THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Board Report

Engineering Services Group

- **Engineering services Monthly Activities Report for August 2024**

Summary

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

- Colorado River Aqueduct (CRA) Program
- Dams & Reservoirs Program
- Distribution System Program
- Information Technology and Control Systems Program
- Additional Facilities and Systems Program
- Prestressed Concrete Cylinder Pipe (PCCP) Program
- Water Treatment Plants Program
- Pure Water Southern California
- Drought Mitigation – State Water Project Dependent Areas
- Value Engineering Program
- Mentoring Programs

Purpose

Informational

Attachments

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

Date of Report: September 9, 2024

Engineering Services Key Activities Report for August 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. In addition, Engineering Services provides technical services to enhance reliable system operation and real property planning, valuation, acquisition, and disposition services to protect Metropolitan's assets. Engineering Services empowers our staff and partners with our business partners and the communities we serve to accomplish Metropolitan's mission.

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

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

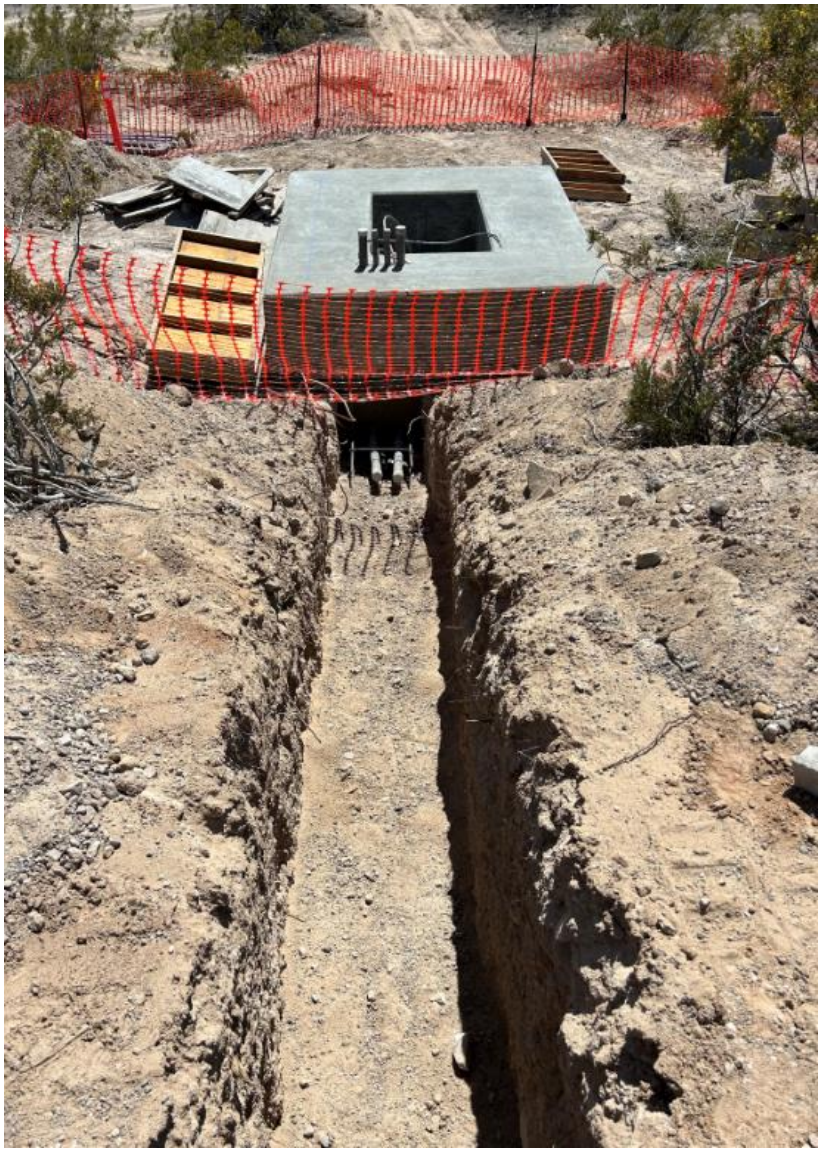
Colorado River Aqueduct (CRA) Program

The CRA program is composed of CIP projects to replace or refurbish facilities and components of the CRA system to reliably convey water from the Colorado River to Southern California.

