



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

4/9/2024 Board Meeting

8-1

## Subject

Appropriate \$636.48 million for projects identified in the Capital Investment Plan for Fiscal Years 2024/25 and 2025/26 and authorize the General Manager to initiate or proceed with work on capital projects identified in the Capital Investment Plan for Fiscal Years 2024/25 and 2025/26; the General Manager has determined that the proposed action is exempt or otherwise not subject to CEQA

## Executive Summary

Metropolitan's proposed overall two-year budget for Fiscal Years (FYs) 2024/25 and 2025/26 includes \$636.48 million for Capital Investment Plan (CIP) expenditures to support core infrastructure refurbishment and replacement work, along with key additional initiatives like drought mitigation portfolio projects and sustainability initiatives. This action enables the General Manager to manage capital projects in accordance with current board authorization and appropriation processes. This action appropriates funds and authorizes work so that staff can implement projects identified in the CIP Appendix for FYs 2024/25 and 2025/26.

## Proposed Action(s)/Recommendation(s) and Options

### Staff Recommendation: Option #1

#### Option #1

- Appropriate \$636.48 million for projects identified in the CIP Appendix for FYs 2024/25 and 2025/26; and
- Authorize the General Manager to initiate or continue work on the capital projects described in the CIP Appendix for FYs 2024/25 and 2025/26, subject to any limits on the General Manager's authority and CEQA requirements.

**Fiscal Impact:** Appropriation of \$636.48 million under Appropriation No. 15535.

**Business Analysis:** This option will allow efficient management of the CIP.

#### Option #2

Do not appropriate funds. Seek board authorizations and appropriations for each project individually.

**Fiscal Impact:** Due to additional administrative effort and time required to prepare funding requests and board actions for individual capital projects for each phase of the project, annual capital expenditures are anticipated to be less than planned under Option #1. Execution of core refurbishment and replacement work may be delayed.

**Business Analysis:** Appropriation of funds and authorization to execute capital projects individually will increase board paperwork and may result in increased project costs while hindering staff's ability to manage the CIP efficiently.

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## Applicable Policy

Metropolitan Water District Administrative Code Section 2431: Engineering and Operations Committee Duties and Functions

Metropolitan Water District Administrative Code Section 5108: Appropriations

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

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## Related Board Action(s)/Future Action(s)

By Minute Item 51353, dated October 9, 2018, the Board appropriated a total of \$290 million for projects identified in the Capital Investment Plan for Fiscal Years (FYs) 2018/19 and 2019/20; authorized the General Manager to initiate or proceed with work on all capital projects identified in the CIP for FYs 2018/19 and 2019/20 subject to any limits on the General Manager's authority and CEQA requirements; and amend the Administrative Code to (a) allow for an appropriation of planned CIP expenditures following the approval of the biennial budget and authorize work on all capital projects identified in the CIP subject to the requirements of CEQA and limits on the General Manager's authority; and (b) delegate responsibility to the General Manager to determine whether a project is exempt from CEQA.

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## California Environmental Quality Act (CEQA)

### CEQA determination for Option #1:

The proposed action is not defined as a project under CEQA because it involves the creation of government funding mechanisms or other government fiscal activities, which do not involve any commitment to any specific project which may result in a potentially significant physical impact on the environment (State CEQA Guidelines Section 15378(b)(4)).

Metropolitan, as the Lead Agency, will be responsible for complying with the requirements of CEQA and the State CEQA Guidelines for each project that meets the CIP criteria prior to final approval of that project.

As preliminary work and design on CIP projects proceeds, Metropolitan staff will conduct any necessary CEQA review and prepare the appropriate environmental documentation for consideration and approval by the Board or the General Manager, as appropriate.

### CEQA determination for Option #2:

None required

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## Details and Background

### Background

As part of Metropolitan's biennial budget process, staff develops a recommended two-year budget and expenditure plan for the CIP. The budget and expenditure plan for the CIP are reflected in the CIP Appendix and included in Metropolitan's overall two-year budget and associated budget documents. With the approval of the biennial budget, the Board also takes action to appropriate the funds necessary to fund the CIP in the upcoming biennium. In addition, the Board authorizes the General Manager to initiate or proceed with work on capital projects identified in the CIP Appendix (**Attachment 1**), subject to the requirement of CEQA and the limits of the General Manager's authority. This approach to appropriating all funds for the CIP and authorizing the General Manager to conduct all work identified in the CIP Appendix in a single board action has been in effect since October 2018. Since then, staff has utilized this streamlined approach to efficiently perform work on the CIP, resulting in a higher percentage of planned CIP work being conducted in a biennium compared to the prior authorization practices.

With the proposed budget for FYs 2024/25 and 2025/26, staff recommends that the planned CIP expenditures be increased to \$636.48 million from the current budget of \$600 million for the biennium. This increase is intended to address inflationary factors reflected in the California Construction Cost Index, which, if left unaddressed over time, would tend to erode the level of investment required to rehabilitate Metropolitan's existing infrastructure

and construct newly planned infrastructure. The recommended budget supports core refurbishment and replacement work, like prestressed concrete cylinder pipe rehabilitation and upgrade of the electrical systems at the Colorado River Aqueduct pumping plants, while simultaneously advancing work on key initiatives like drought mitigation portfolio for the State Project Water dependent areas and battery energy storage systems for energy sustainability. The proposed two-year CIP budget does not include funding for the full-scale Pure Water Southern California Program. A separate future board action will be required to include it as a capital program in the CIP for FYs 2024/25 and 2025/26.

Staff anticipates that a sustained and consistent effort to rehabilitate Metropolitan's infrastructure will be needed through the current 10-year budget forecast, increasing four percent per year to account for inflationary trends to maintain the system's overall reliability. For this proposed budget, approximately \$3.7 billion of capital work has been identified in the 10-year budget window, of which \$3.2 billion is planned as refurbishment and replacement projects for existing infrastructure.

In February 2024, staff delivered the proposed CIP Appendix to the Board as Attachment 3 to the Proposed Biennial Budget for FYs 2024/25 and 2025/26 (Board Item 9-4). The CIP Appendix includes a description of the capital project evaluation and prioritization process, a summary by program and project group of planned biennial expenditures, a two-year and 10-year expenditure projection by program, planned major objectives under each program, and a description of each planned capital project. The only program that does not include individual project descriptions is the Minor Capital Projects Program. Projects within the Minor Capital Projects Program are identified on an ongoing basis during the two-year budget cycle and consist of individual projects valued at less than \$400,000. The anticipated expenditures on this program for the next two years are estimated to be approximately \$16.2 million.

To develop the proposed two-year budget and 10-year expenditure plan, Metropolitan used an extensive evaluation process that includes a risk analysis to identify and prioritize projects for implementation. The resulting CIP for the upcoming biennium comprises a mix of projects supporting Metropolitan's strategic plan and financial targets. The plan considers budget and staffing constraints, and the data collected for budget preparation indicates that it will take more than ten years to complete the current list of priority projects. This estimate does not consider additional priority projects, which will be identified in future budget cycles. The proposed budget of \$636.48 million for the next two years fits the proposed rate model and reasonably equates to Metropolitan's capacity to work on capital projects. Expenditures less than the proposed budget would defer priority rehabilitation work needed to maintain system reliability, increasing the likelihood of unplanned system outages and/or service disruptions.

The CIP Appendix summarizes planned biennial expenditures totaling approximately \$636.48 million. Some major objectives planned over the next two years are summarized below. For the proposed budget, two dedicated programs have been added to the CIP to address the Board's direction to support (1) the Climate Adaptation Master Plan for Water (CAMP4W) process, and (2) drought mitigation portfolio projects to address the vulnerability experienced by specific member agencies impacted during supply shortages on the State Water Project system. Other programs have been regrouped or renamed for clarity. This change includes creating a dedicated program for information technology and control systems and another program for facilities and systems that support Metropolitan's business and operations but do not fall neatly under other programs. Examples of the projects under the latter program are La Verne Water Quality Laboratory Building Upgrades and Etiwanda Testing Facility. The new program structures and examples of included projects are:

#### ***Climate Adaptation Program***

- Complete construction of Jensen and Skinner Battery Energy Storage Systems and Delta Properties Infrastructure Improvements.
- Complete design and construction of the Demonstration Plant Direct Potable Reuse Modifications project.
- Complete construction of Zero Emission Fleet Pilot Infrastructure.

***Colorado River Aqueduct (CRA) Program***

- Complete construction of CRA Pumping Plant Storage Buildings at Hinds, Eagle Mountain, and Iron Mountain, CRA Pumping Plants Water Treatment Systems Replacement, CRA Pumping Plants Crane Improvements, and CRA Conduit Structural Protection.
- Complete design and begin procurement of equipment for the CRA Main Transformer Rehabilitation project.

***Dams & Reservoirs Program***

- Complete design and begin construction of Diamond Valley Lake and Garvey Reservoir dam monitoring system upgrade projects.
- Complete design of the Jensen and Mills finished water reservoir rehabilitation projects and design of the Garvey Reservoir Rehabilitation project.

***Distribution System Program***

- Complete construction of Perris Valley Pipeline Interstate 215 Tunnel Crossing, Foothill Hydroelectric Power Plant Seismic Upgrade, and Rialto Pipeline Rehabilitation.
- Begin design of the Lake Mathews Forebay Pressure Control Structure and Bypass project utilizing progressive design-build project delivery.

***Drought Mitigation – SWP Dependent Areas Program***

- Complete construction of Badlands Tunnel Surge Protection Facility, Inland Feeder-Rialto Pipeline Intertie, and Wadsworth Pumping Plant Bypass Pipeline.
- Complete design and commence construction on the Sepulveda Feeder Pump Stations project, Stage 1.

***Minor Capital Projects Program***

- Implement various projects with an estimated cost of less than \$400,000 that may require rapid response to address unanticipated failures, safety, or regulatory compliance concerns or to take advantage of shutdown opportunities.

***Information Technology & Control Systems Program***

- Complete implementation of new software for procurement services and a cloud-based Enterprise Content Management System.

***Additional Facilities and Systems Program***

- Complete construction of Diamond Valley Lake Floating Wave Attenuator – Stage 2 and La Verne Shops Improvements – Equipment Installation and Building Completion.
- Complete preliminary design of the La Verne Water Quality Laboratory Upgrades project.
- Complete planning and preliminary design of the District Housing Improvements and Employee Village Enhancement at Hinds, Eagle Mountain, Iron Mountain, and Gene Pumping Plants project.

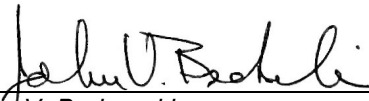

***Prestressed Concrete Cylinder Pipe (PCCP) Program***

- Continue construction to rehabilitate the PCCP portions of the Allen-McColloch Pipeline and Sepulveda Feeder.
- Continue design and construction to rehabilitate the remaining PCCP portions of the Second Lower Feeder.
- Continue preliminary design to rehabilitate PCCP portions of Calabasas Feeder and Rialto Pipeline. Continue annual electromagnetic inspections of all PCCP pipelines.

***Water Treatment Plants Program***

- Complete construction of Mills Electrical Upgrades – Stage 2 and Weymouth Basins 5-8 & Filter Building No. 2 Rehabilitation.
- Complete design of the Diemer Filter Rehabilitation, Weymouth Administration Building Upgrades, and Jensen Solids Mechanical Dewatering Facility projects.

This action appropriates \$636.48 million for projects identified in the CIP Appendix for FYs 2024/25 and 2025/26. This action also authorizes the General Manager to initiate or continue with work on the capital projects described in the CIP Appendix for FYs 2024/25 and 2025/26, initiate new minor capital projects to be identified during the biennial period, and continue work on existing minor capital projects, subject to any limits on the General Manager's authority and CEQA requirements. The General Manager will allocate the appropriated funds to existing and new capital projects as needed in accordance with project schedules and progress. Actions taken by the General Manager per this authority will continue to be reported to the Board in the CIP Quarterly Reports.

 _____ John V. Bednarski Manager/Chief Engineer Engineering Services	3/21/2024 _____ Date
 _____ Adel Hagekhalil General Manager	3/22/2024 _____ Date

**Attachment 1 – Capital Investment Plan Appendix for Fiscal Years 2024/25 and 2025/26**

Ref# es12701830



# Capital Investment Plan Appendix

Fiscal Years  
2024/25 and 2025/26



*Uniquely Metropolitan:  
Maintaining Regional Reliability*



GOVERNMENT FINANCE OFFICERS ASSOCIATION

*Distinguished  
Budget Presentation  
Award*

PRESENTED TO

**Metropolitan Water District of Southern California  
California**

For the Biennium Beginning

**July 01, 2022**

*Christopher P. Morill*

Executive Director

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# CAPITAL INVESTMENT PLAN

## TABLE OF CONTENTS

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<b>Summary</b>	<a href="#"><u>1</u></a>
<b>Capital Investment Plan Organization</b>	<a href="#"><u>2</u></a>
Table 1 - Capital Programs	<a href="#"><u>2</u></a>
<b>Capital Investment Plan Development</b>	<a href="#"><u>3</u></a>
Table 2 - Project Proposal Guidelines	<a href="#"><u>4</u></a>
Table 3 - Evaluation Criteria and Multiplier	<a href="#"><u>6</u></a>
Project Evaluation	<a href="#"><u>7</u></a>
<b>Capital Investment Plan for Fiscal Years 2024/25 and 2025/26</b>	<a href="#"><u>8</u></a>
<b>Financial Projections</b>	<a href="#"><u>10</u></a>
Figure 1 - Capital Investment Plan for FY 2024/25 and FY 2025/26 by Program	<a href="#"><u>10</u></a>
Figure 2 - CIP 10-year Plan by Program	<a href="#"><u>11</u></a>
Figure 3 - CIP 10-Year Plan by Program with Pure Water Southern California - Phase 1	<a href="#"><u>11</u></a>
Table 4 - Two-year Outlook	<a href="#"><u>12</u></a>
<b>CIP Funding</b>	<a href="#"><u>14</u></a>
<b>Capital Investment Plan Detail</b>	<a href="#"><u>15</u></a>
Table 5 - Key Program Information	<a href="#"><u>15</u></a>
Table 6 - Program Summary Index	<a href="#"><u>15</u></a>
<b>Individual Program Summaries</b>	<a href="#"><u>16</u></a>

# CAPITAL INVESTMENT PLAN

## Summary

The primary focus of the Capital Investment Plan (CIP) Appendix is to provide information on all CIP programs and projects that have been proposed, evaluated, and included in the budget forecast to begin or continue during and after fiscal year (FY) 2024/25 and FY 2025/26. Projects included in this document are referred to as “planned” and upon appropriation of the CIP budget for FY 2024/25 and FY 2025/26 are authorized to proceed by the Chief Engineer’s approval under the authority of the General Manager.

Scope, accomplishments, objectives, and financial projections are provided for each capital program. Every project with work planned for the two budget years and beyond is listed under the Individual Program Summaries. However, projects in the post-construction phase or the post-deployment phase are not included but will proceed to completion and closeout under the authorization carried over from previous biennia.

The total planned capital spending for FY 2024/25 and FY 2025/26 of approximately \$636.5 million includes all anticipated costs for labor including administrative overhead, construction, and professional services contract costs, right of way, materials, operating equipment, and incidental expenses.

Annual planned capital spending for FY 2024/25 and FY 2025/26 is estimated to be approximately \$312.0 million and \$324.5 million, respectively, and is planned to be funded by a combination of current operating revenues (i.e., PAYGO) and debt. Engineering Services tracks actual spending against the plan and adjusts priorities and staff assignments to manage spending consistent with the overall CIP budget.

Capital Program	FY 2024/25	FY 2025/26	Total
Climate Adaptation	\$ 7,760,000	\$ 17,680,000	\$ 25,440,000
Colorado River Aqueduct	\$ 43,640,000	\$ 42,190,000	\$ 85,830,000
Dams & Reservoirs	\$ 36,230,000	\$ 35,880,000	\$ 72,110,000
Distribution System	\$ 59,370,000	\$ 42,590,000	\$ 101,960,000
Drought Mitigation – SWP Dependent Areas	\$ 39,320,000	\$ 27,010,000	\$ 66,330,000
Information Technology & Control Systems	\$ 24,130,000	\$ 25,950,000	\$ 50,080,000
Minor Capital Projects	\$ 8,490,000	\$ 7,720,000	\$ 16,210,000
Additional Facilities and Systems	\$ 19,120,000	\$ 10,180,000	\$ 29,300,000
Prestressed Concrete Cylinder Pipe	\$ 16,880,000	\$ 49,580,000	\$ 66,460,000
Water Treatment Plants	\$ 57,060,000	\$ 65,700,000	\$ 122,760,000
<b>Total</b>	<b>\$ 312,000,000</b>	<b>\$ 324,480,000</b>	<b>\$ 636,480,000</b>

## Capital Investment Plan Organization

### CIP Structure

The CIP is structured into three levels for clear planning and reporting in the following format:

1. PROGRAM
2. PROJECT GROUP
3. PROJECT

The highest level of the CIP structure is Program. Programs are comprised of one or more Project Groups. There are 10 capital programs described in Table 1.

**Table 1 - Capital Programs**

<b>Program</b>	<b>Definition</b>
Climate Adaptation	Projects under this program will replace, refurbish, upgrade, or construct new facilities to prepare Metropolitan to adjust to current and projected climate change impacts on its operation and its mission to provide its service area with adequate and reliable supplies of high-quality water in an environmentally and economically responsible way.
Colorado River Aqueduct (CRA)	Projects under this program will replace or refurbish facilities and components on the CRA system to reliably convey water from the Colorado River to Southern California.
Dams & Reservoirs	Projects under this program will upgrade or refurbish Metropolitan's dams, reservoirs, and appurtenant facilities to reliably meet water storage needs and regulatory compliance.
Distribution System	Projects under this program will 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.
Drought Mitigation – SWP Dependent Areas	Projects under this program will replace, refurbish, upgrade, or construct new facilities, which are identified to mitigate the vulnerability experienced by specific member agencies that are impacted during shortages on the State Water Project supplies.
Information Technology & Control Systems	Projects under this program will 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.
Minor Capital Projects	This program is comprised of projects, with an estimated cost of less than \$400,000, that often require rapid response to address unanticipated failures, safety or regulatory compliance concerns, or to take advantage of shutdown opportunities. The projects will be identified after adoption of the budget.
Additional Facilities and Systems	Projects under this program will refurbish, replace, upgrade, or provide new facilities and systems that support Metropolitan's business and operations.
Prestressed Concrete Cylinder Pipe (PCCP)	Projects under this program will refurbish or upgrade Metropolitan's PCCP feeders to maintain reliable water deliveries without unplanned shutdowns.
Water Treatment Plants	Projects under this program will replace or refurbish facilities and components at Metropolitan's five water treatment plants and chlorine unloading facility (CUF) to continue to reliably meet treated water demands.

## Capital Investment Plan Development

### Background

The projects that comprise the proposed CIP have been identified from many Metropolitan studies of projected water needs as well as ongoing monitoring and inspections, condition assessments, and focused vulnerability studies. Staff continues to study operational demands on aging facilities and has made recommendations for capital projects that will maintain infrastructure reliability and ensure compliance with all applicable water quality regulations, and building, fire, and safety codes. Staff has also studied business and operations processes and proposed projects that will improve efficiency and provide future cost savings. Additionally, a number of projects have been identified and prioritized to mitigate the vulnerability experienced in the State Water Project dependent areas during the most recent drought.

### CIP Development Process

The CIP is structured to reflect Metropolitan's strategic goals of providing a reliable supply of high-quality water at the lowest cost possible. As part of the CIP development process, all new and existing projects are evaluated against an objective set of criteria to ensure existing and future capital investments are aligned with Metropolitan's priorities for water supply reliability, water quality, and public safety.

This rigorous evaluation process has resulted in a thorough review and assessment of all proposed capital projects by staff and managers prior to inclusion in the CIP budget. Staff continues to conduct comprehensive field investigations that identify critical replacement and refurbishment projects and a variety of necessary facility upgrades related to infrastructure reliability as well as regulatory compliance. Project schedules are evaluated regularly to plan for necessary capital investments in infrastructure reliability and to accommodate the urgency of each project. Additionally, current demand projections that account for ongoing conservation, planned increased local supply production, and the economy, have been evaluated to ensure that demand and drought-related projects are appropriately scheduled.

### Project Proposals

Project sponsors are required to submit proposals for all projects that have not yet been authorized through the completion of the project to be considered for inclusion into the CIP. For newly proposed projects, proposals must include scope, justification, alternatives, impacts of re-scheduling work for a later time, impact on operations and maintenance costs, and an estimate of total project cost. For existing projects, staff must also provide justification for continuing the project, explain any changes since the proposal was last evaluated, and describe critical phases for the upcoming years.

The projects are evaluated, scored, and prioritized based on the contents of the proposals. The key guidelines provided to the project sponsors are summarized in Table 2.

Table 2 - Project Proposal Guidelines

Section	Guideline												
Appropriation No., CIP Index No., Project No., (if existing) and Project Title	If a proposed project has been previously included in the CIP and has been assigned a CIP index number, provide the appropriation and CIP index number along with the project title and project number if one has been assigned. If not previously included in the CIP, provide a project title only.												
Sponsoring Group	<p>Indicate the group sponsoring the project, as follows:</p> <table> <tr> <td>1) Administrative Services</td><td>7) Real Property</td></tr> <tr> <td>2) Bay Delta</td><td>8) Security</td></tr> <tr> <td>3) Engineering Services</td><td>9) Sustainability</td></tr> <tr> <td>4) Finance</td><td>10) Water Resource Management</td></tr> <tr> <td>5) Human Resources</td><td>11) Operations</td></tr> <tr> <td>6) Information Technology</td><td></td></tr> </table>	1) Administrative Services	7) Real Property	2) Bay Delta	8) Security	3) Engineering Services	9) Sustainability	4) Finance	10) Water Resource Management	5) Human Resources	11) Operations	6) Information Technology	
1) Administrative Services	7) Real Property												
2) Bay Delta	8) Security												
3) Engineering Services	9) Sustainability												
4) Finance	10) Water Resource Management												
5) Human Resources	11) Operations												
6) Information Technology													
Project Manager and Proposal Preparer	Enter the name of the project manager if one was assigned and enter the name of proposal preparer.												
Estimated Total Project Cost	Show the total estimate of cost from inception to completion of a project, including administrative overhead and contingency, as applicable.												
GM Business Plan	Indicate the strategic priorities under GM's Business Plan the project best supports.												
Current Project Phase	Indicate the phase (Study, Preliminary Design, etc.) as of the date proposal submitted.												
Current Phase % Complete	Current phase percent complete as of the date proposal submitted.												
Project Description	Describe the project scope of work.												
Changes to Existing Project	For an existing project, describe any changes to the project scope, budget, or schedule over the past two years.												
Justification	<p>Describe the nature of the issue to be addressed by the project. What is the problem? What is the function of the facility/component being addressed by the project? Why is the project needed? Why can't the project be postponed?</p> <p>Consider issues such as:</p> <ul style="list-style-type: none"> <li>• Operational flexibility</li> <li>• New facility expansion</li> <li>• New water supply</li> <li>• Aging infrastructure deterioration/failure</li> <li>• Process improvement/failure</li> <li>• Maintenance capability</li> <li>• Seismic vulnerability</li> <li>• Obsolescence (vendor support, parts, technology, etc.)</li> <li>• Security</li> <li>• Regulatory Compliance (water quality, environmental, health and safety, etc.)</li> <li>• Cost savings</li> <li>• Revenue generation</li> <li>• Energy savings</li> <li>• Productivity/Innovation/Sustainability</li> </ul> <p>Include an explanation of how the project addresses any of the above issues and provide documentation, when applicable, to substantiate the need for the project.</p>												

Section	Guideline
Directive	<p><b>Regulatory/Legal Settlement:</b> Indicate if this is related to a written citation, verbal/written directive (including environmental mitigation mandated by a Mitigated Negative Declaration or Environmental Impact Report), or in-house identification (including enforceable code requirement or Metropolitan standard).</p> <p><b>Special Initiative/Directive:</b> Indicate if the project is specifically identified in one of the core or strategic initiatives; identified via Area Study, System Overview Study, etc.; and/or what phase(s) of the project have been authorized such as study, preliminary design, or final design.</p>
Service Disruption	Describe how Metropolitan's day-to-day operations could be impacted if the project is not approved. Consider business, as well as water system operations, including maintenance activities.
Cost/Sustainability/ Customer Service	Describe potential cost, water, and/or energy savings, waste reduction, revenue/energy generation, better customer service (internal or external), etc., that justify the project. Include a pay-back period.
Alternatives	Provide a brief description of any potential project scope alternatives, including any opportunities to "stage" the work. Include if it is possible to only perform a portion of a project to meet foreseeable customer needs. Consider the possibility of new technology, changing demands, as well as environmental impacts and economies of scale. Describe any reasonable projects, processes, or other initiatives available as alternatives to the project. Discuss both positive and negative aspects of each alternative. If possible, explain what other similar agencies are doing about this or similar issue.
Additional Background Information	Provide any other supplemental information (e.g. detailed history of a problem, supporting technical information, shutdown constraints, etc.) that will help in evaluating the project. This can also be attached to the proposal.
Schedule	Indicate the proposed beginning and end dates for all appropriate phases.
Detailed Project Cost Estimate	<p>Include an itemized list of all costs for the project, as follows:</p> <ol style="list-style-type: none"> <li>1) Direct Labor with additives at the indicated rate</li> <li>2) Equipment and Materials</li> <li>3) Incidental Expenses</li> <li>4) Professional/Technical Services (e.g., consultants)</li> <li>5) Right-of-Way and Land Purchases (e.g., easements, fee title, escrow fees)</li> <li>6) Operating Equipment Use and Rental</li> <li>7) Contract Payments (e.g., construction contracts)</li> <li>8) Administrative Overhead at the indicated rate</li> <li>9) Contingency</li> </ol> <p>All new project proposals and existing projects must include this estimate.</p>
Post-Implementation O&M Impacts	To the extent available/known, provide a description of the impacts, costs, and/or benefits this capital project is anticipated to have on Metropolitan's current and future O&M expenses and services upon completion (e.g. labor, maintenance, and equipment costs; enhanced reliability; improved water quality, etc. For example, "Ozone generators will substantially increase electrical consumption by approximately \$1 million annually and the number of new pieces of equipment will require periodic maintenance per the manufacturer's recommendations beginning in FY 2025/26. PDR and future studies will provide additional detail on the overall lifecycle costs"). This is required for projects greater than \$2 million and whose planned implementation date is within the next five fiscal years.
Approvals	<ol style="list-style-type: none"> <li>1) Person submitting the proposed project - Type name only</li> <li>2) Team manager sponsoring the project</li> <li>3) Unit manager sponsoring the project</li> <li>4) Section manager sponsoring the project (e.g., all new and existing projects)</li> <li>5) Group manager sponsoring the project (e.g., all new projects)</li> </ol>

## Evaluation Criteria

The evaluation criteria cover four characteristics or objectives for capital projects: Project Justification, Directive, Service Disruption, and Cost/Sustainability/Customer Service. In addition, a multiplier is applied to a project rating to factor in a risk assessment. Table 3 provides a description of the criteria and multiplier.

Table 3 - Evaluation Criteria and Multiplier

Criteria	Description
Justification	Assessment of the overall importance of a project. Criterion looks at whether or not a project supports the following: <ul style="list-style-type: none"> <li>- Supply reliability</li> <li>- Infrastructure reliability</li> <li>- Regulatory compliance</li> <li>- Other goals (e.g., cost savings, revenue generation, energy savings, increased productivity, innovation, and sustainability)</li> </ul>
Directive	Assessment of whether or not a project is specifically identified in one of the core or strategic initiatives, if any permitting agency such as the California State Department of Safety of Dams has issued a directive or citation to take corrective actions, the current authorized scope of work, and/or support the GM Business Plan: <ul style="list-style-type: none"> <li>- Regulatory/Legal Settlement</li> <li>- Special Initiative/Directive</li> <li>- GM Business Plan</li> </ul>
Service Disruption	Assessment of not doing a project. Criterion evaluates the following: <ul style="list-style-type: none"> <li>- Impact to Metropolitan's business operations</li> <li>- Impact to water system operations (e.g., system delivery and/or reliability, cascading impact on system due to failure, etc.)</li> </ul>
Cost/Sustainability/Customer Service	Assessment of whether or not a project improves the following: <ul style="list-style-type: none"> <li>- Cost efficiency</li> <li>- Sustainability</li> <li>- Customer service</li> </ul>

Multiplier	Description
Risk Assessment	Assessment of the following probability. This assessment is also assisted by evaluation of risk/consequence heatmap, which provides information on the relative consequence and likelihood of failure before and after the proposed project is complete. <ul style="list-style-type: none"> <li>- Facility/component/process failure</li> <li>- Health, safety, water quality, or environmental impact</li> <li>- Missed opportunity (e.g., available resources, shutdown, revenue generation, cost savings, supply)</li> <li>- Not meeting service demands</li> </ul>

### Project Evaluation

A CIP Evaluation Committee comprised of staff from Operations, Water Resource Management, Real Property, Engineering Services, Finance, Information Technology, Environmental Planning, Safety & Regulation, and External Affairs evaluate and score all project proposals. The evaluation criterion is designed to prioritize projects that directly support reliability, quality, and safety for inclusion in Metropolitan's proposed CIP.

An iterative process is employed to first score and rank every new and existing project, and then solicit feedback from project sponsors, resource providers, and management to establish schedules and cash flow requirements. The final schedule and implementation plan for FY 2024/25 and FY 2025/26 are reflected in the budget and objectives summarized under each of the Individual Programs Summaries that appear later in this document.

## Capital Investment Plan for Fiscal Years 2024/25 and FY 2025/26

In October 2018, Metropolitan's Board amended the Administrative Code to allow for an appropriation of the total amount of planned biennial CIP spending following the approval of the biennial budget and authorize work on all capital projects identified in the CIP subject to the requirements of CEQA and limits on the General Manager's authority; and delegate responsibility to the General Manager to determine whether a project is exempt from CEQA. In order to be considered a planned project, the project must be included and described in this Capital Investment Plan Appendix for the two-year budget cycle. Consistent with this action, all requests to allocate appropriated CIP funds and proceed with planned capital projects are reviewed and approved by the Chief Engineer acting under the General Manager's authority. Upon approval, such requested funds are then transferred to the pertinent capital project. These transfers are based on management decisions to initiate capital projects and/or proceed to the next phase of planned work.

To arrive at the spending plan for individual programs, the budget and schedule for each individual project is paired with project metadata (sponsor and management priorities, CIP scores, project status, etc.). The projects are then organized (or leveled) using an algorithm that combines anticipated capital spending with project prioritization. The resulting plan represents a spending model snapshot in time and is adjusted during the biennium as priorities and conditions change.

### Additions

Projects not described in this CIP Appendix are considered unplanned and are not included in the planned biennial spending. Unplanned projects require specific board authorization to amend the CIP Appendix to add unplanned projects before work can be initiated. Six unplanned projects were added to the FY 2022/23 and FY 2023/24 budget as authorized by the Board through the first quarter of FY 2023/24. These projects were identified after adoption of the budget and included projects such as Upper Feeder Santa Ana River Crossing Expansion Joint Replacement, Foothill Feeder Blowoff Valve Replacement, Diemer Helicopter Hydrant Facility, Jensen Administration Building Column Panel Replacement, Skinner Sodium Hypochlorite Tank Replacement, and Auld Valley and Red Mountain Control Structure Upgrades. The Upper Feeder Santa Ana River Crossing Expansion Joint Replacement project is complete and the remaining projects are now included in this document and are considered planned projects for FY 2024/25 and FY 2025/26.

### New Projects

Since the start of the current biennium, a total of approximately 100 new project proposals, including unplanned but excluding Minor Capital projects have been submitted and reviewed by the CIP Evaluation Committee to either proceed as proposed, or be staged to perform only a portion of the work in the biennial budget period, and have been incorporated into the current or this new CIP Appendix.

### Major Objectives

Below, grouped by CIP Program, are descriptions of some of the capital project major activities anticipated to be underway or completed over the next two fiscal years.

#### Climate Adaptation

Complete construction of Jensen and Skinner Battery Energy Storage Systems and Delta Properties Infrastructure Improvements. Complete design and construction of the Demonstration Plant Direct Potable Reuse Modifications project.

#### Colorado River Aqueduct

Complete construction of CRA Pumping Plant Storage Buildings at Hinds, Eagle Mountain, and Iron Mountain, CRA Pumping Plants Water Treatment Systems Replacement, CRA Pumping Plants Crane Improvements, and CRA Conduit Structural Protection. Complete design and begin procurement for the CRA Main Transformer Rehabilitation project.

### Dams & Reservoirs

Complete design and begin construction of Diamond Valley Lake and Garvey Reservoir dam monitoring system upgrade projects. Complete design of the Jensen and Mills finished water reservoir rehabilitation projects and design of the Garvey Reservoir Rehabilitation project.

### Distribution System

Complete construction of Perris Valley Pipeline Interstate 215 Tunnel Crossing, Foothill Hydroelectric Power Plant Seismic Upgrade, and Rialto Pipeline Rehabilitation. Complete delivery of the Lakeview Pipeline Relining - Stage 2 steel pipe. Begin design of the Lake Mathews Forebay Pressure Control Structure and Bypass project utilizing progressive design-build project delivery.

### Drought Mitigation – SWP Dependent Areas

Complete construction of Badlands Tunnel Surge Protection Facility, Inland Feeder-Rialto Pipeline Intertie, and Wadsworth Pumping Plant Bypass Pipeline. Start construction of the Inland Feeder-San Bernardino Valley Municipal Water District Foothill Pump Station Intertie project. Complete design and commence construction on the Sepulveda Feeder Pump Stations project.

### Information Technology & Control Systems

Complete construction of Gene Communication System Upgrade. Complete deployment of Maximo Mobile Upgrade, Payroll-Timekeeping Reimplementation, and WiFi Upgrade. Complete design and begin construction of the Desert Microwave Tower Site Upgrades project.

### Additional Facilities and Systems

Complete construction of Diamond Valley Lake Floating Wave Attenuator – Stage 2 and La Verne Shops Improvements – Equipment Installation and Building Completion. Complete preliminary design of the La Verne Water Quality Laboratory Upgrades project. Complete planning and preliminary design of the District Housing Improvements and Employee Village Enhancement at Hinds, Eagle Mountain, Iron Mountain, and Gene Pumping Plants project.

### Prestressed Concrete Cylinder Pipe

Continue design and construction to rehabilitate the remaining PCCP portions of the Second Lower Feeder. Continue final design and start construction to rehabilitate the PCCP portions of the Allen-McColloch Pipeline and Sepulveda Feeder. Continue preliminary design to rehabilitate PCCP portions of Calabasas Feeder and Rialto Pipeline. Continue annual electromagnetic inspections of all PCCP pipelines.

