



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

1/9/2018 Board Meeting

8-3

Subject

Adopt CEQA determination and appropriate \$2.1 million; and authorize: (1) design and construction to refurbish the generator at Valley View Hydroelectric Plant; and (2) preliminary design to rehabilitate auxiliary systems at that facility (Appropriation No. 15458)

Executive Summary

This action authorizes Metropolitan staff to refurbish components of the generator at Valley View Hydroelectric Plant, and preliminary design to rehabilitate electrical and mechanical equipment that support the facility's turbine and generator.

Timing and Urgency

The Valley View Hydroelectric Plant has been removed from service due to deterioration of several components of the power plant's generator. Staff recommends proceeding with a two-stage rehabilitation plan: Stage 1 will perform immediate repairs to enable the plant to return to operation. Stage 2 will address long-term improvements needed for auxiliary systems at the plant.

This work has been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria and is included in the Distribution System Reliability Program. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2017/18.

Details

Background

The Valley View Hydroelectric Plant was constructed in 1985. The plant receives raw water from the Lower Feeder and East Orange County Feeder No. 1. Flow leaving the hydroelectric plant is conveyed to Anaheim Lake through the lower reach of East Orange County Feeder No. 1 for ground water recharge. The Valley View Hydroelectric Plant can produce up to 4.1 megawatts of power with its single turbine. Depending on seasonal pipeline flowrates, revenues have recently ranged from \$1 million to \$2 million annually. When the hydroelectric plant is shut down, flows are diverted through an adjacent pressure control structure.

The hydroelectric plant contains the following mechanical equipment: two 24-inch needle valves to control flow entering the turbine; a Pelton-wheel turbine with generator; and auxiliary systems that include a cooling water system, oil pressure system, compressed air system, and tailrace for discharging water from the turbine.

The Valley View Hydroelectric Plant has operated reliably for nearly 30 years and has undergone regular maintenance. The plant was taken off-line recently to investigate irregular sounds originating from the generator. After an inspection, staff performed several repairs to address these issues and returned the unit to service. However, based on observations made after the unit was returned to service, a detailed assessment was performed that identified the need for a full rehabilitation of the unit to prevent further damage and ensure reliable operation for the long-term.

Staff recommends completing the rehabilitation work in two stages. Stage 1 will address needed repairs to the generator that will enable the plant to return to operation. Stage 2 will address long-term improvements that are needed to maintain reliability of the hydroelectric plant. This action authorizes execution of the Stage 1 work and preliminary design of the Stage 2 work, which will focus on the plant's mechanical and electrical systems.

Project No. 1 – Generator Refurbishment at Valley View Hydroelectric Plant – Design and Construction (\$1,740,000)

Planned design phase activities include: (1) conducting field investigations; (2) equipment selection; (3) preparation of drawings and specifications for repairs to the generator's rotor assembly and needle valves; (4) procurement of replacement mechanical components; and (5) receipt of multiple competitive bids for specialized repairs. Metropolitan staff will perform all design and procurement activities, while construction will be performed by Metropolitan forces with the assistance of specialized contractors.

Metropolitan force construction activities will include: (1) disassembly of the generator and needle valves; (2) refurbishment of the two needle valves including replacement of worn or damaged components, replacement of seals and rubber gaskets, sandblasting and recoating of the valve bodies, and recoating of the plunger, spring, actuator shaft, and deflector plate; (3) replacement of grout on baseplates; (4) reassembly of the generator's rotor assembly and needle valves; and (5) testing and recommissioning of the plant. Contractor activities will include refurbishment of: (1) generator components including the rotor assembly and keyway sections; (2) bearings; and (3) the overhead bridge crane to allow safe disassembly, removal, and reassembly of plant components.

This action appropriates \$1.74 million and authorizes design and construction to refurbish components of the generator at Valley View Hydroelectric Plant. The requested funds include: \$90,000 for the design phase activities described above; \$926,000 for Metropolitan force construction; \$315,000 for the services of three specialized contractors to refurbish the generator, bearings and the overhead crane; \$130,000 for procurement of mechanical components; \$81,000 for receipt of multiple bids, preparation of record drawings, and project management; and \$198,000 for remaining budget. The contracts for refurbishment of the generator components, bearings, and overhead crane are planned to be awarded under the General Manager's Administrative Code authority to award contracts of \$250,000 or less.

The total cost to refurbish the generator, including the amount appropriated to date and current funds requested, is \$1.74 million.

