THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Board Report

Engineering Services Group

- **Engineering Services Monthly Activities for March 2024**

Summary

This monthly report provides a summary of Engineering Services Group activities for March 2024 in the following key areas:

- Distribution System Reliability Program
- Prestressed Concrete Cylinder Pipe (PCCP) Reliability Program
- Colorado River Aqueduct (CRA) Reliability Program
- Treatment Plant Reliability Program
- System Reliability Program
- Safety of Dams
- Pure Water Southern California Program
- System Flexibility/Supply Reliability
- Engineering Cooperative Education Program

Purpose

Informational

Attachments

Attachment 1: Detailed Report - Engineering Services Group's Monthly Activities for March 2024

Date of Report: April 8, 2024

Engineering Services Key Activities Report

March 2024

Engineering Services manages and executes projects within the Capital Investment Plan (CIP) to maintain infrastructure resiliency, ensure regulatory compliance, enhance sustainability, and provide flexibility in system operations to address uncertain water supply conditions.

Recent activities on CIP programs and other key engineering functions are described below.

Protect public health, the regional economy and Metropolitan's assets

Distribution System Reliability Program

This capital program maintains reliable water deliveries through specific rehabilitation and upgrade projects on Metropolitan's pipelines, reservoirs, and control structures. Recent activities include the following:

- Lake Mathews Wastewater System Improvements – This project consists of replacing the existing septic tank system at Lake Mathews with a new wastewater collection system. The new wastewater system connects to a nearby off-site Western Municipal Water District main wastewater line. The contractor is conducting tests of the connections to the buildings and completing the punch list items. Construction is approximately 98 percent complete and is scheduled to be complete in April 2024.
- Service Connection OC-88 Chiller Replacement – This project replaces deteriorated cooling equipment including three chillers and two chilled water pumps that provide cooling for the pump station's pump motors and air conditioning system. The contractor has begun to install the first chiller and the stainless-steel chilled water piping. Construction is approximately 60 percent complete and is scheduled to be complete in November 2024.
- Sepulveda Electrical Improvements – This project replaces deteriorated electrical components, makes other upgrades at three Sepulveda Feeder underground structures, and installs two blind flanges after removing a spool on the West Valley Feeder No. 1. The contractor completed installation of the power pedestal, lighting, and receptacles in all vaults, and began installation of conductors for control and power to electrical devices. Construction is 74 percent complete and is scheduled to be complete by August 2024.

- San Diego Canal Relining – This project will replace damaged concrete lining at three locations along the San Diego Canal. The contractor has completed the liner replacement work at two of the three locations and is installing steel rebar at the final location prior to placement of the new concrete liner panels. Construction is approximately 90 percent complete and is scheduled to be completed in April 2024.
- Santa Monica Feeder Cathodic Protection – This project will install cathodic protection for the cast-iron portion of the Santa Monica Feeder to address corrosion observed during a 2018 inspection of the pipeline. This project will install two 400-foot-deep anode wells along with rectifiers and remote monitoring equipment along the feeder. Final design is complete and scheduled for award of a construction contract in July 2024.

Service Connection OC-88 Chiller Replacement

Service Connection OC-88 Chiller Replacement – Chiller installation

San Diego Canal Relining – Preparation of subgrade prior to concrete placement

Prestressed Concrete Cylinder Pipe (PCCP) Reliability Program

This capital program was established to enhance the reliability of Metropolitan's water distribution system and to reduce the risk of costly emergency repairs of PCCP. The priority pipelines included in the program are the Second Lower Feeder, Sepulveda Feeder, Calabasas Feeder, Rialto Pipeline, and the Allen-McColloch Pipeline. A total of 100 miles of PCCP pipelines will be refurbished under this multi-year program. Recent activities include the following:

- Lake Mathews PCCP Valve Warehouse – This project constructs a 18,160 square-feet pre-engineered metal building on a reinforced concrete slab at Lake Mathews for valve and equipment storage related to the PCCP relining program. The contractor has completed the work associated with the building structure itself. The contractor is currently installing the fire water line that feeds the building's sprinkler system and will begin testing of the dry-pipe fire sprinkler system. Construction is 95 percent complete and is scheduled to be complete in May 2024. It is anticipated that valves will be moved into the building in Summer 2024.
- Sepulveda Feeder PCCP Rehabilitation Reach 2 – This project rehabilitates 3.8 miles of PCCP in the southern portion of Sepulveda Feeder through the cities of Torrance and Los Angeles. Final design is approximately 97 percent complete and is scheduled to be complete by May 2024. A board action to award the construction contract for this project is anticipated in late-2024.
- Sepulveda Feeder PCCP Urgent CFRP Relining – This project rehabilitates three deteriorated Sepulveda Feeder PCCP segments in the Van Nuys, Sherman Oaks, and Brentwood neighborhoods of the City of Los Angeles using carbon fiber reinforced polymer (CFRP) lining. Construction is 15 percent complete and is scheduled to be complete by May 2024. CFRP installation is scheduled to take place during a planned Sepulveda Feeder shutdown between March 18 and April 6, 2024.

- Allen-McColloch Pipeline Urgent PCCP Rehabilitation - This project will perform urgent relining of distressed PCCP segments of the Allen-McColloch Pipeline (AMP) discovered during a recent inspection. In March 2024, staff completed installation of a 24-inch bypass valve at OC-88 to temporarily reduce the operating pressure to protect the pipeline. Relining of the AMP will be performed in stages to minimize impacts to member agencies. The first stage will focus efforts on the northern portion and will be performed in April 2024. The second stage, performed from May to December 2024, will address the southern portion of the pipeline. A bulkhead will be utilized to provide flows to the northern portion of the line during an extended outage of the southern portion. To expedite the work, the first stage is being performed under change orders to existing construction contracts as authorized by the Board in February 2024. The second stage was advertised to prequalified contractors for competitive bidding in March 2024. Board award of the second stage contract is currently scheduled for May 2024.

AMP Urgent PCCP Rehabilitation – Welding 60-inch diameter steel liner

AMP Urgent PCCP Rehabilitation – Hydrostatic testing of 63-inch diameter steel liner pipe

Colorado River Aqueduct (CRA) Reliability Program

This capital program maintains the reliability of Metropolitan's CRA conveyance system. Recent activities include the following:

- Conduit Structural Protection – This project consists of installing new reinforced concrete slab protection crossings over portions of the cut-and-cover conduits on the Colorado River Aqueduct. The contractor is currently performing grading and installation of form work for concrete pads at multiple sites. Construction is 70 percent complete and is scheduled to be complete in January 2025.
- Gene Security Upgrades Pilot – This project installs security equipment such as cameras, card readers, and door switches at the Gene Pumping Plant. This is a pilot effort to support the larger CRA Security Improvements Project will allow staff to optimize the equipment's capability and functionality within the harsh desert environment, validate its integration with Metropolitan's proprietary security software, and establish parameters for data storage on encrypted cloud-based applications. Final design is complete, and a construction contract is scheduled for board award in April 2024.
- Main Transformer Replacement – This project replaces the thirty-five 230 kV and 69 kV step-down transformers that are used to run the main pumps at all five of Metropolitan's Colorado River Aqueduct pumping plants. Preliminary design was completed in June 2023. The transformer procurement was advertised as a best value procurement in March 2024. Award of the procurement contract is scheduled for board award in August 2024.

- Eagle Mountain Utility Upgrades – This project will replace the existing potable water, non-potable water, and sewer lines at the Eagle Mountain Pump Plant housing village. Final design is 60 percent complete and is schedule to be complete in April 2024.