### Water Treatment Plants

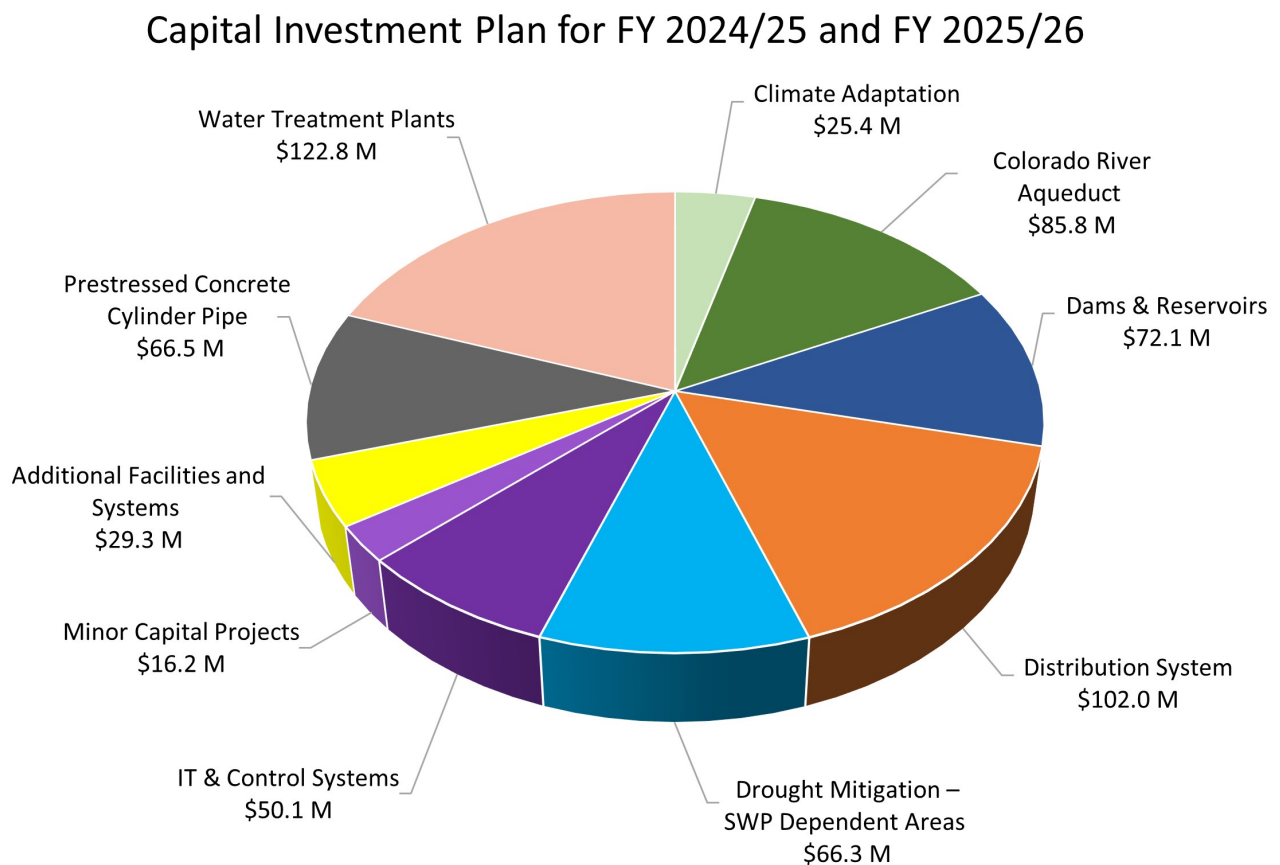
Complete construction of Mills Electrical Upgrades – Stage 2, Weymouth Basins 5-8 & Filter Building No. 2 Rehabilitation, and Weymouth Wheeler Gate Security Improvements. Complete design of the Diemer Filter Rehabilitation, Weymouth Administration Building Upgrades, and Jensen Solids Mechanical Dewatering Facility projects.

## Financial Projections

Planned capital spending for FY 2024/25 and FY 2025/26 is estimated to be \$312.0 million and \$324.5 million, respectively, and are planned to be funded by a combination of current operating revenues (R&R and PAYGO) and debt. Considerations for timing of nearby projects and facility shutdowns, urgency, aging infrastructure, updated service demand projections, and regulatory requirements are taken into account. Estimated capital spending is updated on a regular basis as new projects are added, other projects are completed, construction cost estimates are refined, or contracts awarded. From time to time, projects that have been undertaken are delayed, redesigned or deferred for various reasons and no assurance can be given that a project in the CIP will be completed in accordance with its original schedule.

The total planned spending for the FY 2024/25 and FY 2025/26 biennium is approximately \$636.5 million as shown in Figure 1 by Program. Planned spending has been estimated based on anticipated project progress and estimated costs for all ongoing and planned work for the new biennium budget period.

Figure 1 - Capital Investment Plan for FY 2024/25 and FY 2025/26 by Program



Figures 2 and 3 depict the 10-year CIP projected cash flow from FY 2024/25 through FY 2033/34 with or without the projected cash flow for Pure Water Southern California (PWSC) and Table 4 provides a more detailed two-year outlook. Currently, activities associated with the PWSC are limited to operations and testing at the Advanced Water Treatment Demonstration Plant (demo plant) and environmental permitting. Ongoing modifications to the demo plant are included in the CIP, while preparation of a Programmatic Environmental Impact Report is funded under the O&M budget via the \$80 million state grant. The capital work on the PWSC will require specific Board decisions prior to funding and authorization to proceed.

Figure 2 - CIP 10-year Window by Program

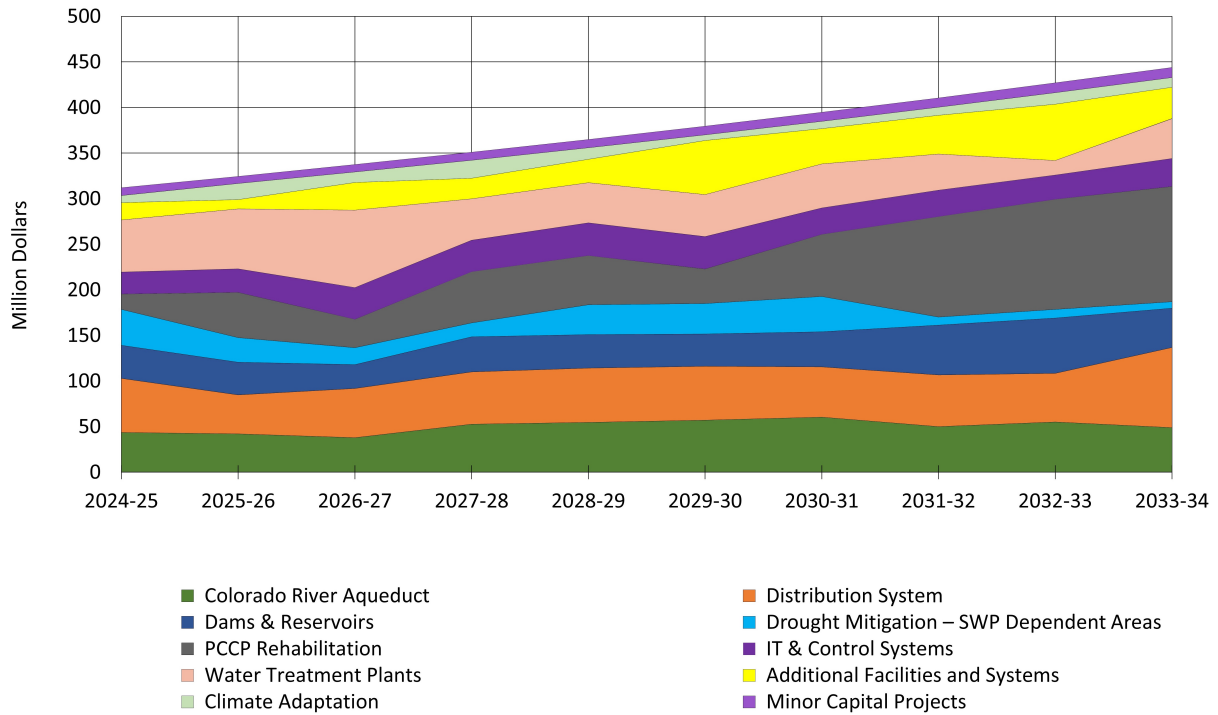


Figure 3 - CIP 10-year Window by Program with Pure Water Southern California - Phase 1

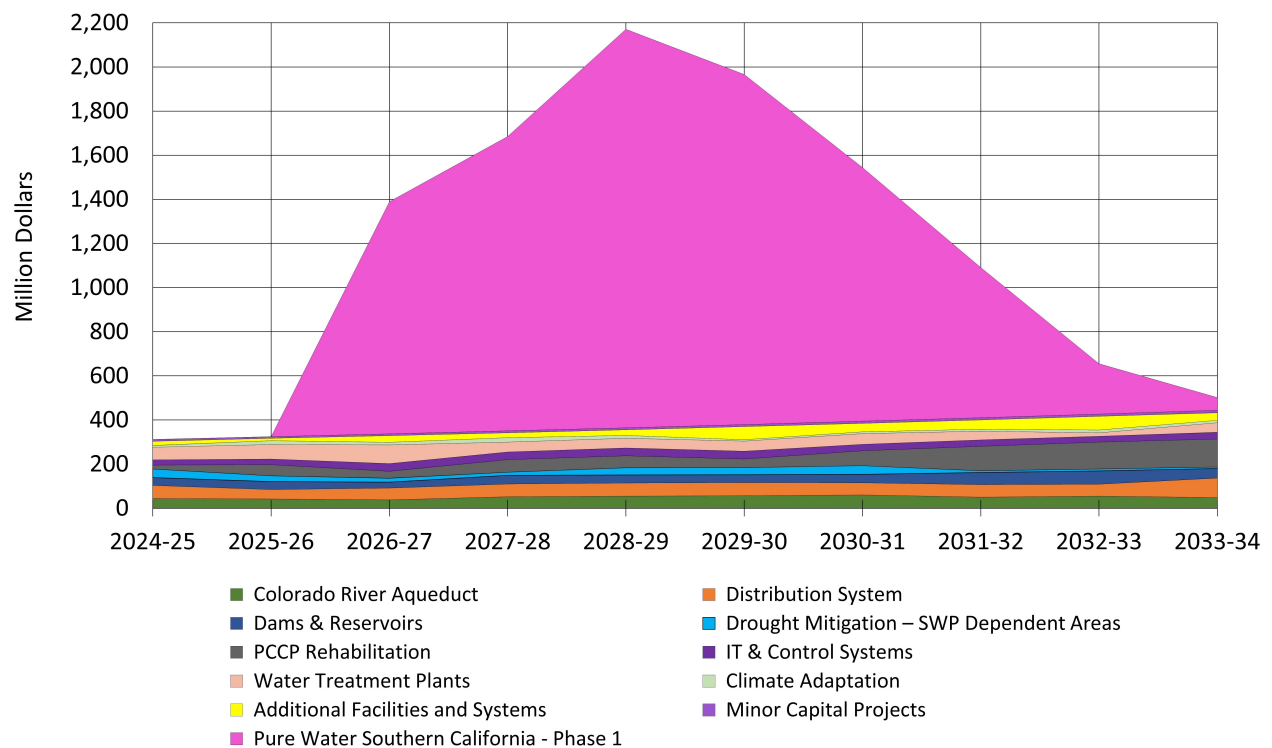


Table 4 - Two-Year Outlook

Capital Program and Project Groups	FY 2024/25	FY 2025/26
<b>Climate Adaptation</b>	<b>\$ 7,760,000</b>	<b>\$ 17,680,000</b>
Climate Adaptation - All	\$ 7,760,000	\$ 17,680,000
<b>Colorado River Aqueduct</b>	<b>\$ 43,640,000</b>	<b>\$ 42,190,000</b>
CRA - Conveyance	\$ 4,050,000	\$ 2,490,000
CRA - Electrical Systems	\$ 1,290,000	\$ 12,930,000
CRA - Pumping Plants	\$ 38,300,000	\$ 26,770,000
CRA - Other	\$ —	\$ —
<b>Dams &amp; Reservoirs</b>	<b>\$ 36,230,000</b>	<b>\$ 35,880,000</b>
Dams & Reservoirs - All	\$ 36,230,000	\$ 35,880,000
<b>Distribution System</b>	<b>\$ 59,370,000</b>	<b>\$ 42,590,000</b>
Pipelines, Tunnels, Canals	\$ 17,350,000	\$ 6,350,000
Pump Stations/Pressure Control Structures/Hydroelectric Plants/ Service Connections/Flow Meters/Valves & Gates Structures	\$ 31,960,000	\$ 29,400,000
Right-of-Way & Infrastructure Protection	\$ 8,200,000	\$ 2,740,000
Distribution System - Other	\$ 1,860,000	\$ 4,100,000
<b>Drought Mitigation – SWP Dependent Areas</b>	<b>\$ 39,320,000</b>	<b>\$ 27,010,000</b>
Drought Mitigation – SWP Dependent Areas - All	\$ 39,320,000	\$ 27,010,000
<b>Information Technology &amp; Control Systems</b>	<b>\$ 24,130,000</b>	<b>\$ 25,950,000</b>
IT Applications	\$ 8,080,000	\$ 6,680,000
IT Infrastructure	\$ 4,160,000	\$ 4,600,000
IT Security	\$ 1,890,000	\$ 3,260,000
Control Systems/SCADA	\$ 10,000,000	\$ 11,410,000
<b>Minor Capital Projects</b>	<b>\$ 8,490,000</b>	<b>\$ 7,720,000</b>
Minor Capital Projects - All	\$ 8,490,000	\$ 7,720,000
<b>Additional Facilities and Systems</b>	<b>\$ 19,120,000</b>	<b>\$ 10,180,000</b>
Employee Housing	\$ 430,000	\$ 530,000
Recreation	\$ 1,240,000	\$ —
Districtwide & Additional Facilities & Systems	\$ 17,450,000	\$ 9,650,000

<b>Capital Program and Project Groups</b>	<b>FY 2024/25</b>	<b>FY 2025/26</b>
<b>Prestressed Concrete Cylinder Pipe</b>	<b>\$ 16,880,000</b>	<b>\$ 49,580,000</b>
Allen McColloch Pipeline	\$ 2,900,000	\$ —
Calabasas Feeder	\$ —	\$ —
Rialto Feeder	\$ —	\$ —
Second Lower Feeder	\$ 1,010,000	\$ 3,410,000
Sepulveda Feeder	\$ 9,820,000	\$ 43,630,000
PCCP - Other	\$ 3,150,000	\$ 2,540,000
<b>Water Treatment Plants</b>	<b>\$ 57,060,000</b>	<b>\$ 65,700,000</b>
Diemer	\$ 11,930,000	\$ 44,560,000
Jensen	\$ 9,720,000	\$ 9,940,000
Mills	\$ 5,170,000	\$ 2,200,000
Skinner	\$ 1,440,000	\$ 2,040,000
Weymouth	\$ 28,800,000	\$ 6,230,000
Water Treatment - General	\$ —	\$ 730,000

## CIP Funding

Funding for CIP is becoming more diverse than it has ever been as Metropolitan continues to seek outside sources of funds to support infrastructure projects. Listed below are funding sources other than the funds Metropolitan's Board will approve and appropriate for the next biennium.

### Battery Energy Storage System

In October 2020, Metropolitan's Board authorized to amend the CIP Appendix to add unplanned battery energy storage system (BESS) projects to enhance the efficiency of Metropolitan's long-term power use, provide a hedge against projected electricity price increases, and improve the resiliency of electric supply at the Jensen, Skinner, and Weymouth Water Treatment Plants. This decision was aided by the California Public Utilities Commission's enhanced incentives for microgrid-capable BESS at critical facilities, which are expected to reimburse Metropolitan for \$10.3 million of project costs.

Weymouth BESS construction is estimated to be completed in the second half of FY 2023/24 and Jensen & Skinner BESS construction is estimated to be completed in FY 2024/25.

### Webb Tract Delta Island Flooded Wetlands and Rice Field System

In May 2023, Metropolitan was awarded a \$20.9 million grant from the Delta Conservancy to fund design, environmental documentation, permitting, and construction of the Webb Tract Delta Island Flooded Wetlands and Rice Field System project.

### Diamond Valley Lake Recreation

The Diamond Valley Lake (DVL) Recreation Program is a unique appropriation. The program was fully funded with \$92.8M in 2004 with the intent of constructing recreational facilities at the East and West Dams. One condition placed on the appropriation was that proceeds from the sale of any surplus DVL properties would be used as additional funds to the program. In 2021, Metropolitan sold DVL land valued at \$4.5M and this amount was added to the DVL Recreation appropriation. Future sales will be addressed similarly. The proposed projects under this program are described in the Additional Facilities and Systems Program section.

## Capital Investment Plan Detail

The core of this section is the Individual Program Summaries, which provide information for each capital project that has been proposed, evaluated, and included in the budget forecast to begin or continue during and after FY 2024/25 and FY 2025/26. Scope, accomplishments, objectives and financial projections are provided for each capital program. Every project with work planned for the two budget years and beyond is listed under the appropriate Program Summary by Project Group. The information provided reflects project details current as of the time of publication and is subject to change. The Individual Program Summaries are ordered alphabetically by program title. The information contained in the Individual Program Summaries is described in further detail below.

### Key Information

For each program, key information is highlighted at the top of the Individual Program Summary page and includes the FY 2024/25 and FY 2025/26 biennial estimate. Table 5 provides an explanation of each item.

Table 5 - Key Program Information

Item	Description
Program Description	A brief explanation of the types of projects included in the Program
Fiscal Year 2024/25 Estimate	Estimate of planned spending from July 2024 through June 2025. It does not include a contingency amount.
Fiscal Year 2025/26 Estimate	Estimate of planned spending from July 2025 through June 2026. It does not include a contingency amount.
Accomplishments for FY 2022/23 and FY 2023/24	Listing of new projects initiated and major milestones achieved during the last biennium
Objectives for FY 2024/25 and FY 2025/26	Listing of key projects with major milestones planned during the budget biennium with the total project estimate, estimated construction completion, and the planned milestone for FY 2024/25 and FY 2025/26

### Narratives

Each Individual Program Summary also contains a narrative portion that includes a description of each project planned to be underway during the two-year budget period and beyond.

Table 6 - Program Summary Index

Program Title	Page No.
Climate Adaptation	<a href="#"><u>16</u></a>
Colorado River Aqueduct	<a href="#"><u>20</u></a>
Dams & Reservoirs	<a href="#"><u>35</u></a>
Distribution System	<a href="#"><u>46</u></a>
Drought Mitigation – SWP Dependent Areas	<a href="#"><u>76</u></a>
Information Technology & Control Systems	<a href="#"><u>79</u></a>
Minor Capital Projects	<a href="#"><u>91</u></a>
Additional Facilities and Systems	<a href="#"><u>92</u></a>
Prestressed Concrete Cylinder Pipe	<a href="#"><u>103</u></a>
Water Treatment Plants	<a href="#"><u>106</u></a>

## Individual Program Summaries

### Climate Adaptation Program

Fiscal Year 2024/25 Estimate: \$7.8 million

Fiscal Year 2025/26 Estimate: \$17.7 million

**Program Information:** *The Climate Adaptation Program is composed of projects to replace, refurbish, upgrade, or construct new facilities to prepare Metropolitan to adjust to current and projected climate change impacts on its operation and its mission to provide its service area with adequate and reliable supplies of high-quality water in an environmentally and economically responsible way.*

#### Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated:
  - Delta Properties Infrastructure Improvements Phase 5
  - Delta Smelt and Native Species Preservation
  - Webb Tract Delta Island Flooded Wetlands and Rice Field System
  - Zero Emissions Fleet Pilot Infrastructure – Stage 1
- Major milestones achieved or estimated to be achieved:
  - Advanced Water Treatment Demonstration Plant
    - Technical memoranda for phased DPR implementation and tertiary membrane bioreactor (tMBR) modification plan - completed
    - Direct potable reuse (DPR) bench scale testing - completed
  - Delta Properties Infrastructure Improvements - completed installation of twenty-five additional flow meters
  - Delta Properties Infrastructure Improvements Phase 5 – awarded flow meter procurement contract
  - Weymouth Battery Energy Storage System – construction to be completed

## Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Delta Islands Pump Station Rehabilitation	\$ 15,000,000	2024	Complete design
Delta Properties Infrastructure Improvements	\$ 1,000,000	2024	Complete construction
Delta Smelt and Native Species Preservation Wetlands	\$ 12,700,000	2025	Complete design and construction
Demonstration Plant Direct Potable Reuse Modifications	\$ 18,000,000	2025	Complete testing, design, and construction
Jensen and Skinner Battery Energy Storage Systems	\$ 18,600,000	2025	Complete construction
Webb Tract Delta Island Flooded Wetlands and Rice Field System	\$ 21,600,000	2026	Complete design and begin construction

## Climate Adaptation - All

**Delta Islands Pump Station Rehabilitation**

In 2016, Metropolitan purchased five islands/tracts (about 20,400 acres) in the central Delta: Bacon, Bouldin, Holland Tract (portion), Webb Tract, and West Chipps Islands (sold in 2021 to DWR). Collectively, these lands represent a crucial part of the Delta for multiple potential values that are consistent with the State's co-equal goals of ecosystem restoration and water supply reliability for California. As part of this purchase, each property has an existing infrastructure that contains a system of individual siphons that bring diverted river water onto the property, through irrigation canals for agriculture purposes, and eventual conveyance of net water by gravity to pump stations, which pumps remaining water off the property through discharge pipes to prevent flooding. This project will construct new pump stations to replace aging pump stations to increase system reliability and minimize the service disruption that could result in loss of revenue if tenant operations are impacted.

**Delta Properties Infrastructure Improvements Phase 5**

California State Senate Bill (SB 88) requires monitoring and reporting of certain diversions within the Delta. Metropolitan's Delta properties will need to comply. Approximately up to 88 meters with telemetry and support equipment are necessary to comply with the regulation. Total of 38 flow meters were installed and this project will install the remaining flow meters and support equipment.

**Delta Smelt and Native Species Preservation Wetlands**

The Delta Smelt is a small, euryhaline fish species endemic to the San Francisco Estuary. Since the 1980s, the Delta Smelt population has exhibited significant declines in abundance leading to it being listed as endangered under the California Endangered Species Act, which may potentially create additional regulatory operational constraints on Delta water exports for state and federal water contractors. Metropolitan is working with multiple state and federal government agencies and researchers from UC Davis to advance research objectives through multiple collaborative study efforts. This project will utilize natural pond habitats located on Metropolitan's Delta island(s) to construct tule marsh wetlands, supplementation ponds, and associated hydraulic water conveyance systems including irrigation ditches and potential groundwater wells to address issues and questions including methods for potential successful reintroduction of Delta smelt in the Delta. An evaluation determined that Bouldin Island is the most suitable location for this project. Other goals related to this project could involve use of floating peat wetlands, setting back the existing levee, and reintroduction of tidal energy gradients.

**Demonstration Plant Direct Potable Reuse Modifications**

Metropolitan's Advanced Water Treatment Plant (AWT) at the Los Angeles County Sanitation Districts' Warren Water Resource Facility (Warren Facility) in Carson was originally designed to demonstrate testing of potential treatment processes for Indirect Potable Reuse (IPR) applications, as part of the Pure Water Southern California Program (PWSC), formerly known as Regional Recycled Water Program (RRWP). This project will expand the existing process train to facilitate additional testing and data collection aiming at process optimization and incorporation of Direct Potable Reuse (DPR) treatment options for regulatory acceptance and full-scale implementation. DPR treatment processes will be added for pathogen and chemical controls in accordance with the latest DPR framework provided by the California Division of Drinking Water. This project will also include design and construction/installation of permanent exhibits, equipment, and accessible tour routes to support public outreach functions at the Demonstration Plant.

**District-wide Zero and Near-Zero Emissions Fleet Infrastructure**

Identifying new ways to reduce greenhouse gas (GHG) emissions and reduce Metropolitan's carbon footprint is essential to the implantation of Metropolitan's Climate Action Plan (CAP). This project will design and construct infrastructure to meet mandated Zero Emission (ZE) and Near-Zero Emission (NZE) state and local regulations and comply with California Environmental Quality Act (CEQA) GHG reductions identified in CAP. This project would be implemented in phases, starting with development of a comprehensive transition plan to a ZE and NZE fleet, implementation of transition plan that includes interim and long-term infrastructure design, installation of recommended infrastructure (e.g., charging and/or dispensing stations), and installation of infrastructure related to solar and/or battery energy storage and other sustainability opportunities. The fleet includes passenger vehicles; light-, medium-, and heavy-duty on-road vehicles, off-road construction vehicles/equipment; forklifts; and employee and rideshare vehicles. The initial step to implement the transition includes a pilot approach to install two Level-2 electric vehicle charging stations with two ports each to charge two zero emission vehicles at Union Station and the Weymouth plant, and all associated cable and conduit required to power these charging stations.

**Groundwater Treatment**

Local groundwater supplies within Metropolitan's service area are currently underutilized due to contamination, political constraints, or cost concerns. This project will add water treatment systems where needed to treat contaminated groundwater. The addition of the treatment systems will be primarily focused for State Project Water (SWP) dependent areas. This project will improve resiliency against severe drought or earthquake and reduce dependency on imported water supplies.

**Hayfield Groundwater Storage and Extraction**

This project will improve the spreading basin and construct a well field extraction and conveyance system to withdraw stored CRA water and discharge it back into the CRA at the Hinds Pumping Plant. The initial stage of the project will focus on installing a limited conveyance system capable of extracting the 100,000 acre-ft stored in the Hayfield Groundwater Basin. This stage will include a groundwater well installation, pump and motor, and approximately 1,500 feet of small diameter pipe. The Hayfield basin is located south of the Julian Hinds Pumping Plant, adjacent to the CRA. The project will improve drought resilience and enhance reliability of CRA operation.

**Inglewood Lateral Improvement**

The project would provide additional capacity to the existing Inglewood Lateral via an upsized or parallel pipeline. The purpose of the project is to remove an existing constraint in the distribution system that would enable increased deliveries from the Jensen Water Treatment Plant during high State Water Project allocations and maximize deliveries during low State Water Project allocations using two expanded Sepulveda Feeder pump stations.

**Jensen, Skinner, and Weymouth Battery Energy Storage Systems**

In 2020, Metropolitan completed the Energy Sustainability Plan effort to identify new projects and initiatives within the Energy Management Policies' framework. The plan combined an analysis of Metropolitan's electricity charges and a holistic multi-criteria decision analysis framework, in which potential projects were vetted against a range of future scenarios based upon historical water and power demands and time-of-use tariff updates. Through this effort, battery energy storage systems (BESS) facilities at the Jensen, Skinner, and Weymouth plants were recommended for near-term implementation.

BESS is a peak-load reduction technology, which stores energy during off-peak hours and discharges stored energy for use during peak hours. This system will be paired with existing solar facilities of which the excess solar energy will be stored for later use instead of sending this energy to the nearby off-site electrical grid. The construction of the BESS facilities will enable Metropolitan to reduce exposure to energy price volatility, electrical supply reliability, improve operational reliability and resiliency, and support Metropolitan's Climate Action Plan by reducing greenhouse gas emission. The cost of this project will be offset by incentives from the Self-Generation Incentive Program, which is administered by California Public Utilities Commission.

**Webb Tract Delta Island Flooded Wetlands and Rice Field System**

Located in the Sacramento-San Joaquin Delta region, Webb Tract was purchased by Metropolitan in 2016. The island is deeply subsided due to current agricultural practices. Metropolitan plans to develop a multi-benefit project on Webb Tract that will grade up to 1,500 acres of land for rice cultivation and restore up to 3,500 acres to wetland. The expected benefits from the project are stopping and/or reversing subsidence, reduction in greenhouse gas emissions, and increased revenue from rice cultivation leases and carbon credits realized from the reduction in greenhouse gas emissions in addition to protecting the State Water Project's freshwater pathway. Land leveling will be required for the rice cultivation area to ensure a uniform land elevation for agricultural use. Wetland construction will require excavation of surface soil and using that soil to build berms around the excavated area to contain the wetland. Earth movement will be required to contour earth surface elevation to ensure flow across the wetland and to ensure a controlled water depth and adjustable weirs will be constructed and installed at the outflow to control the water depths in the wetland. Construction of small ponds may be required to facilitate tule cultivation that will be used to seed the wetland plants. Equipment pads and access roads to the pads will also be constructed. This project will be funded in combination by a \$20.9 million grant from the Sacramento-San Joaquin Delta Conservancy (Delta Conservancy) in addition to Metropolitan's CIP.

**Weymouth Energy Management Dashboard**

In 2020, Metropolitan completed the Energy Sustainability Plan (ESP) proposing an adaptive energy management strategy to: contain costs and reduce Metropolitan's exposure to energy price volatility; increase operational reliability and flexibility; move Metropolitan towards energy independence and sustainability; and support Metropolitan's Climate Action Plan effort to reduce greenhouse gas emissions (GHG). In support of that effort, this new project will develop and implement a comprehensive energy monitoring system that will bring access, awareness, and knowledge to operations staff regarding energy usage and cost of the water treatment process, promote sustainable operational decision making, and reduce energy costs at Weymouth plant and other Metropolitan facilities at the La Verne site.

**Yorba Linda Power Plant Power Supply to Diemer Water Treatment Plant**

This project will modify the Yorba Linda Power Plant to directly supply power to the Diemer Water Treatment Plant and sell excess power to the wholesale energy market. The scope of work includes installation of new 4.16 kV feeder between the power plant and the Diemer switchgear, breakers, power meters; reprogramming of programmable logic controllers; and modification of switchgears and auxiliary equipment.

## Colorado River Aqueduct (CRA) Program

Fiscal Year 2024/25 Estimate: \$43.6 million

Fiscal Year 2025/26 Estimate: \$42.2 million

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

### Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated:
  - CRA Freda Siphon Barrel No. 1 Restoration
  - CRA Pumping Plants Crane Improvements
  - CRA Pumping Plant Pump Lower Guide Access Improvements
  - Eagle Mountain Utilities Replacement
  - Eagle Mountain Village Paving Replacement
  - Hinds Village Paving Replacement
- Major milestones achieved or estimated to be achieved:
  - Construction:
    - CRA Conveyance System Flow Monitoring Stations – to be completed
    - CRA Pumping Plants Crane Improvements – to be completed
    - CRA Pumping Plant Sump System Rehabilitation - completed
    - Eagle Mountain 230 kV Local Breaker Failure Backup – completed
    - Eagle Mountain 230 kV Physical Security Upgrades - completed
    - Hinds Transformer Bank Protection Relays Replacement – to be completed
    - Iron Mountain Transformer Bank Protection Relays Replacement – to be completed
    - Iron Mountain & Eagle Mountain 230 kV Transmission Line Pilot Relay - completed
    - Mile 12 Flow and Chlorine Monitoring Station Upgrades - completed
  - Construction contracts awarded:
    - CRA Conduit Structural Protection
    - CRA Conveyance System Flow Monitoring Stations
    - CRA Freda Siphon Barrel No. 1 Restoration
    - CRA Pumping Plant Storage Buildings at Hinds, Eagle Mountain, and Iron Mountain

## Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Copper Basin Reservoirs Discharge Valve Rehabilitation	\$ 27,100,000	2026	Begin construction
CRA 6.9 kV Power Cables Replacement for Pump Units 6 to 9	\$ 26,300,000	2027	Begin construction
CRA Conduit Structural Protection	\$ 15,200,000	2025	Complete construction
CRA Desert Region Security Improvements	\$ 8,200,000	2027	Begin construction
CRA Main Transformer Refurbishment	\$ 107,100,000	2032	Begin equipment procurement
CRA Pumping Plant Sump System Rehabilitation	\$ 41,800,000	2026	Begin construction
CRA Pumping Plants Crane Improvements	\$ 19,600,000	2024	Complete construction
CRA Pumping Plant Storage Buildings at Hinds, Eagle Mountain and Iron Mountain	\$ 21,800,000	2026	Complete construction
Eagle Mountain Pumping Plant Village Utilities & Paving Replacement	\$ 9,200,000	2025	Begin construction
Gene Pumping Plant Village Utilities & Paving Replacement	\$ 20,400,000	2027	Begin construction
Hinds Pumping Plant Discharge Valve Pit Platform Replacement	\$ 9,400,000	2026	Begin construction
Hinds Pumping Plant Village Utilities & Paving Replacement	\$ 11,600,000	2025	Begin construction

## CRA - Conveyance Project Group

**Cabazon Radial Gate Facility Improvements**

The Cabazon Radial Gate facility is located on the CRA in the city of Cabazon within Riverside County and approximately one mile upstream of the San Jacinto Tunnel. The Cabazon Radial Gate facility was constructed in 1936 and consists of a 17-foot-wide by 16-foot-tall radial gate controlled by an electric motor actuator. The facility was designed to protect the downstream conduits and tunnels from becoming over-pressurized in the event of a blockage by diverting water into an 800-foot long, concrete-lined channel which flows into the San Gorgonio Wash. The existing radial gate, motor, and controls have reached the end of their service life and are no longer reliable. This project will replace the radial gate, motor, and controls.

**CRA Canal Rehabilitation**

The CRA is a 242-mile-long conveyance system comprising five pumping plants, 124 miles of tunnels, 63 miles of canals, and 55 miles of conduits, siphons, and reservoirs. The aqueduct is routinely shut down and inspected for signs of deterioration and to perform needed repairs. This project will conduct a comprehensive audit investigation of the approximate 63 miles of open CRA canal sections, looking into the need for any possible upgrades or replacements to address deficiencies in the existing CRA canal system, which may include the replacement of portions of concrete, improvements to instrumentation and controls, communication, and electrical systems that serve CRA canal, replacement or improvements of the security fencing spanning 125 miles around the perimeter of canals, and road and drainage improvements.

**CRA Conduit Structural Protection**

The CRA has 55 miles of cut-and-cover conduits where vehicles and storm water flows can cross over the aqueduct. These conduits are unreinforced concrete horseshoe-shaped structures placed upon an invert slab. At some locations, these conduits are subject to heavy vehicle loading or over pressurization due to friction inside the conduits during high pump flow. Few locations include existing dirt roads that cross the aqueduct with insufficient soil cover over the conduit; including locations where heavy equipment must be placed over or near the conduit for access into tunnels or siphons. This project will install new protective structures such as reinforced concrete slabs that span over the unreinforced conduits and epoxy lining the conduits at specific locations. New pressure sensor systems will be installed to monitor the pressure inside the conduits during the high pump-flow operation. The slabs will protect the conduits from damage by distributing the equipment loading to the surrounding soil and epoxy liner will decrease internal friction to allow increased flow through the CRA conveyance system.

**CRA Conveyance System Flow Monitoring Stations**

CRA pumping system upgrades performed in the early 1990s increased pumping capacity above the design flow of the CRA. Close monitoring of the CRA system is needed to reliably maintain 8-pump flow. This project will add new gauging stations along the conveyance system that will be tied into Supervisory Control and Data Acquisition (SCADA) system to provide flow data and information that will assist with maintaining uniform and steady-state flow conditions through the CRA system.

**CRA Conveyance System High Flow Reliability Upgrades**

With recent drought conditions and low State Project Water allocations, Metropolitan has needed to maximize flow through the CRA. With climate change impacting regional hydrology, this operational flexibility will continue to be a priority. This project will strengthen the conveyance portion of the CRA system and make other improvements to provide reliable flow through eight CRA pumps year-round. Some of the options that will be considered include carbon fiber lining, polyurethane lining, epoxy lining, steel lining, and structural strengthening from the outside of the conduits. Additional options include installation of orifice gates at Hinds and Iron Mountain pumping plants along with a recirculation system at Eagle Mountain Pumping Plant to reduce heightened vibration along the discharge structures during 8-pump flow conditions.

