



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

1/10/2023 Board Meeting

7-4

Subject

Authorize an agreement with Arcadis U.S., Inc. in an amount not to exceed \$2 million for preliminary design to rehabilitate the finished water reservoirs at Henry J. Mills and Joseph Jensen Water Treatment Plants; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

Metropolitan's finished water reservoirs provide operational storage capacity within the distribution system to regulate treated water deliveries to member agencies. The California Division of Drinking Water (DDW) requires that all reservoirs holding treated water be covered in order to protect it from contamination. The flexible floating covers of two finished water reservoirs at the Henry J. Mills Water Treatment (Mills) Plant and one finished water reservoir at the Joseph Jensen Water Treatment Plant (Jensen) have exceeded their recommended 20-year service life and need to be replaced. This action authorizes an agreement with Arcadis U.S., Inc. (Arcadis) to provide engineering services to complete preliminary design for the rehabilitation of finished water reservoirs at the Mills and Jensen plants.

Details

Background

Located within the city of Riverside, the Mills plant was placed into service in 1978, has a current treatment capacity of 220 million gallons per day (mgd) and treats water from the East Branch of the State Water Project (SWP) and occasionally from Diamond Valley Lake. The plant operates two finished water reservoirs with floating covers and geomembrane liners. The hypalon cover on Reservoir No. 1 was installed in 1997, while the polypropylene cover on Reservoir No. 2 was installed in 1996. Each reservoir has a capacity of 25 million gallons (MG), and both are classified as jurisdictional dams by the state Division of Safety of Dams (DSOD).

Located in the community of Granada Hills, the Jensen plant was placed into service in 1972, has a current treatment capacity of 750 mgd, and treats water from the West Branch of the SWP. The plant has two 50-MG finished water reservoirs. Reservoir No. 1 is a concrete structure with a concrete roof, while Reservoir No. 2 has a polypropylene floating cover which was installed in 1997.

Treated water is stored in these reservoirs to serve the downstream distribution system. To protect treated water from contamination, DDW requires that all finished water reservoirs be covered. Metropolitan has a rigorous floating cover inspection and maintenance program to ensure compliance with DDW regulations. The floating covers are carefully inspected on a regular basis to identify damage and signs of deterioration. The useful life of a reservoir's floating cover is determined by the longevity of the cover material based on the ability of staff to repair the cover. As the cover material ages, the bonding capability of repair patches to adhere to the original material declines. The repair patches become increasingly less effective, and the actual repair work becomes more difficult to perform. When the cover material can no longer be reliably repaired, it is considered to be at the end of its useful life. The typical useful life for a floating cover is approximately 20 years.

The floating covers at both Mills reservoirs and Jensen's Reservoir No. 2 have exceeded the recommended 20-year service life based on the repair criteria described above. Each cover must be rehabilitated to maintain treated water quality, comply with DSOD operating permits, and minimize the risk of costly urgent repairs. In addition to the new liners and floating covers, other improvements are also needed, including a rainwater

removal system and dewatering system, enhanced security features, refurbishment or replacement of the existing gates, and installation of a new drop gate at the Mills reservoirs. In addition, the Jensen Reservoir No. 2 inlet needs to be modified, as turbulent flow at the inlet has torn holes in the floating cover on several occasions near the corners of the fixed metal air vents.

In April 2017, Metropolitan's Board authorized preliminary design to rehabilitate the three finished water reservoirs with floating covers at the Mills and Jensen plants. To date, staff has performed reservoir gate inspections during recent plant shutdowns, evaluated the Jensen plant's domestic water connections and groundwater extraction system at Reservoir No. 2, reviewed floating cover structural support and anchorage, and conducted value engineering on the proposed modifications. Staff also assessed the impact of low-flow operations at both plants which leads to inadequate mixing, increased water age, and potential water quality concerns within the finished water reservoirs. A computational fluid dynamic model was developed for each reservoir to locate potential stagnant zones where mixing needs to be improved to maintain uniform chlorine residual through the reservoir. While the study concluded that modifying the inlet flow in all three reservoirs would enhance the mixing conditions, specialized simulation expertise is required to further evaluate multiple mixing scenarios for water dispersion and retention, optimize the inlet flow modifications, and develop a series of recommended improvements that will effectively reduce tearing to the floating covers. The results and recommendations of these additional studies and modeling will be taken into account during the preliminary design process and will be added to the project scope as appropriate.

