THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

BOARD ACTION

- Board of Directors
  Engineering and Operations Committee

10/14/2014 Board Meeting

7-1

Subject

Appropriate $700,000; and authorize two rehabilitation projects at the F. E. Weymouth Water Treatment Plant (Approp. 15477)

Executive Summary

This action authorizes design of two rehabilitation projects at the F. E. Weymouth Water Treatment Plant: (1) improvements to the domestic water and fire water system; and (2) rehabilitation of Metropolitan's demonstration-scale testing facility.

Timing and Urgency

The Weymouth plant has a single combined domestic and fire water system. Adequate water pressure must be maintained at all times throughout the plant for both reliable chlorine delivery and for fire protection. Much of the piping in the domestic and fire water system was installed during the plant's original construction nearly 75 years ago. Due to the decades of continuous service and numerous structures added to the Weymouth site over time, such as the new ozonation facilities, much of the plant's water system needs to be enlarged or replaced. The construction of these improvements is being phased. Portions of the water system are being upgraded in conjunction with the Weymouth Oxidation Retrofit Program (ORP), while the remaining improvements will take place in conjunction with the plant's new post-filtration chlorination system, which will commence operation in 2016.

Rehabilitation of Metropolitan's demonstration-scale testing facility, originally known as the Oxidation Demonstration Project (ODP), is needed to enhance the safety and reliability of equipment at the facility. This 5.5-mgd facility is approximately a 1:100 scale version of Metropolitan's five larger plants, including a complete treatment process train. The ODP is a key asset that assists in determining the feasibility and application of emerging water treatment processes in order to comply with existing and upcoming drinking water regulations. Previous studies conducted at this facility provided critical process design and operating information that yielded significant cost savings for Metropolitan. Some components of the testing facility's infrastructure and support systems have deteriorated through continual use, potentially affecting the operational reliability of the facility. Rehabilitation of several key equipment items is recommended to proceed at this time.

These projects have been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria and are categorized as Infrastructure Reliability projects. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2014/15.

Details

Background

The Weymouth plant was placed into service in 1941 with an initial capacity of 100 million gallons per day (mgd), and has been expanded twice to its current treatment capacity of 520 mgd. The plant delivers a blend of waters from the Colorado River Aqueduct and State Water Project to Metropolitan's Central Pool portion of the distribution system, and to an exclusive service area. The Weymouth plant is located in the city of La Verne.

Metropolitan staff conducts regular maintenance of the Weymouth plant's facilities, mechanical components, and equipment. Although the plant continues to perform reliably today, some systems are exhibiting signs of normal wear and tear, as may be expected from nearly 75 years of operation. Two projects are recommended to proceed at this time to maintain plant reliability and enhance worker safety.

Project No. 1 – Domestic and Fire Water System Improvements – Final Design Phase ($450,000)

The existing Weymouth domestic and fire water system combines potable water, service water for chlorine solution injection, and fire protection within a single water distribution system. This system forms a general loop around the plant with inner loops that provide water to individual buildings. On the north side of the plant, however, the domestic water is supplied by a single pipeline. Staff conducted a comprehensive assessment of the plant's domestic and fire water system in accordance with the California Fire Code based on the needs of new facilities which have recently been completed or are currently under construction. The assessment concluded that the system needs to be upgraded, including the addition of two domestic water pumps, several fire hydrants, a surge chamber, and several air release/vacuum valves. In addition, some reaches of pipeline need to be replaced or paralleled with a second line. Due to the widespread location of the upgrades throughout the plant, portions of the work have been incorporated into specific projects such as the Weymouth ORP. The remaining upgrades are being addressed as a stand-alone project.

In August 2012, Metropolitan's Board authorized preliminary design of improvements to the domestic and fire water system at the Weymouth plant. Preliminary design has been completed, and staff recommends proceeding with final design at this time. This project will address the remaining system improvements that were not incorporated into other projects, including the installation of new piping; addition of fire hydrants at the caustic soda and ammonia tank farm; and installation of surge protection equipment.

Planned activities include detailed engineering design, preparation of drawings and specifications, and development of a construction cost estimate.

This action appropriates $450,000 and authorizes final design of upgrades to the domestic and fire water system at the Weymouth plant. All work will be performed by Metropolitan staff. Requested funds include $275,000 for final design; $98,000 for permitting with the local fire authority and project management; and $77,000 for remaining budget.