**CRA Erosion Protection**

The CRA is comprised of 55 miles of cut-and-cover conduits. The cut-and-cover conduits are arch or horseshoe shape, unreinforced, cast-in-place concrete. In most locations along the CRA, the overlying soil protects the cut-and-cover conduits from rock and debris flows. However, at narrow ravine crossings, heavy storm events often erode the soil and expose the conduits making them vulnerable to structural damage from the rock and debris flows. This project will provide erosion protection features such as gabion structures or concrete slabs, including grading of the eroded areas to protect the conduit. In addition, diversion berms or concrete swales will be constructed to divert storm flows over the concrete slabs.

**CRA Flow Measuring Stations Security Upgrades**

Metropolitan has several remote sites along the CRA that are used to monitor and control the aqueduct. Due to the remote location, these sites have solar panels, electrical panels, and solar batteries to power the control systems. These systems have been the target of vandalism and theft. This project will furnish and install concrete buildings at remote locations along the Colorado River Aqueduct and move pole mounted electrical panels and battery cabinets inside the buildings. These precast buildings will be installed at the Coxcomb, Rice, and Vidal wasteway Radial gate locations.

**CRA Freda Siphon Barrel No. 1 Improvements**

Like many of the CRA's 146 siphons, the Freda Siphon was constructed of cast-in-place reinforced concrete in the 1930s. Freda Siphon, like many of the other siphons, develop minor surface leaks. This project will investigate methods to permanently address reoccurring leaks and will perform improvements that are cost-effective, long-term, and require minimal shutdown time and maintenance.

**CRA Freda Siphon Barrel No. 1 Restoration**

Surface investigations of the CRA Freda Siphon Barrel No. 1 conducted over the past two years revealed as many as eight leakage locations. This project will install internal seals along the siphon during the 2024 CRA scheduled shutdown, reducing the risk of future unplanned outages and costly emergency repairs.

**CRA Iron Mountain and Eagle Mountain Pumping Plant Reservoirs Floor Relining**

The Iron Mountain and Eagle Mountain CRA Pumping Plants each have approximately 9.3-acre forebay reservoirs, constructed in the 1930s. Recent geotechnical investigations of the asphalt reservoir floor liners found them to be in poor condition. This project will replace the liners at each plant with a material that precludes seepage water loss and extends the life of the facility.

**CRA Sodium Hypochlorite Injection Improvements**

Sodium hypochlorite is added along the Colorado River Aqueduct (CRA) to control algal growth, which could damage downstream process equipment and reduce flow through the aqueduct. The existing process of providing weekly chlorine addition into the canal produces spikes in chlorine concentrations, which causes the Colorado River water to be more corrosive to conveyance systems and plant equipment and produces higher concentrations of trihalomethanes (THMs). This project will construct new chlorine storage and injection facilities to provide a steady rate of chlorine addition at five locations along the CRA. Each new chlorine injection facility will be upgraded to include a sodium hypochlorite tank and pump skid, chemical storage building with climate control and spill containment, delivery driveway with spill containment area, piping, chlorine injection system, security cameras, fencing, electrical and Supervisory Control and Data Acquisition (SCADA) upgrades, and other appurtenances.

**CRA Tunnels - Seismic Resilience Upgrades**

The CRA is a 242-mile-long conveyance system that transports water from the Colorado River to Lake Mathews in Riverside County, including 124 miles of tunnels which were constructed in the late 1930s and was placed into service in 1941. While the CRA was constructed in accordance with current seismic codes of that time, recent seismic risk assessments of the CRA identified that some tunnels are vulnerable to damage from a strong earthquake on the southern San Andreas Fault. The scope of this project includes detailed seismic evaluations and completion of upgrades to strengthen vulnerable tunnel sections.

**Eagle Lift & Eagle West Siphons Seismic Improvements**

The CRA was placed into service in 1941. As the aqueduct traverses the desert, it must cross numerous drainage channels, ravines, and other natural depressions. At each crossing, the aqueduct's open channel transitions into a buried conduit (an inverted siphon) which drops below ground and passes beneath the natural surface feature. At the downstream end of the siphon, water re-emerges into the open aqueduct. Typically, siphons are cast-in-place reinforced concrete conduits, which vary in length from 150 feet to 5 miles. An initial assessment of the Eagle Lift and Eagle West Siphons identified potential slope failure of the soil covering the siphons as a result of a strong seismic event. This project will perform a detailed slope stability analysis and evaluate and implement mitigation options.

**Iron Mountain Tunnel Rehabilitation**

The Iron Mountain Tunnel was constructed between 1933 and 1938 as part of the CRA system. The tunnel is located downstream of the Iron Mountain pumping plant and is eight miles long. The tunnel's cross-section is horseshoe-shaped, with overall dimensions of 16 feet high by 16 feet wide. Longitudinal and transverse cracks up to one inch wide have developed along a 2,500-foot-long stretch of the tunnel. This project will mitigate the cracks with focus on tunnel strengthening and corrosion protection.

**West Portal Perimeter Security Upgrade**

The West Portal site of the San Jacinto Tunnel does not have a continuous perimeter fence. The location is susceptible to intruders. This project will install a complete and continuous anti-cut anti-climb perimeter fence with barbed wire top guard at West Portal to meet security standards and will install multiple network security detection systems to detect and deter unauthorized individuals from accessing the site.

**Whitewater Tunnel No. 2 Seismic Upgrades**

The CRA consists of five pumping plants, 124 miles of tunnels, 63 miles of canals, and 55 miles of conduits, siphons, and reservoirs. One of the tunnels, CRA Whitewater Tunnel No. 2, is a 1.5-mile-long; 16-feet-high by 16-feet-wide horseshoe-shaped tunnel that parallels closely to the southern San Andreas Fault and crosses a splay of the fault approximately one-third mile from its west portal. A recent seismic risk assessment of the CRA identified that this tunnel is vulnerable to major damage from a strong earthquake on the southern San Andreas Fault. This project will perform near-term upgrades to strengthen vulnerable tunnel sections at the east and west portals of this tunnel and will improve access at the west portal. Furthermore, to expedite post-earthquake repairs of damaged tunnel sections, the design of a new bypass tunnel will be prepared in advance, steel sets will be procured and stockpiled, and tunnel repair contractors will be prequalified so that specialized equipment and crews may mobilize rapidly.

**CRA - Electrical Systems Project Group****Black Metal Mountain 2.4 kV Electrical Power Upgrade**

Black Metal Mountain (Black Metal) Site No. 1 and Site No. 2 are two of Metropolitan's communication sites, located in the San Bernardino Mountains. The sites are situated on top of a mountain and provide line-of-sight propagation to subsequent communication sites. Given their prime location, the communication sites on Black Metal Mountain house communication equipment for Metropolitan, several state and local government agencies, and local radio stations and cellular service providers. The existing power line that serves the two communication sites is aging and deteriorated, and is located in rocky, mountainous terrain, with some poles on the edge of 600-foot cliffs. This project will design and construct the replacement of the existing 2.4 kV power line that serves Metropolitan's Black Metal Mountain communication sites. The work will include installation of new power poles and larger conductors to increase the available power to the sites; and improvements to the service roads to improve access for maintenance and safety.

**CRA 230 kV Transmission Line Rehabilitation and Improvements**

The CRA has an extensive 230 kV transmission system that originates from Hoover Dam and supplies power to all five pumping plants. This 305-mile-long transmission system was installed in the 1930s and consists of approximately 75-foot-high steel towers with concrete and wood footings, aluminum and copper conductors and supports to attach the conductors and insulators to the towers. Spans between the towers average 1,200 feet with varying ground elevations. Vertical clearances between the lowest conductor and the ground in a span can vary with temperature, wind speeds, and power loads. Over the years, operating under maximum power loads and extreme desert temperatures has led to insufficient vertical clearances as required by the current electrical standards. This project will assess ground clearances of the conductor spans and increase clearances, as needed, by raising the heights of existing towers and/or adding new towers between spans, and construct tower refurbishment or replacement.

This project will also rehabilitate and improve substations, switching stations, and control rooms related to the CRA's 230 kV transmission system to comply with NERC (North American Electric Reliability Corporation) standards, increase system reliability, and reduce the risk of unplanned CRA outages. Rehabilitation and upgrades include new relays at Eagle Mountain Pumping Plant to mitigate potential cascading power outages from a stuck breaker scenario at Eagle and installation of physical and cyber security systems at Gene and Eagle Mountain pumping plants control rooms and switch yards (NERC requirements); replacement of outdated bank protection relays at Intake, Gene, Iron Mountain and Hinds pumping plants; replacement of outdated 230 kV disconnect switches at Camino Switching Station and at the Gene and Iron Mountain 230 kV transfer buses; installation of a new 230 kV circuit breaker at Iron Mountain to enable isolation of the Iron-Eagle 230 kV transmission line without disruption of CRA water deliveries; and, purchase of SCE circuit breakers which are integrated with the CRA's 230 kV system at Gene and Eagle Mountain pumping plants to give Metropolitan greater flexibility without having to rely on SCE. Additional scope may be added as a result of the planned assessment of the existing system.

**CRA 6.9 kV Power Cable Replacement for Pump Units 6 to 9**

There are a total of 45 primary pumps and motors at the five CRA pumping plants. Power is transmitted to the motors via 3-inch-diameter cables which run through a tunnel that connects each switch house to each pump house. The quantity of cables varies from nine to 27 per plant. These cables were installed in four phases from 1939 through 1959. After 59 to 79 years of continuous service, the power cables have deteriorated and need to be replaced. Oil has begun to leak through cracks in the lead jacket, at the cable connection joints, and at the cable termination points. Frequent repairs are required to address the leaks and maintain the cables' insulating capacity. The cables for pump units 1 to 5 have been replaced. This project includes the replacement of the deteriorated main power cables for pump units 6 to 9 at each of the five CRA pumping plants.

**CRA Automated Trash Rack Cleaning System at Three Pumping Plants**

The Iron Mountain, Eagle Mountain, and Hinds pumping plants have trash racks protecting the plant intake siphons. These trash racks are critical for CRA reliability by preventing stringy weeds, vegetation, sticks, and other larger debris from entering the plants. If these weeds and debris pass through the trash rack, it can result in emergency failures to equipment like circulation water pumps and sand strainers, increased labor for maintenance, and decreased equipment service life. This project will install automated trash rack cleaning systems, which would resolve these issues, facilitating thorough removal of the debris from the rack while allowing plant staff to be more productive with other tasks.

**CRA Auxiliary Power Systems**

All five CRA pumping plants have medium and low voltage systems that were constructed to the design standards of the 1930s-1950s. They provide power for general lighting, cranes, computers, shop equipment, and critical equipment such as the pumping plant sump pumps and lubrication oil pumps. Over the years, numerous additional electrical loads have been added to the auxiliary power systems. As a result, the distribution panel capacity limits have been exhausted, and some wiring is now undersized. The scope of this project includes upsizing the distribution panels to allow additional capacity and space for future loads and replacing the cables and conduits to comply with current National Electrical Code and safety standards. Additional scope may be added as a result of preliminary assessment of each of the sites to make the auxiliary power systems reliable.

**CRA Hinds Sand Trap & Wasteway Radial Gate Power Cable Replacement**

The power cables that feed the Hinds sand trap and wasteway radial gate are installed in a shallow ductbank that is deteriorating due to heat, in a conduit that is overfilled. This project will construct a new ductbank with power conductors designed to address these deficiencies.

**CRA Main Transformer Rehabilitation**

Seven transformers provide electrical power to each CRA pumping plant to maintain continuous operation. All existing transformer units are original equipment, with many dating from the 1940s. Recent inspections revealed oil leakage and other signs of aging for some of the transformers. Failure of an existing transformer would disrupt power supply to a pumping plant and interrupt water delivery. The scope of the project includes replacement of the transformers along with spill containment structures. This work also includes rehabilitation of transformer cranes, upgrade of transformer monitoring and protection equipment, and secondary spill containment for the transformer banks. Additional scope may be added as a result of preliminary assessment to ensure reliable and safe operation of the CRA pumping plants.

**CRA Pumping Plants 2.3 kV and 480 V Switchrack Rehabilitation**

All five CRA Pumping Plants have a 2.3 kV and 480 V switchracks that are the central power distribution for the 2.3 kV, 480 V and 120 V that feed multiple medium and low voltage critical equipment within the pumping plants. These switchracks have been in service since the original construction of the CRA. The equipment is old, obsolete and replacement parts are difficult to obtain. This project will rehabilitate or replace the 2.3 kV and the 480 V switchracks and associated support systems at all five CRA pumping plants to ensure the equipment meets the current safety and electrical codes and provides a reliable power supply to the plants.

**CRA Pumping Plants 6900V Circuit Breaker Replacements**

Each of the CRA pump plants has eleven 6.9 kV circuit breakers. These circuit breakers provide a method to isolate portions of the electrical system for maintenance and provide surge protection. The circuit breakers installed in the 1960s and 1970s require extensive maintenance and cannot be replaced because they are no longer being manufactured. This project replaces the existing air-breaker-type circuit breakers. The project will include new control wiring, improved safety features, and new weather-proof doors to the switch houses where they are located.

**CRA Standby Diesel Engine Generator Replacements**

Back-up power for critical auxiliary systems at the Iron Mountain, Gene, and Intake pumping plants is provided by stand-by diesel generators. The standby generators are over 50 years old, require frequent repairs, and have reached the end of their service lives. In addition, upgrades to the generators' ancillary equipment are planned to meet current fire codes and environmental regulations. This project will improve the reliability of emergency power for critical auxiliary systems at the pumping plants. The scope of the project includes relocation and installation of new generators. The replacement generator will include alarms, valves, meters, and a control system capable of automatic start-up upon loss of primary power, automatic transfer back to primary power once the normal source is reestablished, and remote status monitoring.

**Gene, Iron Mountain, Eagle Mountain, and Hinds Pumping Plants Electrical Power Distribution Upgrades**

The 2.4 kV electrical power distribution system at all five Desert pumping plant facilities conveys power from the Metropolitan-owned 2.4 kV switchyard to all areas within the property confines, including the operations and maintenance (O&M) areas and the villages. The power is stepped down from 2.4 kV, typically by a pole-mounted transformer, to the required voltage based on the end-user's requirements, usually 120 V for houses and buildings, or 480 V for workshops. The existing breakers are no longer common in the power industry, and spare parts are difficult to obtain.

This project will replace the existing electrical power distribution systems at Gene, Iron Mountain, Eagle Mountain and Hinds Pumping Plants with new distribution systems. The work will include replacing existing 2.4 kV breakers with 4160 V breakers, and replacing associated cables, conduits, feeders, risers, wooden poles and transformers, and appurtenances. Underground power distribution will be used when feasible. This project will improve the reliability of water deliveries and will optimize maintenance.

**CRA - Pumping Plants Project Group****CRA Asphalt Replacement**

The existing asphalt pavement at the desert facilities has deteriorated from the many years exposed to the harsh desert environment. The subject project will remove and replace existing deteriorating roadways and paved working areas surrounding the pump plant, maintenance/storage yards within all five CRA pumping plant locations. The proposed rehabilitation will include survey of existing conditions and replacement of existing asphalt concrete with new engineered asphalt pavement mix, roadway striping, grading and potential stormwater drainage system improvements.

**CRA Desert Region Communications Building**

The existing communications infrastructure and facilities were part of the plant's original construction in the 1930s and have gradually been extended across multiple facilities over the years. Therefore, there is no centralized location at the Desert Headquarters (the Gene Pumping Plant) capable of housing all server equipment, batteries, and emergency generator. While there is an existing communication building at the Gene Pumping Plant, it is undersized to accommodate all the various server racks necessary for IT, SCADA, security, and NERC, and it does not have space for a backup generator or adjacent battery room. The backup batteries and generators are critical to ensure redundancies during a power failure. This project will construct a new communications building that includes a generator room, a battery room, and a large room for communications and electrical equipment. The communications rooms will be sized to accommodate multiple rows of racks for IT, SCADA, security, and telecommunication equipment and wiring, and possibly NERC-compliant electrical equipment.

**CRA Desert Region Security Improvements**

CRA facilities are critical components of Metropolitan's water delivery system. These facilities include five pumping plants and the El Camino Electrical Substation. These facilities have inadequate perimeter fencing. This project will install physical security improvements such as fencing, signage, cameras, motion detectors, remote speakers, card readers, and lighting at Metropolitan's CRA pumping plants and at the El Camino Electrical Substation. This project will also include road and access control improvements at the main entrances to the pumping plants and integration of security devices with Metropolitan's security system. Construction of permanent guard stations will be also considered.

**CRA Fall Prevention Swing Gate Installations**

The project will furnish and install over 300 Cal-OSHA compliant, self-closing swing gates to replace non-OSHA compliant fall prevention chains located on fixed-ladder ways and elevated work platforms at the five CRA pumping plant facilities (Intake, Gene, Iron Mountain, Eagle Mountain, and Hinds). The scope will include removing and disposing of the existing chains and clamping on the new swing gates. The new swing gates will be installed at every fixed ladder way, including at each unit's discharge sump, suction valve sump, heat exchange catwalks, distribution pipe, headgate catwalks, and other miscellaneous locations.

**CRA Hinds Pumping Plant Sand Trap Slide Gate Installation**

Hinds sand trap creates a plant vulnerability because it cannot be opened (like a sluice gate) during an emergency, such as a severe leak in the plant or a plant outage. Consequently, the water volume stored in the sand trap's outlet channel and the additional plant inlet conduit and canal would be gravity-fed into the plant continuously. This can potentially overwhelm the circulating water sump pumps and flood the plant, resulting in catastrophic damage to the plant facility. This project will replace a steel plate that covers the 3-foot square opening with a sluice gate, allowing staff to open it in case of an issue that could flood the plant, such as a power outage.

**CRA Intake Pumping Plant Shore Protection**

The existing shore protection consisting of rocks and concrete was installed around the time the Intake Pumping Plant was constructed in the 1930s and has exceeded its service life. This project will improve the shore adjacent to the Intake Pumping Plant to protect the access road and facilities and mitigate against short and long-term coastal erosion due to wave attack, flooding, and water surface level changes in Lake Havasu.

**CRA Intake Pumping Plant Substructure Improvements**

An inaccessible sub-structure cavity containing utility piping is located beneath the HVAC equipment room located on the north end of the Intake Pumping Plant Control House. This project will install a new concrete access manway and wall at this location along the exterior of the Intake Control House to provide maintenance access and prevent lake water intrusion. The project will also evaluate options for creating a base surface for maintenance by installing a platform or filling the cavity void above Intake Delivery Line No. 3 and determine the extent of the required plumbing replacements. Intruding soil and water in the substructure will be removed before the upgrades, paving will be replaced, and existing surface structures, such as the HVAC condenser units, will be relocated as needed to accommodate the work.

**CRA Main Pump, Motor & Discharge Valve Refurbishment**

Each of the five CRA pumping plants has nine main pumps that lift the water to the required elevation necessary to continue flow down the aqueduct. The 45 main pumps rely on multiple auxiliary systems including lubricating oil systems, circulating water systems, controls and instrumentation systems, discharge valves, electrical and control panels, and individual equipment components. In the mid-1980s, a major rehabilitation project was undertaken on the 45 main pumps. As a result, the 45 main pumps have performed well over the nearly 30 years since the rehabilitation work was completed. However, the pumps are now showing signs of deterioration caused by continuous operation over that length of time. While that project successfully extended the service life of the pumps and increased their hydraulic capacity, the pump auxiliary systems were not addressed at that time. The pump auxiliary systems are from the original CRA construction and are now deteriorating and need to be replaced. An assessment of the main pumps, motors, and their auxiliary systems at all five CRA pumping plants will capture current operating conditions, create updated baseline documents of all existing equipment and systems, and provide replacement or rehabilitation recommendations for all pump and auxiliary system components. This project will refurbish the 45 main pumps and their auxiliary systems, including lubricating oil systems, circulating water systems, controls and instrumentation systems, discharge valves, electrical and control panels, and individual equipment components, as deemed appropriate by the assessment.

**CRA Main Pumping Plants Sand Removal System**

At each of the five CRA pumping plants, water is withdrawn from the CRA, filtered to remove large debris and sand, and then pumped through a circulating water system. The circulating water system feeds the pump house service water system, the cooling system at each pump unit, the fire water system, the irrigation water system, and the domestic water treatment system. The existing filtration system is not designed to strain out fine silts. Consequently, the fine silt has built up as sediment in the circulating water systems leading to excessive wear and failure of equipment such as pump packing, cooling water piping, and heat exchangers. This project will upgrade the filtration system to remove fine silt and eliminate sediment build up and refurbish or replace any identified damaged components.

**CRA Main Pumping Plants Unit Coolers and Heat Exchangers**

Each of the five CRA pumping plants has nine main pumps. Each main pump has a cooling system to cool various components of the pump system. At each pump house, water is pumped through a circulating water system, which feeds multiple unit coolers and heat exchangers for each individual main pump unit. Over the years, the unit coolers have developed many leaks. Lack of sufficient cooling water could cause equipment overheating, and the leaks could damage nearby electrical equipment. This project will replace, refurbish, or upgrade the cooling and heat exchange system at each pump unit.

**CRA Pumping Plant Storage Buildings at Hinds, Eagle Mountain and Iron Mountain**

Between 1950 and 1955, several metal-sided buildings with timber frames were built at the CRA pumping plants to store equipment, spare parts, and maintenance supplies. Two of these buildings have been replaced at the Gene Pumping Plant; however, four original buildings still remain in service. These buildings have deteriorated after close to 70 years of service in the harsh desert environment and no longer seal properly to prevent rain and dust from entering the interiors. This project will replace the four remaining deteriorated storage buildings and add asphalt paving leading to and around each of the buildings.

**CRA Pumping Plants Access Road Rehabilitation**

The Colorado River Aqueduct (CRA) pumping plant access roads must accommodate heavy traffic loads for deliveries of chemicals, materials, equipment, and staff. The existing asphalt roads are distressed and show numerous areas of longitudinal and alligator cracking. The harsh desert climate conditions have caused the pavement to age and become distressed more quickly. These roads are the sole means of access to the pumping plants, making reliable use of the roads critical to allow equipment, chemical, and material deliveries, ingress for first responders, and general access. This project will rehabilitate approximately 11 miles of the existing access roads leading to the Intake, Iron Mountain, Eagle Mountain, and Hinds Pumping Plants using a combination of pavement overlay and pavement replacement with new aggregate base subgrade. This project will also include pavement markings.

**CRA Pumping Plants Circulation Water Systems**

Each of the five CRA pumping plants has nine main pumps. Each of these pump units use cooling equipment to cool various components of the pump system that feeds from the plant's circulating water system. This system has a loop with branch connections and an isolation valve at each unit. The piping and the valves that supply the circulating water systems run through the entire length of the plants and are all from the original CRA construction. The piping and the valves are now showing signs of deterioration. They are clogged, corroded and leaking. This project will replace and upgrade the circulation water systems for each pumping unit. Additional scope may be added as a result of preliminary assessment to ensure reliable operation of the CRA pumping plants.

**CRA Pumping Plants Delivery Line Rehabilitation**

Each of the nine main pumps at the five CRA pumping plants discharges the water into individual six-foot diameter discharge lines. The nine discharge lines then merge and transition into three 10-foot diameter pipelines, Delivery Line Nos. 1, 2 and 3, that convey flow to the top of the lift and then discharge into a headgate structure which empties the water into the next section of the aqueduct. These delivery lines vary in length from 500 feet to 1,400 feet up steep and rocky slopes. The five Delivery Line No. 1s were constructed in the 1930s and were lined with coal tar enamel to protect the interior of the pipe from corrosion. After 82 years of service, the existing coal tar enamel lining on Delivery Line No. 1 at each plant is cracking, flaking, and the steel is starting to corrode. The mortar linings for Delivery Line Nos. 2 and 3 are still in good condition and do not require repair.

Depending on the length of each delivery line, there are a total of three or four expansion joints located along the line. These expansion joints are deteriorated and showing signs of corrosion. A number of the most deteriorated joints have been rehabilitated recently. This project provides a comprehensive rehabilitation of the remainder of delivery lines at each of the five CRA pumping plants, including replacement of the coal tar enamel with a cement mortar lining, expansion joints, and minor coating refurbishment.

**CRA Pumping Plants Public Address and Alarm Communication System Upgrades**

The existing communication signals at each of the five CRA pumping plants are currently separated into different systems including: the public address system; plant alarms; evacuation, fire, and carbon dioxide alarms; and phones. The signals in these systems were originally installed to utilize the existing 1930's era phone line systems and is becoming increasingly difficult to maintain as replacement parts are becoming harder to find and troubleshooting is difficult. This project will replace the existing communication systems with a new integrated and modernized auditory communication system with alarms that are able to be identified based on different distinct alarm tones. Signal wires will be routed to a network enabled public address and general alarm system and new speakers will be added at each plant to improve ability to hear audible alarms throughout the plants, even when loud pumps are operating.

**CRA Pumping Plants Pump Lower Guide Access Improvements**

At each of the CRA pumping plants, maintenance staff performs a monthly inspection of the lower guides below each main pump. The access hatch utilized for this inspection is located about twenty feet above the deck and situated where it is difficult for workers to reach and inspect the lower guides. This project will design, fabricate, and install new work platforms/mezzanines to improve safety and to facilitate the routine inspections.

**CRA Pumping Plants Rollup Door and Window Replacements**

Over the past 80 years, the desert has taken its toll on the windows and rollup doors at all five CRA pumping plants. Many windows can no longer be opened, making it difficult to keep the main pump motors cool on 120-degree summer days. And the rollup doors in the pumphouses and head gate structures require continual maintenance to keep them operable. This project will replace these building features while remaining consistent with architectural standards.

**CRA Pumping Plants Reservoir Spillway Auto Rejection - Iron Mountain and Eagle Mountain**

The Iron Mountain and Eagle Mountain Reservoirs are located on the upstream side of the Iron Mountain and Eagle Mountain pumping plants, respectively. The reservoirs dampen fluctuations in flow between the five pumping plants. Each reservoir contains a spillway which allows discharge of water to the desert in the event of a power outage of the main pumps. The two spillways were designed in the 1930s to safely reject up to approximately 1,200 cubic feet per second (cfs). The pumping plants were expanded in the 1950s and the aqueduct can now operate up to approximately 1,750 cfs. Rejection of flows greater than 1,200 cfs would cause uncontrolled release of water at these two reservoirs, which could damage nearby facilities and public roads or property. This project will modify the reservoir spillways to allow safe rejection of up to 1,750 cfs of water in the event of a power outage of the main pumps.

**CRA Pumping Plants Sand Trap Traveling Bridge Cranes Control Upgrades**

Three of the CRA pumping plants (Iron Mountain, Eagle Mountain, and Hinds) have a sand trap facility located upstream of the plants. These sand trap facilities are critical to minimizing sand entering the pump plant facility. The CRA system's sandy terrain combined with high-velocity wind gusts results in large quantities of sand blown into the CRA canal system, where it gets suspended in the moving water. If this sand is not removed, it can flow in the water into plant intakes, results in pipe walls and turbines being damaged by this abrasive sand and water mixture, ultimately resulting in premature equipment failures. This project will provide upgrades to the existing three sand trap facilities (Iron Mountain, Eagle Mountain, and Hinds) to convert the traveling bridge pump systems to an automated system that can be controlled by staff remotely or scheduled to run autonomously, equipped with safeguard protections to self-disable, alarm systems to alert plant staff of failures, SCADA and camera system upgrades, and programmable logic controller (PLC) programming to allow plant monitoring and control.

**CRA Pumping Plants Sump System Rehabilitation**

Each of the five CRA pumping plants has two independent main sumps that collect water leakage from the main pumps and discharge valves. Each main sump is approximately 9 feet wide, 20 feet long, and 35 feet deep, and can hold up to 48,000 gallons, or approximately one day's worth of leakage water. The sump system pumps this water back to the pumping plant's main intake manifold or to its forebay, depending on the plant. The 72-year-old sump piping systems and support structures are deteriorating and have exceeded their service lives. Failure of the sump piping systems has the potential to cause extensive flooding and damage to valves and pumps within the pumping plants. This project will rehabilitate the pumping plant sump systems, including replacement of corroded sump mechanical equipment, piping, and access structures at all five CRA pumping plants. Access features will be upgraded by replacing corroded catwalks, ladders and handrails within the sumps. This project will also rehabilitate circulating water equipment and piping systems, which are in the sump area. A construction contract was awarded by the Board in December 2018, but construction activities were suspended in March 2020 due to the COVID-19 pandemic, which led to cancellation of the construction portion of the contract. The delivered equipment and materials will be installed by another contractor.

**CRA Pumping Plants Water Tanks Rehabilitation**

Each of the five CRA Pumping Plants has three concrete water storage tanks for circulating water, irrigation/fire water, and domestic water. The tanks are 85 years old and are critical to operation of the plants. This project will upgrade all 15 tanks to address seismic deficiencies, leakage, and temperature issues. Work will also include improvements to linings, coatings, and appurtenances such as ladders, vents, piping, and wall penetrations.

**CRA Pumping Plants Water Treatment Systems Replacement**

All five of Metropolitan's Pumping Plants are located in remote areas of Riverside and San Bernardino Counties where municipal water treatment systems are not available. Each plant is instead served by a community on-site water treatment system. These on-site treatment systems are skid-mounted membrane filtration units that include a strainer, a pair of activated carbon vessels, and a domestic water storage tank. These systems have been in continuous operation for almost 30 years and now suffer from frequent membrane and pipe failures. This project will replace the skid-mounted water treatment systems in its entirety including replacement of water quality monitoring instrumentation and laboratory equipment, upgrading electrical and instrumentation control systems for the disinfection system, construction of a temperature-controlled building to house granulated active carbon vessels and disinfection equipment, and construction of ancillary support systems.

**CRA Village Utilities & Asphalt Replacement**

All five of Metropolitan's pumping plants are located in remote areas of Riverside and San Bernardino Counties where municipal water distribution systems are not available. Each plant is instead served by a community on-site water treatment system. Water from the CRA is treated and conveyed to each village house and to the industrial portions of the pumping plants through a gravity-fed water distribution system which consists of distribution piping, isolation valves and valve boxes. Recent inspections of the distribution systems have found blockages, leaks, taste and odor problems, and root intrusion. This project will replace the domestic water distribution systems at all five CRA pumping plants which include the main line pipes, building laterals, new backflow prevention devices, valves, meters, remote water quality analyzers, and other appurtenances to deliver quality water reliably.

Municipal wastewater collection and treatment facilities are not available where the pumping plants are located. The pumping plants are served by community on-site wastewater systems. These on-site systems collect, treat, and dispose of domestic wastewater generated from bathrooms, kitchen facilities, maintenance buildings, guest lodges, and staff residences at the plants. The on-site systems consist of three primary components: community septic tanks and leach fields; collector lines located throughout the pumping plants which convey wastewater to the septic tanks; and sewer laterals which convey wastewater from individual buildings to the collector lines. The existing wastewater systems at the plants have deteriorated through continual use and need to be replaced. This project will replace the wastewater systems at the pumping plants. The systems will include new main-line pipes, building laterals, septic tanks and leach fields, and other appurtenances to reliably collect and treat wastewater.

The asphalt roadways at the pumping plants provide access between buildings and the villages for Metropolitan staff, residents, and visitors. There is a total of approximately 30 acres of asphalt-paved roadways and surfaces at all five pumping plants, and these asphalt surfaces are over 30 years old. Due to the harsh desert conditions and deterioration of the subgrade over time, potholes and cracks have developed throughout the villages. The planned upgrades to the roadway pavement include placement of a new layer of asphalt on less distressed areas throughout the CRA villages; removal and replacement of more heavily damaged roadways; and grading and installation of culverts to improve drainage.

**Erosion and Drainage Control Protection for CRA Switchracks and Ancillary Structures**

The five CRA pumping plants are located in remote areas of the California desert which are periodically subjected to flash floods that carry high volumes of water, silt, and debris. During major storm events, the pumping plants' pump houses and support facilities are susceptible to flooding and deposition of silt and debris. In recent years, at several of the plants, debris flows have affected various critical electrical facilities. This project will include site grading, addition of perimeter drainage channels to intercept offsite flows, upsizing of storm drain culverts and extension of patrol roads to access the new storm drain facilities for maintenance. Additional scope may be added as a result of the preliminary assessment to ensure reliable operation of the CRA pumping plants.

**Gene and Intake Pumping Plant Outlet Structure Gate Rehabilitation**

Each of the five CRA pumping plants has nine main pumps that lift water from the pump house through a series of converging delivery lines that convey water from the pump house to a headgate structure located at the top of a hill. These structures then convey water to the downstream portion of the aqueduct. Flow from each headgate structure is regulated by three nine-foot square steel gates. Recent inspections at the Intake and Gene pumping plants have revealed that the protective coatings on various components of the gates have begun to crack and peel. This project will recoat the headgate structure outlet gates at the Intake and Gene pumping plants to prevent metal loss due to corrosion. Additional scope may be added as a result of the preliminary assessment to ensure proper operation and maintenance of the outlet gates.

**Gene Pumping Plant Warehouses Storage Rack Rehabilitation**

Existing materials storage racks located within the Gene Pumping Plant Warehouse and Spare Parts Warehouse buildings need additional anchorage to the concrete floors and are susceptible to toppling or movement that causes heavy items to fall in the event of an earthquake. Retrofits of these racks are needed primarily to ensure worker safety in the two warehouses at the Gene Pumping Plant and minimize the potential of damage to materials/equipment during a failure by ensuring secure racks. This project will evaluate structural and seismic deficiencies in existing storage racks, including anchorage and structural members, and provide retrofits as needed to bring the storage racks to meet the latest code. There are approximately 42 storage racks in and around the Spare Parts Warehouse and approximately 10 storage racks inside the Main Warehouse at the Gene Pumping Plant.

**Hinds Pumping Plant Discharge Valve Pit Platform Replacement**

At each of the CRA pumping plants, water is pumped from the plants' intake manifold through the main pumps and out of the discharge valves. From the discharge valves, water travels through the delivery lines and into the aqueduct. The discharge valves are located in small concrete pits below the pumping plant floor room. At the Hinds Pumping Plant, the concrete pit is equipped with a raised platform due to the deep pit. The platform is necessary to maintain the discharge valve's ancillary equipment. After close to 80 years of service in a humid environment created mainly from the pump cooling water discharge, the metal platform has corroded significantly and needs to be replaced. This project will replace the discharge valve platform and relocate cooling water discharge piping in all nine discharge pits at the Hinds Pumping Plant. Additional scope may be added as a result of the preliminary assessment to replace the platform that will ensure the safety of the workers as well as improving access to maintain the discharge valves.

**Intake Pumping Plant Road Improvements**

The 1.75-mile-long asphalt access road into the Intake Pumping Plant travels between a large hill and Lake Havasu. At approximately the midpoint of the access road, it crosses a culvert that drains storm runoff from the hillside into the lake. This culvert is undersized, has partially collapsed, and fills with debris from an unlined wash during rain events. After rain events, Metropolitan staff must clear debris from the culvert to prevent rainwater from overtopping the culvert and eroding the access road. This project will replace the existing culvert with a new culvert and deteriorated portions of the asphalt road. The project will also add traffic safety rails along the road to enhance safety.