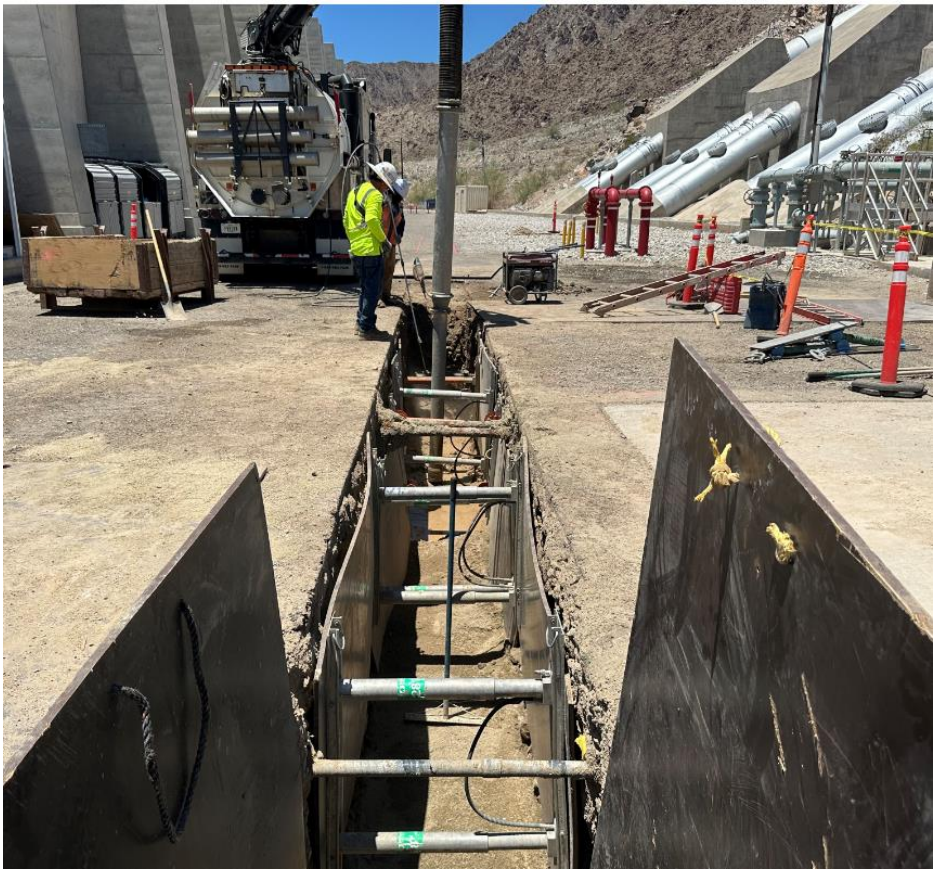
- Conduit Structural Protection—This project consists of installing new reinforced concrete slab protection crossings over portions of the cut-and-cover conduits on the Colorado River Aqueduct. Construction is complete with the notice of completion filed in July 2024.
- Flow Level Monitoring Stations—This project will install 12 flow monitoring stations at remote locations along the Colorado River Aqueduct. The contractor has completed the modifications of the existing manhole structures and has placed the concrete for the building foundation at mile marker 54.25. Construction is 90 percent complete and is scheduled to be complete in September 2024.
- CRA Storage Buildings—This project furnishes and installs storage buildings at Hinds, Eagle Mountain, and Iron Mountain and constructs associated site improvements. The contractor has mobilized at all three sites and is performing site work. Construction is 40 precent complete and is scheduled to be completed in April 2026.
- CRA Main Transformer Replacement—This project replaces the 35 230 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 contract, and staff is currently reviewing and evaluating proposals. The procurement contract award and authorization of a consulting agreement for final design are scheduled for a November 2024 board action.

- Erosion Control Improvements—This project will install erosion control features at 23 conduit locations along the CRA, which are vulnerable to erosion during storm events. The Board authorized an agreement amendment for final design in May 2024. The consultant agreement is being amended with final design scheduled to begin in September 2024.



Flow Level Monitoring Stations—MM 100.91 Building Foundations



CRA Storage Buildings—Julian Hinds FMS 8 inch HDPE Fire Water Line Trench Hydro Excavation

Dams & Reservoirs Program

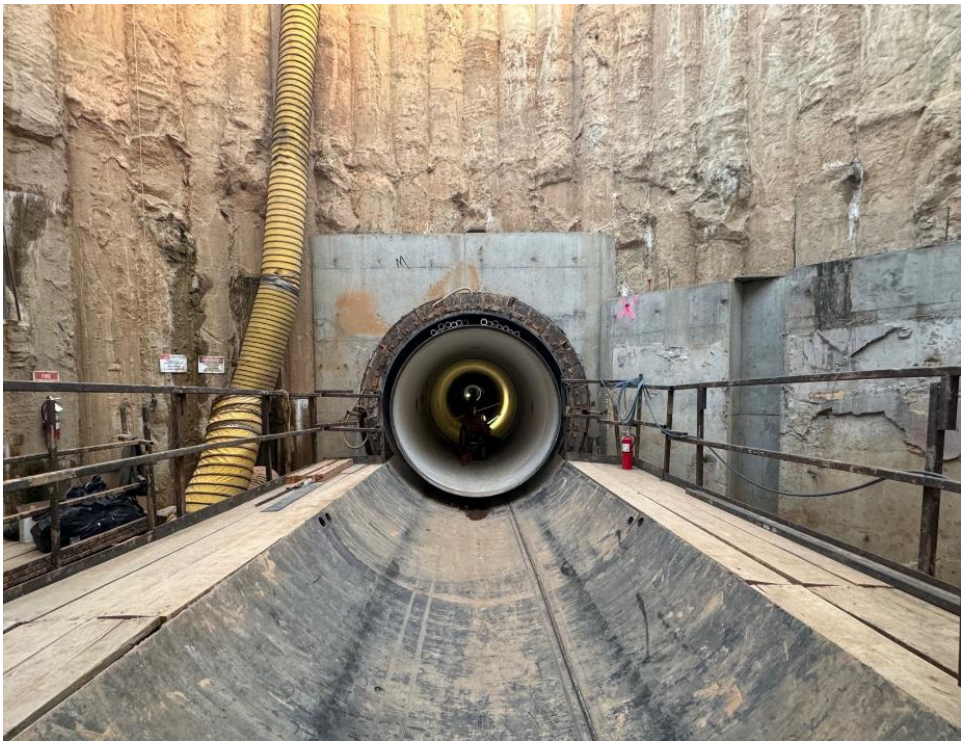
The Dams & Reservoirs Program is composed of CIP projects to upgrade or refurbish Metropolitan's dams, reservoirs, and appurtenant facilities to reliably meet water storage needs and regulatory compliance.