To fully address the reservoir mixing issues, staff recommends that the preliminary design of Mills and Jensen reservoir rehabilitation be completed by a specialized consultant under a new professional services agreement, which is the subject of this action.

In accordance with the April 2022 action on the biennial budget for fiscal years 2022/23 and 2023/24, the General Manager will authorize staff to proceed with the action described herein, pending board authorization of the agreement described below. Based on the current Capital Investment Plan (CIP) expenditure forecast, funds for work to be performed pursuant to this action during the current biennium are available within the CIP appropriation for fiscal years 2022/23 and 2023/24 (Appropriation No. 15525). This project has been reviewed in accordance with Metropolitan's CIP prioritization criteria and was approved by Metropolitan's CIP evaluation team to be included in the Dams and Reservoirs Improvements Program.

Mills and Jensen Finished Water Reservoirs Rehabilitation – Preliminary Design

Planned activities to complete preliminary design for rehabilitation of the Mills and Jensen finished water reservoirs include: (1) detailed field inspections of existing reservoir features and appurtenant equipment; (2) evaluation of mixing scenarios for water dispersion and retention; (3) development of final design criteria; (4) preparation of preliminary design drawings and three-dimensional reservoir models; (5) development of construction cost estimates and schedules for each reservoir; and (6) preparation of preliminary design reports for each reservoir. These activities will be performed by Arcadis as discussed below. Metropolitan staff will prepare the piping and instrumentation diagrams and design of new reservoir instrumentation and control features, including sampling equipment, water quality analyzers, level alarms, elevation monitoring, and control of new slide gates and rainwater removal pumps. Metropolitan staff will also perform overall project management and technical oversight and review of the consultant's work.

A total of \$3.65 million is required to complete preliminary design to rehabilitate the Mills and Jensen finished water reservoirs. Additional funds required to complete the preliminary design include \$2 million for engineering services provided by Arcadis as described below; \$744,000 for Metropolitan's staff portion of the design, technical oversight, and review of consultant's work; \$566,000 for permitting with DSOD and DDW, environmental support, project management, and project controls; and \$340,000 for remaining budget.

Attachment 1 provides the allocation of the required funds to complete the preliminary design work. The total estimated cost to complete this project, including the amount appropriated to date, funds allocated for the work described in this action, and future construction costs, is anticipated to range from \$39 million to \$43 million.

Engineering Services (Arcadis U.S., Inc.) – New Agreement

Arcadis is recommended to complete preliminary design for the rehabilitation of three finished water reservoirs at the Mills and Jensen plants, as described above. Arcadis was selected through a competitive process under

Request for Proposals No. 1328. Arcadis was selected for this project based on their staff qualifications, experience in the evaluation and design of similar projects, and technical approach and methodology.

This action authorizes an agreement with Arcadis for a not-to-exceed amount of \$2 million to provide engineering services to complete preliminary design for the rehabilitation of three finished water reservoirs at the Mills and Jensen plants. For this agreement, Metropolitan has established a Small Business Enterprise participation level of 25 percent. Arcadis has agreed to meet this level of participation. See **Attachment 2** for a listing of the subconsultants.

Alternatives Considered

Alternatives considered to complete the preliminary design for finished water reservoir rehabilitation at the Mills and Jensen plants included assessing the availability and capability of in-house Metropolitan staff to complete this work. Metropolitan's staffing strategy for utilizing consultants and in-house Metropolitan staff has been: (1) to assess current work assignments for in-house staff to determine the potential availability of staff to conduct this work; and (2) for long-term rehabilitation projects, when resource needs exceed available in-house staffing or require specialized technical expertise.