**Iron Mountain, Hinds & Eagle Mountain Hazardous Waste Containment**

Hazardous wastes such as chemicals, oil, paint, paint thinners and antifreeze are generated through routine operations at the Iron Mountain Pumping Plant. Hazardous wastes are collected and placed into either metal or plastic drums ranging in size from five to 55 gallons. The existing hazardous wastes are then stored in a fenced temporary storage area. This project will replace the existing hazardous waste storage facility with a code-compliant hazardous waste storage facility.

**CRA - Other Project Group****Desert HVAC Replacement**

This project will replace heating, ventilation, and air conditioning (HVAC) systems throughout the desert region for CRA support facilities, which are less energy efficient and past their useful life, with newer, more energy efficient units. The new systems will consist of certified energy efficient equipment with modernized HVAC controllers that ties into a cohesive building automation network. This integration will allow Metropolitan staff to more efficiently respond to HVAC interruptions, more quickly troubleshoot problems, provide early detection of problems before catastrophic failures, and ensure optimal performance of the HVAC systems. This project will also include addition of any appurtenances and construction of support facilities for more reliable and efficient HVAC operation.

**Seismic Upgrades of CRA Support Facilities**

A recent initial seismic risk assessment has revealed that several CRA support structures may be vulnerable from a major seismic event. These support structures include office and maintenance buildings, guest lodges, and dining and recreation halls located at Hinds, Eagle Mountain, Iron Mountain and Gene Pumping Plants. This project will perform detailed seismic assessments and retrofit the support structures if necessary.

## Dams and Reservoirs Program

Fiscal Year 2024/25 Estimate: \$36.2 million

Fiscal Year 2025/26 Estimate: \$35.9 million

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

### Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated:
  - Diamond Valley Lake Dam Monitoring System Upgrades - Stage 3
  - Diemer FWR Slope Protection Improvements
  - Eastern Region Security Camera System Upgrade – Area 3
  - Eastern Region Security Camera System Upgrade – Area 4
  - Garvey Reservoir Dam Monitoring System Upgrades
  - Lake Skinner Dam V-Ditch Replacement
  - Western Region Security Camera System Upgrade – Area 1
  - Western Region Security Camera System Upgrade – Area 5
- Major milestones achieved or estimated to be achieved:
  - Diamond Valley Lake Dam Monitoring System Upgrades - Stage 3 – final design and equipment installation to be completed
  - Garvey Reservoir Dam Monitoring System Upgrades – final design to be completed
  - Garvey Reservoir Rehabilitation – preliminary design completed
  - Lake Skinner Outlet Tower Seismic Upgrade – valve procurement contract awarded

### Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Diamond Valley Lake Dam Monitoring System Upgrades – Stage 3	\$ 2,500,000	2025	Begin construction
Garvey Reservoir Rehabilitation	\$ 101,500,000	2027	Complete Design
Jensen Finished Water Reservoir Rehabilitation	\$ 16,600,000	2027	Complete design
Live Oak Reservoir Rehabilitation	\$ 19,800,000	2026	Begin construction
Mills Finished Water Reservoir Rehabilitation	\$ 25,000,000	2026	Complete design

## Dams & Reservoirs - All Project Group

### **Copper Basin Reservoir Discharge Valve Rehabilitation & Meter Replacement**

The Copper Basin Reservoir provides critical storage that enables flowrates along the CRA to be stabilized and controlled. If the reservoir needed to be drained rapidly in the event of an emergency, the discharge valves located at the base of the dam would be opened to safely release the water. Following 72 years of continuous service, the valves have begun to leak and need to be replaced. The dam is under the jurisdiction of the California Division of Safety of Dams (DSOD), which requires that the discharge valves be fully operational at all times. The project scope includes replacement of the fixed cone valves at the base of the dams; refurbish hydraulically operated gate valve, refurbish pipes, upgrade of the electrical and control systems; install cathodic protection system, replace ladders on the dam, and improve access road to safely enable construction personnel, materials, and equipment to reach the work site.

### **CRA Copper Basin Road Improvements**

The Copper Basin road provides operational access to the facility, and notably enables critical sodium hypochlorite deliveries used to disinfect the downstream CRA facilities, preventing growth of quagga and zebra mussels. This existing access road is commonly closed for maintenance after a storm event, so sodium hypochlorite tankers are unable to make deliveries. Among other improvements, this project will improve the 4.2-mile dirt road by providing an enhanced driving surface, erosion protection, and adding turn-out areas.

### **CRA Copper Basin Sodium Hypochlorite Tank Expansion**

Quagga mussels are an invasive species in the Colorado River that breed and grow in layers on CRA System surfaces. This has a detrimental effect on CRA conveyance structures (canals, conduits, siphons, tunnels, reservoirs) and pump plant facilities and equipment (pump impellers, valves, circulation water systems, motors, headgates, etc.). The best defense to prevent the growth of Quagga Mussels is dosing with sodium hypochlorite at Copper Basin. Copper Basin has a facility with two 15,000-gallon tanks to store sodium hypochlorite. However, this volume can only accommodate two days of CRA operations when at 8-pump flow and high temperatures. This limited volume can require three deliveries of 5,000 gallons of sodium hypochlorite tankers per day, which is an operational vulnerability if the chemical cannot be delivered for some reason. This project will expand the existing Copper Basin Sodium Hypochlorite tank farm, doubling the capacity with two new 15,000-gallon storage tanks.

### **Dam Monitoring System Upgrades at Lake Mathews and Lake Skinner**

Metropolitan relies on extensive instrumentation and regular inspections as a cornerstone of its dam monitoring program. The instrumentation provides warning signs of dam distress and provides real-time monitoring of the embankments and foundations. Extensive monitoring equipment has been installed at Lake Skinner and Lake Mathews over the last 48 years and 83 years, respectively. Recent inspections have noted that several of the piezometers and weirs at these facilities no longer function reliably and require rehabilitation or replacement.

Field surveys and condition assessments will be conducted at both dams to develop a staged replacement schedule. Based on the results of the assessments, installation of automated dam monitoring systems and upgraded communications system with remote monitoring units at each dam may be required. This project will also rehabilitate embankment surfaces to address erosion and surface drainage issues.

### **Diamond Valley Lake Crane Rehabilitation**

The scope of the project is to rehabilitate the 25-ton gantry crane at the Diamond Valley Lake Inlet/Outlet Tower. The project will also include a study to evaluate the possibility of increasing the crane capacity to enable it to be used as an alternative lifting device for the emergency drop gate in the event of a failure of the drop gate's normal hydraulic lifting system. This project will enhance infrastructure safety, security, and resiliency, and will enhance the reliability of water deliveries.

**Diamond Valley Lake Dam Monitoring System Upgrades**

The three rock-fill dams which form Diamond Valley Lake (DVL) are monitored continuously by the facility's geodetic deformation monitoring system, which transmits real-time displacement data to Metropolitan's Headquarters at Union Station and to the Operations Control Center at Eagle Rock. This data is collected to provide early indication of a potential problem within the dam embankments or foundations, and to prepare mandatory reports on the dams' performance for submission to DSOD. After 21 years of continuous operation, the existing monitoring equipment has deteriorated and needs to be replaced. The planned upgrades will maintain the capability to continuously monitor dam performance in compliance with the DSOD operating permit.

Upgrades to the dam monitoring network at DVL will be accomplished in three stages. Stage 1 - procurement and installation of the weir level sensors and strong motion accelerographs; Stage 2 - design and preparation of procurement documents for the geodetic deformation monitoring system; and Stage 3 - design and procurement of automated data acquisition system, upgrades to the communication network, and replace sensors, remote monitoring units, and ancillary equipment. Stage 2 has been completed. Stages 1 and 3 will upgrade the West Dam, East Dam, and Saddle Dam areas.

**Diamond Valley Lake Forebay Concrete Joint Seal Replacement**

The concrete joint seals in the Diamond Valley Lake (DVL) Forebay have been in service for over 20 years and have far exceeded the typical service life of two to five years. Division of Safety of Dams (DSOD) had previously directed Metropolitan to address seal replacement at the DVL Spillway; that replacement was completed in 2018. Based on a Metropolitan inspection in July 2018, the Forebay seals are in similar condition to the Spillway seals. This project will remove deteriorated and de-bonded joint seals at the DVL Forebay (approximately 150,000 linear feet), and replace with a new, cost-effective and high-performance MWD-approved sealant.

**Diamond Valley Lake Network Security Detection Systems**

In 2018, a serial arsonist set 11 fires in the Diamond Valley Lake (DVL) area. This project will install multiple network detection security systems around DVL to cover areas with historically high security incidents. The network detection security system will utilize ground-based radar and thermal imaging as necessary to monitor for trespassing, criminal activity, security incidents, illegal dumping, fire, and medical emergencies.

**Diamond Valley Lake Oxygenation System**

This project will construct a liquid oxygen (LOX) storage and feed system at Diamond Valley Lake to improve water quality, reduce impacts of cyanobacterial blooms, and maintain operational flexibility to ensure reliable and high-quality water deliveries under drought and emergency conditions. The LOX system will maintain oxygenated conditions in the deeper waters of DVL and prevent the formation of reduced compounds (sulfides, metals) that interfere with water treatment processes. This will allow for high-quality water to be released from the reservoir year-round. The system consists of: (1) a LOX tank; (2) evaporators to convert LOX to gas; (3) supply lines to deliver oxygen; (4) diffusers to mix the oxygen; and (5) a control system to regulate oxygen flow. Also, a cost benefit analysis will be performed during the early stage of the project to compare the life-cycle cost of purchasing LOX from a vendor versus installing a LOX generation facility at DVL.

**Diamond Valley Lake Secondary Inlet Sleeve Valve Refurbishment**

Diamond Valley Lake (DVL) is used for operational and dry-year, and emergency storage. The existing sleeve valve at the DVL Secondary Inlet is corroding, which will eventually make the valve inoperable. This is the only control valve for the secondary inlet, which is used to refill DVL. This project will remove, refurbish, and replace the existing sleeve valve; recoat existing appurtenant piping; and replace associated couplings.

**Diemer FWR Slope Protection Improvements**

The California Division of Safety of Dams' annual inspection of the Diemer Finished Water Reservoir (FWR) noted that the existing dense vegetation on the abutting slope was obscuring dam safety inspections and providing shelter for burrowing rodents. This project will remove the existing 2.5-acre dense vegetative ground cover on the embankment slopes of the Diemer FWR and rehabilitate the embankment surface with a new slope protection system that minimizes surface erosion, prevents rodent burrowing, and maintains the stability and integrity of the reservoir embankment slopes.

**Eastern Region Security System Upgrade – Area 3**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Chemical Unloading Facility, Lake Mathews, Temescal HEP, Cactus City Communication Site, and Pleasant Peak.

**Eastern Region Security System Upgrade – Area 4**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Detention Peak Communications Site, Diamond Valley Lake, San Diego Canal, West Portal, PC-1 PCS, Perris HEP/PCS, Red Mountain HEP/PCS, and Badlands Tunnel.

**Etiwanda Reservoir Rehabilitation**

The Etiwanda Reservoir has been in operation for 28 years. The liner and appurtenances are in need of refurbishing to maintain their integrity and prevent excessive seepage as noted during periodic inspections. This project will rehabilitate the reservoir by replacing the reservoir liner with a geomembrane liner, replacing the sub-drain sump pump system, and installing new electronic monitoring instrumentation and equipment to better monitor operational status of the sump pump system. The project scope will also include inspection, evaluation, and rehabilitation or replacement of: (1) the asphalt pavement for the reservoir perimeter roads and parking lot; and (2) various valves and gates.

**Etiwanda Reservoir Security Upgrades**

Etiwanda Reservoir has experienced incidents of trespassing and illegal dumping. This project will replace the gate near residences with a high security gate that is cut and climb resistant and install multiple network security detection systems to detect and deter unauthorized individuals from accessing the site.

**Garvey Reservoir Dam Monitoring System Upgrades**

Garvey Reservoir is impounded by three earthfill embankment dams: the North Embankment, Southeast Embankment, and the Southwest Embankment. The reservoir is equipped with an automated data acquisition system (ADAS) to collect data from instruments in and around the dams including piezometers, underdrains, and leakage detection system flowmeters. Data collected from the instruments is used to monitor the performance of the dams and the reservoir liner, and to detect early warning signs of any dam distress. Monitoring data is reported to the DSOD annually and is transmitted to the City of Monterey Park on a near real-time basis. Over the last decade, the existing system hardware and power components have been deteriorating with increasing frequency, and repairs have become increasingly more difficult as the units are no longer manufactured and spare parts are no longer readily available. This project will upgrade the monitoring system at Garvey Reservoir by replacing the existing ADAS equipment and associated sensors. The project will also include the development of a data management and dashboarding system with the ability to automatically transmit the data to the City of Monterey Park.

**Garvey Reservoir Rehabilitation**

Garvey Reservoir was placed into operation in 1954. It is located at the junction of the Middle Feeder and the Garvey-Ascot Cross Feeder in the city of Monterey Park. Garvey Reservoir provides hydraulic grade stabilization, pressure relief, and operational and emergency storage for the Central Pool portion of the distribution system. A flexible membrane liner and reservoir floating cover were installed in 1999. The service life of a reservoir floating cover is approximately 20 years. The existing floating cover at Garvey Reservoir has become increasingly difficult to repair and needs replacement.

This project will replace the reservoir's aging floating cover and flexible membrane liner. In addition, this project will refurbish the existing inlet/outlet tower; modify circulation piping; replace the standby generator and upgrade the electrical system; replace/fix perimeter and security fences; improve surface drainage and erosion controls; rehabilitate the outdated on-site water quality laboratory building; install additional sodium hypochlorite storage tank plus containment and appurtenances; replace valves at the junction structure; and other improvements necessary to rehabilitate the reservoir and support facilities.

**Gene Wash and Copper Basin Dams Safety Monitoring Improvements**

The Copper Basin and Gene Wash Dams are in a very remote area with difficult access requiring four-wheel drive vehicles and boats. Both dams are visually inspected twice per year by Engineering Services including the annual inspection by the California Division of Safety of Dams (DSOD). This project will improve the safety monitoring system at the Gene Wash and Copper Basin dams to maintain compliance with DSOD regulations and Metropolitan's ability to detect dam safety issues in a timely manner. The project scope includes installation and implementation of a modern dam monitoring system that utilizes automatic data acquisition system (ADAS) for continuous monitoring. This project also will perform dam concrete condition assessments, geological evaluations of dam abutments, inspection, survey, and stability analysis. This is a new project for this budget cycle.

**Jensen Finished Water Reservoirs Rehabilitation**

The Jensen plant has two 50-MG finished water reservoirs. Reservoir No. 1 is a concrete structure with a concrete roof that was completed in 1972. Reservoir No. 2 has a polypropylene floating cover that was installed in 1997. The concrete roof of Reservoir No. 1 has a bituminous built-up roofing system and lightweight concrete cap made of perlite. Portions of the perlite cap have deteriorated over time due to weathering. The floating cover at Reservoir No. 2 is showing significant signs of wear and needs to be replaced, and turbulent flow at the inlet has torn holes in the floating cover on several occasions near the corners of the fixed metal air vents. Inadequate mixing contributes to chloramine decay, which in turn increases the nitrite levels within the reservoirs and downstream distribution system causing bacterial regrowth.

The rehabilitation work for Reservoir No. 1 will include refurbishment of the areas of the roof where the existing material has failed from significant weathering damage and implementation of measures to protect the roof. The rehabilitation work for Reservoir No. 2 will include installation of a new finished water reservoir liner and floating cover with a rainwater removal system, modification of plant domestic water system connection, and refurbishment of the effluent gate and dewatering system. To enhance mixing and reduce the occurrence of nitrification within Reservoir No. 2, the work will implement modifications to the existing inlet configuration, replacement of instruments and flow meters, and installation of inlet diffuser pipe system. In addition, within both reservoirs, this project will replace perimeter fence, install bollards and posts, rehabilitate asphalt concrete and access road, and provide other improvements necessary to enhance security and reliability.

**Lake Mathews Area Paving**

The Lake Mathews site serves as the central location for Metropolitan force construction staff, equipment, and supplies. These resources provide construction and maintenance capabilities for projects requiring rapid response or specialized expertise throughout Metropolitan's service area. After 46 years of service the paving throughout Lake Mathews now shows extensive signs of deterioration including alligator cracking, upheaval, swell, settlement, grade depressions, rutting, and potholes. This project will remove, haul away, repave, re-stripe, and improve drainage within multiple severely deteriorating pavement areas of the Lake Mathews site, including the maintenance/yard area between Buildings Nos. 1 and 23, entrance road, area east of Buildings Nos. 7 and 8, and the administration building area including the access roads.

**Lake Mathews Dam Erosion Control**

Lake Mathews is impounded by three embankment dams: Main Dam, Dike No. 1, and Dike No. 2. The Main Dam and Dike No. 1 were originally constructed in 1938, and raised to their current height in 1961, when Dike No. 2 was constructed. Over the years, erosion issues were encountered on the crest, downstream faces of the dam and dikes and surrounding areas. The erosion in these areas has impacted the effective drainage of surface water runoff away from the dam and dike structures and has caused the loss of dam materials from the crest and downstream face. This project will install erosion control features at the Lake Mathews dam and dikes to address the drainage issues to minimize further erosion of the dam materials and to minimize maintenance efforts after storm events.

**Lake Mathews Electrical Reliability**

The existing electrical distribution system at Lake Mathews constructed during the 1930s needs to be upgraded for reliability. This system has been in service for over 79 years and serves the lake's outlet towers and junction shaft, hydroelectric plant, forebay, chlorination system, administrative offices, and maintenance and repair shops. The electrical distribution system is outdated, has experienced numerous overloads, and lacks capacity for planned additional equipment. The system needs to be upgraded to maintain reliability and meet future power demands. This project will evaluate and upgrade power distribution system, which may include use of alternate medium power distribution voltage (4.16 kV) in line with other Metropolitan facilities, underground and overhead power lines and condition of electrical poles, voltage stability for all facilities, the ability to isolate feeders to provide selective isolation and safer maintenance, and emergency generators capability to provide adequate backup. This project also plans to integrate the upgraded electrical system with Metropolitan's system-wide supervisory control and data acquisition system.

**Lake Mathews Forebay Pressure Control Structure and Bypass**

Lake Mathews is the terminus of Metropolitan's CRA and was constructed in the 1930's. Untreated water stored in the reservoir is withdrawn through the lake's forebay and hydroelectric plant and is then conveyed through the Upper Feeder and Lower Feeder to the Weymouth and Diemer plants, respectively. The Lake Mathews forebay discharge valves and outlet tower have gradually deteriorated over 77 years of operation. Portions of the facilities need to be replaced to maintain reliable deliveries from Lake Mathews into the Central Pool. The ten 32-inch-diameter Howell-Bunger valves that are used to withdraw water from the lake have gradually deteriorated through continuous use. The frequency of repairs is increasing, while replacement parts are difficult to obtain. These 64- to 79-year-old valves need to be replaced.

Upgraded facilities may include a new bypass system with pressure control structure, which includes new headworks regulating valves, upgraded outlet tower gates, and a new overflow spillway structure. This project will also include seismic retrofit of the existing forebay, forebay tower, and dike; and replacement of mechanical equipment including slide gates as these facilities are used with the existing turbine operation. The system is expected to provide full-service capacity and deliver water to the Upper and Lower Feeders year-round.

**Lake Mathews Junction Shaft Gate Hydraulic Power Unit Study - Outlet Tower No. 2 Isolation**

The roller gates at the Lake Mathews junction shaft do not operate consistently and reliably. The large isolation gates utilize hydraulic power units (HPUs) to operate under normal conditions and store energy for use in emergency conditions when electric power is not available. Although maintained in accordance with the manufacturer's recommendations, the gates no longer function as designed. This project will evaluate the two roller gate operators at the Lake Mathews junction structure that provide isolation for Outlet Tower No. 2 and rehabilitate the HPUs and support systems. This project also includes instrumentation and controls upgrade at Outlet Tower No. 2 to obtain accurate readings of the valve positions. The study will focus on the condition of hydraulic power unit equipment, safety elements related to pressurized hydraulic reservoirs/tanks, and operating procedures/practices.

**Lake Mathews Network Security Detection Systems**

Existing portions of the current perimeter fencing at the Lake Mathews facility are deteriorated and do not prevent intruders. The inability to properly monitor the area has resulted in incidents of theft and illegal dumping. This project will install multiple network detection security systems around Lake Mathews to cover areas with historically high security incidents. The network detection security system will utilize ground-based radar and thermal imaging to monitor for trespassing, criminal activity, security incidents, illegal dumping, fire, and medical emergencies.

**Lake Mathews Perimeter Fencing Upgrade**

Lake Mathews is the terminus of the CRA. Water is stored in Lake Mathews Reservoir, withdrawn through the lake's main outlet towers into the forebay, and is then conveyed through the Upper Feeder and Lower Feeder to the Weymouth and Diemer plants, respectively. The existing chain link fencing along the approximately 15-mile perimeter of the Lake Mathews facility has deteriorated and is ineffective at preventing intrusions. The fencing can be easily cut, resulting in an increase in break-ins and illegal dumping through the fencing. This project will replace the existing five-foot tall chain link fencing with eight-foot tall, anti-cut, anti-climb security fencing, constructed of steel or wrought iron. This project will enhance infrastructure safety, security, and resiliency, and will improve security and emergency response.

**Lake Mathews Outlet Tower No. 2 Valve Rehabilitation**

The outlet tower valves operate intermittently and do not open and close completely. Without proper operation of the valves, tier selection and flow rates are impacted which may adversely affect system operations including raw water quality, water treatment processes at the downstream Weymouth and Diemer plants, and secure isolation of the tower from the lake needed for maintenance and inspection work. This project will complete a comprehensive study and implement recommendations on replacement or refurbishment of the butterfly valves on the Lake Mathews Outlet Tower No. 2, which may include replacement or refurbishment of 30 butterfly valves.

**Lake Mathews Reservoir Dredging and Emergency Dewatering Facilities**

Sediment has accumulated in the reservoir since it was first built and filled in 1938. Sediment is a result of continual erosion within the Lake Mathews watershed and has led to increased turbidity at water treatment plants, reservoir storage loss, and plugged the main dam diversion tunnel into Cajalco Creek. In addition, the California Department of Water Resources, Division of Safety of Dams (DSOD), has specific outlet dewatering requirements for large dams/reservoirs that impound over 5,000 acre-feet of water. Although the current dewatering method at the forebay meets DSOD's requirement, there is a possibility that the Upper Feeder and Lower Feeder that take water from the forebay may be damaged and become unusable during a seismic event. It is now recommended to reestablish access to the diversion tunnel at the bottom of the main dam by dredging. This project will evaluate dredging options for Lake Mathews Reservoir. Dredging will remove decades of accumulated sediment that reduces reservoir storage capacity, contributes to decreased water quality, and blocks access to dewatering infrastructure at both Outlet Tower No. 1 and the main dam diversion tunnel. The evaluation will identify and prioritize dredging locations through bathymetric surveys and other remote methods, as well as identify mitigation options for the environmental hazards of dredging. The project will also determine the condition of the main dam diversion tunnel and all its mechanical equipment and perform a comprehensive refurbishment to restore its full function.

**Lake Mathews Sodium Hypochlorite Injection System**

Update and redesign the Lake Mathews sodium hypochlorite injection system to relocate the injection point to a location that will minimize the impacts of chlorine injection on the forebay and appurtenant structures. The design will also consider effective Quagga Mussel control, enhancing safety and reliability of the injection system, and adherence to water quality goals and requirements. The project will develop options to replace the existing interim sodium hypochlorite system at the Lake Mathews Forebay with a system at Lake Mathews Outlet Tower No. 1 and Outlet Tower No. 2, and to provide continuous chemical injections from the towers through the Lake Mathews Forebay, Power Plant, and into the Upper and Lower Feeders.

**Lake Skinner Dam V-Ditch Replacement**

Lake Skinner is impounded by an embankment dam 109 feet high and 5,150 feet long, constructed in 1973. The original construction of the dam incorporated concrete v-ditches on the downstream face and the toe of the embankment dam. The purpose of the v-ditches is to provide drainage control from surface runoff to prevent erosion of the dam materials. Over the years, the existing v-ditches have deteriorated and are not functioning as intended, and the DSOD indicated the need for repair or replacement of the v-ditches in several of their annual inspection reports for the facility. This project will replace the v-ditches and other erosion control features along the downstream face and the toe of the Lake Skinner Dam to restore the functionality of the drainage system.

**Lake Skinner Outlet Tower Butterfly Valve Replacement**

The Lake Skinner Outlet Tower is a critical component of the Skinner plant and distribution system operations and is equipped with five tiers of submerged butterfly valves. The valves have been in operation for 45 years and are approaching the end of their service lives. Replacement parts are not available and must be custom fabricated. This project will replace or rehabilitate all the butterfly valves at the Lake Skinner Outlet Tower. Although there is a plan to potentially add a new outlet tower to Lake Skinner, improving the condition of the existing outlet tower valves will allow for operational flexibility and maintain operational reliability at the lake. This is a new project for this budget cycle.

**Lake Skinner Outlet Tower Seismic Upgrade**

Lake Skinner was constructed in the 1970s and is located in the city of Temecula, in Riverside County. Water is delivered from the lake through its outlet tower to the Skinner Water Treatment Plant. If the lake needed to be drained rapidly in the event of an emergency, the outlet tower would be used to safely release the water. The outlet tower is under the jurisdiction of the California Division of Safety of Dams (DSOD) which requires that the tower meet current seismic codes.

Metropolitan has an ongoing program to evaluate the seismic stability of its facilities to maintain reliable water deliveries and to meet current design practices and building codes. Under Metropolitan's seismic assessment program, staff conducted an initial assessment of the Lake Skinner Outlet tower. Seismic analyses of the Lake Skinner Outlet Tower have identified that the tower may be damaged during a major earthquake. This project will (1) replace two valves located at tier 5 of the outlet tower, which are currently not operational, (2) develop an emergency dewatering plan for DSOD's review and approval; and (3) conduct detail seismic evaluation of the tower, develop options to mitigate impacts to the tower if necessary, and to implement a preferred option to mitigate the seismic impact to the inlet/outlet operation.

**Lake Skinner Oxygenation System**

Lake Skinner is subject to seasonal thermal stratification when the lake water temperature prevents mixing of vertical layers resulting in anaerobic conditions and cyanobacteria blooms. These conditions in the lake can ultimately affect water treatment operations and the quality of the finished drinking water due to taste and odor compounds and sometimes cyanotoxins produced by the cyanobacteria. Lake Skinner currently has a compressor-based aeration system that pumps air to the bottom of the lake in an attempt to mix the water and prevent the thermal stratification but the system is undersized and has been at times, ineffective. This project will construct a hypolimnetic oxygenation system at Lake Skinner including an oxygen supply or liquid oxygen facilities, an anchored diffuser piping assembly in the lake, and associated electrical modifications to improve water quality conditions in Lake Skinner and ensure water supply reliability.

**Live Oak Reservoir Rehabilitation**

The Live Oak Reservoir has a 2,500-acre-foot capacity and is located in the city of La Verne. The main purpose of the reservoir is to allow peaking of the Devil Canyon Power Plant and to provide for outages. The reservoir water surface controls the upstream hydraulic gradient for the San Dimas Hydroelectric Power Plant. An inspection identified the following: (1) several valves that are leaking; (2) the reservoir liner is damaged in several areas; (3) the emergency backup generator is no longer manufactured and parts are obsolete; (4) the existing HVAC system including the ductwork for the control room has exceeded its expected service life; (5) improvements to provide access control, intrusion alarm, and surveillance are needed; and (6) improvements to the grading, surface drainage, and paved roads adjacent to the Live Oak Reservoir are also needed. This project will replace leaking valves, reline the influent manifold with reinforced mortar, rehabilitate the fire loop, rehabilitate the existing asphalt concrete (AC) liner and install liner subdrainage system as necessary, replace the existing Emergency Standby Generator and hydraulic power pack unit, replace the existing Heating, Ventilation, and Air Conditioning (HVAC) system, improve surface drainage and erosion controls for the facility, identify and restore all electrical components to new condition or replace with new, including electrical, panel boards and grounding, sump pumps, and associated instrumentation, replace instruments in piezometer room, conduct a security assessment of the facility to reinforce or upgrade physical features and protect infrastructure, which includes replacement of the inner fencing for the reservoir with security type fencing, and other improvements necessary to rehabilitate the reservoir and support facilities.

**Mills Finished Water Reservoir Rehabilitation**

The Mills plant relies on two finished water reservoirs with floating covers and geomembrane liners to provide storage for the downstream distribution system. Their capacity is approximately 25 million gallons (MG) each. The Hypalon cover on Reservoir No. 1 was installed in 1997, while the polypropylene cover on Reservoir No. 2 was installed in 1996. Over the past seven years, an increasing number of rips and pinhole leaks in the covers were discovered and repaired. Due to their deterioration, the floating covers and geomembrane liners at both reservoirs need to be replaced. The rehabilitation work will include installation of new finished water reservoir liners and floating covers with a rain removal system, refurbishment or replacement of existing reservoir gates, installation of a new drop gate, and installation of a permanent bulkhead at Modules 1 & 2 in the combined filter effluent (CFE).

To enhance mixing and reduce the occurrence of nitrification within the reservoirs, the work will also include the installation of an inlet diffuser pipe system, replacement of reservoir instrumentation and influent flow meters. In addition, within both reservoirs, this project will replace perimeter fence, install bollards and posts, rehabilitate asphalt concrete and access road, and provide other improvements necessary to enhance security and reliability.

**Palos Verdes Reservoir Groundwater Management**

This project will address long-term groundwater management at the Palos Verdes Reservoir. The project will evaluate monitoring and disposal options for groundwater seepage, install monitoring instrumentation, develop groundwater and stormwater handling systems, if needed, and provide a connection to the sewer.

**Palos Verdes Reservoir Modifications**

The Palos Verdes Reservoir provides operational flexibility by maintaining deliveries to nearby service connections LA-21 and WB-32 when major feeders in Metropolitan's distribution system are shut down for maintenance. The PV reservoir is used to regulate flows from the PV Feeder. The Palos Verdes Reservoir is challenging to operate since water cannot be stored without experiencing nitrification. This project will investigate the causes of nitrification and implement solutions to mitigate or abate this issue. The solution may involve designing and modifying the reservoir's inlet/outlet structures and valves and other modifications and improvements needed to ensure water quality that meets Metropolitan standards. The project will also include evaluating permanent dewatering facilities to allow reservoir drainage during nitrification.

**Palos Verdes Reservoir Sodium Hypochlorite Storage and Chemical Feed System and Security Upgrades**

This project will replace the 12,000-gallon fiber-reinforced plastic (FRP) sodium hypochlorite (NaOCl) storage tank and appurtenant fittings at the Palos Verdes Reservoir (PVR). The existing FRP tank, manufactured in 1992, is well past its recommended service life of 6-10 years. The FRP tank will be replaced with two 6,000-gallon titanium tanks, which are designed to last 50-70 years and do not corrode in the presence of sodium hypochlorite. Further, modifications to the tank farm feed systems are required to meet revised minimum flow and dosage requirements recently directed by Water Quality and Member Agency demands. Lastly, security cameras will also be added around the PVR facility to provide increased security monitoring.

**Skinner Dam Embankment Stability Evaluation and Mitigation**

Skinner Dam is used to impound water from Lake Skinner to supply raw water to the Skinner Water Treatment Plant and San Diego Pipeline Nos. 3, 5, and 6. Previous evaluations recommended further detailed assessment of the dam embankment under seismic loading. A large magnitude earthquake could prevent Metropolitan from being able to store water behind the dam, disrupting water supply to Skinner Water Treatment Plant and San Diego Pipeline Nos. 3, 5, and 6. Damage to the dam's internal drainage system will necessitate dewatering of the reservoir until repairs can be made. Otherwise, progressive failure of the dam could initiate, ultimately resulting in an uncontrolled release of water. A detailed analysis of the dam embankment is required to refine the findings of the previous evaluations and identify seismic deficiencies and rehabilitation alternatives if necessary. This project will conduct a detailed seismic evaluation of the Skinner Dam embankment. Establish seismic design criteria and ground motions, perform detailed seismic analyses, identify any necessary seismic mitigation alternatives, and design and construct necessary improvements.

**Skinner Finished Water Reservoir Slide Gates Rehabilitation**

The three operational slide gates (Inlet, Outlet, and Bypass) that control the inlet and outlet flows from the Skinner Finished Water Reservoir have been exposed to a corrosive and wet environment since 1991. Visual inspections identified leaking gates and continuing deterioration of the slide gates' exterior coatings. These gates have been in service for 30 years and have not been recoated. This project will rehabilitate the three Skinner Finished Water Reservoir slide gates. The gates will be removed from the gate frames, thoroughly inspected for carbon steel material loss, blasted and recoated to extend their service life. The existing gate frames will be replaced with new frames and other installation components (i.e., guides, wedge blocks, and seals). In addition, the rejection structure will be modified to separate the stormwater and rejection water pipelines and prevent potential stormwater from flowing into the finished water reservoir.

**Spillway Upgrades - Lake Mathews and Lake Skinner**

Following the incidents at Oroville Dam in 2017, the California Division of Safety of Dams (DSOD) is now requiring that dam owners in California assess the condition of dam spillways to confirm that they meet minimum safety standards. In July 2017, DSOD issued an initial list of 93 dams requiring comprehensive spillway assessments to evaluate hydraulic capacity, geotechnical stability, structural integrity, and potential erosion from dam releases. Of the 20 Metropolitan facilities that are permitted by DSOD, two have been directed to undergo the comprehensive assessments: Lake Mathews and Lake Skinner.

Metropolitan submitted the required work plans for re-evaluation of the spillways at Lake Mathews and Lake Skinner and received approval of those plans in September 2017. For each dam, a comprehensive spillway assessment report was prepared and is currently under review by the DSOD. Based on the input from DSOD, the dam spillway and underdrain system will be rehabilitated.

**Western Region Security System Upgrade – Area 1**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at 108<sup>th</sup> PCS, Advanced Purification Center at Carson, Oak Street PCS, Palos Verdes Reservoir (PVR), PVR Relief Structure, Second Lower Spillway at PVR, and Carson/Alameda PCS.

**Western Region Security System Upgrade – Area 5**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Cayote Creek HEP, Deodora PCS, Orange County Reservoir, Santiago Tower, and Valley View HEP.

**Weymouth Finished Water Reservoir Rehabilitation**

The Weymouth plant's 50-million-gallon finished water reservoir was built in 1964 to meet then-current building code. Because the finished water reservoir's concrete roof was constructed with no expansion joints, numerous cracks in the roof slab continue to open and close with the expansion/contraction cycles caused by daily fluctuation in temperature. Rehabilitation is required to protect the concrete and to prevent corrosion of the exposed reinforcing steel. In addition, a rapid seismic assessment conducted in 2000, indicated that the reservoir was marginally stable under seismic loading conditions of that time. Since then, seismic evaluations for the Weymouth facilities and revised building codes have indicated that greater ground motions should be considered.

This project will fix cracked and spalling concrete on the underside of the finished water reservoir roof slab, support beam connections, and entry staircase. The project will also perform seismic evaluation and any needed seismic retrofit to meet the latest DSOD standards.