- Garvey Reservoir Rehabilitation—This project will replace the aging reservoir floating cover and liner, structurally strengthen the outlet tower, upgrade the on-site water quality laboratory building, rehabilitate the junction structure, and replace the existing standby generator and a portion of the security perimeter fence. The draft Environmental Impact Report (EIR) for this rehabilitation effort was released on June 12, 2024, for review and is scheduled to be considered in a November board action. Final design is approximately 38 percent complete and is scheduled to be completed in June 2025.
- Diamond Valley Lake Secondary Inlet Improvements—This project rehabilitates the Diamond Valley Lake secondary inlet sleeve valve and inlet piping and replaces the instrumentation for the sleeve valve. Rehabilitation is approximately 70 percent complete and is scheduled to complete testing and commissioning in the spring of 2025.

Distribution System Program

The Distribution System Program is composed of CIP projects to replace, upgrade, or refurbish existing facilities within Metropolitan's distribution system, including pressure control structures, hydroelectric power plants, and pipelines, to reliably meet water demands.

- Perris Valley Pipeline Tunnels—This project will complete construction of the Perris Valley Pipeline and provide service connections to Eastern and Western Municipal Water Districts. This project installs 3,000 linear feet of tunnel which crosses the Interstate 215 freeway. The contractor has excavated all four shafts and completed construction of the three tunnel reaches and has started installing the welded steel carrier pipe. Construction of the last tunnel reach, which crosses I-215 and the railroad tracks, commenced in early August 2024. Overall construction is 75 percent complete and is scheduled to be complete in early 2025.
- San Jacinto Diversion Structure Gates—This project will replace three cast iron slide gates at the San Jacinto Diversion Structure with stainless steel slide gates designed for throttling. Final design is approximately 30 percent complete. The shutdown for installation has been scheduled for the 2026 CRA shutdown.
- Yorba Linda PCS Valve Replacement—This project will rehabilitate five 54-inch sleeve valves in the pressure control structure. Before rehabilitation of the sleeve valves, the project will also rehabilitate five 54-inch butterfly valves needed for isolation of the sleeve valves. The shutdown for the butterfly valve rehabilitation has been scheduled for April 2025. Currently, materials for the shutdown are being procured.
- San Diego Canal Gates Rehabilitation—This project replaces two deteriorated radial gates along the San Diego Canal. The radial gates are used to modulate flows in the San Diego Canal. Final design is approximately 60 percent complete and is scheduled to be complete in December 2024.
- San Diego Canal Liner Rehabilitation—This project will replace damaged concrete lining at one locaton along the San Diego Canal. Final design is complete, and a contract award is planned for the October 2024 board meeting.
- Foothill Hydroelectric Plant and Control Building Seismic Upgrade—This project strengthens the Foothill Hydroelectric Plant and Control Building to withstand a major earthquake and retain its functionality as an essential facility. The contractor completed the structural strengthening of the roof and continued installing structural rebars and placing concrete around the existing concrete columns. Construction is approximately 70 percent complete and is scheduled to be complete in December 2024.



Perris Valley Pipeline Tunnels—Drive 2 Carrier Pipe Installation

Information Technology and Control Systems Program

The Information Technology and Control Systems Program is composed of projects to replace, upgrade, or provide new facilities, software applications, or technology that will enhance cyber security, reliability, flexibility, and capability of information, communication, and control systems.

- Supervisory Control and Data Acquisition (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 pilot phase is 100 percent complete. Staff continued evaluating the results of the recently installed pilot equipment to determine the criteria for equipment implementation. The system upgrades at the Mills plant are scheduled to be completed in October 2026.