The final design cost as a percentage of the estimated construction cost is approximately 15 percent. Engineering Services' goal for final design and inspection of projects with construction cost less than $3 million is 9 percent to 15 percent. The construction cost for this project is anticipated to range from $1.4 million to $2 million. The total estimated cost to complete this project, including current funds requested and the future construction cost, is anticipated to range from $1.9 million to $2.4 million.

Project No. 2 – Demonstration Testing Facility Rehabilitation – Preliminary Design Phase ($250,000)

Metropolitan's demonstration-scale testing facility was placed into service in 1992 to perform testing of ozone processes in advance of the full-scale ORP. Since the original testing to support the ORP was completed, this facility has been used continuously to determine the feasibility and application of emerging water treatment processes. For example, this facility was used to evaluate biofiltration, arsenic removal, enhanced coagulation, bromate control technologies, chlorine dioxide as an alternative oxidant, and N-nitrosodimethylamine (NDMA) precursor control. These studies have resulted in direct financial benefit to Metropolitan. In the case of biofiltration testing, an expenditure of over $100 million was avoided when staff determined that granular activated carbon filters would not be needed at Metropolitan's treatment plants for control of assimilable organic carbon (AOC). Currently, Metropolitan is saving approximately $700,000 in annual chemical costs at the Mills plant as a result of a newly developed ammonia-chlorine process for bromate control. In the future, the demonstration-scale testing facility will continue to be utilized to conduct water quality studies, optimize treatment processes at Metropolitan's full-scale plants, and prepare for new regulations.

Following 22 years of continuous use, many equipment items at the testing facility have deteriorated and become less reliable. Staff conducted an assessment of the facility's primary equipment and support systems, and identified several needed improvements to maintain safe and reliable operation.

Many components of the testing facility's chemical storage and feed systems are worn out and need to be replaced, including overflow sensors and leak detectors, and the ozone system's single operational generator. The demonstration-scale testing facility was originally equipped with three different ozone generators. Two of the generators are obsolete and have not been used in over 15 years. The third ozone generator has deteriorated over time and has become unreliable; replacement parts are no longer manufactured. In addition, the ozone generation system requires safety enhancements in order to meet current fire code requirements, including the addition of room partitions and a ventilation system to more readily contain ozone leaks.

Planned preliminary design phase activities include evaluation of refurbishment options for chemical storage and feed systems and the ozone generation system; preparation of conceptual layouts of improvements; and development of a construction cost estimate. Preliminary design will be performed by Carollo Engineers, Inc., as described below.

This action appropriates $250,000 and authorizes preliminary design to rehabilitate Metropolitan's demonstration-scale testing facility. Requested funds include $35,000 for field investigations; $147,000 for development of design criteria and conceptual drawings, and an evaluation of existing equipment; $28,000 for project management; and $40,000 for remaining budget. Staff will return to the Board at a later date for authorization of final design phase activities.

Engineering Design Services – Carollo Engineers, Inc. (No Action Required)

Preliminary design of improvements to the testing facility is recommended to be performed by Carollo Engineers, Inc. under an existing professional services agreement. This work is highly specialized, and Metropolitan has insufficient technical staff available to perform the work in-house. Carollo Engineers, Inc. was prequalified through a competitive process via Request for Qualifications No. 927 and selected for this project due to its expertise in chemical systems and process equipment. For this agreement, Metropolitan has established a Small Business Enterprise participation level of 18 percent. Carollo Engineers, Inc. has agreed to meet this level of participation.

The planned scope of work includes evaluating alternatives for upgrading the chemical feed and storage, ozone generation, and chemical control systems; and preparing a preliminary design report. The estimated cost for these services is $147,000. No amendment is needed to the existing agreement with Carollo Engineers, Inc. for this work.

Summary

This action appropriates $700,000 and authorizes two rehabilitation projects at the Weymouth plant. Each of these projects has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available in the fiscal year 2014/15 capital expenditure plan. See **Attachment 1** for the Financial Statement and **Attachment 2** for the Location Map.

These projects are included within capital Appropriation No. 15477, the Weymouth Improvements Appropriation – FY 2012/13 Through FY 2017/18, which was initiated in fiscal year 2012/13. With the present action, the total funding for Appropriation No. 15477 will increase from $5,832,000 to $6,532,000.