## Distribution System Program

Fiscal Year 2024/25 Estimate: \$59.4 million

Fiscal Year 2025/26 Estimate: \$42.6 million

**Program Information:** *The Distribution System Program is comprised of 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.*

### Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated:
  - Auld Valley and Red Mountain Control Structures Upgrades
  - Foothill Feeder Blowoff Valve Replacement
  - Lower Feeder Air Entrainment Improvement
  - San Diego and Auld Valley Canals Concrete Replacement – Site No. 622
  - San Diego and Auld Valley Canals Concrete Replacement – Site No. 1055
  - San Diego Pipelines 1 and 2 Rehabilitation
  - Service Connection A-02 Rehabilitation
  - Service Connection EM-14 Meter Replacement
  - Service Connection EM-21 Meter Replacement
  - Upper Feeder Santa Ana River Crossing Stainless Steel Slip Joint Upgrade
  - Wadsworth Pumping Plant Fire Protection System Upgrades
  - Western Region Security Camera System Upgrade – Area 2
  - Western Region Security Camera System Upgrade – Area 3
  - Western Region Security Camera System Upgrade – Area 4
  - Western Region Security Camera System Upgrade – Area 7
  - Western Region Security Camera System Upgrade – Area 9

- Major milestones achieved or estimated to be achieved:
  - Construction:
    - Casa Loma Siphon Barrel No. 1 Seismic Retrofit – completed
    - Etiwanda Pipeline Lining Replacement – Stage 3 – completed
    - Garvey Reservoir Drainage & Erosion Control Improvements Areas 6, 7, 8, 10, and 11 – completed
    - Garvey Reservoir Sodium Hypochlorite Feed System Upgrades – completed
    - Lake Mathews Administration and Warehouse Building Roof Replacement – to be completed
    - Lake Mathews Facility Wastewater System Replacement – to be completed
    - Live Oak Reservoir Bypass Pipeline Cathodic Protection – completed
    - OC-88 Pumping Plant Chiller Replacement – to be completed
    - Orange County Feeder Relining – Reach 3 – to be completed
    - San Diego Canal Concrete Liner Replacement – Site No. 622 – to be completed
    - San Diego Canal Concrete Liner Replacement – Site No. 1055 – to be completed
    - San Diego Pipeline No. 1 Rainbow Tunnel Concrete Liner Rehabilitation – completed
    - Sepulveda Feeder/East Valley Feeder Interconnection Electrical Upgrades – to be completed
    - Skinner Bypass Pipelines Cathodic Protection – completed
    - Upper Feeder Santa Ana River Crossing Expansion Joint Replacement – completed
    - Western San Bernardino Region – Stage 1 Improvements – completed
  - Procurement contract awarded:
    - Lakeview Pipeline Relining – Stage 2 Pipe Procurement
    - Orange and Riverside/San Diego County Operating Regions Valve Replacement – Orange County Area Pressure Control Structures Globe Valve Procurement
    - Rialto Feeder Rehabilitation – Valve Procurement for Service Connection CB-11
    - San Diego Pipelines 3 & 5 Vacuum Valve Replacement – Valve Procurement
    - San Jacinto Diversion Structure Slide Gates V-01, V-02, & V-03 Rehabilitation – Slide Gate Procurement
  - Final design completed:
    - Etiwanda Pipeline Lining Replacement – Stage 3
    - Foothill Hydroelectric Plant Seismic Upgrade
    - San Diego Canal Concrete Liner Replacement – Site No. 622
    - San Diego Canal Concrete Liner Replacement – Site No. 1055
    - San Diego Pipeline No. 1 Rainbow Tunnel Concrete Liner Rehabilitation
    - Western San Bernardino Region – Stage 2 Improvements

## Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Foothill Hydroelectric Power Plant Seismic Upgrade	\$ 9,700,000	2024	Complete construction
Lake Mathews Forebay Pressure Control Structure and Bypass	\$ 177,500,000	2025	Initiate Stage 1 progressive design-build agreement
Perris Valley Pipeline I-215 Tunnels Crossing	\$ 7,830,000	2025	Complete construction
Rialto Pipeline Rehabilitation	\$ 3,500,000	2024	Begin construction
Right-of-Way Infrastructure Protection Program – Los Angeles County Operating Region	\$ 9,200,000	2025	Begin construction of Stage 1
San Gabriel Tower and Spillway Improvements	\$ 16,200,000	2026	Complete design
West Valley Feeder No. 1 - Access Road and Valve Structure Improvements	\$ 4,700,000	2025	Begin construction

## Pipelines, Tunnels, Canals Project Group

**Casa Loma Siphon Barrel No. 1 Seismic Retrofit**

In November 2016, leaks were detected on Barrel No. 1 of the Casa Loma Siphon. It was determined that the pipe has had significant horizontal and vertical movements. The leaks do not immediately jeopardize the structural integrity of the aqueduct but if repairs are not performed, the continued leakage over time could erode soil, undermine the siphon, and cause damage to the siphon structures. The Casa Loma Siphon Barrel No. 1 is vital to Metropolitan's conveyance system moving water from the desert pumping plants to Lake Mathews. The work is conducted in two stages. Under Stage 1, internal seals were installed on 13 joints as an interim measure to address the leaks. These repairs were completed in February 2017, during a planned shutdown of the CRA. Stage 2 will permanently restore the pipe joints within the siphon by replacing 148-inch diameter steel and concrete pipe segments that cross the Casa Loma Fault zone with two parallel barrels of 104-inch diameter earthquake resistant ductile iron pipe segments and steel pipe, which will accommodate relatively large ground displacements from an earthquake and the ongoing ground settlement.

**Casa Loma Siphon No. 1 and San Jacinto Pipeline Protection**

The Casa Loma Siphon No. 1 and the San Jacinto Pipeline cross the San Jacinto River in Hemet, CA. The river experiences periodic high flows during severe storms, exposing the pipelines at the river crossing to damage due to exposure, undermining, or flotation. The scope of the project is to construct a weighted protective cover system, consisting of cable-connected articulated concrete blocks, spanning approximately 200 feet in length over Casa Loma Siphon No. 1 and the San Jacinto Pipeline. This project will enhance infrastructure safety, security, and resiliency, and will improve the reliability of water deliveries.

**Cone Camp Intertie Bypass Rehabilitation**

This project will rehabilitate the Cone Camp Intertie including the existing 24-inch bypass pipe around the 78-inch butterfly valve. Work may include replacement of the 24-inch bypass pipe and associated valves, and other features necessary to support the bypass operation. The Cone Camp Intertie was constructed in 2002 as a part of the Inland Feeder Highland Pipeline to allow the Inland Feeder to receive State Project Water (SPW) through San Bernardino Valley Municipal Water District (SBVMWD) Foothill Pipeline. At the intertie, a bypass pipeline is used to equalize pressure on both sides of the 78-inch butterfly shutoff valve prior to operating the valve. This bypass pipeline has been taken out of service due to pinhole leaks caused by microbiological corrosion due to stagnant water. Although normal operation of the Inland Feeder does not require the intertie, the intertie may be used to convey water for the Inland Feeder when Devil Canyon 2nd afterbay is offline.

**Etiwanda Pipeline (South) Protection - Sta. 332+00 to 349+00**

The City of Rancho Cucamonga is planning to construct a grade separation on Etiwanda Avenue where the Etiwanda Pipeline is located, south of the Etiwanda Reservoir near the tie-in point to the Upper Feeder. Metropolitan is required to either relocate or protect its pipeline, at its own expense, to allow for improvements by the City. The option to protect the pipeline was selected over the relocation option due to time constraints imposed by the grade separation project. The City will install cast-in drilled hole piles (CIDH) in isolation casing within the main bridge span to protect the pipeline. Metropolitan is responsible for the cost of the City's relocation of rectifier and electrical service cabinets, underground conduits, electrolysis test stations, anode well, and patrol road to access manholes; modification of manholes and vent piping for flowmeters and air release vacuum valves, and sump discharge lines.

**Etiwanda Pipeline Lining Replacement**

The Etiwanda Pipeline was constructed in 1993 to convey untreated water from the Rialto Pipeline to the Upper Feeder. This 6.4-mile-long welded steel pipeline is 144 inches in diameter. The northern portion of the pipeline, which is 5.4 miles long, conveys high-pressure water to the Etiwanda Power Plant. From that facility, the southern portion of the pipeline continues for one mile to an interconnection with the Upper Feeder. During an internal inspection, staff discovered that approximately 37 percent of the northern portion of the line has missing or delaminated mortar lining. At the present time, the structural integrity of the pipeline remains sound. Over time, however, the loss of mortar lining will expose the pipeline to accelerated rates of corrosion and eventual leakage. This project will remove existing and failing cement mortar lining and install a flexible polyurethane lining system. Stages 1 and 2 of this three-stage project have been completed, and rehabilitation of the remaining 2.5 miles of the middle reach of the feeder will be completed under Stage 3, which will also include installation of 1,200 feet of steel liner.

**Garbani Water Delivery Pipeline**

Metropolitan is required to provide water to Domenigoni Properties for agricultural usage as a settlement due to the Diamond Valley Lake's construction. Water is currently being fed to the Domenigoni property from the canal using pumps. During high algae bloom, the system gets clogged and must be cleaned every few hours. If the system is not cleared, water is provided to the property through an Eastern Municipal Water District (EMWD) connection. Metropolitan is responsible for the EMWD water bill, which costs up to \$20,000 monthly. This project will construct an interconnection with the San Diego Canal and a pipeline with a gravity-fed system to deliver water to Domenigoni Properties.

**Lake Perris Seepage Water Conveyance Pipeline**

Metropolitan and Department of Water Resources (DWR) have partnered to design and construct facilities to capture and convey Lake Perris leakage water to the CRA. DWR will design and construct a seepage collection wellfield near the foot of the Lake Perris Dam, and this project will design and construct a conveyance pipeline extending from the DWR wellfield to the CRA.

**Lakeview Pipeline Relining**

The Lakeview Pipeline was constructed in 1973 to provide water from the East Branch of the State Water Project (SWP) to the Skinner area. Since it was completed, the Lakeview Pipeline has been shut down on numerous occasions to repair leaking joints. The line has experienced significant deformation which has caused leaks at pipe joints and loss of mortar lining. Due to the significant potential for corrosion of the pipeline, and the lack of structural integrity in many locations, permanent restorations should proceed expeditiously. In March 2015, in response to the ongoing state-wide drought, the Stage 1 restorations were completed. This work included lining a one-mile portion of the Lakeview Pipeline known as the Bernasconi Tunnel with a steel liner. In conjunction with the recently completed Lakeview Pipeline/Inland Feeder intertie, this improvement enables up to 200 cubic feet per second (cfs) of water stored in Diamond Valley Lake to be delivered to the Mills plant. In May 2021, a 133-inch diameter section of pipe referred to as a "wye" branch near the east portal of the Bernasconi Tunnel was relined and a 60-inch diameter "tee" section of pipe located at the Lake Perris Control Facility was replaced. Completion of this work enabled reliable delivery of up to 120 cfs of water stored in Diamond Valley Lake to the Mills plant, while maintaining overall pipeline structural integrity. The Stage 2 work includes lining 3.7 miles of the Lakeview Pipeline between the Inland Feeder's PC-1 control structure and the Perris Control Facility, along with installation of a 1,000-foot-long reach of 9.5-foot-diameter pipe to bypass the Perris Control Facility. Upon completion of the Stage 2 work, the Lakeview Pipeline will be capable of delivering up to 340 cfs from Devil Canyon through the Inland Feeder to the Mills plant, providing an alternate delivery route to the plant as backup to the Santa Ana Valley Pipeline. The Stage 3 work will include lining the remaining 6.7 miles of the Lakeview Pipeline that extends from PC-1 to the San Diego/Casa Loma Canal junction structure.

**Orange County Feeder Dewatering Improvements**

The Orange County Feeder originates at the Weymouth plant in La Verne and extends south for 41 miles to its terminus in the City of Newport Beach. Operations staff struggles with dewatering the pipeline due to development-driven relocations and aging infrastructure. This project will perform the analyses, equipment and facility modifications, and documentation to facilitate future pipe dewatering operations.

**Orange County Feeder Flushing Upgrades**

When the Orange County Feeder is dewatered, Service Connection CM-01 is used as a primary location to release water in the storm drain at a rate of 2 cfs. Service Connection CM-01 is on a narrow, heavily populated street in Corona Del Mar in Orange County. Due to the location, the dewatering setup takes a large street footprint, inconveniencing the community. Furthermore, releasing water into the storm drain has resulted in community inquiries and concerns, primarily due to drought conditions. Solutions such as a hose directly to the drain have been explored, but due to local business and driveway, it has been deemed unsafe and an impractical option. This project will install a dewatering pipe that connects directly to the storm drain and other appurtenances for dewatering.

**Orange County Feeder Relining**

The Orange County Feeder conveys treated water from the Weymouth Water Treatment Plant in La Verne to six member agencies in Los Angeles and Orange Counties. Recent internal inspections of the feeder have identified significant deterioration of the existing coal-tar enamel lining, which is 79 years old. While the pipeline's structural integrity remains sound at present, the interior lining displays blistering and disbonding, which expose the pipeline to accelerated rates of corrosion and eventual leakage. The lining needs to be rehabilitated to maintain long-term reliability of the pipeline.

This project replaces the lining on the 11-mile-long Feeder, which is being accomplished in three stages. Stages 1 and 2 of this three-stage project have been completed. Stage 3 will reline the remaining four miles of the middle reach of the feeder. Stage 3 work includes replacement of the lining, welding of corroded pipe joints, and replacement of deteriorated valves along the feeder.

**Perris Valley Pipeline I-215 Tunnel Crossing**

The objective of the Perris Valley Pipeline is to supply additional water deliveries from Mills plant to EMWD and WMWD per their request. Construction of this 6.5-mile-long pipeline was initiated in 2007, to be implemented under two contracts: the North Reach consisting of 2.7 miles of pipeline and two service connections (WR-24 and EM-23), and the South Reach consisting of 3.8 miles of pipeline and two additional service connections (WR-35 and EM-24). In 2009, the North Reach was completed and placed in service. In 2010, 3.3 miles of the South Reach were completed. This project will connect northern and southern reaches of Perris Valley Pipeline by micro-tunneling and constructing approximately 3,000 linear feet of 97-inch diameter welded steel pipe. This project will also construct four access shafts, cathodic protection test stations, and geotechnical instrumentation and monitoring equipment.

**Rehabilitation of Metallic and Concrete Pipelines Phase 1 - Select High Priority Feeders**

Metropolitan's water delivery system consists of 830 miles of pipelines, of which 670 miles are comprised of reinforced concrete, welded steel, and cast-iron pipe. The majority of Metropolitan's non-PCCP lines were installed over 50 years ago. Experience has shown that degradation from corrosion of reinforced concrete and metallic pipelines can often develop undetected. Some of these pipelines are also showing signs of deterioration, as evidenced by several recent lining and joint restoration projects (e.g., Etiwanda Pipeline, Orange County Feeder, and Lakeview Pipeline).

Phase 1 for high priority pipelines, including Santa Monica Feeder, Upper Feeder, Lower Feeder, and Middle Feeder, will include a complete risk assessment and prioritization of pipeline inspections, condition assessment of these high priority pipelines using prequalified inspection technologies, and recommendations for inspection technologies to be used for future condition assessments. This project also includes installation of permanent pipeline appurtenances required to access the pipeline and rehabilitation of pipelines to reduce the risk of failure, minimize repair costs, and prevent unplanned shutdowns. During the course of this project, other feeders may be identified and added to the high priority list.

**Rialto Pipeline Rehabilitation**

The Rialto Pipeline conveys untreated water from Lake Silverwood to the Live Oak Reservoir in La Verne. The pipeline supplies water from the East Branch of the State Water Project to the Weymouth Water Treatment Plant, and directly services three member agencies through 11 service connections. The size of the pipeline ranges in diameter from 96 to 120 inches and is part of the greater Rialto Pipeline System, which includes the Rialto Pipeline, Etiwanda Pipeline, and La Verne Pipeline.

In February 2010, an internal condition assessment of the pipe mortar lining and remote field eddy current inspection of prestressed concrete cylinder portions were performed. One pipe section with significant mortar damage was observed at Station 2986+09 through Station 2986+44, exposing roughly 26 linear feet of steel. This pipe segment was again inspected in December 2018 and 2020 where it was discovered that an entire 30-foot segment of pipe was devoid of mortar lining with a significant amount of the exposed steel needing immediate weld rehabilitation. This project will perform extensive weld rehabilitation of pipe wall and replacement of missing mortar lining. This project will also replace a pipe spool and isolation valve at CB-11 service connection, eight 72-inch butterfly valve seats at San Dimas Pressure Control Structure, and six lubricated plug valves ranging in size from 4 inches to 16 inches; reconfigure CB-15 service connection to allow blowoff discharge and provide access to one blowoff and one pump well structure; and install internal pipe seals at San Dimas Pressure Control Structure.

**San Diego and Auld Valley Canals Concrete Replacement**

The scope of this project is a comprehensive rehabilitation of damaged concrete liner within the San Diego and Auld Valley Canals. The work will need to be performed during an extended shutdown of the two canals, to the extent that demands, and storage can be accommodated. An extended outage of approximately 30 days will facilitate rehabilitation of priority areas and reaches of the canals, will shorten the overall project timeline, and will reduce the risk of further deterioration. Failure of the liner in either canal will interrupt or reduce raw water deliveries to the Skinner plant and to various downstream member agencies and sub-agencies. The canals are the sole conveyance route for Colorado River water and State Project water to the Skinner plant.

**Rainbow Tunnel Rehabilitation**

The San Diego Pipelines 1 and 2 were built in the 1940s and have multiple diameters and pipe materials consisting of steel, precast concrete cylinder pipe, and precast non-cylinder pipe. The Rainbow Tunnel has an approximate 72-inch diameter, and is horseshoe-shaped. A recent inspection identified sections where the lining needs replacement. Several valves at turnout structures have reached the end of their service lives and require replacement. This project will perform a detailed evaluation of the tunnel and appurtenant structures, replace damaged lining, and refurbish or replace other components as needed.

**San Diego Pipelines 1 and 2 Rehabilitation**

The San Diego Pipelines 1 and 2 were built in the 1940s and have multiple diameters and pipe materials consisting of steel, precast concrete cylinder pipe, and precast non-cylinder pipe. Some of the steel section have cement mortar lining, the remaining sections all have coal tar lining. Several valves at turnout structures have reached the end of their service lives and require replacement. This project will perform a detailed evaluation of the pipelines appurtenant structures, replace damaged lining, and refurbish or replace other components as needed.

**Upper Feeder - Lining Replacement at the Santa Ana River Bridge**

The Upper Feeder was constructed between 1933 and 1941 with a 116-inch-diameter steel pipe and lined with coal tar enamel liner (CTE). This portion of the Upper Feeder is located above ground and crosses the river bed via a bridge. Exposure to the sun subjects the pipeline to a thermal cycle that is continuous heating and cooling of the pipe material. Over the past seven years, staff have performed inspections on this segment of the Upper Feeder and determined that approximately 90% of the pipe's internal lining has failed. Mild to moderate pitting on the interior of the pipe indicate rust tuberculation and corrosion. This project will reline approximately 1,000 feet of the 116-inch diameter pipeline with an approved liner material.

**Upper Feeder Santa Ana River Crossing Stainless Steel Slip Joint Upgrade**

The original expansion joint on the Upper Feeder was replaced with a bellows-style expansion joint in January 2018. The bellows expansion joint then developed a leak in April of 2022 and was replaced with a new expansion joint under an emergency project in September 2022. The new expansion joint was designed for an expedited fabrication and construction schedule, so readily available materials were used and the design was simplified to meet the emergency replacement schedule. The new expansion joint will be fabricated with upgraded materials and a more robust design. In addition, the movement of the bridge itself will be studied using survey data collected during the emergency replacement project to determine the best placement of the upgraded expansion joint, or any additional structural upgrades to the bridge that might be needed. This project will install a new stainless steel (or equal) expansion joint or multiple joints in place of the expansion joint installed under the emergency replacement project in September 2022. Also, the work may require modifications to the bridge structure.

**Pump Stations/PCs/HEPs/Service Connections/Flow Meters/Valves & Gates Project Group****108th Street Pressure Control Structure Valve Replacement**

The 108th Street Pressure Control Structure (PCS) located on the Palos Verdes Feeder was constructed in 1941. The pipeline has a design capacity of 80 CFS in this area and provides the flexibility to deliver water through the Inglewood Lateral and Culver City Feeders to member agencies, including the city of Los Angeles, Central Basin Municipal Water District, and West Basin Municipal Water District. This project will rehabilitate the control structure including replacing valves, a corroded ladder, and catwalk grating; restoring electrical components to new condition; installing an emergency backup generator and security features; and refurbishing or replacing other appurtenances. Electrical components consist of electrical panel boards and grounding, sump pumps, and associated instrumentation.

**Appian Way Valve Replacement**

The Appian Way Sectionalizing Valve Structure on the Palos Verdes Feeder was constructed in 1937. The pipeline has a design capacity of 60 CFS in this area and delivers water to Metropolitan's member agencies, Central Basin Municipal Water District, and the city of Los Angeles. The sectionalizing valve provides Metropolitan the flexibility to isolate flows on the Palos Verdes Feeder between the Long Beach Lateral Turnout Structure and Appian Way Sectionalizing Valve Structure to perform preventive maintenance, planned shutdowns, and emergency activities if required. This operational reliability allows for continued delivery of water to Metropolitan's central pool. The failing sectionalizing valve is 82 years old. Over the past few years, the 24-inch valve has been rebuilt several times to extend its service life. This valve can no longer be rebuilt and has become extremely difficult to operate as it gets stuck and does not fully open or close. The body and cone have eroded, which prevents the valve from properly sealing. This project will replace failing valves, dresser couplings, corroded pipe spools, and install a new precast concrete roof slab at the Appian Way Sectionalizing Valve Structure. Additionally, the project would identify and restore all electrical components add 240-volt electrical service, provide for SCADA control of the valves, and refurbishment or replacement of other appurtenances. Electrical components include electrical panel boards and grounding system, sump pumps, and associated instrumentation.

**Auld Valley and Red Mountain Control Structures Upgrades**

The Red Mountain and Auld Valley PCS facilities control flows in pipelines to the San Diego area. Due to a lack of isolation valves, the pipelines must be shutdown to perform work on the sleeve valves. The sleeve valves are worn and in need of refurbishment or replacement. This project will include procurement or replacement of sleeve valves for the Red Mountain PCS and the Auld Valley PCS. The scope will also include adding isolation butterfly valves upstream and downstream of the sleeve valves at the Auld Valley and Red Mountain PCSs to make future maintenance possible without taking their respective pipelines out of service.

**Conveyance and Distribution System Electrical Structures Rehabilitation**

Metropolitan's distribution system includes over 1,000 structures which house equipment used to measure pipeline flow, control pipeline flow and/or pressure, relieve pressure or vacuum, and isolate or sectionalize a pipeline. The conduits and electrical equipment inside the structures have corroded and no longer provide adequate grounding. In addition, the wiring inside the conduits may be compromised. These electrical components have been in continuous service in a damp, underground environment for over 50 years, and need to be upgraded. The rehabilitation for the Conveyance and Distribution System Electrical Structures has been prioritized and will be completed in five stages. Upgrades of the first 15 highest priority service connection structures within Orange County have been completed as Stage 1. Stage 2 improvements will upgrade the remaining 244 structures within Orange County. Stage 3 improvements will upgrade 258 structures in northern Los Angeles County. Stage 4 improvements will upgrade 258 structures in southern Los Angeles County. Stage 5 improvements will upgrade 301 structures in Riverside, San Diego, and San Bernardino Counties. The precise number of structures to be improved may vary depending on condition assessments. The planned work includes identification and restoration of all electrical components to new conditions including service panels, conduits, wiring lights, and receptacles; and providing new grounding systems, sump pumps, exhaust fans, remotely monitored flood alarms at each structure, and other appurtenances.

**Conveyance and Distribution System Hydraulic Pilot Valve Standardization**

There are approximately 265 pilot valves within the conveyance and distribution system, located at pressure relief or pressure control structures. A pilot valve works together with a control or relief globe valve to set pressures within the distribution system. Currently, several different types of valve and superstructure assemblies exist throughout the system and as they age, lack of a common design makes replacement difficult. This project will develop, fabricate, and install a standardized hydraulic control/relief pilot valve and superstructure at pressure control structures District-wide across the conveyance and distribution system. Utilizing a standardized valve and superstructure assembly will increase productivity and reliability.

**Covina Pressure Control Structure Rehabilitation**

The Covina Pressure Control Structure (PCS) controls flow in the Middle Feeder North and multiple service connections. It has recently experienced numerous valve failures and pin-hole leaks. This project will replace valves, pipes, and control and electrical systems; rehabilitate the restroom and structural components; install security features and other work necessary to restore reliability of the pressure control structure. The work will be performed in stages to allow for replacement of critical flow control valves in advance of the remaining improvements.

**Coyote Creek Hydroelectric Plant/PCS Emergency Standby Generator Replacement**

The existing emergency stand-by generator was installed when the Hydroelectric Plant/Pressure Control Structure (HEP/PCS) was constructed in 1982. The emergency generator is 39 years old and has deteriorated with age. This project will replace the existing emergency generator with a new 150 kW, 3-phase 480-volt, diesel engine driven generator and construct an additional manual transfer switch outside the stationary generator room to provide for a secondary portable generator hookup. This project will also upgrade electrical and mechanical system to the generator building to meet current emission and fire code regulations under the Environmental Protection Agency's Tier 3 Emission and Fuel Standards Program.

**Coyote Creek PCS HEP Perimeter Security Upgrade**

The Coyote Creek Pressure Control Structure (PCS) and Hydroelectric Plant (HEP) facility falls under North American Electric Reliability Corporation (NERC) and Federal Energy Regulatory Commission (FERC) oversight and must adhere to critical infrastructure regulations set by these agencies. The current perimeter security fencing and security measures at this site do not meet the NERC/FERC security standards. This project will replace all perimeter fencing and both entry gates, relocate the rear vehicle gate to the front of the driveway at Lambert Road, and install multiple network security detection systems to detect and deter unauthorized individuals from accessing the site.

**Diamond Valley Lake and Skinner Area Flow Meter Replacement**

The flow meters at the Diamond Valley Lake (DVL) Inlet/Outlet Tower, DVL Connection Canal, DVL Secondary Inlet, Cabazon Radial Gate Facility, Lake Skinner Inlet, and DVL North and South siphons are critical to operation of Metropolitan's distribution network in the vicinity of DVL and the Skinner Plant. This project will either replace or refurbish these aging flow meters making them either new or like-new.

**Districtwide Valve Rehabilitation and Improvements**

Several Metropolitan distribution system valves are approaching, or have reached, the end of their service lives. There is an inability to operate an increasing number of motor-operated valves and gates due to the failure of obsolete electric motors, which cannot be repaired due to the lack of available spare parts. Failures of valves often do not have visible indications or warnings that can be observed before an incident. Staff is currently operating in a reactive mode, replacing valves as they fail, which causes unplanned shutdowns and obstacles in operating the distribution system. This project will establish a method to systematically assess the condition of all valves and supporting infrastructure located throughout Metropolitan's conveyance and distribution systems, identify valves that require rehabilitation or replacement, and implement a rehabilitation or replacement plan.

**Dominguez Channel Pressure Relief Structure Improvements**

The Dominguez Channel Pressure Relief Structure is located on the Palos Verdes Feeder near the Harbor Freeway and Hoover Street at the Dominguez Channel Crossing. Recent inspections have found leaking valves, inoperable needle valves, failed electrical services, and failed communication cables. This project will replace valves, modify piping and concrete, and construct new underground electrical and communication service as necessary to restore reliability of the relief structure.

**Eagle Rock Tower Distribution System Upgrades**

Eagle Rock Tower diverts the flow of water from the Weymouth plant into the Palos Verdes Feeder, Santa Monica Feeder, and the Eagle Rock Lateral. The tower is also used to maintain the required hydraulic grade to the service connections upstream of the tower. This project will perform needed rehabilitation of various components of the Eagle Rock Tower distribution system. The project will include the following: (1) replace the leaking control and isolation valves at the interconnections to the Palos Verdes and Santa Monica Feeders, (2) replace corroded slide gate, and tower access ladder and cover, (3) refurbish slide gate rails and associated components, (4) fabricate and install new drop gate at inlet side of Eagle Rock Tower to improve isolation capability, (5) extend Santa Monica Feeder interconnection blowoff structure and install isolation valves to improve maintenance flexibility, (6) construct new access road from main access road to the Palos Verdes and Eagle Rock Interconnection Structure to facilitate safe access to the structure, (7) replace corroded work platforms and ladders in interconnection structures to improve worker safety, and (8) refurbishment and upgrades of other appurtenances as they are identified during the facility assessments.

**East Orange County Feeder No. 2 Service Connection OC-44A Valve Replacement**

The East Orange County Feeder #2 is a 25-mile-long pipeline which delivers treated water from the Diemer plant to the cities of Anaheim, Orange, Santa Ana, and Irvine. Service Connection OC-44A, which is located in Newport Beach, was constructed in 1967 and delivers water to the Municipal Water District of Orange County. Gradual corrosion and wear from over 52 years of operation has led to the deterioration of the 16-inch plug valve. The valve is currently leaking and needs to be replaced. The plug valve shaft was installed in the horizontal position to allow placement of the valve within the vault. This unconventional position may have accelerated the deterioration of the valve. This project will replace a 16-inch-diameter plug valve, flowmeter, and appurtenant piping and equipment as required in the Service Connection OC-44A Structure. This project will also identify and restore all electrical components to new condition. Electrical components consist of electrical panel boards and grounding system, sump pump, and associated instrumentation.

**Flow Meter Replacement**

Metropolitan has over 500 flowmeters used for water revenue metering at service connections, operation of the conveyance and distributions, and for process control. Many flowmeters have been in operation over 50 years. Some of these meters are exhibiting signs of deterioration. Spare parts for older meters are increasingly difficult to procure.

This project will be conducted in three stages. Under Stage 1, a comprehensive evaluation of the flowmeters will be conducted to assess their current condition and availability of spare parts. Under Stage 2, deteriorating meters in critical services will be replaced. Under Stage 3, a comprehensive, risk-based approach will be implemented to replace the remaining flow meters.

**Foothill Feeder Blowoff Valve Replacement**

The Foothill Feeder conveys untreated water from the West Branch of the State Water Project into the western portion of Metropolitan's service area. To maintain delivery reliability and identify any prestressed concrete cylinder pipe (PCCP) segments that may become distressed, the pipe is inspected every five to seven years. Current state-of-the-art inspection techniques require dewatering of the pipe using seven blowoff structures. Each blowoff structure has two valves, one for isolation and the other to control flows. The existing blowoff valves are from the original construction and have been in service continuously since 1968. Although the valves have been maintained, they have deteriorated to the point that they are no longer repairable, are unable to provide a positive seal, and as a result, leak. This project will replace the blowoff valves and associated appurtenances.

**Foothill Feeder PCS Valve Replacement**

Foothill Pressure Control Facility (PCF) is located at Castaic Lake in northern Los Angeles County. The structure takes untreated water from the west branch of the State Water Project system and controls all untreated water flows into the Jensen plant. Foothill PCS consists of two turbines, two 60-inch inline sleeve valves, and three parallel trains of conical plug valves. Each plug valve train consists of three 48-inch conical plug valves in series, that are throttled to dissipate pressure. Although the conical plug valves are currently used to control flow, these types of valves are not well-suited for this application. In addition, recent valve inspections have identified leaks, cracks, and corrosion. This project will replace the conical valves with valves that are better suited for flow control and will replace all other valves that are at the end of their service life and other facility improvements.

**Foothill Hydroelectric Plant Discharge Elimination**

The Foothill Hydroelectric Plant (HEP) facility uses a raw water lubricating and cooling water system directed to the turbine shaft seals. The water flow is discharged from the plant under a permit governed by the Regional Water Quality Control Board. Metropolitan has received discharge permit violations for water quality constituents directly from Castaic Lake that are outside of Metropolitan's control. The objective is to eliminate or reduce to the most practical extent possible the seal water discharge flow at Foothill HEP.

**Foothill Hydroelectric Plant Refurbishment**

The Foothill Hydroelectric Plant was constructed in 1981. An assessment has identified that the facility is seismically vulnerable and should be upgraded. In addition, the electrical and mechanical systems are exhibiting signs of normal wear and tear after 34 years of service. This project will provide structural strengthening including reinforcing the roof, replacing a cracked beam, and installing connectors and seismic restraints to the roof, columns, and walls. Retrofit work will include upgrades for non-structural components such as equipment anchors, pipe/conduit supports, and crane rail bracing. This project will also refurbish control and electrical protection systems, mechanical piping for the generator cooling water systems, add a Programmable Logic Controller, install on-line data acquisition and monitoring system, refurbish runner, replace wicket gates, and refurbish or replace other deficient equipment.

**Hollywood Tunnel North Portal Equipment Upgrades**

Built as part of the Santa Monica Feeder in 1937, the North Portal of the Hollywood Tunnel is one of three control points along the feeder, which delivers water to the cities of Burbank, Beverly Hills, Los Angeles, and Santa Monica. The valves and mechanical control system at the North Portal of the Hollywood Tunnel are obsolete. Repair parts are not available and must be fabricated at a machine shop. This project will replace the existing sleeve valves and hydraulic actuators at the North Portal of the Hollywood Tunnel with new control valves with electric actuators. The upgrade includes replacing the mechanical controls with electronic, PLC/SCADA controls, which will allow the facility to be monitored and controlled from the Eagle Rock Operations Control Center, and replacement of the isolation valves. This project will also replace control valves for the bypass, install new electrical service to support the load necessary for the new control systems, and other improvements necessary to upgrade and rehabilitate the equipment and support systems.

**Hydroelectric Plant Rehabilitation**

Metropolitan owns and operates 15 hydroelectric power plants with a total installed capacity of 130 megawatts. Approximately 10% of Metropolitan's income is derived from these power plants. The first plant to be commissioned was the Greg Avenue Power Plant in 1979, and the last was the Wadsworth Hydroelectric Power Plant in 2002. Many of these plants have been in operation over 37 years and have not undergone refurbishment or upgrade. Several plants are beginning to show signs of deterioration and several have already been refurbished. A comprehensive approach to rehabilitation of the other hydroelectric plants is needed to protect Metropolitan assets and fortify infrastructure reliability.

This project will assess and evaluate Metropolitan's hydroelectric plants, determine the rehabilitation requirements for each plant, identify needed pilot efforts, prioritize the needed rehabilitation, and develop a multi-phase plan to complete the rehabilitation. New facilities or those that have already undergone rehabilitation will not be included in the evaluation. For the included hydroelectric plants, the assessment will evaluate the following equipment and systems: turbine, generator, power equipment and switchyard, control system, protection system, auxiliary systems such as lube oil and cooling water, and the overall facility. This project will also perform seismic evaluation and improvements as necessary to safeguard the hydroelectric plants from known seismic risk.