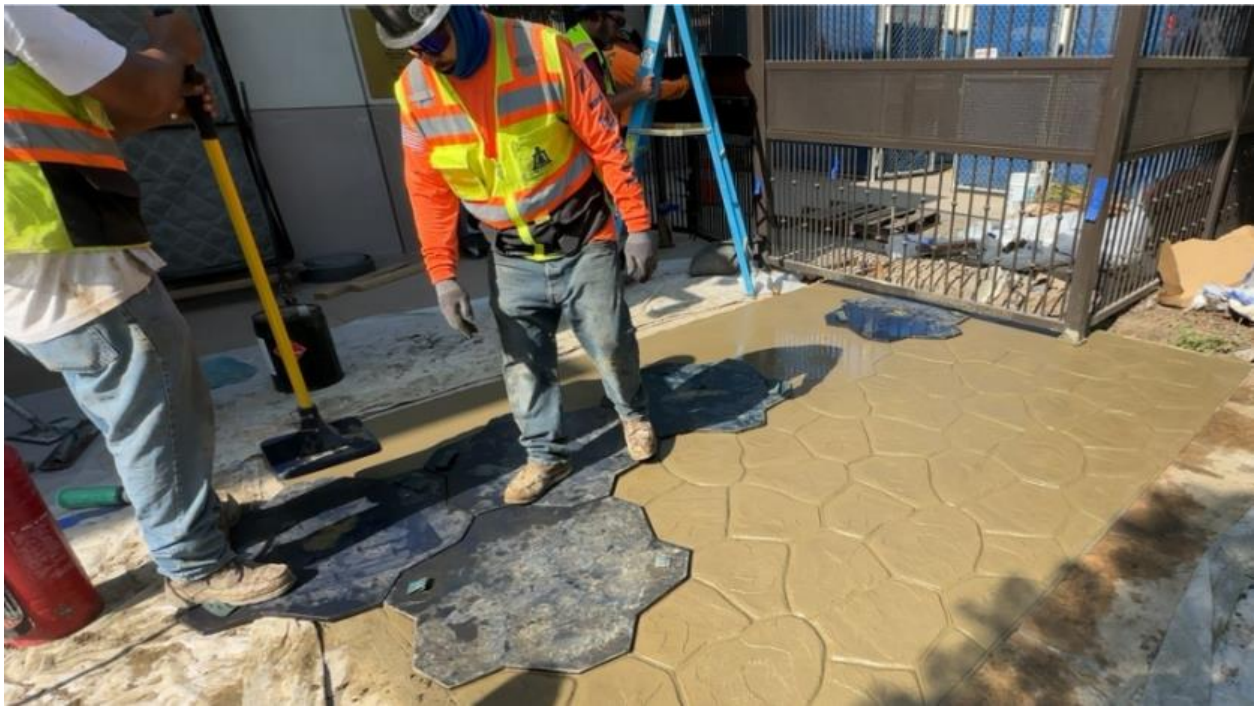
Additional Facilities and Systems Program

The Additional Facilities and Systems Program is composed of CIP projects to refurbish, replace, upgrade, or provide new facilities and systems that support Metropolitan's business and district-wide operations.

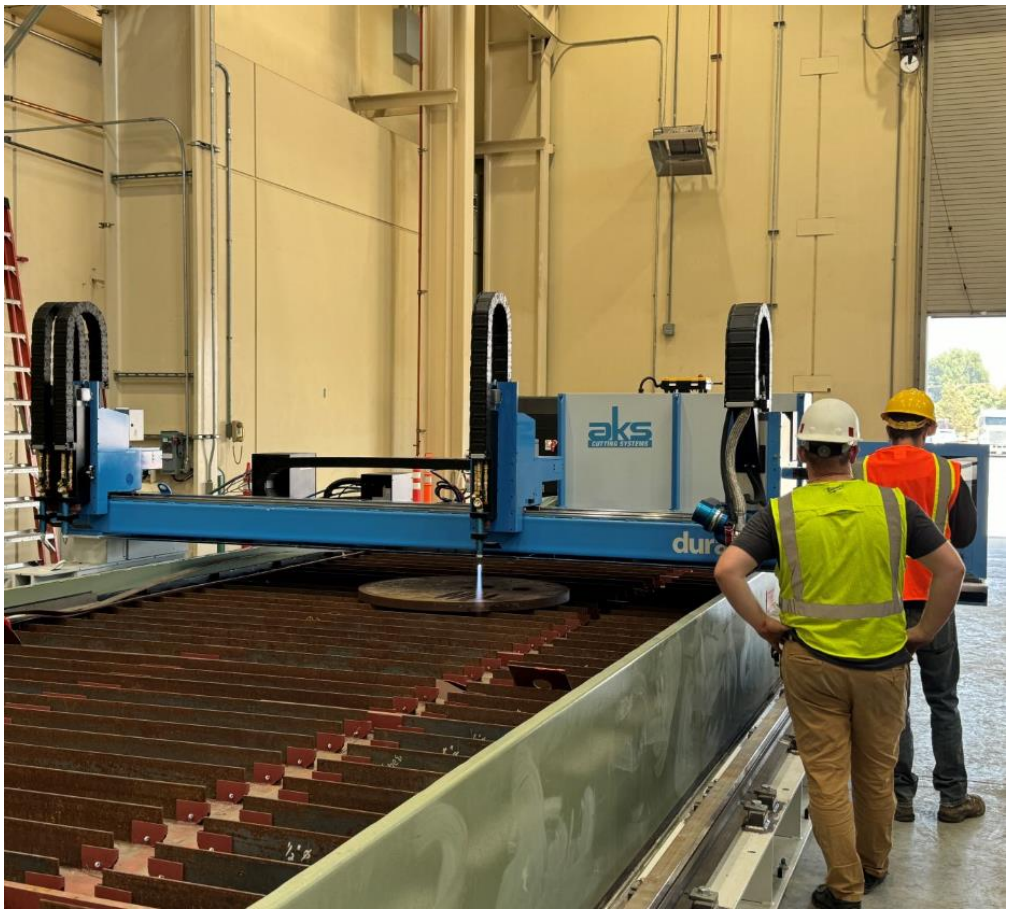
- Headquarters Physical Security Upgrades—This project implements comprehensive security upgrades for the Metropolitan Headquarters Building. These upgrades are consistent with federally recommended best practices for government buildings. The work has been prioritized and staged to minimize rework and 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 completed installation of the ornamental fence around the courtyard and placement of sleeves for the concrete bollards. Construction is 98 percent complete and is scheduled to be complete in October 2024.