Staff has determined that specialized technical expertise is required to complete the preliminary design of the reservoir liner, floating cover replacement, and the mixing improvements required to minimize stagnant water in the reservoirs. Metropolitan staff do not routinely perform these designs. After assessing the current workload for in-house staff, the relative priority of this project, and the specialized technical expertise required, staff recommends the use of a professional services agreement to complete the subject project. This approach will allow for the completion of not only this project, but also other budgeted capital projects within their current schedules and ensure that the work is conducted in the most efficient manner possible.

Summary

This action authorizes an agreement with Arcadis U.S., Inc. in an amount not to exceed \$2 million to complete the preliminary design for the rehabilitation of finished water reservoirs at the Mills and Jensen plants. See **Attachment 1** for the Allocation of Funds, **Attachment 2** for the List of Subconsultants, and **Attachment 3** for the Location Map.

Project Milestone

April 2024 – Completion of preliminary design to rehabilitate the reservoirs at the Mills and Jensen plants

Policy

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

By Minute Item 50782, dated April 11, 2017, the Board authorized preliminary design to rehabilitate finished water reservoirs at the Joseph Jensen and Henry J. Mills Water Treatment Plants.

By Minute Item 52778, dated April 12, 2022, the Board appropriated a total of \$600 million for projects identified in the Capital Investment Plan for Fiscal Years 2022/23 and 2023/24.

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 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 actions qualify for a Class 6 Categorical Exemptions (Class 6, Section 15306 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Authorize an agreement with Arcadis U.S., Inc. in an amount not to exceed \$2 million for preliminary design to rehabilitate the finished water reservoirs at Henry J. Mills and Joseph Jensen Water Treatment Plants.

Fiscal Impact: Expenditure of \$3.65 million in capital funds. All costs will be incurred in the current biennium and have been previously appropriated.

Business Analysis: This option will improve the reliability of the Mills and Jensen reservoirs, maintain treated water quality, and enhance flexibility within the distribution system to meet member agency demands.

Option #2


Do not proceed with the project at this time.

Fiscal Impact: None

Business Analysis: Under this option, staff would continue to inspect and repair the finished water reservoir covers and equipment, as required. If damage to a floating cover could no longer be reliably repaired, the reservoir would be removed from service until the floating cover is replaced.

Staff Recommendation

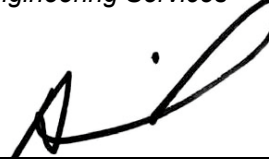
Option #1



 John V. Bednarski
 Manager/Chief Engineer
 Engineering Services

12/19/2022

Date



 Adel Hagekhalil
 General Manager

12/22/2022

Date

Attachment 1 – Allocation of Budgeted Funds

Attachment 2 – Listing of Subconsultants

Attachment 3 – Location Map

Allocation of Funds for Mills and Jensen Finished Water Reservoirs Rehabilitation

	Current Board Action (Jan. 2023)
Labor	
Studies & Investigations	\$ 744,000
Final Design	-
Owner Costs (Program mgmt., envir. monitoring)	566,000
Submittals Review & Record Drwgs.	-
Construction Inspection & Support	-
Metropolitan Force Construction	-
Materials & Supplies	-
Incidental Expenses	-
Professional/Technical Services	-
Arcadis U.S., Inc.	2,000,000
Right-of-Way	-
Equipment Use	-
Contracts	-
Remaining Budget	340,000
Total	\$ 3,650,000

The total amount expended to date for the Mills and Jensen Finished Water Reservoirs Rehabilitation is approximately \$1.25 million. The total estimated cost to complete this project, including the amount appropriated to date, funds allocated for the work described in this action, and future construction costs, is anticipated to range from \$39 million to \$43 million.

The Metropolitan Water District of Southern California
Subconsultants for Agreement with Arcadis U.S., Inc.
Mills and Jensen Finished Water Reservoirs Rehabilitation

Subconsultant and Location
Hilts Consulting Group, Inc. Yorba Linda, CA
Paul Hansen Engineering Rancho Palos Verdes, CA
Beyaz & Patel, Inc. San Diego, CA

Distribution System