Project No. 2 – Rehabilitation of Valley View Hydroelectric Plant – Preliminary Design Phase (\$360,000)

The planned scope of preliminary design includes: (1) conducting a condition assessment of all electrical and mechanical systems within the plant; (2) review of compiled operation and maintenance data; (3) development of design criteria for the improvements; (4) preparation of conceptual-level cost estimates; and (5) value engineering. Site investigations will include inspections of: (1) the electrical protection and control relays; (2) the generator's transformer; (3) the cooling water system, including the copper piping which supplies cooling water to the generator enclosure; (4) isolation and control valves; and (5) the generator and turbine brake systems. All inspections will be performed by Metropolitan staff. Dewatering and disassembly of major equipment and piping will be required to allow the internal inspections. A specialized consultant will perform the third-party value engineering under an agreement planned to be awarded under the General Manager's Administrative Code authority to award contracts of \$250,000 or less.

Based on the results from the investigations, staff will identify improvements to extend the service life and improve reliability of the generator and auxiliary systems at Valley View Hydroelectric Plant.

This action appropriates \$360,000 and authorizes preliminary design to rehabilitate Valley View Hydroelectric Plant. The requested funds include \$237,000 for the technical activities listed above; \$55,000 for development of a construction cost estimate, preparation of environmental documentation, hazardous material testing, and project management; \$35,000 for value engineering by the specialized consultant; and \$33,000 for remaining budget. Staff will return to the Board to authorize final design of the recommended improvements.

Summary

This action appropriates \$2.1 million, authorizes design and construction to refurbish the generator at Valley View Hydroelectric Plant, and authorizes preliminary design to rehabilitate auxiliary systems at that facility.

These projects are included within capital Appropriation No. 15458, the Hydroelectric Power Plant Improvements Appropriation – FY 2008/09 Through FY 2017/18, which was initiated in fiscal year 2008/09. With this action, the total funding for Appropriation No. 15458 will increase from \$8,797,000 to \$10,897,000.

These projects have been evaluated and recommended by Metropolitan’s CIP Evaluation Team, and funds are available within the fiscal year 2017/18 capital expenditure plan. See **Attachment 1** for the Financial Statement and **Attachment 2** for the Location Map.

Project Milestones

November 2018 – Completion of refurbishment of the generator at Valley View Hydroelectric Plant

November 2018 – Completion of preliminary design to rehabilitate auxiliary systems at Valley View Hydroelectric Plant

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 proposed actions are categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The overall activities for both projects involve repair and replacement of existing 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)

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination that the proposed actions are categorically exempt, and

- a. Appropriate \$2.1 million;
- b. Authorize design and construction to refurbish the generator at Valley View Hydroelectric Plant; and
- c. Authorize preliminary design to rehabilitate auxiliary systems at that facility.

Fiscal Impact: \$2.1 million of capital funds under Appropriation No. 15458

Business Analysis: This project will return Valley View Hydroelectric Plant to operation, enhance reliability, and reduce the risk of costly repairs and unplanned shutdowns.

Option #2

Do not proceed with the refurbishment work at this time.

Fiscal Impact: Continued loss of revenue of up to \$5,700 per day

Business Analysis: Under this option, the hydroelectric plant would remain out of operation.

Staff Recommendation

Option #1



Gordon Johnson
Manager/Chief Engineer
Engineering Services

12/14/2017
Date



Jeffrey Kightlinger
General Manager

12/21/2017
Date

Attachment 1 – Financial Statement

Attachment 2 – Location Map

Ref# es12655243

Financial Statement for Hydroelectric Power Plant Improvements Appropriation

A breakdown of Board Action No. 9 for Appropriation No. 15458¹ is as follow:

	Previous Total Appropriated Amount (Dec. 2016)	Current Board Action No. 9 (Jan. 2018)	New Total Appropriated Amount
Labor			
Studies & Investigations	1,427,000	237,000	1,664,000
Final Design	784,000	90,000	874,000
Owner Costs (Program mgmt, envir. doc., haz. materials testing)	811,000	136,000	947,000
Metropolitan Force Construction	3,884,694	926,000	4,810,694
Materials & Supplies	459,000	130,000	589,000
Incidental Expenses	41,000	-	41,000
Professional/Technical Services	958,000	-	958,000
Value engineering firm	-	35,000	35,000
Equipment Use	59,000	-	59,000
Contracts	10,000	-	10,000
Generator refurbishment contractor	-	200,000	200,000
Bearing refurbishment contractor	-	40,000	40,000
Crane refurbishment contractor	-	75,000	75,000
Remaining Budget	363,306 ²	231,000	594,306
Total	\$ 8,797,000	\$ 2,100,000	\$ 10,897,000

Funding Request

Appropriation Name:	Hydroelectric Power Plant Improvements		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15458	Board Action No.:	9
Requested Amount:	\$ 2,100,000	Budget Page No.:	233
Total Appropriated Amount:	\$ 10,897,000	Total Appropriation Estimate:	\$ 39,300,000

¹This action is the initial appropriation for rehabilitation of Valley View Hydroelectric Plant.

²Includes reallocation of \$49,064 from Remaining Budget for seismic assessment of the pressure control structure at the Greg Avenue Pump Plant.

Distribution System