- La Verne Shop Improvements—This project will complete the La Verne Shops building improvements and install Metropolitan-furnished shop equipment. The contractor continued installing electrical conduits for branch circuits, began installing reinforcing steel for the new blast booth foundation, continued installing maintenance holes for the new electrical ductbank, began installing concrete formwork for the blast booth pit walls, and began installing new underground natural gas lines. Construction is approximately 93 percent complete and is scheduled to be complete in October 2024.
- Lake Mathews Above Ground Storage Tank—This project will replace the existing above-ground diesel storage tank at Lake Mathews with a new code-compliant tank. Final design is approximately 95 percent complete and is scheduled to be complete in November 2024.



Headquarters Physical Security Upgrades—Stamping Concrete at Gate 4



La Verne Shop Improvements—Blast booth retrofit structure at Coating Shops

Prestressed Concrete Cylinder Pipe (PCCP) Program

The PCCP Program is composed of CIP projects to refurbish or upgrade Metropolitan's PCCP feeders to maintain water deliveries without unplanned shutdowns.

- Second Lower Feeder Valves—This procurement contract provides 13 conical plug valves for the Second Lower Feeder PCCP rehabilitation. Metropolitan's Board awarded a procurement contract for the valves in December 2018. Ten valves have been delivered as of January 2024. The 11th and 12th valves are expected to arrive in late September 2024. Fabrication of the final valve will be completed in late 2024, and delivery is projected for early 2025. Stored valves at Lake Mathews were moved into the new valve storage warehouse.
- Second Lower Feeder Reach 3B—This project installs steel lining and three conical plug valves (described above) along a 3.7-mile-long portion of the Second Lower Feeder that traverses the cities of Lomita, Los Angeles, and Torrance. The contractor is currently installing accessway assemblies, replacing vent stacks, and acquiring permits. A shutdown is planned for next winter to complete the relining and replace three 42-inch valves with three 48-inch valves. Construction is 74 percent complete and is scheduled to be complete in September 2025.

- Allen-McColloch Pipeline Urgent PCCP Rehabilitation—This project will perform urgent relining of approximately three miles of distressed PCCP segments of the Allen-McColloch Pipeline (AMP) that were discovered during an inspection in 2023. Relining of the AMP is being performed in stages to minimize impacts to member agencies by installing a bulkhead and returning the northern portion of the pipeline to service while the southern portion remains under construction. Stage 1 includes carbon fiber reinforced polymer (CFRP) lining of four segments and steel relining of approximately 4,500 feet of pipeline. Construction of the CFRP and 2,100 feet of steel liner within the northern portion of the AMP was successfully completed in April 2024. The remaining 2,300 feet of steel liner installation in the southern portion is approximately 70 percent complete and will be finished by October 2024. Stage 2 work consists of 12,600 feet of steel liner installation and appurtenant work. The Board awarded the Stage 2 contract in May 2024. The Stage 2 contractor has completed potholing, mobilized in July, and shutdown work is planned to be completed by December 2024. All encroachment permits have been issued.

  Electromagnetic Inspections—Regular inspections of the PCCP feeders are a critical step in evaluating the condition of each pipeline and assist staff in prioritizing the relining work on each feeder. This project conducts the fifth cycle of electromagnetic and visual inspections of Metropolitan's approximate 146.4 miles of PCCP pipelines. Inspections of the San Jacinto Pipeline and Orange County Feeder were completed in March 2024 and inspection reports received in May 2024.