Treatment Plant Reliability Program

This capital program was initiated to maintain reliability and improve the operating efficiency of Metropolitan's water treatment plants through specific improvement projects. Recent activities include the following:

- Weymouth Basins 5-8 and Filter Building No. 2 Rehabilitation – This project rehabilitates major mechanical and structural components of Basins 5-8 and Filter Building No. 2 at the Weymouth plant, including the flocculation/sedimentation equipment, sludge pumps, baffle boards and walls, launders, inlet gates, and outlet drop gates. Rehabilitation work also includes seismic upgrades of basin walls and inlet channel, hazardous material abatement, and replacement of filter valves and actuators in Filter Building No. 2. The contractor completed all rehabilitation work and testing in Basin 8 and startup testing of filter valves, piping, and electrical components in Filter Building No. 2, and initiated startup and testing in Basin 7. Overall construction for this contract is 60 percent complete and is scheduled to be complete in June 2025.
- Weymouth Administration Building Upgrades – This project upgrades the Weymouth Administration Building to withstand a significant earthquake. The planned upgrades include structural strengthening consistent with current seismic standards for essential facilities as well as accessibility and fire/life safety improvements, architectural modifications near the areas of structural upgrades, and improvements associated with the preservation of historic architectural features. Final design is approximately 40 percent complete and is scheduled to be completed in March 2025.
- Mills Electrical Upgrades – This project upgrades the electrical system with dual-power feeds to key process equipment to comply with current codes and industry practice, improve plant reliability, and enhance worker safety. Stage 1 construction is complete. Stage 2 improvements will add a second incoming 12 kV service from Riverside Public Utilities, reconfigure the existing 4160-volt switchgear, and replace the standby generator switchgear and the emergency generator programmable logic controller. The contractor completed installation of the roofing and HVAC systems and continued installation of the electrical conduits inside the ORP Switchgear Building. Construction is approximately 48 percent complete and is scheduled to be complete in August 2025.
- Jensen Ozone PSUs Replacement – This project rehabilitates the ozone generation system at the Jensen plant by replacing four existing ozone power supply units (PSUs) and four sets of generator dielectrics. The project also makes required modifications to the associated electrical, control, and cooling water systems. Metropolitan's Board awarded a construction contract in June 2022. All PSUs and dielectrics have been manufactured and delivered. Replacement of the PSUs has been staged to ensure continuous use of ozone during construction. The contractor has completed functional acceptance tests for two newly installed PSUs and preparation for the replacement of the two remaining PSUs. Construction is 80 percent complete and is scheduled to be complete in June 2024.

System Reliability Program

The System Reliability Program consists of capital projects to improve or modify facilities located throughout Metropolitan's service area to utilize new processes and/or technologies and improve facility safety and overall reliability. Recent activities include the following:

- Headquarters Physical Security Upgrades – This project implements comprehensive security upgrades for Metropolitan's Union Station Headquarters. These upgrades are consistent with federally recommended best practices for government buildings. The work has been prioritized and staged to minimize rework and impacts on day-to-day operations within the building. Stage 1 work is complete and provides enhanced security related to perimeter windows and doors. Stage 2 work is complete and provides security system upgrades inside the building with a focus on the main entry rotunda area, boardroom, executive dining lounge, and security control room. Construction of Stage 3 improvements is underway and will provide security system upgrades around the perimeter of the building. The contractor began installation of the ornamental fence within the courtyard and continued concrete placement for the fixed bollards. Construction is 60 percent complete and is scheduled to be complete in June 2024.
- Headquarters Building Fire Alarm and Smoke Control System Upgrades – This project upgrades Metropolitan's Union Station Headquarters fire life safety systems, which includes replacement of the fire detection and alarm system and HVAC system improvements for smoke control. The fire alarm and smoke control systems in Metropolitan's Headquarters Building provide detection, notification, and control of building functions so that occupants and visitors can safely exit in the event of a fire. The contractor continued final testing and sign-off of the fire alarm and smoke control systems by the LAFD and Los Angeles Department of Building and Safety. Construction is complete and the new system is scheduled to be certified by LAFD and LADBS in April 2024.
- SCADA System Upgrades – This project will upgrade Metropolitan's entire control system in incremental stages, spanning the Colorado River Aqueduct, the five water treatment plants, and the conveyance and distribution system. The first stage of this project replaces the control system at the Mills plant, starting with a pilot effort on one of the plant's remote terminal units to demonstrate the proposed technology and the consultant's approach for the plant and the overall project. The consultant has installed the pilot equipment, and staff is currently evaluating the results of the pilot unit. The pilot phase is approximately 98 percent complete and is scheduled to be complete in April 2024. The system upgrades at the Mills plant are scheduled to be complete in October 2026.
- Foothill Hydroelectric Plant and Control Building Seismic Upgrade – This project strengthens the Foothill Hydroelectric Plant and Control Building to withstand a significant earthquake, by removing and replacing the roofing system; adding encasements to enlarge and strengthen concrete columns; and reinforcing shallow foundations. The contractor continued performing abatement activities on the building's roof, and installation of structural steel roof plates. Construction is approximately 40 percent complete and is scheduled to be complete in December 2024.