**Inland Feeder and Perris Control Structures Refurbishment**

The Inland Feeder Pressure Control Structure (PC-1) and Perris Pressure Control Structure (Perris PCS) provide the mechanism to properly manage the flow of water through the Inland Feeder and Lakeview Pipeline, respectively. The PC-1 was built in the 1990s and is located along the Inland Feeder pipeline, between stations 1986+00 and 1999+00. It interconnects to the CRA at approximately mile marker 225.0, 16 miles north of DVL. The PC-1 controls the flow of water through the Inland Feeder to target destinations. It regulates State Water Project (SWP) flow from Devil Canyon through the Inland Feeder to Diamond Valley Lake, where water can be diverted into the lake or delivered to the San Diego Canal via the DVL Forebay. The Perris PCS was built in the 1970s and is located at the base of Perris Dam. The facility is used to regulate the flow of State Project water through the Lakeview Pipeline. The two lines deliver water from the Lake Perris Outlet Tower to the Perris PCS. Each of these lines has a butterfly valve, one or both of which remain open during normal operation, depending on flow requirements. The valves in PC-1 and Perris PCS have recently experienced excessive torquing due to debris which has led to damage of the valves and their components. This project will rehabilitate these valves, pipes, control and electrical systems, and other work necessary to restore the reliability of the pressure control structures. This is a new project for this budget cycle.

**LADWP Connection in Magazine Canyon**

The Los Angeles Department of Water and Power (LADWP) connection in Magazine Canyon is rated for 400 cfs and was designed to supply water to the Jensen plant from LADWP's aqueduct system. However, the connection is unreliable as the bar screen located in the LADWP piping builds up debris and clogs. This project will redesign and build new flow control equipment downstream of the LADWP turnout valve with the capability to collect and remove debris. This equipment would allow the LADWP bar screen to be removed and the LADWP turnout valve to be left in the fully open position during operation providing the Jensen plant with a reliable, back-up source water supply to limit disruptions during unforeseen events.

**Lake Mathews and Temescal Hydroelectric Plants Circuit Breaker and Oil Circuit Recloser Replacement**

The Lake Mathews & Temescal Sulfur Hexafluoride (SF<sub>6</sub>) circuit breakers have operated for the last 40 years and are at their end of life. Sulfur Hexafluoride is an ozone depleting greenhouse gas with annual leakage reporting requirements. This project will replace the Temescal and Lake Mathews Hydroelectric plant electrical interrupting devices with vacuum circuit breakers and replace damaged switchyard disconnects which will satisfy Metropolitan's regulatory requirements under new proposed regulations to phase out SF<sub>6</sub> gas insulated equipment.

**Lakeview Delivery Structure Isolation Gates**

The Lakeview Delivery Structure diverts water to the San Diego Canal or the Casa Loma Canal. Isolation and diversion are done manually by staff working over open and active canals installing wooden weirs. The installation of the weirs is cumbersome and time-consuming. Furthermore, the weirs leak excessively, which means they allow water to enter work zones when used as isolation. This project will fabricate and install four new isolation gates for the Lakeview Delivery Structure on the Lakeview Pipeline.

**Oak Street Pressure Control Structure Rehabilitation**

The Oak St. Pressure Control Structure (PCS) is one of two control facilities on the Second Lower Feeder (SLF) and provides water to the Palos Verdes Reservoir and several service connections. Recent inspections have identified various work to be performed to restore reliability of the pressure control structure. This project will replace valves, gratings, fasteners, and control and electrical systems; rehabilitate structural components; install security features; and other work necessary to restore reliability of the pressure control structure.

**OC 76 Flow Control Facility**

The OC-76 flow control facility is located in a residential neighborhood in Lake Forest. Over the last eight years, the home next to the structure has complained about the noise emanating from the structure when water flows. After some investigation, it was determined that water flowing at a low rate through the existing 16-inch flow control valve causes the valve to vibrate loud enough to bother the homeowner next door. Further investigation showed that the structure was designed and built with an 8-inch valve for low-flow scenarios. The 8-inch valve was removed at some point, leaving only the pedestal. This project will procure and install a new 8-inch flow control valve at the OC-76 flow control facility. The project will also include additional piping and SCADA to return the pressure control structure to its original design.

**OC-88 Pumping Plant Rehabilitation**

The OC-88 Pumping Plant, consisting of the OC-88 and OC-88A pump stations, was constructed in 1990 and is located in the city of Lake Forest. Treated water from the Diemer plant is conveyed through the Allen-McColloch Pipeline (AMP) to the OC-88 Pumping Plant, which in turn pumps water directly into the Municipal Water District of Orange County's (MWDOC's) South County Pipeline. The surge tank system protects the AMP and the South County Pipeline from pressure surges. Two new surge tanks were added when the OC-88 Pumping Plant modifications were completed in 2005. However, the air compressor was not upgraded at that time. A recently completed high-flow test at the OC-88 Pumping Plant identified that a second air compressor should be installed to adequately protect the AMP and the South County Pipeline. In addition, Southern California Edison performed an efficiency test on the three existing pump motors located at the OC-88A pump station and found that improvements in motor efficiency could result in annual savings of approximately \$25,000 in electricity costs, and an estimated 235 tons of CO<sub>2</sub> emissions. Lastly, the chiller units and ultrasonic flow meters have exceeded expected useful service lives and are in need of replacement. This project will upgrade the OC-88 Pumping Plant's surge tank system, install a second air compressor, replace flow meters and pumps with ones that have high-efficiency motors equipped with variable frequency drives, perform overhead crane improvements, fire protection, and HVAC systems; and perform other associated facility improvements.

**Olinda Pressure Control Structure Valve Replacement**

The Olinda Pressure Control Structure was constructed in 1969 to provide regulation of flows in the Lower Feeder between the Santiago Control Tower and Diemer Filtration Plant. This project will replace two conical plug valves to increase efficiency, reliability, and mitigate the vibrations caused by operating the valves. The structure's electrical and instrumentation components and other facility components will also be evaluated and refurbished or replaced. Replacing the existing 53-year-old valves will improve operational control of the Lower Feeder between the Santiago Control Tower and the Diemer plant. If cost-effective, relocation of the PCS will also be considered.

**Orange and Riverside/San Diego County Operating Regions Valve Replacement**

Metropolitan's distribution system includes over 830 miles of pipelines and 5,400 individual structures that require regular maintenance and monitoring. The system is comprised of four regions: the Los Angeles County, Orange County, Riverside/San Diego County, and Western San Bernardino County regions. The subject project will replace valves within the Orange and Riverside/San Diego County operating regions. Replacement of these valves is a priority due to the age of the feeders and the number of critical valves that need to be replaced.

The valves on the Second Lower Feeder, Orange County Feeder, East Orange County Feeder, Lower Feeder, Santiago Lateral, the Allen-McColloch Pipeline, Lakes Skinner Outlet Conduit, San Diego Pipelines Nos. 3, 4, and 5 have been in service up to 54 years and have reached the end of their useful and expected service life. Failure of these valves or their associated components may result in an unplanned emergency shutdown of one of these pipelines impacting delivery to our member agencies. The valves to be replaced include air release/vacuum valves that are installed at high points in the lines to exhaust or admit air during pipeline filling or dewatering operations, and small globe, plug, and butterfly valves. The latter valves are used for isolation of air release/vacuum valve assemblies, blowoff structures, and pressure control structures. Closing these isolation valves allows inspection and maintenance activities to proceed without requiring a shutdown of the feeder. The scope of work is to replace approximately 120 deteriorated valves ranging in size from 1 to 12 inches in diameter on various pipelines in the Orange, Riverside, and San Diego County Operating Regions. This project will also include relocation of air release/vacuum valves from underground to above-ground structures.

**Palos Verdes Feeder - Long Beach Lateral Turnout Structure Sta. 1442+15 Valve Replacements**

The Palos Verdes Feeder - Long Beach Lateral turnout structure, located in the County of Los Angeles, was constructed in 1938. The Long Beach Lateral turnout structure consists of seven valves that allows Metropolitan to continue delivering water upstream and downstream to member agencies during preventive maintenance, shutdowns, and emergencies. This project will replace the seven valves on the Palos Verdes Feeder/Long Beach Lateral Turnout Structure that are 84 years old. The structure will also be refurbished and include replacing the existing catwalk grating, a new precast concrete roof slab, lifting mechanism, security type entry hatches, and identify and restore all electrical and instrumentation components to like new condition. Electrical components consist of electrical panel boards and grounding system, sump pump and associated instrumentation.

**Perris Control Facility & Hydroelectric Plant Upgrades**

The Lake Perris Control Facility (LPCF) includes a pressure control structure, pump back system with four electric and two diesel pumps, and a hydroelectric plant. This facility controls flows from delivered from the Department of Water Resources Silverwood Reservoir located at Devil's Canyon, and Lake Perris to the Lakeview Pipeline. To improve Mills Plant reliability, water from Diamond Valley Lake and Inland Feeder can be delivered to Mills plant by gravity flow but would require some modifications to the Lake Perris Control Facility's pressure control structure and HEP. The project will upgrade the LPCF systems to handle the maximum head of 1934 feet (from the Inland Feeder) by upgrading components of the pressure control structure and replacement of the hydroelectric plant.

**Perris Pressure Control Structure Perimeter Security Upgrades**

The current fencing at the Perris Pressure Control Structure (PCS) is inadequate, evidenced by a recent intrusion. This project will replace all perimeter fencing with a high security fence that is cut and climb resistant with a 3-strand barbed wire top guard, and install multiple network security detection systems with the intent to lower the District's exposure to theft, arson, and vandalism.

**Prevention of CRA Water Migration to SPW at Weymouth Junction Structure**

Recently, quagga mussel veligers were discovered at the USG-03 service connection necessitating coordination with local water agencies and implementation of a control and mitigation plan. The affected areas were flushed and chlorinated, groundwater recharge basins were desiccated, and no additional veligers were found. It was determined that Colorado River Water (CRW) was able to inadvertently migrate through the Weymouth Water Treatment Plant (WTP) Junction Structure's sectionalizing valves into the La Verne Pipeline and travel through the Glendora tunnel to service connection USG-03. This project will install pressure monitoring devices connected to nearby existing Remote Terminal Units at key locations along the La Verne Pipeline. Pressure ranges and set points for alarms will be determined to provide adequate time for operations and field staff to respond to abnormal conditions in the system to detect CRA water intrusion. This project would minimize the potential for CRW to enter unaffected facilities that normally move State Water Project (SWP).

**Ramona Pressure Control Structure Rehabilitation**

The Ramona Pressure Control Structure (PCS) is located on the Middle Feeder and controls the pressure in the pipeline. Staff is no longer able to repair the aging equipment because replacement parts are no longer available. There has also been a dramatic increase in vandalism and theft at the facility. This project will rehabilitate the Ramona PCS facility including replacement of valves, actuators, motors, control systems, lighting, electrical components, corroded piping, platforms, ladders, sump pumps, and other facility appurtenances. This project will also include security upgrades.

**Rio Hondo Pressure Control Structure Valve Replacements**

The Rio Hondo Pressure Control Structure (PCS) on the Middle Feeder pipeline was constructed in 1983. Construction of the Rio Hondo PCS incorporated an existing valve structure, so the valves at this location have been in operation since 1953 as part of the original underground valve structure. The existing valves have been in continuous service for approximately 69 years, and over time have required frequent repairs/rebuilding.

The Eagle Rock Operations Control Center utilizes the Rio Hondo PCS to maintain the lower pressure zone on the southern half of the Middle Feeder, and to assure deliveries to member agency water demands in the southwestern service area. This project will replace failing valves at the Rio Hondo PCS. The work will include replacing dresser couplings, pipe spools and fittings, and pipe supports; providing improved ventilation, insulation, equipment access, and structural resiliency for the structure; rehabilitating the existing wastewater system; upgrading various security features, and identifying and restoring all electrical components to new condition. Electrical components consist of electrical panel boards and grounding system, sump pumps, and associated instrumentation. This project will also perform condition assessment of inlet and outlet manifold piping as well as remaining control lines to identify rehabilitation needs and evaluate hydraulic impact on the adjacent hydroelectric plant resulting from this project.

**San Diego Canal Radial Gates V-06 and V-08 Rehabilitation**

The protective coatings on the radial gate at the San Diego Canal and the operating components of the gates have begun to fail, and significant metal loss has occurred. In addition, the performance of the existing motor actuators used to open and close the gates has diminished. Should this gate fail, there would be loss of control to regulate flow into Lake Skinner from the San Diego Canal, along with loss of control in surface elevation that regulates flows through the Lake Skinner Bypass screening structures. The bypass structures supply the Skinner area raw water pipelines and the Skinner plant when Lake Skinner is being bypassed, typically due to a taste and odor issue in the lake. This project will rehabilitate or replace the San Diego Canal Radial Gates V-06 and V-08. The rehabilitation may include strengthening or replacing steel members as needed, replacing the radial gate actuator and controls, modifications to the seals and guide rails, and preparing and coating steel surfaces with an approved coating, such as a galvanic metalized coating. This project will also add sensors and software to report the elevation of the gates relative to the water elevation and percent opening of the gates.

**San Diego Pipelines 3 & 5 Vacuum Valve Replacement**

This project will remove and replace over seventy existing vacuum valves on San Diego Pipeline No. 3 (SDPL3) and San Diego Pipeline No. 5 (SDPL5). The existing valves on SDPL3 have been in service for almost 64 years, while those on SDPL5 have been in use for almost 44 years. All the valves have reached the end of their services lives, and the majority are not in a condition to be rehabilitated. All valves will be replaced in-kind. This project will lower corrective maintenance costs, and the risks of valve failures resulting in property or pipeline damage or unscheduled pipeline outages.

**San Dimas and Red Mountain Power Plants Standby Diesel/Engine Generator Replacements**

The emergency generator at Red Mountain Hydroelectric plant was installed during the original plant construction in 1983. The generator at the San Dimas Hydro Electric Power Plant was installed during original Pressure Control Structure construction in 1975. These generators are necessary to ensure all operating equipment performs the required flow transfers between the Hydroelectric Power Plant (HEP) and the Pressure Control Structure (PCS) during un-scheduled HEP interruptions and San Diego Gas & Electric (SDGE) station-power failures. The scope of work is to design, procure, and construct two standby diesel engine generators, one each at the San Dimas and Red Mountain Power Plants. The project scope includes removal of the existing generators and fuel tanks, construction of a new unloading facility with spill containment, steel overhead canopies, and electrical and mechanical system upgrades to the replacement generator to meet current emission and fire code.

**San Dimas Hydroelectric Plant Rehabilitation**

The San Dimas Hydroelectric Plant was constructed in 1981, and the electrical and mechanical systems are exhibiting signs of normal wear and tear after 43 years of service. The scope of work is to rehabilitate the electrical and mechanical systems including turbine, generator, generator cooling system, all bearing and bearing lubrication systems, switchgear, protection and control relays, speed controller, data logger, annunciator, vibration and exciter systems, and to provide associated controls. This project will also include seismic evaluation and upgrades consistent with current building and safety codes and other facility upgrades.

**San Jacinto Diversion Structure Slide Gates V-01, V-02, and V-03 Replacement**

The San Jacinto Diversion Structure, located at the base of the San Jacinto Mountains, was completed in 1939. The diversion structure divides incoming flow from the CRA to three different outlets, using slide gates to control each flow. Although the existing gates were originally designed for open/close operation only, they had historically also been used for throttling the flow, which had caused substantial damage to the gates. This project will replace the existing V-01, V-02, and V-03 cast iron slide gates with stainless-steel slide gates designed for throttling, install a new stainless-steel drop gate at the valve structure V-04, and appurtenances at both facilities. This project will increase the operational reliability of the structure and the connection to the Casa Loma Siphon No. 1 and CRA.

**Santa Monica Feeder and East Valley Feeder Bypass for Sectionalizing Valves**

The lack of a bypass line at the Santa Monica Feeder and East Valley Feeder creates the potential for damage to the valves and their operators due to the inability to equalize pressure across the valves before operating. Further operation of these valves, without installing a bypass, will continue to place the valves and pipeline at risk for damage and potential emergency or unplanned shutdown. This project will design, fabricate, and install bypass lines at three sectionalizing valve locations that currently do not have a bypass line, and replace existing sectionalizing valves.

**Santiago Lateral Station 216+40 Butterfly Valve Replacement**

The Santiago Lateral is a pre-cast concrete pipeline, ranging in size from 60-inch to 72-inch in diameter, and was constructed in 1955. It extends southerly from the Santiago Control Tower in the Anaheim Hills approximately 7.4 miles to Irvine Lake. The pre-cast concrete pipeline provides raw CRA water to Anaheim, IRWD and Irvine Lake. The 42-inch sectionalizing butterfly valve currently leaks, resulting in unwanted flows to the south portion of the Santiago Lateral. This project will investigate alternatives to replace the existing sectionalizing butterfly valve, which could also be able to handle lower flow rates. The options may include replacing with the same type of valve and motor with construction of a bypass or expansion of the existing valve vault, or construction of a new vault to accommodate a multi-orifice valve with a knife gate valve for better flow control.

**Sepulveda Canyon Control Facility Electrical and Mechanical Rehabilitation & Seismic Upgrades**

The Sepulveda Canyon Facility consists of a pressure control structure, hydroelectric plant, and two water storage tanks. The pressure control structure was constructed in the early 1970s to reduce pressure in the 9-foot-diameter Sepulveda Feeder as it conveys treated water from the Jensen Plant. The two water tanks have a combined capacity of 18 million gallons of water and are used to regulate flows through the pipeline. The hydroelectric plant, which was constructed in 1982, takes advantage of excess pressure in the Sepulveda Feeder to generate up to 8.6 megawatts of electricity with its single turbine. The facility is located on top of a large pad that was constructed by filling a steeply sloped V-shaped ravine. The pad is approximately 120 feet above the toe of the slope. The site is located within one mile of the Santa Monica Fault, which is capable of generating a 6.8 magnitude earthquake. Preliminary slope analyses indicate that the fill could slide down the slope during a major earthquake, causing significant damage to the pressure control structure, the water tanks, and the hydroelectric plant. This project will consolidate all seismic upgrade efforts for the entire Sepulveda Canyon Control Facility and seismically upgrade the facility. This project will also consider construction of a 96-inch diameter bypass line and new pressure control structure at the Sepulveda Canyon Facility to continue water deliveries if the existing facility is out-of-service due to a major earthquake.

The Sepulveda Canyon Hydroelectric Plant was constructed in 1982, and the electrical and mechanical systems are exhibiting signs of normal wear and tear after 32 years of service. The scope of work is to perform an investigation and survey of the facility, and rehabilitate the electrical and mechanical components, including the turbine/generator and upgrades to the protection and control systems. The project also includes replacement of cooling water piping for the generator enclosure, rehabilitation and structural improvements to the switchyard, and rehabilitation of other facility components.

**Sepulveda Canyon HEP Flow Transfer System Upgrade**

Automatic flow transfer is needed whenever the hydroelectric plant (HEP) trips offline. Due to current limitations, the Sepulveda Canyon HEP is unable to operate in low-flow conditions. This project will modify the flow transfer system to increase the operational flexibility of the facility. The modification will include the installation of altitude pilot valves and associated piping.

**Sepulveda-Culver City Feeder Intertie Valve Replacement**

The Sepulveda-Culver City Feeder Intertie Structure provides isolation between the two pipelines. The facility and its equipment are over 55 years old, are no longer operable, and cannot be repaired. This project will replace valves at the Sepulveda-Culver City Feeder Intertie Structure including valves, actuator, motors, control systems, electrical components, corroded piping, platforms, ladders, sump pumps, buried roof slabs, and other facility appurtenances.

**Sepulveda Feeder/East Valley Feeder Interconnection Electrical Upgrades**

The East Valley valve structure is located on the north sidewalk of the Rinaldi Street and Hayvenhurst Avenue intersection in Granada Hills. During the wet season, this structure receives intrusive storm water leakage causing the junction boxes, electrical enclosures, and conduits to corrode and short circuit. The extent of damage has accelerated, and storm water now enters the structure. This project will install new wiring and control panels for operation of the existing valve, remove the existing aboveground disconnect switch and install a new power distribution panel, install new duct banks and conduits to supply power to each of the critical structures, install additional bollards around the distribution panel to minimize damage from vehicles, replace damaged sidewalk, and assess potentially relocating the existing metering structures. This project will also replace access ladder, modify stairs and install a platform to meet current Cal OSHA requirements, install guardrail at the upper landing of the ladder, install a swing-gate for the catwalk, and mitigate water infiltration into the vaults by replacing curbs and gutters around the valve structures, sealing the interior of the manway riser joints, and implementing other mitigation measures.

**Sepulveda-West Basin Interconnection Valve Replacements**

The Sepulveda-West Basin Interconnection was constructed in 1970. The interconnection allows Metropolitan's Sepulveda Feeder pipeline the flexibility to convey supplemental flow to the West Basin Feeder. The structure includes two 16-inch lines with sleeve valves and one 12-inch line with a globe valve. Each line may be isolated at either end with plug valves. This project will replace failing valves at the Sepulveda-West Basin Interconnection structure. The work will include replacing associated dresser couplings, pipe spools, and pipe supports. Additionally, work on the structure will include installing a new precast concrete roof slab, providing adequate ventilation for the structure, replacing a sump pump, structure modifications to address algae accumulation on adjacent sidewalk due to frequent water discharge from the sump pump, identifying and restoring all electrical components to new condition, and refurbishing other facility components. Electrical components will consist of electrical panel boards and grounding, sump pumps, and associated instrumentation.

**Service Connection A-02 Rehabilitation**

A recent inspection of service connection A-02 in the City of Anaheim, revealed that piping in the meter vault had displaced, resulting in misalignment of a coupling and damage to the check valve support pedestal. If not addressed, continued movement of the piping could result in a leak, flooding, disruption of service, and costly repairs. This project will refurbish or replace the Service Connection A-02 Meter Vault piping, thrust restraint(s), meter, coupling, check valve, and plug valve in adjacent isolation valve vault.

**Service Connection CENB-36 Rehabilitation**

Service Connection CENB-36 delivers treated water for groundwater replenishment. This facility last delivered water in 1998. Much of the equipment is not operational. Improvements at the facility are also required to meet current regulations and standards. This project will rehabilitate Service Connection CENB-36 including replacement of valves, actuators, motors, control systems, lighting, electrical components, corroded piping, platforms, ladders, sump pumps, and other facility appurtenances. This project will also include security upgrades. This project will rehabilitate the chemical injection system used for dechlorination operation including replacement of the chemical tank, chemical unloading pad, pumps, injection lines, containment systems, control systems, electrical components, eye wash stations, and associated appurtenances.

**Service Connection EM-01 Relocation**

Service Connection EM-01 is located after a CRA's canal section. Over time, debris like tumbleweeds land in the water and break into smaller pieces inside the EM-01 service connection piping. The debris flows into the valves, causing them to get clogged, which stops the water flow out of the service connection to Eastern Municipal Water District (EMWD). The clogging increases in frequency in the summer and fall when the heat dries out tumbleweeds and other vegetation in the area, and crews have to unclog the valves every other day. Returning the service connection to service after it is clogged can take up to eight hours. This project will relocate Service Connection EM-01 to a debris-free area of the CRA.

**Service Connection LA-17 Rehabilitation**

Service Connection LA-17 is located in the city of Los Angeles at the terminus of the Eagle Rock Lateral. It includes three lines: (1) 17A is a 24-inch line with a capacity of 30 cfs, (2) 17B is a 48-inch line with a capacity of 100 cfs, and (3) 17C is an 85-inch line with a capacity of 310 cfs. Three venturi tubes at the LA-17 service connection have been in service for more than 64 years and require significant rehabilitation or replacement.

Significant coating deterioration and metal loss with extensive pitting and corrosion were identified on the bottom side of the 48-inch venturi tube. The wall thickness of this venturi tube is approximately 30% of its original thickness. Failure to replace this venturi tube will lead to eventual leakage, flooding the structure, and impacting water deliveries to the member agency. This project will replace the deteriorating LA-17B welded steel venturi tube located at the Service Connection LA-17 structure along with installation of new 24-inch piping and a mechanical coupling. The work will also recoat the LA-17A and LA-17C venturi tubes within this structure. Additionally, work will include replacing the sump pump and identifying and restoring all electrical components to new condition. Electrical components will consist of electrical panel boards and grounding, and associated instrumentation.

**Service Connection P-01 Valve Replacement**

The isolation valve for the Service Connection P-01 along the Upper Feeder is unable to properly isolate flows. Positive isolation is needed for upcoming planned work by the member agency. This project will replace the service connection isolation valve, check valve, and associated appurtenances at Service Connection P-01. Appurtenances include piping, bypass system, including air release, vacuum, and lubricated plug valves.

**Service Connection WB-06 Fall Protection**

This project will replace existing grating platforms and ladders inside Service Connection WB-06 structure. The replacement will provide the highest level of protection ensuring safety, limiting liability, improving staff productivity, and ensuring compliance with the latest Cal-OSHA requirements.

**Upper Feeder Blowoff Structure Replacement**

Blowoff structures provide a means to completely drain a pipeline for emergencies, inspections, repairs, and general maintenance. The Upper Feeder Blowoff Structure, located in the city of Sierra Madre, discharges the Upper Feeder directly into the Little Santa Anita Wash. The valves and piping in this structure have been in service for almost 80 years and have reached the end of their service life. One valve is stuck in the closed position, and another is experiencing leakage. In addition to a variety of different sizes and configurations of pipe within the structure, the structure itself does not comply with some of the safety and design features of more modern structures. This project will replace and enhance the Upper Feeder Blowoff Structure to ensure reliable dewatering capability and comply with OSHA standards. The work includes but is not limited to replacement of manhole, access ladder, and various valves and valve stem extensions; and addition of various pipe couplings, various valves, pumps, pipes, and catwalk platforms.

**Upper Feeder Raw Water Vacuum Valves and Blowoff Improvements**

Isolation valves along the sections of Upper Feeder that conveys untreated (Raw) water have failed to isolate due to a service life of nearly 80 years and there is a need to install sectionalizing valves in strategic locations along the feeder to facilitate isolation and access to the feeder for internal inspections and repairs without having to shut down the Weymouth plant. Further, a higher hydraulic grade is required to pass Upper Feeder flows through the ozone contactors since the ozone facility at the Weymouth plant was commissioned. The grade difference has impacted various systems and operations along the Upper Feeder. This project will study the hydraulic grade elevation changes and impacts to the Upper Feeder and associated systems (Etiwanda and La Verne Pipelines, and Glendora Tunnel); update feeder operations manual, dewatering profiles, and plan and profile drawings; replace various vacuum valves with improved self-closing units; identify new design flow rates at Upper Feeder service connections; replace isolation valves with regulating type valves; install sectionalizing valves to isolate flows to the Weymouth plant; install inflatable rubber dam on the Etiwanda bypass channel to restore bypass channel flow capabilities; and replace failed blowoff and vacuum valve isolation valves.

**Upper Newport Bay Blowoff Structure Rehabilitation**

The existing blowoff structure on the Orange County Feeder enables the pipeline to be dewatered in the event of an emergency and provides access for routine maintenance and inspection. Following 77 years of continuous operation in a moist environment near Upper Newport Bay, the blowoff valves and piping inside the structure have corroded and need to be replaced. In addition, due to ongoing erosion, the only road available to access the blowoff structure has been damaged and requires restorations. This project will restore access to the structure and replace its internal valves and piping. The planned rehabilitation includes regrading of the existing access road and reinforcement of crossings where the road intersects drainage channels; strengthening of the existing turn-around area adjacent to the blowoff structure, which will allow maintenance vehicles to set up for construction activities; installation of new valves and replacement of corroded piping; and modification of piping to ensure continued compliance with current California Division of Drinking Water regulations to prevent potential cross connections.

**Valley View Hydroelectric Plant Rehabilitation**

The Valley View Hydroelectric Plant was constructed in 1986. The mechanical components were rehabilitated in 2019. The electrical and control systems are yet to be rehabilitated and have been requiring increased maintenance. Many of the components are no longer manufactured or supported. This project will replace the electrical protection and control relays, data acquisition equipment, electrical panels, annunciator, vibration system, automated voltage regulator, governor and speed controller, switchyard circuit breakers, and other improvements to extend the service life and improve reliability.

**Valley View Pressure Control Structure HEP Perimeter Security Upgrades**

The Valley View Pressure Control Structure (PCS) and Hydroelectric Plant (HEP) facility falls under North American Electric Reliability Corporation (NERC) and Federal Energy Regulatory Commission (FERC) oversight and must adhere to critical infrastructure regulations set by these agencies. Upgrades to perimeter security fencing and security measures are needed to comply with NERC/FERC security standards. This project will replace fencing and gates to meet security standards and will install multiple network security detection systems to detect and deter unauthorized individuals from accessing the site.

**Venice Hydroelectric Plant Rehabilitation**

The Venice Hydroelectric Plant (HEP) was constructed in 1982, and the electrical and mechanical systems are exhibiting signs of normal wear and tear after 34 years of service. The scope of work is to rehabilitate the electrical and mechanical components including the turbine generator, the protection and control systems, and other facility components. The project also includes rehabilitation and structural improvements to the switchyard.

**Venice Pressure Control Structure Valve and Security Upgrades**

Venice Pressure Control Structure (PCS) is the second of two pressure control structures located along the Sepulveda Feeder. Venice PCS performs the critical operational functions of reducing grade and controlling flows in the Sepulveda Feeder. The PCS consists of multiple control valves and associated piping. The valves are almost 51 years old and have been experiencing increased failures over the last 12 years. This project will refurbish valves and other appurtenances. This project will also install multi-hazard security features for facility infrastructure protection.

**Wadsworth/DVL Control & Protection System Upgrade**

This project is the final phase of the Wadsworth Pumping Plant/DVL control system upgrade and includes replacement of the entire Diamond Valley Lake (DVL) control and communications systems, the protection relay system, uninterruptible power supply (UPS), vibration monitoring system, and pump/turbine drive controls.

**Wadsworth Pumping Plant Fire Protection System Upgrades**

The Wadsworth Pumping Plant is located near Hemet at Metropolitan's Diamond Valley Lake (DVL). The pumping plant includes 12 vertical turbine pumps that are used to pump water into DVL or to generate electricity when water flows out of DVL into the forebay/San Diego Canal. Each pump/generator has a dedicated CO<sub>2</sub> fire suppression system to prevent fires from spreading from one unit to another. However, the system is designed so that if the fire suppression system is inactive, the pump/generator will not operate. Some components of the current fire suppression system and control panels have been in service for almost 22 years and need to be replaced. In addition, the fire alarm system for the Wadsworth building is antiquated, and replacement parts are no longer available. This project will upgrade Wadsworth's fire suppression system by: (1) replacing the existing individual CO<sub>2</sub> fire suppression systems for the operational vertical turbine pumps, and (2) upgrading the Wadsworth building fire alarm system.

**Wadsworth Pumping Plant Sleeve Valve Refurbishment**

Recent inspections have identified numerous deteriorated sleeve valves at the Wadsworth Pumping Plant. The sleeve valves originally installed in 1999 control the flow of water from DVL to the San Diego Canal. While operation of the pumping plant has not yet been impacted, failure of the valves could lead to an unplanned shutdown and interruption of water delivery to member agencies. This project will refurbish seven 66-inch by 42-inch sleeve valves at the Wadsworth Pumping Plant at DVL.

**Wadsworth Pumping Plant Stop Logs**

The Wadsworth Pumping Plant was built with 12 pump/generation units. Units 1, 5, and 9 were decommissioned to allow DVL generation to be certified as "renewable energy" by the California Energy Commission. Hydroelectric plants are required to have a nameplate capacity of 30MW or less to be certified. At 3.3MW per unit, the nine remaining units provide a generation capacity of 29.7MW. Generated energy must be certified renewable for electric utilities to meet the requirement that 33% of their energy come from renewable resources by 2020. The stop logs would provide a means to isolate the three decommissioned pumps from the DVL forebay keeping them out of the water and dry. Isolating the pumps from water contact reduces corrosion damage to the pumps and provides flexibility in the event pump/generation units need to be re-commissioned or repaired. This project will fabricate stop logs to isolate three decommissioned Wadsworth plant generation/pumping units from the forebay.

**Walnut Pressure Control Structure Drainage Improvements**

The top of the Walnut Pressure Control Structure (PCS) is about five feet below the surrounding grade. Water ponds in this depression and leaks into the structure, which may leak onto electrical and control systems. This project will place drainage improvements at Walnut PCS to prevent ponding over the structure.

**Washington Street Pressure Control Structure Valve Replacement & Security Upgrades**

The Washington Street Pressure Control Structure (PCS) located on the Palos Verdes Feeder was constructed in conjunction with the Palos Verdes Feeder pipeline in 1941. The pipeline has a design capacity of 100 CFS in this area. This project will replace two failing hydraulically operated and three electronically operated globe valves at the Washington Street PCS. The work will also include replacing all block valves, identifying and restoring all electrical components to new condition, and moving electric meter from outside to inside the structure. Electrical components consist of electrical panel boards and grounding, sump pump, and associated instrumentation. Additionally, a security assessment of the facility will be conducted to determine the need to reinforce or upgrade physical features for enhanced infrastructure protection.

**West Coast Feeder WC-0 Interconnection Structure Upgrades**

The WC-0 interconnection structure controls flows from the Lower Feeder into the West Coast Feeder. Stagnant flows in this area cause water quality issues. Installation of a bypass line at this location will improve water quality. This project will upgrade the West Coast Feeder WC-0 structure and install a new bypass line. Upgrades will include valves, actuators, motors, control systems, electrical components, piping, platforms, ladders, sump pumps, and other facility appurtenances.

**West Orange County Feeder OC-09 Rehabilitation**

The West Orange County Feeder was constructed in 1956 as a component of the Lower Feeder system. It delivers treated water from the Robert B. Diemer Water Treatment Plant in Yorba Linda to the northwestern portion of Orange County. Service Connection OC-09 on the West Orange County Feeder consists of a turnout tee, a venturi meter, and a shutoff valve. The turnout tee is encased in concrete and is located beneath the traffic lanes of Katella Avenue in the city of Garden Grove, adjacent to the boundary line with the city of Stanton. The meter vault is located below Dale Street. This structure contains a 14-inch conical plug valve, a venturi meter, and associated piping and electrical systems. Gradual corrosion from over 64 years of operation in a damp underground environment has led to deterioration of the equipment within the vault. This equipment needs to be replaced and other facility components rehabilitated to maintain reliable deliveries from the service connection.

**West Orange County Feeder Valve Replacement**

The West Orange County Feeder was constructed in 1956 as a component of the Lower Feeder system. It delivers treated water from the Diemer plant in Yorba Linda to the northwestern portion of Orange County. A recent condition assessment identified that 13 structures require rehabilitation, including the replacement of air release/vacuum valve assemblies and adjacent plug valves. These valves were installed during the original construction of the feeder and have been in service for over 64 years. Six of the air release/vacuum valves will also be relocated from a manhole to an above ground cabinet within the street-side parkway zone to prevent the potential of treated water in the distribution system becoming exposed to stormwater under certain operating conditions. Refurbishment or replacement of other facility components, including meter replacement or relocation, may be implemented based on the additional site evaluations.

**West Valley Feeder No. 1 - Access Road & Valve Structure Improvements**

The West Valley Feeder No. 1 and appurtenant valves were constructed and installed by Calleguas Municipal Water District in 1962. Metropolitan acquired the feeder in 1970. Most of the deteriorated valves were replaced and valve structures improved between 2006 and 2012. This project will replace the remaining deteriorated valves located in Chatsworth Park, add new valve structures to house isolation valves that are presently directly buried, install enclosures for air release/vacuum valves, and perform grading of an all-weather access road to support maintenance activities.