  Valve Warehouse—This project constructs an 18,160 square-foot 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 assembly of the building structure, the water line tie-in for the building, and installation of the fire water pipe and building sprinkler system. All construction was completed in June 2024, and the valves were moved into the warehouse in July.

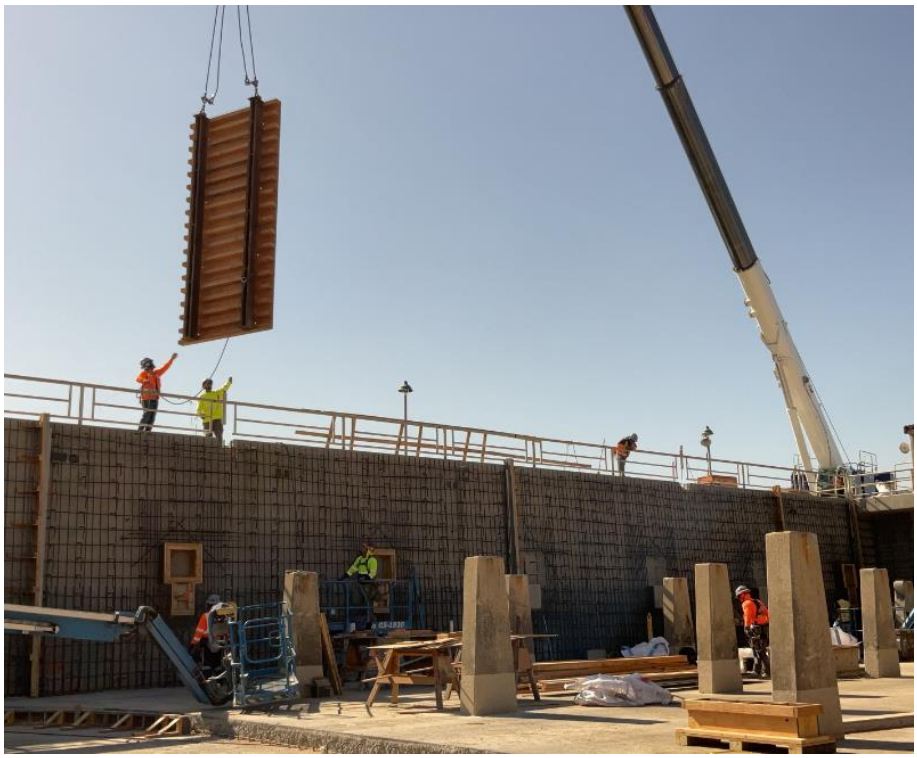
PCCP Valve Warehouse—Offloading crated valves

PCCP Valve Warehouse—Valves in storage with room for valves still to be received

Water Treatment Plants Program

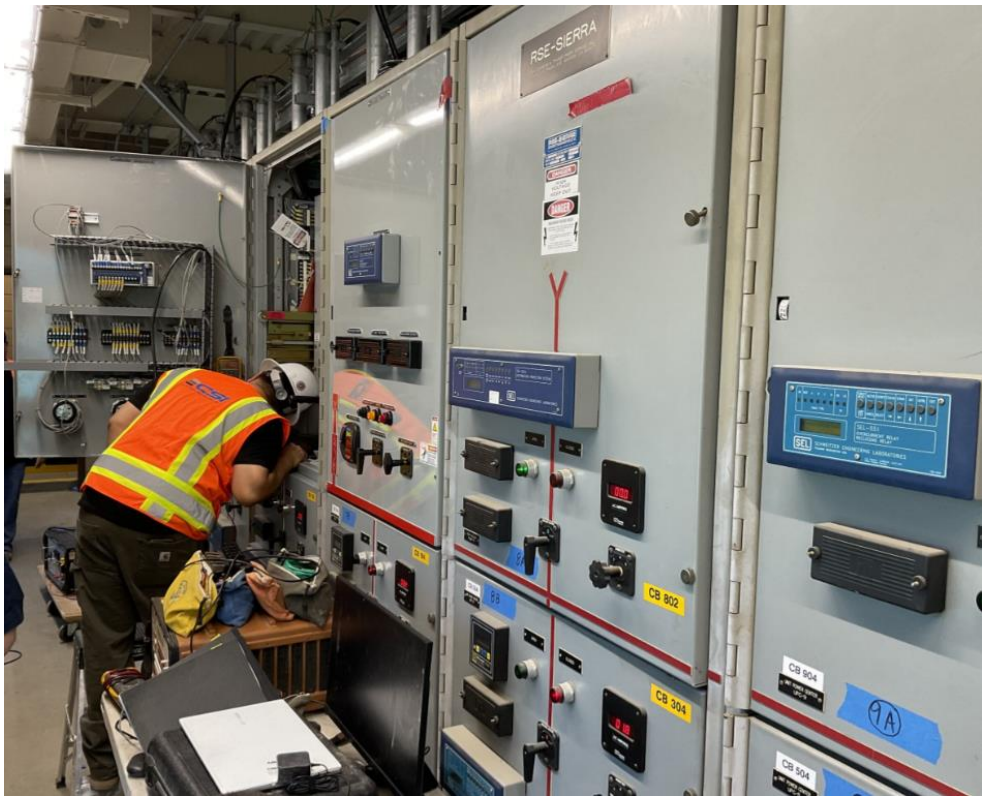
The Water Treatment Plants Program comprises CIP projects to replace or refurbish facilities and components at Metropolitan's five water treatment plants and the chemical unloading facility to continue to reliably meet treated water demands.