Headquarters Physical Security Upgrades – Installation of bollards

Protecting the Public and Metropolitan's Assets – Safety of Dams

Engineering Services continued to develop state-mandated Emergency Action Plans (EAPs) for Metropolitan's state-regulated dams to help ensure long-term public safety. This month, the EAP for Live Oak Reservoir was officially approved by the Cal OES. EAPs for the Weymouth Finished Water Reservoir, and the Goodhart Canyon Detention Basin are currently under review and are expected to be approved in April 2024. To date, 11 of Metropolitan's 13 state required EAPs have been fully approved by Cal OES.

Adapt to changing climate and water resources

Pure Water Southern California

The Pure Water Southern California (PWSC) Program is a large-regional recycled water project that will provide a new local source of safe and reliable drinking water for Southern California. PWSC currently focuses in four areas: demonstration testing, environmental planning, technical studies, and preliminary design of initial pipeline reaches. PWSC will produce 150 million gallons per day (mgd) of purified water from the Advanced Water Purification Facility (AWPF) in Carson, for indirect potable reuse (IPR) and direct potable reuse (DPR) applications, with the initial deliveries by 2030 and completion by 2035.

- Demonstration Testing: Demonstration testing began in 2019 with N-only tertiary membrane bioreactor (tMBR) testing completed in 2021 and secondary MBR (sMBR) testing completed in 2023. Maintenance and modifications for tMBR optimization testing have been completed. The system is online and currently operating in the nitrification/denitrification mode.
- Environmental Planning: The Environmental Planning Phase began in 2020 with the goal of preparing an Environmental Impact Report (EIR) for approval in 2025. Various technical studies have been prepared to support the effort. The draft EIR is currently scheduled for publication in early-2025, with board certification of the document in the third quarter of 2025. Staff continues to finalize the project description, perform additional technical studies, incorporate changes to the program due to inclusion of the LADWP Operation NEXT pipe upsizing, and development of the draft EIR. The Board authorized an amendment to the existing agreement with Helix Environmental Planning Inc. in March 2024 to address the program changes and allow additional planning studies for NEPA documents required by federal funding.
- Program Management: PWSC program management efforts lead the planning for the Program, including project controls, scheduling, budget development, risk management, coordination with Program partners and stakeholders, grants and funding, and preparation of various plans and studies.
    - A PWSC cost estimate update was presented to the PWSC/Regional Conveyance Subcommittee in November 2023. A cost estimate methodology technical memorandum was prepared to document the cost details developed for the AWPF and conveyance systems and provided to the Subcommittee in January 2024.
    - A draft construction sequencing memorandum has been prepared to identify the milestones and construction contracts needed to meet the projected completion of the AWPF, the backbone pipeline, and full delivery for IPR in 2032. The memorandum will be finalized by April 2024.
    - A Large-Scale Water Recycling grant application requesting $125 million was submitted to the US Bureau of Reclamation (USBR) in November 2023. Successful applicants will be notified in the second quarter of 2024. To receive funding, Metropolitan prepared and submitted a feasibility study in January 2024 to meet the USBR requirements.