**Western Region Security System Upgrade – Area 2**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Foothill PCS, Sepulveda Canyon HEP, Venice HEP/PCS, and Ballona Creek Relief Structure.

**Western Region Security System Upgrade – Area 3**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Hollywood Portal North, Hollywood Portal South, Washington Street PCS, Soto Street Facility, Greg Avenue HEP, Service Connection B-06, Fenton/Maclay AMR, Ascott North, Ascott South, San Fernando Gate Structure, and Scholl Canyon Spillway.

**Western Region Security System Upgrade – Area 4**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Carbon Creek PCS, Coastal Junction PCS, Irvine Regulating Structure, OC-88 PCS, and Santiago Creek HEP.

**Western Region Security System Upgrade – Area 7**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Covina PCS, Garvey Reservoir, Live Oak Reservoir, Puddingstone Spillway, Ramona PCS, and San Gabriel PCS.

**Western Region Security System Upgrade – Area 9**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Rio Hondo HEP and Service Connection CB-14.

**Whitewater DWCV-1 Flow Control Valve Replacement**

The existing 36-inch butterfly valve has been in service at the DWCV-1 service connection since 1973, when the structure was built. The valve is used to throttle, which is not the correct application for a butterfly valve. A sleeve valve is preferable. The valve is also leaking, so not all water that is being delivered is metered. This project will remove and replace the existing butterfly control valve at the Whitewater DWCV-1 service connection and update the electrical components to operate the valve remotely.

**Willits Street Pressure Control Structure**

The Willits Street Pressure Control Structure (PCS), located in the city of Santa Ana, was built in 1944. This pressure control structure located on the Orange County feeder regulates pressure and conveys treated water to the Irvine Regulating Structure. This PCS is an underground structure consisting of three parallel trains of pressure control valves. At full capacity, two trains are in operation while the third train acts as a stand-by. The existing structure is congested and does not provide suitable access for maintenance, repairs or the replacement of valves. The maintenance access was impacted during street widening that required the size of the structure to be reduced. The modified structure configuration does not have a lifting mechanism to remove or transport these valves out of the structure for replacement or repairs. Additionally, the existing catwalk does not have adequate coverage. This project will construct a new pressure control structure to replace the existing Willits Street PCS located on the Orange County Feeder. The work includes a new concrete substructure, relocating and replacing the control and isolation valves, new sampling connections for water quality, and all necessary electrical and ventilation equipment. Once the new structure is complete, the older structure will be abandoned, and the pipeline will be attached to the new structure during a brief outage.

**Yorba Linda Pressure Control Structure Rehabilitation**

The Yorba Linda Pressure Control Structure (PCS) was constructed in 1975 and controls pressure on the Yorba Linda Feeder prior to the influent flow reaching the Diemer plant. A recent inspection of the facility revealed extensive corrosion at the sleeve valves, damage and failure of mortar lining in appurtenant piping, observed damage to the valve body seat on the butterfly valves, and inadequate cathodic protection. This project will rehabilitate this PCS to restore reliability.

**Yorba Linda Power Plant Improvements**

The Yorba Linda Power Plant is located on the Yorba Linda Feeder at the inlet to the Diemer plant and can generate up to 5 megawatts. Installation of a new turbine generator was completed in November 2015, and generator enclosure in May 2020. This project will improve emergency shutdown, alarm, and public address systems; and upgrade Human Machine Interface (HMI) panel to improve reliability and safety of the plant operation by replacing the existing shutdown system that requires operator intervention that could cause undesired pipeline pressure surges to a redundant and automated system that will engage in the event of wicket gate closing system failure. Extension of the Diemer plant's public announcement system into the Yorba Linda Power Plant and addition a new alarm system in key locations will enhance personnel safety and improve operator's response time. This project will also install a new wicket gate drive system and rehabilitate the turbine shutoff valve actuator system.

## Right-of-Way & Infrastructure Protection Project Group

### **Right-of-Way & Infrastructure Protection - Colorado River Aqueduct**

The Right-of-Way Infrastructure Protection Program (RWIPP) identifies, prioritizes, and executes site improvements throughout Metropolitan's service area. This project encompasses site improvements along the CRA and addresses access limitations, erosion-related improvement work, and security needs along the surface of the CRA's rights-of-way. Under the initial stage of the program, site improvements needed along the CRA will be identified, a comprehensive regional compliance and permitting program will be developed, and environmental document will be prepared to secure environmental approval for multiple projects along the CRA rather than pursuing individual approvals on a project-by-project basis. This project will add the CRA to the RWIPP, which already includes the Orange County, Western San Bernardino, Riverside/San Diego, and Los Angeles operating regions.

### **Right-of-Way & Infrastructure Protection - Los Angeles County Region**

This project identifies and addresses right-of-way and security issues; identifies and executes needed improvements within the Los Angeles County Operating Region; prepares environmental documentation; acquires regional environmental permits; and monitors and reports to permitting agencies for ten years following completion of construction. To expeditiously complete this project, sites within this region are grouped and prioritized and staged for construction depending on the site requirements.

### **Right-of-Way & Infrastructure Protection - Orange County Region**

This project identifies and addresses right-of-way, access, and security issues; identifies and executes needed improvements within the Orange County Operating Region; prepares environmental documentation; acquires regional programmatic environmental permits; and monitors and reports to permitting agencies for ten years following completion of construction. To expeditiously complete this project, sites within this region are grouped and prioritized and staged for construction depending on the site requirements.

### **Right-of-Way & Infrastructure Protection Program - Property Acquisition**

The scope of this project includes procurement of right-of-way or property to support access or needed repairs to pipelines and facilities. Activities include developing conceptual solutions, layout drawings, and final design criteria of needed improvements; preparing pre-appraisal documentation for acquisition of easements and right-of-way; conducting field surveys and topographic mapping; ordering and reviewing title reports and supporting recorded documents; initiating consultations with permitting agencies for required permits; preparing legal descriptions, exhibit maps, and other exhibits as needed for acquisition planning, permits, and real estate negotiations; completing right-of-way mapping and preparing Record of Survey maps to be filed with the county of origin; and setting monuments and witness posts.

### **Right-of-Way & Infrastructure Protection Program - Riverside and San Diego County Region**

This project identifies and addresses right-of-way, access, and security issues; identifies and executes needed improvements within the Riverside and San Diego County Operating Region; prepares environmental documentation; acquires regional environmental permits; and monitors and reports to permitting agencies for ten years following completion of construction. To expeditiously complete this project, sites within this region are grouped and prioritized and staged for construction depending on the site requirements.

### **Right-of-Way & Infrastructure Protection Program - Western San Bernardino County Region**

This project identifies and addresses right-of-way, access, and security issues; identifies and executes needed improvements within the Western San Bernardino County Operating Region; prepares environmental documentation; acquires regional environmental permits; and monitors and reports to permitting agencies for ten years following completion of construction. To expeditiously complete this project, sites within this region are grouped and prioritized and staged for construction depending on the site requirements.

## Distribution System - Other Project Group

### **Chloramine Booster Station at Three Locations within the Treated Water Distribution Systems**

Metropolitan uses chloramines, formed by combining chlorine and ammonia, as a disinfectant in our distribution systems. Internal research has determined the most effective chloramine concentration to prevent microbial growth at low flow conditions. Addition of chlorine and liquid ammonium sulfate (LAS) in the treated water distribution systems will allow the total chlorine residual within the distribution system to be maintained at or above 1.8 mg/L, especially during low demand periods. LAS is recommended instead of aqueous ammonia because LAS has fewer regulatory requirements, as well as lower construction and operating costs. The project will determine the three optimum locations to install: (1) sodium hypochlorite and LAS tanks, (2) feed pumps and appurtenances, (3) piping, and (4) instrumentation and control systems to ensure the safety and reliability of the feed systems.

### **Distribution System Online Analyzers Replacement**

Online analyzers continuously monitor water quality in the treated water distribution system and help ensure that safe reliable water reaches our member agencies. They provide prompt indication of water quality issues and an early warning to allow actions to be taken to minimize impacts. The existing online analyzers are almost 20 years old and have exceeded their typical service life. They are outdated, no longer sold or supported by vendors, and replacement parts are becoming increasingly difficult to obtain. At approximately 23 locations, this project will (depending on the location): decommission existing analyzers, install analyzers which measure various water quality constituents, and install prefabricated sheds.

### **Distribution System Structure Security Improvements**

Metropolitan's distribution system includes 830 miles of pipelines and over 5,000 structures. The number of break-in and vandalism incidents has been increasing. This project includes physical security improvements to all conveyance and distribution system facilities. These facilities include access hatches, access covers, AMR cabinets, air release and vacuum valve cabinets, and other enclosures. The project will be implemented in multiple stages.

### **East Lake Skinner Bypass & Bypass No. 2 Screening Structure Upgrade**

The East Lake Skinner Bypass Slide Gates were built 56 years ago in 1967 and are in need of rehabilitation. The gates are binding during operation which is rendering them inoperable. In addition, the East Lake Skinner Bypass Afterbay Trash Rack needs to be replaced with a new stainless-steel rack to minimize the corrosion which caused the existing galvanized material to collapse under the weight of a severe algae bloom during bypass operations. The scope of work consists of reconditioning three of the East Lake Skinner Bypass Slide Gates, and to replace the East Lake Skinner Bypass Afterbay trash rack which is severely corroded and partially collapsed. In addition, this project will modify the East Lake Skinner Bypass Algae Screening Mechanisms Discharge Piping to bypass the Algae Shakers and upgrade the Lake Skinner Bypass No. 2 Forebay Trash Rack Lifting Mechanisms.

### **East Orange County Feeder No. 2 Cathodic Protection System Rehabilitation**

The existing cathodic protection systems for East Orange County Feeder No. 2 were installed in 1994. Recent surveys of the existing systems have indicated that they no longer provide adequate cathodic protection due to the gradual deterioration of their anodes after years of service. The typical design life of an impressed-current cathodic protection system is 25 years. Therefore, the time in service and recent surveys indicate the systems have reached the end of their useful life and require rehabilitation. This project will rehabilitate the impressed-current cathodic protection anode wells and rectifiers on East Orange County Feeder No. 2.

### **East Orange County Feeder No. 2 Seismic Retrofit at Diemer Water Treatment Plant**

A recent assessment identified a slope near the south-western pad at the Diemer plant as having the potential to damage the East Orange County Feeder No. 2 pipeline during a significant earthquake. This structure requires further analysis to ensure that it meets Metropolitan's current structural standards and the facility is reliable in the event of seismic activity. This project will assess, design, and complete seismic retrofit construction near the south-western pad at the Diemer plant.

**Foothill Feeder Erosion Protection at Newhall Creek**

The Foothill Feeder supplies water from the West Branch of the State Water Project to the Jensen plant. The pipeline crosses under the Santa Clara River and several tributaries. Recent heavy storms and high flows in Newhall Creek have eroded the soil over the Foothill Feeder and have exposed the pipeline. This project will redirect flows away from the pipeline, restore the soil cover, and install armoring to protect the pipeline.

**Holland Road Drainage Modification**

An open channel in Metropolitan right-of-way, in the vicinity of Diamond Valley Lake (DVL), has allowed for the growth of a habitat. In its current condition, it contains approximately 0.7 acres of riparian habitat that supports several species. Allowing water to continue to move in an open channel has the potential for an increase in the size of the habitat. A larger habitat would inhibit Metropolitan maintenance as permits would be required. Installing a drainage pipe would substantially reduce vegetation growth within the existing channel by redirecting the drainage from Wadsworth/DVL and San Diego Canal areas. It would also prevent the expansion of established habitat within the existing channel where environmental and regulatory restrictions prohibit the performance of routine maintenance and removal.

Additionally, excessive growth within the channel could restrict flow and potentially cause flooding to adjacent private property owner's houses or land. This project will install a drainage system adjacent to the open channel ditch parallel to Holland Road. The purpose of the drain system is to allow seepage flow from the West Dam and excessive surface runoff from the Wadsworth Facility to flow uninterrupted to the end of the open channel.

**Lake Mathews Administration and Warehouse Building Roof Replacement**

The Lake Mathews Administration and Warehouse Buildings have been in operation since the 1970s. The administration building provides essential offices, breakroom, and restrooms, while the warehouse building provides central storage of materials and equipment to support Metropolitan's construction activities. The existing metal roofing systems, installed on each building at the time of their original construction, have exceeded their service life and show significant signs of deterioration and leakage. This project will replace the roofs on these two buildings.

**Lake Mathews, Garvey and Chlorine Unloading Facility Support Facilities Seismic Upgrade**

As part of Metropolitan's seismic upgrade program, a rapid evaluation was conducted and identified seismic deficiencies in the Garvey microwave station; the Lake Mathews Hazardous Materials Building, meter shop, auto shop, and heavy equipment shop; the Chlorine Unloading Facility Main Office; and other buildings at these locations. This project will construct improvements to address these deficiencies as well as, should it provide value to the District, improve non-structural features in each building such as roofing, insulation, and other building characteristics.

**Lake Mathews Facility Wastewater System Replacement**

The wastewater system at Lake Mathews has been in operation for nearly 84 years and is no longer reliable. Despite receiving regular maintenance, the system is exhibiting signs of failure including plumbing and septic tank backups, clogged leach fields, and slow-draining collection pipes. On-site treatment of the wastewater via septic tanks will be discontinued, and new collector lines will be connected to the local sewer system that was installed in the early 2000s. Western Municipal Water District has a nearby sewer main that includes a connection point specifically installed for Metropolitan's future use. This connection can accept wastewater by gravity from the entire on-site system. This project will remove the on-site wastewater system and construct a wastewater system that ties into the Western Municipal Water District's sewer line to reduce the risk of costly unplanned repairs and to maintain system reliability.

**Lake Skinner Conveyance and Distribution Building Roof Replacement**

Lake Skinner Conveyance and Distribution (C&D) building, still has its original roof from the time when the building was built. The roof has developed several holes the size of a quarter that led to leaks during the rainy season. Furthermore, the gutters are not draining as designed and are routing water into the building, and the water has saturated the walls and caused them to crack inside the building. This project will replace the roof and rain gutters on the C&D building.

**Lake Skinner West Bypass Screening Structure Rehabilitation**

The San Diego Canal West Bypass Screening Structure is located at the terminus of the San Diego Canal and is the starting point for water which bypasses Lake Skinner to downstream users. The bypass screening structure is fitted with an electrically powered revolving screen extending across the channel, which dips into the channel to intercept and collect algae mats and other floating debris. This system prevents algae mats and other debris from entering the treatment plant or member agency water systems via the bypass pipelines. The screening equipment was installed in the 1960s and has now been removed due to operational difficulties. The concrete support structure for the screening equipment constricts flow entering the bypass pipeline and canal must be operated near spill elevation to achieve the maximum flow of 280 cfs in the canal/pipeline under current conditions. This project will demolish the concrete support structure for the bypass screening structure to remove the flow constriction point and replace the deteriorated trash rack located upstream of the bypass pipeline entrance.

**Lower Feeder Air Entrainment Improvement**

When operated at flows higher than 300 cfs, air becomes entrained in the water traveling through the Lower Feeder due to large elevation drops within the conveyance system. When coagulant is added to this inflowing water in the rapid mixers at the Diemer plant, the result is clusters of floating foam mats on the water surface in the coagulation and sedimentation basins which causes operational, maintenance, and aesthetic concerns. Entrained air also increases filter run time. This project will reduce or eliminate entrained air through modifications and addition of components along the Lower Feeder including at the Corona and Temescal power plants, pressure control structures, pipelines, air stacks, and air release/vacuum valves.

**Lower Feeder Cathodic Protection System Rehabilitation**

The existing cathodic protection systems for the Lower Feeder were installed in 1995. Recent surveys of the existing systems have indicated that they are no longer providing adequate protection due to gradual deterioration of their anodes. This project will rehabilitate or replace the equipment, such as impressed-current anode wells and rectifiers; and remove existing equipment as required by law.

**Middle Feeder North Drainage and Protection Restoration**

The Middle Feeder North from Station 1067+00 to Station 1071+00 lies within both a Metropolitan fee parcel and easements between Graves Avenue and Mooney Drive in the unincorporated Los Angeles County community of South San Gabriel. A recent visual inspection and survey of the area determined that the current soil cover over the feeder has eroded to less than design minimums. This project will restore the design soil cover over Middle Feeder North conduit and improve drainage features to preclude this problem in the future.

**Orange County Feeder Cathodic Protection System Rehabilitation**

The Orange County Feeder conveys treated water from the F. E. Weymouth Water Treatment Plant in La Verne to its terminus at service connection CM-1 in Newport Beach. The feeder is approximately 41 miles long and was installed in 1942. The feeder consists of approximately 21 miles of welded and un-bonded steel pipe, 19 miles of precast concrete pipe, and one mile of prestressed concrete cylinder pipe. Previously, cathodic protection could not be effectively applied to the subject reach; however, recent pipeline rehabilitation has made cathodic protection a viable option to prevent external corrosion and thus prevent future pipe leaks. The first three locations that were identified during the routine testing, which were no longer providing corrosion protection to the pipeline, have been replaced. This project will install a new cathodic protection system on the remaining portion of Orange County Feeder to protect approximately 11.2 miles of feeder. The scope of work includes design and installation

**Rialto Pipeline Cathodic Protection System Rehabilitation**

The existing cathodic protection systems for Rialto Pipeline were installed between 1988 and 1995. Recent surveys of the existing systems have indicated that they are no longer providing adequate protection due to gradual deterioration of their anodes. This project will rehabilitate or replace the equipment such as impressed-current anode wells and rectifiers; and remove existing equipment as required by law.

**San Diego Pipeline 1 and 2 Station 1214+00 Exposure Rehabilitation**

On February 14, 2019, the Temecula area experienced heavy and sustained precipitation followed by additional storm events over the 2019-2020 storm season. The resulting accelerated stream flows exposed the buried San Diego Pipeline Nos. 1 and 2 where the pipelines cross an ephemeral stream channel. Emergency repairs were made in October 2020 under an emergency permit from the Regional Water Quality Control Board. As a condition of the permit, a permanent solution for the site must be constructed within two years of the authorization of the emergency permit. This project will develop and construct a permanent erosion control solution for the pipeline exposure on San Diego Pipeline Nos. 1 and 2.

**San Gabriel Tower and Spillway Improvements**

The San Gabriel Tower (SGT), 86-foot-tall free-standing with a 24-foot by 14-foot rectangular base, was constructed in 1936, north of the city of Azusa. It sits at the base of the steep and weathered San Gabriel Mountains, between the west portal of Monrovia Tunnel No. 1 and the east portal of Monrovia Tunnel No. 2. The tower is surrounded by Angeles National Forest and is adjacent to Morris Reservoir. The function of the SGT is to regulate and isolate flows from the Weymouth plant via the Upper Feeder pipeline to the Eagle Rock Control Facility located in the city of Los Angeles. It is situated between two active faults, the Sawpit and the Sierra Madre faults, which are both capable of generating a magnitude 6.5 earthquake. While the tower was designed and constructed to the codes and standards in place during the 1930s, significant advancements have been made since that time in predicting the response and performance of structures as a result of seismic ground shaking. Planned upgrades to the San Gabriel Tower include: (1) reducing the height of the tower to increase its structural stability; (2) replacing the slide gates and actuators to restore isolation capability for the Upper Feeder; (3) improving access to the tower and spillway, including the river crossing; (4) restore the spillway's concrete; (5) stabilizing the adjacent rocky slope; and (6) installing a barrier such as new fencing or protective screen to prevent animal entry into the spillway. This project will also evaluate and upgrade the Morris Dam connection, which includes large needle and isolation butterfly valves, and evaluate condition of the conical plug valve at groundwater replenishment connection USG-03 before deciding to upgrade to control valves or installation of a crane system that allows safe installation of the various orifice plates to control flow.

**Santa Ana River Discharge Pad - Upper Feeder**

Severe storm events eroded the north slope of the Santa Ana River near the Upper Feeder crossing. This damage resulted in large voids in the riverbank to the footing supporting the bridge span and the foundation of the emergency discharge bunker valve. The damage was repaired, and a recommendation was made during the repair to construct a concrete pad to prevent a reoccurrence of this type of damage. This project will construct a concrete discharging pad to prevent erosion from storms and discharge from the bunker valve.

**Santa Monica Feeder Cathodic Protection**

The Santa Monica Feeder is a mortar coated welded steel pipeline with a diameter of 49 inches and is approximately 4.25 miles long. The pipeline is one of the few reaches of welded steel pipe that is not yet cathodically protected. A failure of the Santa Monica Feeder would inhibit Metropolitan's ability to convey water through its system and potentially disrupt Metropolitan's ability to deliver water to several member agencies. The scope of work is to design and install a comprehensive cathodic protection system in the Santa Monica Feeder.

**Santiago Control Tower Seismic Improvements**

The Santiago Control Tower acts as a control and diversion facility for water supplied to the Santiago Lateral pipeline, the Santiago Lateral Spillway Discharge Pipeline, and the Lower Feeder pipeline. This project will evaluate the Santiago Control Tower's ability to resist expected seismic forces based on the latest geotechnical and geological considerations and retrofit the tower. A detailed geotechnical analysis is required to determine the structure's interaction with surrounding soil and analyze the soil stability of the structure. The structure is located close proximity to the Whittier Fault on a raised area adjacent to a slope.

**Skinner Area Physical Security Upgrades**

An increase in housing adjacent to the Skinner area has resulted in an increased population and has the potential to increase criminal trespassing events. The Skinner area has many industrial hazards that are properly identified and handled by Metropolitan staff. However, trespassers are not likely to understand hazard signs or have appropriate equipment and training to deal with them. Recently, trespassers have been caught swimming in the San Diego Canal and traversing restricted areas of Lake Skinner. This project will install security upgrades around the Skinner area perimeter, including fencing improvements with view-blocking PVC slats, patrol road improvements, additional signage and safety warnings, and additional lighting.

**Soto Street Facility - Security & HVAC Replacement**

The Soto Street Facility serves as the main headquarters for staff and equipment that support the Western Region Unit (WRU) Conveyance and Distribution System. The WRU Incident Command Post, located in the Administration Building, also serves as the backup Emergency Operations Center for the Eagle Rock Operations Center. The Soto Street Facility currently has two layers of access control protection during business hours: a single card reader at the outer vehicle gate, and a single contracted security guard. During periodic foot patrols of the facility, the access gate is left unmanned. In addition, the alarm system is currently inoperable, and there are no access card readers on any of the exterior building doors, which remain unlocked during business hours. There have been recent multiple security events at this facility. Finally, the existing air handling unit that serves the Soto Street Administration Building has been in service since the 1960s, when the building had a different configuration. The current HVAC system does not provide adequate airflow to all parts of the building.

This project will improve the security of the Soto Street Facility by adding access card readers and security cameras, providing security lamination to glass doors and windows, providing a fenced secure outdoor storage yard, replacing the alarm system, and upgrading the HVAC system for the Administration Building.

**Upper Feeder Cathodic Protection System Rehabilitation**

The existing cathodic protection system for the Upper Feeder was installed in 2012. An external corrosion condition assessment performed in July 2021 concluded that the anodes are depleted, and the current system is not providing adequate cathodic protection to the Upper Feeder. The existing soil conditions are considered a high-resistance environment, depleting the anodes faster. A more efficient design, which includes conductive cement, would extend the life of the new anodes. The survey results also indicated stray current interference due to the proximity of Southern California Gas pipelines. This project will construct an impressed current cathodic protection system on approximately 10.45 miles of the Upper Feeder. The project will include abandoning the existing deep anode wells per the California Well Standards and installing new deep anode wells, steady-state rectifiers, and remote monitoring equipment.

**West Orange County Feeder Cathodic Protection**

The West Orange County Feeder (WOCF) was constructed in 1956 and is mortar and dielectrically coated welded steel pipeline with a diameter of 43 inches and 55 inches. The pipeline is approximately 13 miles long. The WOCF connects to the cathodically protected Orange County Feeder (OCF), prestressed and steel reaches of the Second Lower Feeder (SLF), and the cathodically protected Lower Feeder (LF). The pipeline is one of the few reaches of welded steel pipe that is not yet cathodically protected. A failure of the WOCF would inhibit Metropolitan's ability to convey water through its system and potentially disrupt Metropolitan's ability to deliver water. The scope of work is to design and install a comprehensive cathodic protection system in the WOCF.

**Western Conveyance and Distribution Region - Blind Flange Structures Washdown Improvements**

Currently, a substantial number of blind flange pipeline access and turn-out structures in the western conveyance and distribution region do not have an accessible and reliable water connection for washdown of piping, valves, and equipment during preventive maintenance. This project will modify or enhance structures that contain blind flanges to provide washdown capabilities.

**Yorba Linda Feeder Cathodic Protection System Rehabilitation**

The existing cathodic protection systems for Yorba Linda Feeder were installed in 1990. Recent surveys of the existing systems have indicated that they no longer provide adequate cathodic protection due to the gradual deterioration of their anodes after years of service. The typical design life of an impressed-current cathodic protection system is 25 years. Therefore, the time in service and recent surveys indicate the systems have reached the end of their useful life and require rehabilitation. This project will install an impressed-current cathodic protection system on approximately 7.2 miles of Yorba Linda Feeder to replace the depleted anodes. This project will include the installation of new anode wells and rectifiers and abandoning the existing anode wells as required by the Department of Water Resources - California Well Standards.

## Drought Mitigation – SWP Dependent Areas Program

Fiscal Year 2024/25 Estimate: \$39.3 million

Fiscal Year 2025/26 Estimate: \$27.0 million

**Program Information:** The Drought Mitigation – SWP Dependent Areas Program is comprised of projects to replace, refurbish, upgrade, or construct new facilities, which are identified to mitigate the vulnerability experienced by specific member agencies that are impacted during shortages on the State Water Project supplies.

### Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated:
  - Sepulveda Canyon PCS to Venice PCS Valve Replacements
  - Sepulveda Feeder West Area Water Supply Reliability Pipeline Improvements
- Major milestones achieved or estimated to be achieved:
  - Construction contracts awarded:
    - Badlands Tunnel Surge Protection Facility
    - Inland Feeder/Rialto Pipeline Intertie
    - Wadsworth Pumping Plant Bypass Pipeline
  - Procurement contracts awarded:
    - Inland Feeder/San Bernardino Valley Municipal Water District Foothill Pump Station Intertie – Valve Procurement
    - Rialto Pipeline Water Supply Reliability Improvements – Large Diameter Isolation Valve Procurement
  - Progressive design-build services agreement authorized:
    - Sepulveda Feeder Pump Stations

### Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Badlands Tunnel Surge Protection Facility	\$ 17,800,000	2025	Complete construction
Inland Feeder – Foothill Pump Station Intertie	\$ 23,100,000	2025	Complete design
Inland Feeder – Rialto Pipeline Intertie	\$ 11,900,000	2025	Complete construction
Wadsworth Pumping Plant Bypass Pipeline	\$ 21,400,000	2025	Complete construction
Westside Water Supply Reliability - Sepulveda Feeder Pump Stations Stage 1	\$ 110,000,000	2026	Complete design and initiate construction

## Drought Mitigation – SWP Dependent Areas - All

### **Badlands Tunnel Surge Protection Facility**

This project will add a surge protection system to protect the Inland Feeder from pressure surges. After completion of completion of Inland Feeder-Rialto Pipeline Intertie and Inland Feeder-San Bernardino Valley Municipal Water District Foothill Pump Station Intertie and New Pump Station, up to 107 cfs will be able to be delivered from Diamond Valley Lake to the Rialto Pipeline.

### **Burbank Pump Station for Delivery to Service Connection B-5A**

The project consists of constructing a new pump station at the City of Burbank's Valley Blending Facility to allow the city to switch its demand from service connection B-5 to B-5A. Switching to B-5A enables Metropolitan to deliver the entire flow of the Greg Avenue Pump Station to the Western State Water Project Dependent Area during drought operations to maximize its benefits.

### **East West Conveyance System Improvements**

The project would improve system flexibility to provide the Western State Water Project Dependent Areas greater access to existing and potential new supplies and storage. The improvements will include new or upgrades of existing pipelines, new or expanded existing pump stations, and additional facilities to provide surge protection.

### **Inland Feeder-Rialto Pipeline Intertie**

This project will construct an intertie pipeline between the Inland Feeder and the Rialto Pipeline south of Department of Water Resources (DWR) Devil Canyon. The intertie will be approximately seven feet in diameter and 200 feet long, and will include a large diameter valve, meter, and valve and meter structures, and other features necessary to support the intertie operation. Currently flows from the Inland Feeder must pass through higher elevation DWR facilities which reduces flow and expends more energy. An intertie will allow delivery of up to 60 cfs of water from San Bernardino Valley Municipal Water District (SBVMWD) and DWR via a water exchange program. After completion of this project along with completion of Wadsworth Pump Discharge Eastside Pipeline Bypass and Inland Feeder/San Bernardino Valley Municipal Water District Foothill Pump Station Intertie, up to 107 cfs will be able to be delivered from Diamond Valley Lake to the Rialto Pipeline. This project will improve resiliency against severe drought or earthquake by proving the Rialto Pipeline region a second source of water besides State Water Project (SWP) supplies.

### **Inland Feeder/San Bernardino Valley Municipal Water District Foothill Pump Station Intertie and New Pump Station**

This project will construct an intertie between the Inland Feeder and Foothill Pump Station, which is owned and operated by San Bernardino Valley Municipal Water District (SBVMWD). The intertie will include pipelines, valve vaults with valves, electrical and control systems, and other features necessary to support the intertie operation. Construction of an intertie between the Inland Feeder and Foothill Pump Station would enable Metropolitan to deliver higher volume of water from DVL to the Rialto Pipeline service area. After completion of Stage 1, which will construct the intertie system and support features, along with completion of Inland Feeder-Rialto Pipeline Intertie and Wadsworth Pump Discharge Eastside Pipeline Bypass, up to 107 cfs will be able to be delivered from Diamond Valley Lake to the Rialto Pipeline. Stage 2 will construct a new pump station necessary to pump up to an additional 120 cfs of flow at the Foothill Pump Station site. This project will improve resiliency against severe drought or earthquake by providing the Rialto Pipeline region a second source of water besides State Water Project (SWP) supplies.

**La Verne Pipeline & Weymouth Plant Intertie and Upper Feeder Modification**

This project will provide an alternate source of supplies for groundwater replenishment at Service Connection USG-03. USG-3 is a replenishment connection located at the end of the Glendora Tunnel and is typically fed by the Rialto Feeder/Live Oak Reservoir, which is untreated State Project Water (SPW). In times of low SPW supplies, an alternative connection from CRA supplies will allow continued delivery of supplies. This project may include an intertie between the Weymouth plant and the La Verne Pipeline, and modification of a blowoff and/or air release & air vacuum valve on Upper Feeder near Azusa Canyon, and other features necessary to provide an alternate source of supplies at USG-3. This project will improve resiliency against severe drought or earthquake.

**Three Valley MWD Miramar Pumpback Operation Upgrade**

The project would upgrade and expand the Three Valleys Municipal Water District's existing pumpback capacity to increase deliveries from the Weymouth Water Treatment Plant to its Miramar Treatment Plant. The expanded pumpback operation would offset the use of State Water Project supplies during droughts caused by low State Water Project allocations.

**Wadsworth Pumping Plant Bypass Pipeline**

The Wadsworth Pumping Plant is located near Hemet at DVL. The pumping plant includes 12 vertical turbine pumps that are used to pump water into DVL or to generate electricity when water flows out of DVL into the forebay/San Diego Canal. This project will construct a bypass pipeline connecting the Wadsworth Pumping Plant discharge pipeline to the Eastside Pipeline to allow continuous pumping from the Diamond Valley Lake (DVL) forebay to supply DVL water to the Mills plant and the Rialto Pipeline via PC-1 Pump Station, while filling the forebay with water from DVL at the same time, in case of a supply disruption from the State Water Project's (SWP) East Branch due to severe drought or earthquake. The bypass will be 96-inch in diameter and approximately 600 feet long and will include a large diameter valve with a valve structure, and other features necessary to support the bypass operation.

**Westside Water Supply Reliability**

This project will enable Metropolitan to convey treated CRA and DVL water from its Central Pool northward along the Sepulveda Feeder to the west service area, supplementing deliveries from the Greg Avenue Pump Station. This concept requires two new pump stations along the Sepulveda Feeder: one each located adjacent to the existing Venice and Sepulveda Canyon Control Facilities. The project will be implemented in multiple stages. The initial stage (i.e., Sepulveda Feeder Pump Stations) of the larger project includes the construction of two pump stations capable of moving up to 30 cfs northward from the Central Pool to the west service area. However, once operational, the water supply benefits of the project to the west service area will be approximately 60 cfs of water supply as there will no longer be a need to send "operational water" southward on the Sepulveda Feeder from the Jensen plant during periods of low SWP demands. These operational water flows in the Sepulveda Feeder are currently necessary to maintain water quality in the feeder during low SWP allocations. Therefore, once the initial phase of this project is complete, the operational flows can be diverted to the west service area.

The capacity of the initial stage of the project is based on the current pressure limitations of the Sepulveda Feeder, which is primarily comprised of prestressed concrete cylinder pipe (PCCP). The pump station sites will be planned so that additional pumping capacity, up to a potential maximum capacity of approximately 160 cfs, could be added in future stages within Metropolitan's current property holdings. This expansion could take place after the second stage of work, which will reline PCCP portions of the Sepulveda Feeder with welded steel pipe and steel pipeline associated with the increased pressure after the completion of the first stage of this project, is complete.

## Information Technology and Control Systems Program

Fiscal Year 2024/25 Estimate: \$24.1 million

Fiscal Year 2025/26 Estimate: \$26.0 million

**Program Information:** *The Information Technology and Control Systems Program is comprised 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.*

### Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated:
  - CIP Budgeting System Improvements
  - CIP Budget System SharePoint Enhancement
  - Control System Upgrade Phase 6 - Skinner Final Design
  - Eastern Region Security System Upgrade – IT Infrastructure Upgrades
  - Fiber Installation at Iron Mountain, Eagle Mountain, and Hinds Pumping Plants
  - Oracle Database Upgrade
  - Oracle EBusiness Suite Upgrade
  - Western Region Security System Upgrade – IT Infrastructure Upgrades
- Major milestones achieved or estimated to be achieved:
  - Desert Microwave Tower Site Upgrades – major equipment received and design completed
  - Enterprise Content Management – Phase I – deployment completed
  - Fuel Management System Upgrade – deployment to be completed
  - Gene Communication System Upgrade – construction started
  - Security Operation Center – deployment completed

## Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Applications-Servers Upgrade from Old Windows OS	\$ 3,500,000	2024	Complete deployment
Control System Upgrade – Mills Plant	\$ 22,600,000	2024	Begin final design
Desert Microwave Tower Site Upgrades	\$ 13,700,000	2024	Complete design and begin construction
Enterprise Content Management – Phase II	\$ 10,300,000	2025	Complete deployment
Enterprise Data Analytics	\$ 3,300,000	2025	Complete deployment
Gene Communication System Upgrade	\$ 2,500,000	2024	Complete construction
Maximo Mobile Upgrade	\$ 500,000	2024	Complete deployment
Payroll-Timekeeping Reimplementation	\$ 1,800,000	2024	Initiate project and complete deployment
Two-Way Radio System Upgrade	\$ 11,300,000	2025	Complete deployment
WiFi Upgrade	\$ 5,200,000	2025	Complete deployment
WINS Water Billing System Upgrade	\$ 3,800,000	2024	Complete deployment

## IT Applications Project Group

**Applications-Servers Upgrade from Old Windows OS**

A significant number of Metropolitan's systems, including a number of critical enterprise-level business and water applications, are currently running on outdated Microsoft Windows platforms (e.g., Windows 2003, 2007, and 2008). These platforms are either already no longer being supported or will shortly cease to be supported by the Microsoft Corporation. Microsoft's support includes software updates and security-related patches to fix technical issues and mitigate potential new security risks. Losing these software and security updates will increase cyber security risks for the unsupported platforms. This project will upgrade all older application environments to versions of operating systems currently under support. Phase 1 of the project will identify and document required changes, and will group applications into deployment waves. Phase 2 will deploy the upgrades on each of the groups identified in Phase 1.