- 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 in Basins 7 and 8, and continued construction activities in Basins 5 and 6 and Filter Building No. 2. Overall construction for this contract is approximately 75 percent complete and is scheduled to be complete in July 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. The project constructability review workshop was completed in July 2024. Final design is approximately 70 percent complete and is scheduled to be complete in April 2025.



Weymouth Basins 5–8 and Filter Building No. 2 Rehabilitation—Installing the formwork for the Basin 6 East Flocculation Wall

- 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 4.16 kV switchgear, and replace the standby generator switchgear and the emergency generator programmable logic controller. The contractor continued bench testing and began installation of the switchgear doors inside the Ozone Switchgear Building. Construction is approximately 70 percent complete and is scheduled to be complete in August 2025.
- Diemer Filter Rehabilitation—This project rehabilitates the 48 filters at the Diemer plant by improving critical filter features, replacing filter media, and installing filter valve actuators, along with modifications to the filter upstream influent weir, surface wash laterals, instruments, and appurtenances. The planned upgrades also include improving the coal grit removal facilities for the east and west side of the plant. Final design is approximately 75 percent complete and is scheduled to be complete in December 2024.
- Diemer Chemical Tank Farm Rehabilitation—This project rehabilitates the fluoride tank farm at the Diemer plant by replacing the two fluoride tanks, associated feed equipment and roof over the fluoride tank farm. A temporary fluoride feed system and appurtenant equipment will be installed in order to maintain operations during construction. Final design is approximately 80 percent complete and is scheduled to be complete in November 2024.



Mills Electrical Upgrades—ORP Switchgear New Door Testing

Adapt to changing climate and water resources

Pure Water Southern California

The Pure Water Southern California (PWSC) Program is a large regional recycled water program 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 up to 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 Phase 1 Program 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. 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 EIR for approval in 2026. 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 early 2026. Staff continues to review individual draft technical sections and complete the remaining technical studies.

- Program Management—PWSC program management efforts lead the planning for the PWSC 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.
    - Metropolitan received notice in May 2024 that it was one of the recipients of the U.S. Bureau of Reclamation (USBR) Large-Scale Water Recycling grant (LSWR). The USBR announced that they intend to grant Metropolitan up to $99,199,096 to advance the PWSC planning and design efforts. Staff provided an update to the Board in August 2024 on both the grant and proposed modifications to the agreement with Los Angeles County Sanitation Districts (LACSD). Staff plans to return to the Board to amend the agreement with LACSD in September and request authorization to adopt a resolution to receive and match the USBR grant funding in fourth quarter 2024.
    - A second grant application to the LSWR program was prepared and submitted to the USBR in May for up to $26 million dollars, or the difference between the initial grant request of $125 million and the amount awarded.
    - Additional information on program updates, grant status, and LACSD agreement amendment will be presented at the next PWSC/Regional Conveyance Subcommittee meeting in September 2024.
    - Program governance and program management information systems are currently being developed. Technical studies are underway to support the preparation of the direct potable reuse white paper, and EIR analysis on per- and polyfluoroalkyl substances (PFAS) compounds, and development of program phasing options.
- Advanced Water Purification Facility—The AWPF will purify wastewater from LACSD's A.K. Warren Water Resource Facility (Warren Facility) using membrane bioreactors (MBRs), reverse osmosis (RO), and ultraviolet/advanced oxidation (UV/AOP). With its expertise in biological wastewater treatment, LACSD will assume the responsibility of implementing the AWPF pretreatment and the MBR facilities.
    - A draft conceptual facilities plan has been prepared to document key assumptions of AWPF components. The final draft plan is currently being prepared.
    - Metropolitan 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. The MOS investigation is anticipated to be complete later this year.
- Direct Potable Reuse (DPR)—The California Division of Drinking Water (DDW) published the final DPR regulations in December 2023. On August 6, 2024, the California Office of Administrative Law approved these direct potable reuse (DPR) regulations. These regulations will now take effect on October 1, 2024. 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. Following a technical workshop with the Independent Scientific Advisory Panel (ISAP) in March 2024,

a DPR white paper has been developed to establish Metropolitan's DPR implementation approach via the PWSC Program. Potential opportunities for treated water augmentation (TWA) are also being investigated, and a technical memorandum is being prepared.