- Advanced Water Purification Facility: The AWPF will purify wastewater from LACSD's A.K Warren facility (formerly the JWPCP) using membrane bioreactors (MBRs), reverse osmosis (RO), and ultraviolet/advanced oxidation (UV/AOP).
    - A draft conceptual facilities plan has been prepared to document key assumptions of AWPF components.
    - The AWPF team is evaluating the use of progressive design build to design and construct the treatment plant facilities.
    - A proposed Request for Qualifications (RFQ) from qualified firms to design and construct the AWPF is scheduled for the second or third quarter of 2024. Authorization of this procurement is planned for late 2024.
    - The AWPF team has finalized the Method of Services (MOS) study agreements with Southern California Edison (SCE) for SCE to evaluate SCE infrastructure needed to meet AWPF power requirements.
- Direct Potable Reuse (DPR): The California Division of Drinking Water (DDW) published the final DPR regulations in December 2023. Metropolitan has completed bench-scale testing to screen the potential DPR treatment processes that could be used for the program. Planning of pilot-scale testing is in progress. A technical workshop was held with the Independent Scientific Advisory Panel (ISAP) on March 5 and 6, 2024 to discuss bench-scale testing data and proposed DPR treatment train. A DPR white paper is currently being developed to establish Metropolitan's DPR implementation approach via the PWSC Program.
- Conveyance Pipeline System: The program's backbone conveyance system consists of over 40 miles of pipeline and two pump stations. Metropolitan's Board authorized consulting agreements for preliminary design of the first two pipeline reaches in March 2023. Metropolitan surveyors used a new high-definition mobile LiDAR system, which is mounted to the back of a truck, to survey all 14 miles of the proposed alignment for Reaches 1 and 2 in one day. This device captures over 500,000 survey measurements per second. The data is being processed and will assist with project planning and preliminary design.
    - Reach 1 – This reach is approximately 6 miles long and runs through the city of Carson. Current work includes utility field investigation and geotechnical work. Preliminary design is 40 percent complete and is scheduled to be complete by mid-2024.
    - Reach 2 – This reach is approximately 8 miles long and runs through the cities of Long Beach and Lakewood. Current work includes ground penetrating radar and obtaining permits for geotechnical work. Preliminary design is 15 percent complete and is scheduled to be complete by late-2024.

System Flexibility | Supply Reliability Program

Projects under this capital program will enhance the flexibility and/or increase the capacity of Metropolitan's water supply and delivery infrastructure to meet current and projected service demands. Projects under this program address climate change affecting water supply, regional drought, and alternative water sources for areas dependent on State Project Water.

