---|---|---|---|
| ERS Industrial Services, Inc., Fremont, CA | $ 3,599,284.68 | $3,599,284.68 | 100% | Yes |
| Carbon Activated Corporation, Compton, CA | $ 3,708,047.00 | - | - | - |
| Minako America Corporation dba Minco Construction, Gardena, CA | $ 3,877,000.00 | - | - | - |
| Prominent Systems, Inc., City of Industry, CA | $ 4,081,368.00 | - | - | - |
| Zusser Company, Inc., Los Angeles, CA | $ 4,223,222.00 | - | - | - |
| Norman A. Olsson Construction, Inc., Orange, CA | $ 4,445,000.00 | - | - | - |
| J.F. Shea Construction, Inc., Walnut, CA | $ 4,589,259.00 | - | - | - |
| Canyon Springs Enterprises dba RSH Construction Services, Hemet, CA | $ 4,633,051.00 | - | - | - |
| R C Foster Corporation, Corona, CA | $ 5,343,037.00 | - | - | - |
| Abhe & Svoboda, Inc., Alpine, CA | $ 5,362,150.00 | - | - | - |

*SBE (Small Business Enterprise) participation set at 20 percent

# Robert B. Diemer Water Treatment Plant