- Conveyance Pipeline System—The PWSC conveyance system consists of the backbone pipeline, which extends over 40 miles from the AWPF in the city of Carson to as far north as the city of Azusa; repurposing an existing pipeline owned by another agency (Phase 1) and new DPR pipeline (Phase 2) to convey water from the backbone eastward for raw water augmentation at Metropolitan's Weymouth Plant in the city of La Verne. It also includes several pump stations, service connections, isolation valves, and other pipeline appurtenances. As part of the current environmental planning phase efforts, the project team is preparing the Conveyance Facilities Conceptual Design Report to support the environmental studies and permitting processes required by CEQA. The draft report was recently completed, with the final report anticipated by the end of the year. In addition, Metropolitan's Board authorized consulting agreements for preliminary design of the first two pipeline reaches in March 2023, and both projects are on schedule to complete preliminary design by end of the year.
    - Reach 1—This reach is approximately 6 miles long and runs through the city of Carson, with service connections for LADWP and West Basin MWD. Current work includes utility field investigation and geotechnical work, incorporating value engineering comments, as well as the completion of the preliminary design report and associated engineering drawings. Preliminary design is 82 percent complete.
    - Reach 2—This reach is approximately 8 miles long and runs through the cities of Long Beach and Lakewood, with a service connection for Long Beach Utilities District. Current work includes utility field investigation and geotechnical work, incorporating value engineering comments, as well as coordination with Long Beach Utilities District, Caltrans and other permitting entities for the major tunnel crossing of the I-710 and Los Angeles River. Preliminary design is 47 percent complete.

Drought Mitigation—State Water Project Dependent Areas

The Drought Mitigation—State Water Project (SWP)-Dependent Areas Program is composed of CIP projects to replace, refurbish, upgrade, or construct new facilities, which are identified to mitigate the vulnerability experienced by specific member agencies that are affected during shortages of State Water Project supplies.

- Furnishing Three 84-Inch Valves—This contract was awarded in August 2022 to procure the three 84-inch butterfly valves needed for planned infrastructure improvements at multiple locations on the Inland Feeder to enhance operational flexibility to deliver water from Diamond Valley Lake to the Rialto Pipeline service area for member agencies that are currently dependent on supplies from the State Water Project. The valves were successfully delivered in July 2024 to a warehouse at Diamond Valley Lake. Each valve will be transferred to its respective project in early 2025 before the Inland Feeder pipeline shutdown.

- Foothill Pump Station Intertie—This project will connect Metropolitan's Inland Feeder to San Bernardino Valley Municipal Water District 's (SBVMWD) Foothill Pump Station. The project is one of four Rialto Pipeline service area supply repliability improvement projects. Foothill Pump Station will provide the hydraulic lift needed for direct water delivery from Diamond Valley Lake to Rialto Pipeline. The project will install supply and discharge bypass pipelines, isolation valves and their vault, and a surge protection system. Final design for the project is anticipated to be complete by late 2024. CEQA documention is complete, and adoption is to be considered during August 2024 board action. The project requires permits from CA Fish and Wildlife and US Fish and Wildlife to address impacts to endangered speices found at the project site. The project is to receive a $5 million US Bureau of Reclamation (USBR) grant, and USBR will assist Metropolitan with permit consultation with US Fish and Wildlife Service.
- 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 uses a progressive design-build (PDB) project delivery method. The Board awarded a Phase 1 PDB agreement in September 2023. A July 2024 board action authorized amending the agreement for procurement of the project's electrical transformers. A September 2024 board action is planned for the procurement of the remaining long-lead equipment including the pumps, large valves, electrical switchgear, and motor control centers. Phase 1, which includes site investigation, design to the 70 percent level, and development of a guaranteed maximum price to complete all work is scheduled to be completed in November 2024.

Sustain Metropolitan's mission with a strengthened business model

Value Engineering Program

Engineering Services conducts a Value Engineering (VE) program to review capital projects and identify opportunities and alternatives to enhance project performance, optimize the use of funding for CIP projects, and demonstrate responsible use of public funds. The objective of the VE program is to improve the overall value of CIP projects by applying an industry-accepted assessment methodology to examine a project's function, design, equipment, material selections, and contracting approach. This comprehensive assessment is conducted at multiple stages in a project's life cycle.

- New Value Engineering Agreements—In August, Engineering went to the Board to award new on-call agreements with AECOM, RHA LLC, Strategic Value Solutions Inc., and Value Management Strategies Inc., for value engineering and related technical services. The maximum duration for these agreements is three years.

Empower the workforce and promote diversity, equity, and inclusion

Mentoring Programs

Engineering Management Mentoring Program

With nine individuals promoted to team manager this past year, Engineering launched a spinoff of its core mentoring program to focus on new engineering managers. The Engineering Management Mentoring Program seeks to provide increased support for these highly motivated leaders, including holding a "hackathon" session. A hackathon is an intensive, often multi-day event where individuals from diverse backgrounds and areas of expertise collaborate to develop solutions to tackle problems. The impact of hackathons can be substantial, the combination of cross-disciplinary collaboration, time constraints, and competitive spirit can lead to new ideas that may not emerge from a traditional working environment.