Project Milestones

June 2015 – Completion of preliminary design of improvements to the demonstration-scale testing facility

December 2015 – Completion of final design for the improvements to the domestic and fire water system

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

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 appropriation of funds and authorization of preliminary and final design and minor modifications to existing public facilities, 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 for both Class 4 and Class 6 Categorical Exemptions (Sections 15304 and 15306 of the State CEQA Guidelines). Additional CEQA review will be conducted, as necessary, prior to approval of a specific project and solicitation/award of contract.

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

Board Options

Option #1

Adopt the CEQA determination that the proposed action is categorically exempt, and

a. Appropriate $700,000;
b. Authorize final design to improve the domestic and fire water system at the Weymouth plant; and
c. Authorize preliminary design to rehabilitate Metropolitan's demonstration-scale testing facility.

Fiscal Impact: $700,000 of capital funds under Approp. 15477

Business Analysis: This option will improve Weymouth plant reliability, maintain compliance with treated water quality regulations, and enhance worker safety.

Option #2

Adopt the CEQA determination that this action is categorically exempt, and

a. Appropriate $450,000;
b. Authorize final design to improve the domestic and fire water system at the Weymouth plant; and
c. Do not rehabilitate Metropolitan's demonstration-scale testing facility at this time.

Fiscal Impact: $450,000 of capital funds under Approp. 15477

Business Analysis: This option would enhance Weymouth plant reliability, but would forgo an opportunity to refurbish failing equipment and enhance safety at the demonstration-scale testing facility.

Option #3

Do not proceed with the two projects at this time.

Fiscal Impact: None

Business Analysis: This option would forgo an opportunity to improve Weymouth plant reliability, maintain compliance with treated water quality regulations, and enhance worker safety.

Staff Recommendation

Option #1

9/30/2014

Gordon Johnson *Date*
Manager/Chief Engineer
Engineering Services

10/1/2014

Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Financial Statement
Attachment 2 – Location Map

Ref# es12632447

Financial Statement for Weymouth Improvements Appropriation – FY 2012/13 Through FY 2017/18

A breakdown of Board Action No. 9 for Appropriation No. 15477 for the Weymouth Domestic and Fire Water System Improvements[1] and Demonstration Testing Facility Rehabilitation[2] is as follows:

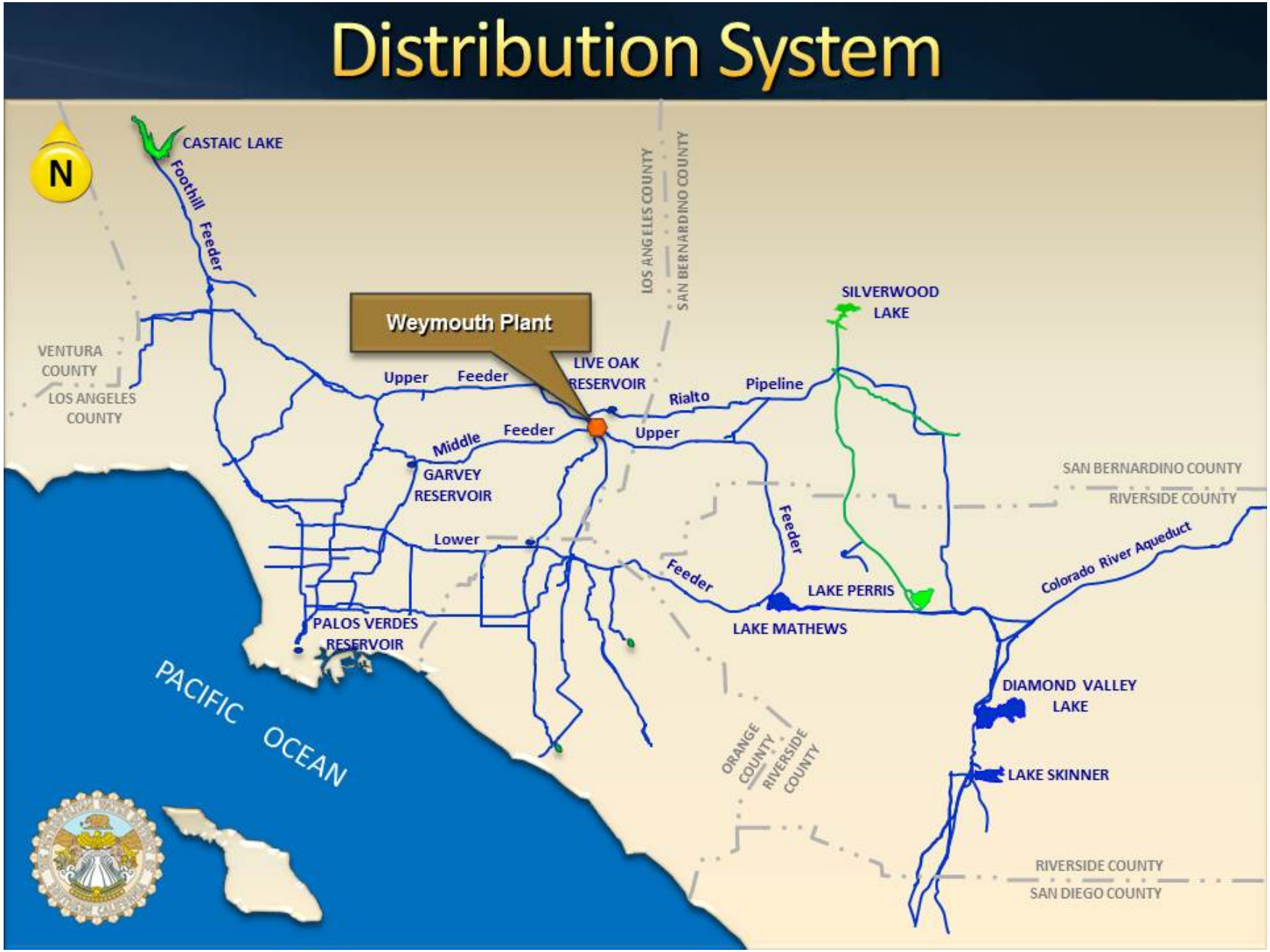
	Previous Total Appropriated Amount (Sept. 2014)	Current Board Action No. 9 (Oct. 2014)	New Total Appropriated Amount
Labor			
Studies & Investigations	$ 986,000	$ 35,000	$ 1,021,000
Final Design	674,500	270,000	944,500
Owner Costs (Program mgmt., permitting)	743,300	126,000	869,300
Submittals Review & Record Drwgs	60,000	-	60,000
Construction Inspection & Support	64,000	-	64,000
Metropolitan Force Construction	70,000	-	70,000
Materials & Supplies	5,500	-	5,500
Incidental Expenses	35,900	5,000	40,900
Professional/Technical Services	2,106,000	-	2,106,000
Carollo Engineers	-	147,000	147,000
Contracts	368,480	-	368,480
Remaining Budget	718,320	117,000	835,320
Total	**$ 5,832,000**	**$ 700,000**	**$ 6,532,000**

Funding Request

Appropriation Name:	Weymouth Improvements Appropriation – FY 2012/13 Through FY 2017/18		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15477	**Board Action No.:**	9
Requested Amount:	**$** 700,000	**Budget Page No.:**	326
Total Appropriated Amount:	**$** 6,532,000	**Total Appropriation Estimate:**	$81,800,000

[1]The total amount expended to date on the Domestic and Fire Water System Improvements is approximately $281,000. The total estimated cost to complete the project, including the amount authorized to date, current funds requested, and future construction costs, is anticipated to range from $1.9 million to $2.4 million.

[2]This action is the initial appropriation for the Demonstration Testing Facility Rehabilitation project. This project had been previously listed in the Capital Investment Plan Appendix for fiscal years 2014/15 and 2015/16 under Approp. 05605, Operations Support Facilities Improvements (Page No. 307).


Distribution System
N
CASTAIC LAKE
Foothill Feeder
VENTURA COUNTY
LOS ANGELES COUNTY
LOS ANGELES COUNTY
SAN BERNARDINO COUNTY
Weymouth Plant
LIVE OAK RESERVOIR
Upper Feeder
Rialto Pipeline
Upper
Middle Feeder
GARVEY RESERVOIR
Lower
SILVERWOOD LAKE
SAN BERNARDINO COUNTY
RIVERSIDE COUNTY
Feeder
Feeder
Colorado River Aqueduct
LAKE PERRIS
LAKE MATHEWS
PALOS VERDES RESERVOIR
PACIFIC OCEAN
DIAMOND VALLEY LAKE
ORANGE COUNTY
RIVERSIDE COUNTY
LAKE SKINNER
RIVERSIDE COUNTY
SAN DIEGO COUNTY