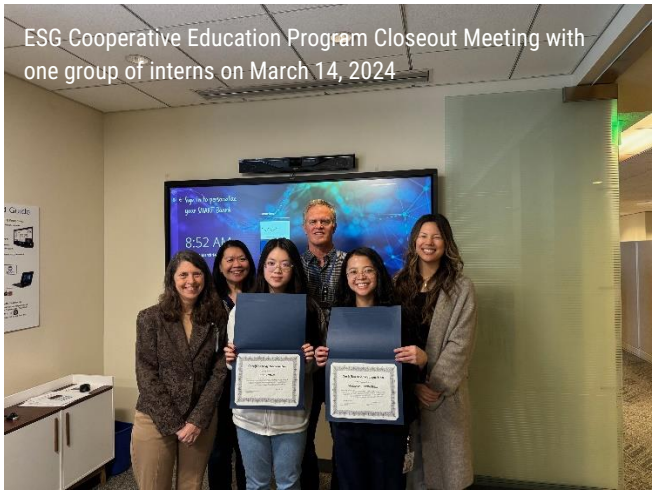
- Wadsworth Pumping Plant Bypass – This project installs a bypass pipeline and an isolation valve to interconnect the Wadsworth Pumping Plant with the Eastside Pipeline. This is one of several projects needed to deliver water from Diamond Valley Lake (DVL) to the Rialto Pipeline. The contractor is currently erecting the valve structure, relocating interfering utilities, and preparing for pipeline tie-in in April 2024. Construction is approximately 65 percent complete and is scheduled to be complete in July 2024.
- Inland Feeder - Badlands Tunnel Surge Protection – This project installs a new open-to-atmosphere surge tank at the south portal of the tunnel, which will protect the Inland Feeder from hydraulic transients when pumping water from DVL to the Rialto Pipeline through the Inland Feeder. The contractor has mobilized and started clearing the work site in preparation for construction. Construction is approximately 20 percent complete and is scheduled to be complete in August 2025.
- Inland Feeder-Rialto Pipeline Intertie – This project installs an interconnection pipeline and isolation valve structure between the Inland Feeder and Rialto Pipeline, so that water can be delivered from DVL to the Rialto Pipeline. The contractor has mobilized and started clearing and grubbing the work site. Construction is approximately 25 percent complete and is scheduled to be complete in March 2025.
- Foothill Pump Station Intertie – This project will connect San Bernardino Valley Municipal Water District's (SBVMWD) Foothill Pump Station with the Inland Feeder to provide the needed hydraulic lift to deliver water from DVL to Rialto service area upon completion. A sensitive species, the San Bernardino Kangaroo-rat (SBKR) was identified on the project's construction site. To minimize the impact of required permitting on the project's schedule, the project will be advertised and constructed in two stages. The first stage will work outside of the SBKR habitat, and the second stage will be within the SBKR area, which requires permits from California and federal Fish and Wildlife. Final design for Stage 1 is 90 percent complete and is estimated to complete by April 2024. Stage 2 final design is 70 percent complete and will be complete by December 2024. The CEQA document is scheduled for board adoption in July 2024.
- Sepulveda Feeder Pumping Stations, Stage 1 – This project installs new pump stations at the existing Venice and Sepulveda Canyon pressure control facilities, providing the ability to reverse flow in the Sepulveda Feeder and deliver 30 cubic feet per second from the Central Pool to portions of the Jensen plant exclusive area. This project utilizes a progressive design-build (PDB) project delivery method. Engineering and Operations staff are reviewing initial submittals and collaborating through a series of design workshops to support upcoming design work. The contractor and Metropolitan are coordinating with both Southern California Edison and Los Angeles Department of Water and Power on upgrades to the incoming power service at both locations. Phase 1, which includes site investigation, design to the 70 percent level, environmental planning, and preparation of long-lead-item procurement documents, is scheduled to be complete in September 2024. Work progress is on track to complete the first major milestones, delivery of the Basis of Design Report (BODR) and the 30 percent design package in May 2024.

Wadsworth Pumping Plant Bypass – Welding buttstrap

Partner with interested parties and the communities we serve

Engineering Cooperative Education Program Fiscal Year 2023-2024

At the end of March, another round of Engineering's annual Cooperative Education Program came to a close. This nine-month program provides opportunities for engineering college students to augment their studies with practical experience working full-time during the summer and part-time during the academic year. Engineering had a total of 11 students who worked alongside staff to support Metropolitan's capital programs. About 273 students have participated in the program since its 2002 inception. We are excited for the next group of college interns to join us as they start on July 1, 2024.



ESG Cooperative Education Program Closeout Meeting with one group of interns on March 14, 2024

ESG Cooperative Education Program Closeout Meeting with another group of interns on March 19, 2024

Past Highlight: Engineering and Water Quality student interns' field trip at the Weymouth plant

Past Highlight: Engineering and Water Quality student interns' meet and greet session with General Manager Adel Hagekhalil, Chair Adan Ortega, and Director Michael Camacho