**Arc Flash Software Model Development**

An arc flash is the light and heat discharge from a high-voltage electric source with enough electrical energy to cause substantial damage, harm, fire, or injury. Arc flash risk analysis is required per National Fire Protection Association (NFPA), National Electrical Code (NEC), and Occupational Safety and Health Administration (OSHA) standards. Metropolitan currently uses a generic tabular approach to quantify the arc flash hazard; this approach no longer complies with the latest NFPA 70E standards. Comprehensive modeling that considers the effects of the surrounding equipment and accurately identifies the arc flash hazards is now required. This project will develop software models for Metropolitan facilities that are susceptible to arc flash hazards. The models will provide complete and consistent information to identify equipment improvements to improve safety and meet regulatory compliance. This project will also install arc flash labels for all equipment as required per NFPA.

**Asset Monitoring and Management System**

This project will establish the foundation for leveraging data already maintained by Metropolitan (under multiple different software platforms) into a common framework to efficiently conduct future infrastructure reliability projects and assessments across Metropolitan. This project is needed to support a common condition monitoring framework across Engineering Services (ESG) and Operations groups, as well as to support condition-based maintenance initiatives as part of the General Manager's initiatives and Operations' business plan.

This project includes building software tools to access and aggregate ESG, Operations, and other asset-related data, such as data from finance, to facilitate infrastructure reliability investigations on one class of assets (revenue meters). Eventually, the software tools developed as a part of this project will be used for future condition assessments in ESG and Operations.

**Asset Monitoring System Stage 1 Conveyance and Distribution**

Currently, asset condition and performance data are maintained in multiple data systems. At times, data is redundant, not consistent, or missing resulting in delays in decision-making and increased uncertainty. This project will create an integrated dashboard interface inter-connected with existing disparate data systems and utilize geographic information system (GIS) functionality to visualize key information related to asset health, condition, performance, location, and other key data in the conveyance and distribution system. Subsequent stages will address treatment plants, reservoirs, power transmission lines, support facilities, communication sites, fleet, real property, and advanced water purification.

**BDMS Rewrite**

This project will upgrade 2013 on-premise solution of the Board Document Management System (BDMS) to Office 365 SharePoint. This will require a complete rework since the cloud version does not support the on-premises code. This upgrade will provide additional functionality such as a mobile and tablet friendly user interface, improved process automation, and possible integration with the board agenda system.

**Computerized Maintenance Management System (CMMS) Upgrade**

This project will upgrade Metropolitan's Computerized Maintenance Management System (CMMS). Support for the 7.x versions of Maximo, Metropolitan's current version, will end in September 2025. To move to the cloud, the Maximo integrations with other applications need to be recreated using the Maximo Integration Framework and documenting all related business processes. These integrations include time keeping, the financial system (Oracle EBS), Facility and Equipment Availability (FEA) watermain shutdown application, the Maximo Business Intelligence (BI) data warehouse, and others. This project will also assess Metropolitan's Maximo on its readiness for upgrading, conduct the upgrade, and accommodate reporting needs.

**CIP Budgeting System Improvements**

The Capital Investment Plan (CIP) process has been in place for over 20 years and since inception, the process has been largely manual. The scope of this project is to consolidate the CIP proposal, risk form, and cash flow form into one seamless single proposal form. This project will also automate submittal tracking and create a new evaluation form, which will be designed to leverage the available historical evaluation data, new scores suggested by the proposal form, risk/consequence data to provide a clearer reference of information when evaluating projects, and other improvements necessary to streamline the budget process. This project will reduce staff time to generate proposals and required CIP documents, and also reduce the administrative and scoring efforts.

**Clear Orbit Bar Coding System Replacement**

This project will replace end-of-life Clear Orbit bar coding system at Metropolitan's eight inventory warehouses. As part of the new system, a new mobile hand-held solution including ancillary hardware and equipment such as charging stations and bar code printers will be deployed. In addition, the new system will be integrated with Oracle OCI and enhance IT infrastructure for wireless connectivity.

**Enterprise Asset Planning System**

Currently, short-term asset renewals are addressed by staff submitting Capital Investment Plan (CIP) proposals that identify upcoming needs to maintain a reliable system. This project will acquire a software application and implement a comprehensive solution to forecast long-term asset lifecycle costs. The resulting decision support tool will support the strategic planning for renewal of Metropolitan assets based on condition, performance, outage constraints, staff resource limitations, planned budget, shutdown schedules, relative value, and risk.

**Enterprise Content Management**

The Enterprise Content Management (ECM) application will classify and manage electronic documents and other media to allow for easy retrieval, review, and destruction of information in accordance with Metropolitan's records retention schedule. In addition, the new ECM application will allow Metropolitan to more effectively and efficiently manage its digital asset needs for business needs to respond to requests under the California Public Records Act (CPRA), and for eDiscovery purposes, and will automate compliance with records retention policies. Phase I of this project is complete, which designed a taxonomy for storing unstructured data and developed a thesaurus to support the implementation of Metropolitan's ECM application. Phase II of this project completes the design and delivers the initial deployment of the enterprise content management software into the Metropolitan environment. The system will allow for the organization, collaborations and automated enforcement of records retentions policies to non-structured electronic media. The final phase III will deliver the balance of the deployment of the enterprise content management software throughout Metropolitan.

**Enterprise Data Analytics**

The project's objective is to modernize Metropolitan's data and analytics portfolio enabling Metropolitan to be a data-centric organization that harnesses the potential of data across the enterprise and delivers value through analytics and insights at all user levels (including leadership roles) and across multiple business groups. It would establish an agile, cross-functional operating model that delivers business value quickly and effectively, setting up a personalized and anticipatory environment that enables user/insights and discovery "by business groups." This project would enable data-driven decision-making, and eliminate mishandling of data across the enterprise, which results in data quality issues and in turn needs extensive manual intervention in fixing data problems when determining and reporting key metrics to management teams. The Enterprise Data Warehouse that will be built will contain both business and operational data. It will be designed to combine financial dimension to operational data. By linking data like EBS (Financial), Supervisory Control and Data Acquisition (SCADA), GIS and Water Supply/Demand, Metropolitan staff can model different scenarios to answer questions and to discover trends and anomalies previously not visible due to isolated reporting.

**Enterprise Software Management**

The IT Business Management Team currently uses an in-house developed tool (Access Database) to track "desktop" software licensing. The current tool is limited to only "desktop" software and no other tool exists for tracking "Enterprise" licensing. This project will facilitate compliance by having an enterprise software management tool, which will include various categories including physical, software, hardware, mobile, and the cloud. This project will also ensure ongoing support of these various categories and increase efficiency across Metropolitan.

**HR Information System Improvements**

With the future of Metropolitan's hybrid working environment (telecommute & onsite) initiatives, improved self-services are needed that require less printing, secured electronic transactions, and allowing proper approvals from managers, while working remotely. This project will enhance the current Human Resource (HR) interface with mobile interface capabilities, enhance the Manager Self-Service Module; and implement a new Performance Management Module. This system will provide employees and managers the tools and technology to improve business operations, promote collaboration, and enhance workforce productivity by simplifying access to HR information.

**Hydraulic Model Enhancements**

Metropolitan uses its current state-of-the industry hydraulic model daily in support of operational and facility planning requests. While the model has significant hydraulic simulation capabilities, this project proposes to enhance the software to better address water quality analyses, hydroelectric power plant power production estimating, hydraulic surge transient analysis, flood simulations, and other studies. The proposed enhancements also include storing this information on the cloud for improved data access.

**Hydraulic Modeling Analysis Toolkit and Water Quality Calibration**

Metropolitan's Engineering Services Group completed development of a system-wide hydraulic model in January 2017 after a multi-year development effort. Even while model development was still underway, many uses for the hydraulic model were identified. This project includes developing tools to support hydraulic model analysis to increase efficiency and enhance productivity while using the hydraulic model for analysis. The project also includes development and calibration of water quality modeling capabilities.

**Maximo Mobile Interface Software**

Metropolitan uses Maximo software to schedule, plan, and execute maintenance work. Currently, Maximo web-based software is not designed for mobile use and desktop or laptop computers are used to generate work orders as the primary method to distribute and plan work for field staff. This project will install and configure a mobile software system that will allow field employees to interact with the Maximo Computer Maintenance Management System from iPad mobile devices. The new system will maximize the value of the new mobile devices, increase the options and opportunity to implement a proactive data driven maintenance strategy, improve response time for corrective actions, and improve timely access to information such as manuals, construction plans, and work plans.

**MWD Intranet Upgrade**

The Intranet is a restricted and internal network that enables Metropolitan employees to store, share, and organize information. Initially developed in 1997, the Intranet is built on technologies which have become obsolete. This project will replace Metropolitan's Intranet with newer technologies to serve as a central hub that performs a broad range of purposes which the current Intranet site is not able to. This includes cloud-based file sharing, document management, content management, inclusion of social technology, employee profiles, live messaging, forums, status updates, and Group sites coupled with published data catalogs to allow data sharing which is accessible from any type of device such as laptop, tablets, and mobile phones.

**MyWarehouse Shopping Cart Replacement Project**

Staff currently uses an outdated system for checking availability and acquisition of Metropolitan owned inventory items that lacks an easy-to-use interface and integration with financial systems. The proposed innovative system will provide staff with a fully integrated, "Amazon-like" user experience to improve efficiency of field, warehouse, and financial staff in checking the inventory in real-time, advance ordering of items in low inventory, and by allowing mobile device capability.

**Oracle Database Upgrade**

Metropolitan currently owns over 50 Oracle databases containing critical systems that will no longer be supported after December 2022. Any database affected by a performance or security issue would have to be removed from the production environment, rendering the associated application inoperable. This project will upgrade all the associated Oracle databases and update or reconfigure the connection points of all affected applications.

**Oracle EBusiness Suite Upgrade**

Metropolitan's Oracle e-Business Suite (EBS) is an integrated set of business applications for automating Metropolitan's financials, procurement, project management, and grants management activities. Metropolitan's e-Business Suite was last upgraded in 2016 and since then, the technology has been superseded by newer hardware, operating systems, and Oracle database versions. This project will upgrade soon-to-be unsupported, end-of-life EBS to the newer version with more functionality and capabilities.

**Payroll-Timekeeping Reimplementation**

This project will re-implement PeopleSoft payroll and will replace the current timekeeping software with a package that provides better integration with the payroll software and a better user interface. The current payroll and timekeeping applications both have deficiencies that have caused significant compensation issues for employees and have resulted in the need for excessive manual corrections by payroll staff. This project will enhance workforce productivity by simplifying access to business information and will maintain sound business practices and fiscal integrity.

**Services Procurement Implementation**

In the current Oracle Business Suite (EBS), it is difficult to automate and record certain transactions such as retention payments, Stop Notices, and Liquidated Damages. These transactions are tracked separately by Finance and Engineering. The Oracle on-premise Service Procurement Module is part of the Oracle E-Business Suite. The module automates retention transactions at the time of payment, and can, through customization, accommodate the need to hold other payments as liabilities in the General Ledger (GL).

This project will implement the Oracle Service Procurement Module, as part of the Oracle E-Business Suite, to automate retention or other withholdings required as liabilities in the GL.

**Supplier Portal Implementation**

This project will implement Oracle's web-based Supplier Portal, which provides self-service capabilities to Metropolitan's supplier community. Suppliers have access to a secure area that provides complete visibility to transactions, including purchase orders, payments and planned payments, offers collaboration with Metropolitan staff, and allows the electronic submission of invoices and other documents. The implementation of the portal will reduce repetitive inquiries from vendors, saving staff time and reducing vendor frustration.

**Water Planning Application Upgrade**

Water planning staff makes decisions every day that affect storage, cost, and movement of water within our system. The current software tool used is inefficient and obsolete, which was initially launched more than 20 years ago and last partially updated in 2008. This project will replace the existing water planning application with a new cloud-based application, which will build a foundation needed for innovative solutions addressing water supply and operational challenges. The new application will also be able to automate the process of gathering, categorizing, cleaning, validating, and reporting of critical data used by planners and meet today's cyber security standards. This is a new project for this budget cycle.

**WINS Water Billing System Version 2.1**

In support of Metropolitan's water billing system, conduct design, development, and deployment activities to add new functionalities and enhancements outside of WINS 2.0 based on new business user requirements.

**WINS Water Billing System Upgrade**

The Water Information System (WINS) bills Metropolitan's member agencies on a monthly basis for approximately \$75 million. WINS is known as Metropolitan's "cash register". The custom application is over 10 years old and needs to be updated. The billing logic is complicated and "hard-coded" into the application, requiring assistance from Metropolitan's Information Technology to make even minor modifications, such as adding new meters or programs. Member agencies have also requested additional functionality. This project will replace the WINS to add needed enhancements to the system to add security and functionality for both Metropolitan and member agencies.

## IT Infrastructure Project Group

### **Data Center Backup Infrastructure Upgrade**

Critical business and water applications rely on backup processes to restore the applications as soon as possible in an emergency. As Metropolitan's data volume progressively increases, so does the duration of the processes to backup, restore, and recover operations. Metropolitan's current backup software was deployed over 15 years ago and uses magnetic tape as the storage medium. This project will replace the backup infrastructure with newer and faster technology and will redesign the backup/restore processes and procedures using the latest components of the backup software.

### **Data Storage Infrastructure Refresh**

IT data storage infrastructure currently has a number of storage arrays that provide disk storage for the primary and secondary datacenters. This project will procure and install new data storage equipment to replace older equipment that will soon reach end-of-support-life by the manufacturer.

### **Desert Microwave Tower Site Upgrades**

This project will improve the reliability, performance, and capacity to Metropolitan's microwave radio wide-area-networks (WANs) in the desert region. Lessons learned from the Diamond Valley Lake (DVL) microwave proof-of-concept will be used in this project. The microwave network uses wireless transmission over radio frequency energy in the 6-18 Gigahertz range. This project will decrease the frequency of microwave system troubleshooting and repair activities and provide an increase in network service reliability.

### **Emergency Generators for Mountaintop Communication Sites**

The purpose of this project is to replace our existing emergency stand-by generators at Metropolitan's basin and mountaintop communication sites. Many of Metropolitan's generators have been in service since 2003 and they are experiencing engine part failures. Some of the parts are no longer manufactured and are difficult to obtain. These failures have resulted in longer downtimes and the temporary use of backup generators to ensure our communication sites continue to operate.

The purchase of new generators engines will eliminate the mechanical issues we are currently facing and eliminate the need to permit the engine with the AQMD (Air Quality Management District). This will also eliminate the regulatory operating restrictions as well as reducing Metropolitan's regulatory footprint. This project will also include the procurement of propane tanks that will allow the generators to continue to operate during long durations of time in the event of an extended power outage.

### **Enterprise GIS Disaster Recovery**

This project will add the Enterprise GIS (EGIS) infrastructure to the secondary datacenter. This includes the purchase, installation, and configuration of new hardware and software to meet Business Impact Analysis (BIA) study requirements for the EGIS infrastructure. The current recovery time for EGIS infrastructure is estimated at greater than a week. The BIA Recovery Time Objective (RTO) for the EGIS infrastructure is less than 72 hours, meaning that the EGIS infrastructure should be functional within 72 hours after an outage. This project will reduce the RTO for the EGIS infrastructure from 72 hours to 1 hour, so that EGIS data could potentially be used to assist in emergency operations.

**Fiber Installation at Iron Mountain, Eagle Mountain, and Hinds Pumping Plants**

Metropolitan currently relies on microwave radio equipment to provide a voice and data communication backbone for the business network, the Supervisory Control and Data Acquisition (SCADA) network, Automated Meter Reading (AMR), and two-way radio network. Information Technology Group's strategic vision is for more reliable fiber optic cables to become the primary communications path connecting all desert sites. This project will connect Iron Mountain, Eagle Mountain, and Hinds Pumping Plants to the public telecommunications network using fiber optic cable thereby enhancing reliability and increasing bandwidth of communications for desert facilities. The fiber optic would follow the paths of existing power transmission lines and terminate in the areas near switchyards and may require repeater stations. A separate project to install a fiber optic line from Gene Pumping Plant to Parker Dam, the Gene Communication System Upgrade, is scheduled for completion in 2024.

**Gene Communication System Upgrade**

Metropolitan's microwave radio wide-area network (WAN) transmits telephone, voice, data, and video communication between all Metropolitan facilities, utilizing point-to-point microwave transmission. While microwave transmission is highly effective, it is limited to line-of-sight propagation; thus, it cannot pass through mountains or other similar obstacles.

Gene Pumping Plant relies on a microwave tower at Black Metal Mountain and does not have a redundant site to support the plant if the system at Black Metal Mountain were to fail. Furthermore, the desert region now requires high-capacity carrier-grade communication links to provide reliable data, voice, and video transmission to support the need of new IT and supervisory control and data acquisition system (SCADA) infrastructures. The type of information that rely on this network are real-time data from the supervisory control and data acquisition system, automated meter reading system, security cameras and teleprotection, and system alarms to Metropolitan's control facilities, and provides access at remote sites to the email, geographical information system, Oracle financials, timekeeping, and PeopleSoft applications. This project will install approximately 22 poles and two miles of fiber optic cable from Parker Dam to Gene Pumping Plant administration building to connect to high-quality, high-speed data system to improve a variety of technological challenges at the desert facilities.

**Maximo Mobile Upgrade**

The goal of this project is to replace existing mobile devices used in Operations with latest tablet technology. The project will enable the use of capabilities of the existing mobile software system that are not available on the existing hardware devices. The project includes an initial pilot followed by purchase of several hundred devices. The new devices will eliminate or reduce the need for desktop computers at field sites and vastly increase the functionality of the existing Maximo mobile devices.

**Pasadena Microwave Project Phase II**

This project will improve stability and reliability of the data transmission within Metropolitan's network by replacing the existing microwave tower and communication equipment at Pasadena Water and Power property with a new tower and equipment. New microwave frequencies and modification to existing Federal Communications Commission (FCC) licenses will also be required for a new communication link to be established within the Metropolitan network.

**Replacement of Network Switches at MWD Headquarters Building**

Network switches are the backbone of the Information Technology (IT) network and connect all IT systems and infrastructure components. Several network switches which were installed at Metropolitan Headquarters in 2014 have reached end of their life cycle and are going out of support. Replacement of these network switches is needed to mitigate risks presented by old and out of support switches. This project will consist of multiple deployments of replacement network switches at Metropolitan Headquarters.

**Standby Generator Relocation at Six WAN Sites**

Metropolitan's Wide Area Network (WAN) provides a critical communication and data link between facilities across the distribution system. The Standby generators at six WAN sites must be relocated for consistency with the current fire codes and to enhance safety. These generators are needed to provide backup power in the event of loss of primary power. The planned improvements will reduce the risk of damage to communication equipment and the buildings in the event of a fuel leak. Metropolitan forces will relocate the standby generators at six WAN sites to reduce the risk of fire damage to Metropolitan's communication systems. The standby generators will be moved to new locations in separate outdoor enclosures, consistent with current fire codes.

**Two-Way Radio System Upgrade**

Metropolitan's current Two-Way Radio system is approaching the end of its service life, and both vendor and after-market support have recently ceased. The existing Two-Way Radio system is Metropolitan's essential communication system for public/employee safety, and for communications when Metropolitan performs tasks involving member agencies. This project, also referred to as the Emergency Radio Communications System Upgrade, will upgrade or replace specific components of the Two-Way Radio system, reusing the majority of the infrastructure; replace some unsupported radios; and will provide improvements to address poor reception at some locations. The upgraded Two-Way Radio system will include features anticipated to provide higher capacity, higher levels of cybersecurity, additional management and monitoring features, and multi-level resiliency.

**Western Region Microwave Tower Sites Upgrade Project**

The western region microwave network consists of communications sites with microwave radios that provide a voice and data communication backbone for the business network, the Supervisory Control and Data Acquisition (SCADA) network, Automated Meter Reading (AMR), and the two-way radio network. A majority of Metropolitan's current microwave radios have reached the end of their service lives, are no longer supported by the manufacturer, and replacement parts and software updates are no longer available, leaving microwave infrastructure vulnerable to equipment failure. Also, inspection of the electrical grounding systems has revealed deficiencies in grounding requirements of some sites and, due to regulatory changes, some propane generators may require upgrades. The scope is to procure microwave radio equipment and associated antennas with waveguides; design microwave network and system infrastructure; install equipment on towers and inside buildings; design and install battery backup systems; rectify any grounding issues; and review the condition and level of code compliance of the propane generator systems and upgrade as necessary.

**Weymouth Communication Room Relocation**

This project will relocate the existing communication room at the Weymouth plant administration building to an upgraded location where appropriate heating, ventilation, and air conditioning (HVAC), redundant power, and a fire suppression system is available to properly support Metropolitan's IT equipment at the Weymouth plant.

**WiFi Upgrade**

This WiFi Upgrade project will improve the reliability, performance, and capacity to Metropolitan's wireless access point (WAP) local-area-networks (LANs) at Headquarters and various field facilities. It will also provide a secure, reliable and robust WiFi System to support increasing business demands and reliance on Metropolitan's wireless infrastructure. The scope for this project includes (1) migration and implementation design plan, (2) removal of obsolete access points and controllers, (3) installation of cable in building ceiling for access points, (4) installation of new access points, and (5) configuration and installation of new controllers.

## IT Security Project Group

### **Cyber and IT Governance Risk and Compliance Implementation**

Cyber and IT Governance Risk and Compliance Implementation will focus on establishing robust frameworks and processes to manage cyber and IT risks effectively. This project involves implementing a Governance Risk and Compliance (GRC) tool, developing comprehensive policies, procedures, and controls to enforce compliance with regulations and industry standards. The GRC tool will integrate with our existing applications like Microsoft Office 365 and allow for cybersecurity compliance processes by generating reports that will support digital audits: 1) top layer - compliance audits: laws, regulations, industry standards, internal policies, vendor management; 2) middle layer - IT audits: data security, network integrity, access controls; 3) bottom layer - operational audits: process documentation, workflow optimization. The GRC will enable IT teams to identify the missing items to achieve compliance, establish workflow automation to handle employee access requests, access reviews, and software license removals.

### **Data Loss Prevention**

Data Loss Prevention will establish a robust Data Loss Prevention (DLP) program within Metropolitan. This project entails several critical components, including data classification, enforcement mechanisms, and ongoing support. Data classification involves identifying and categorizing sensitive information based on its level of confidentiality and importance. Enforcement mechanisms such as access controls, encryption, and data monitoring are implemented to prevent unauthorized access and data leakage. The project aims to successfully implement a comprehensive DLP solution, ultimately safeguarding sensitive data and mitigating the risk of data loss.

### **Eastern Region Security System Upgrade – IT Infrastructure Upgrades**

The existing security system that serves the Eastern Region of Metropolitan's distribution system requires frequent maintenance, is obsolete, and is not integrated with the current enterprise system, and its coverage is incomplete. This project will replace the existing security system with a new enhanced camera system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings.

### **Network Access Control**

Network Access Control (NAC) will ensure that Metropolitan will have the ability to specifically control the exact devices that will be allowed to connect to any one part of the Metropolitan enterprise or operational technology. This project will establish a comprehensive system to manage and control network access within Metropolitan. The NAC solutions will enforce authentication, authorization, and security policies for all devices seeking network connectivity. The NAC system verifies device compliance, checks for vulnerabilities, and ensures that only authorized and secure devices are granted access to the network. It includes features such as user authentication, device profiling, endpoint security checks, and policy enforcement mechanisms. Implementing NAC will enhance network security, protect against unauthorized access, and mitigate the risk of security breaches or data loss caused by compromised or non-compliant devices.

### **Network Visibility and Situational Awareness Upgrades**

This project will implement Network Visibility and Situational Awareness Upgrades to enhance the organization's network monitoring capabilities through the implementation of advanced technologies such as Traffic Access Points (TAP), Extended Detection and Response (XDR), and Network Detection and Response (NDR). TAPs are deployed strategically within the network infrastructure to capture and analyze network traffic, providing comprehensive visibility into data flows and network behavior. XDR platforms are leveraged to collect and correlate data from multiple security tools, enabling holistic threat detection and response across various endpoints. NDR solutions use advanced analytics and machine learning algorithms to identify and mitigate network threats, including anomalous activities and potential breaches. By implementing these technologies, the project aims to improve network visibility, enhance situational awareness, and strengthen the organization's ability to detect and respond to emerging cyber threats effectively.

**Security Operations Center - Cyber Security Upgrade Phase 2**

Cyber security remains a high priority and is a key part of the Information Technology Strategic Plan. Cyber criminals, including cyber terrorists from rogue nations, are launching increasingly sophisticated threats targeting critical infrastructure agencies such as water utilities. This project will assess and remediate exposures and cyber threats throughout Metropolitan with special emphasis on the business and Supervisory Control and Data Acquisition (SCADA) networks. The proposed security measures will enhance incident response times, protect against social engineering attacks, enhance SCADA security, and protect the rapidly growing network of Metropolitan's connected objects including SCADA sensors and telemetry data.

**Security Service Edge Implementation**

Security Service Edge (SSE) Implementation will ensure that Metropolitan can shift its security perimeter closer to the edge of the network, enabling real-time threat detection and mitigation. Through SSE, Metropolitan will integrate security functionalities directly into the network edge, eliminating the need for backhauling traffic to centralized security appliances. This will also facilitate centralized policy enforcement, monitoring, and management, resulting in increased visibility and control over Metropolitan's security ecosystem. This project will involve three key transitions: from domain-joined to non-domain-joined computers; from virtual private network (VPN) to SSE; and from Shared Drives to virtual Shared Drives. The project will include an Active Directory Hardening process, adhering to the best practices recommended by National Institute of Standards and Technology (NIST) and help prevent breach due to a compromise of user accounts and access controls.

**Smartbadge Implementation**

This project will replace current employee badges with new smartbadges to bring all Metropolitan access controls, whether physical or electronic, under a single pane for management for greater flexibility and to enhance physical and cyber security posture. The smartbadges will tie employee user accounts within Metropolitan's Active Directory (AD) infrastructure and would allow transitioning away from Yubikeys. This project will also include upgrading Public Key Infrastructure (PKI) of operating system version.

**Western Region Security System Upgrade – IT Infrastructure Upgrades**

The existing security system that serves the Western Region of Metropolitan's distribution system requires frequent maintenance, is obsolete, is not integrated with the current enterprise system, and its coverage is incomplete. This project will replace the existing security system with new enhanced camera system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings.

**Control Systems/SCADA Project Group****AMR System RTUs and Radio Modem Upgrade**

The Automatic Meter Reading (AMR) system is a critical component for transmitting meter information to allow for billing of member agency water deliveries and analysis of official meter instrumentation. The current system was mostly installed between 2008 and 2009. Portions of the AMR System must be updated because of equipment obsolescence and diminishing vendor support, as parts of the system have reached end of life. This project is planned to be completed in three phases. The first phase consists of a pilot study to evaluate various communication technologies, field test each of the selected communication technologies, and installation of 900 MHz radio modems and master radio station near Garvey Reservoir. The second phase consists of replacement of the remaining radio modems and radio master stations. The third phase consists of replacement of the AMR Remote Terminal Units (RTUs), operator interface terminals, digital displays, configuration laptops, battery chargers for Uninterruptible Power Supply (UPS), associated networking equipment and servers, and other appurtenances to complete the upgrades. It is anticipated that Control System Upgrade project will coordinate technology used in the AMR system with technology used in the SCADA (Supervisory Control and Data Acquisition) system.

**Control System Upgrade**

Metropolitan's control system spans the CRA, Metropolitan's five water treatment plants, and the entire conveyance and distribution system. This project is planned to be implemented in a phased approach through the following projects to upgrade hardware, software, and a communications network. Currently, the phases are planned to consist of the following projects:

- Preliminary investigations
- Conceptual design of the new control system
- Selection and demonstration testing
- Final Design and Implementation of Mills Area
- Final Design and Implementation of Skinner Area
- Continued final design and installation/construction of the new control system in multiple staged contracts

Minor Capital Projects Program

Fiscal Year 2024/25 Estimate: \$8.5 million      Fiscal Year 2025/26 Estimate: \$7.7 million

**Program Information:** The Minor Capital Projects (Minor Cap) Program is comprised of projects, with an estimated cost of less than \$400,000, that often require rapid response to address unanticipated failures, safety or regulatory compliance concerns, or to take advantage of shutdown opportunities. The Minor Cap Program authorizes the General Manager to execute projects that meet defined criteria without seeking additional Board approval.

Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated thru September 2023
  - Thirty-four projects were initiated
- Major milestones achieved or estimated to be achieved:
  - Twenty-one projects were completed

Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Various projects	\$46,160,000 for two open and new Minor Cap Appropriations	2029	Complete all projects within 3 years of initiation

## Additional Facilities and Systems

Fiscal Year 2024/25 Estimate: \$19.1 million

Fiscal Year 2025/26 Estimate: \$10.2 million

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

### Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated:
  - Apprentice Training Center Facility
  - Diamond Valley Lake Boat Dock Anchoring System Replacement
  - Diamond Valley Lake Floating Restroom Replacement
  - Eagle Rock Security Upgrade – Stage 1
  - Headquarters Building Interior and Exterior Lighting and Control System Upgrade
  - Headquarters Chiller Plant Upgrade
  - Headquarters HVAC System Equipment Upgrades
  - HQ Video Room Suite Renovation
  - Western Region Security Camera System Upgrade – Area 10
- Major milestones achieved or estimated to be achieved:
  - Diamond Valley Lake Floating Wave Attenuator – Stage 2 – final design completed
  - Diamond Valley Lake to Lake Skinner Trail – final design to be completed
  - Employee Village Enhancement - engaged a community planner to interview desert staff and management to develop a comprehensive plan for current and future desert housing needs.
  - Headquarters Building Improvements – construction completed
  - Headquarters Building HVAC System Equipment Upgrades – Phase 1 – construction completed
  - Headquarters Building Fire Alarm and Smoke Control Improvements – construction to be completed
  - Headquarters Building Fire Sprinkler Level P1 Replacement – construction to be completed
  - Headquarters Building Physical Security Improvements - Stage 1 – construction completed
  - Headquarters Building Physical Security Improvements - Stage 2 – construction completed
  - Headquarters Building Physical Security Improvements - Stage 3 – construction to be completed
  - Headquarters Cafeteria Walk-in Refrigeration System – construction completed
  - HQ Video Room Suite Renovation – construction to be completed

## Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
CRA Kitchen and Lodging Improvements	\$ 11,700,000	2027	Complete preliminary design for Eagle and Iron Mountain pumping plants
Diamond Valley Lake Floating Wave Attenuator – Stage2	\$ 10,500,000	2026	Complete construction
District Housing Improvements	\$ 63,100,000	2027	Complete preliminary design for Gene, Iron Mountain, Eagle Mountain, and Hinds pumping plants
Employee Village Enhancement	\$ 34,100,000	2027	Complete preliminary design for Gene, Iron Mountain, Eagle Mountain, and Hinds pumping plants
La Verne Shops Improvements - Equipment Installation and Building Completion	\$ 26,700,000	2024	Complete construction

## Employee Housing Project Group

**CRA Kitchen and Lodging Improvements**

Eagle Mountain and Iron Mountain Pumping Plants have kitchens and guest lodges that are used by staff during shutdowns and construction projects and during extended periods of condition assessments and design of rehabilitation work. These facilities will be used frequently over the next decade as the planned rehabilitation of the 45 main CRA pumps moves forward.

The kitchen at Iron Mountain Pumping Plant has been in service for decades and while still functioning, its equipment is deteriorated and obsolete. The kitchen at Eagle Mountain Pumping Plant does not currently meet San Bernardino County Health Services' requirements for large-scale food storage, refrigeration, or handling. As a result, it has been removed from service. The 10-room guest lodge at Eagle Mountain Pumping Plant and the 16-room guest lodge at Iron Mountain Pumping Plant have both deteriorated after more than 44 years of service and require frequent short-term repairs.

An initial assessment discovered that replacement of these facilities would be more economical since renovation would require significant seismic, electrical, plumbing, and roofing upgrades to meet current codes. This project will replace the kitchen and lodge facilities with new buildings with higher capacity in preparation of increasing work to upkeep the facilities out in the desert to maintain the CRA conveyance system reliability.

**District Housing Improvements**

Metropolitan owns 99 houses throughout the five CRA pumping plants and rents to employees involved in operation and maintenance of the CRA. A pilot renovation of 11 houses was completed in 2019 and construction of ten new houses was completed in 2018. In the same year, the Board authorized an assessment to determine whether the best course forward was to replace or renovate the remaining 78 houses. The assessment revealed that replacement of the houses was the best option. In addition, a recent housing analysis determined that only 75 of 78 remaining houses need to be replaced at four of the five pumping plants along with construction of two maintenance and two storage buildings, one each at Eagle Mountain and Iron Mountain Pumping Plants, to support the long-term corrective and preventative maintenance activities after the houses have been replaced. A community planner has been engaged to re-evaluate the desert housing program and provide recommendations. Adjustments to the scope of work will be made based on the recommendations.

**Employee Village Enhancement**

Metropolitan owns houses throughout the five CRA pumping plants and rents to employees involved in operation and maintenance of the CRA. In addition, due to the remote location of the pumping plants, each of the pumping plants has an employee village to provide a sense of community and offer the residents a space away from the work areas. Amenities such as a swimming pool and tennis courts are also part of these villages.

These villages and their current amenities are deteriorating due to the age and exposure to the harsh desert environment. This project will replace and enhance the village amenities at four CRA pumping plants (Hinds, Eagle Mountain, Iron Mountain, and Gene) that would focus on building a vibrant, healthy, and sustainable community for Metropolitan's staff. A community planner has been engaged to re-evaluate the employee village enhancements and provide recommendations. Adjustments to the scope of work will be made based on the recommendations.

**Recreation Project Group****Diamond Valley Lake Boat Dock Anchoring System Replacement**

The floating boat dock system at the Diamond Valley Lake (DVL) marina is nearly 20 years old and past its service life. Multiple anchor cables have failed in recent years and other system components are rapidly deteriorating. The anchor cables run from the top of the boat launch ramp, through the floating boat docks, and terminate at the anchor blocks on the lake floor to secure and stabilize the marina docks for individuals boarding and disembarking vessels. Some of the cables were replaced in 2015 due to the need to extend the boat launch ramps but the remaining system components such as the anchor blocks and the pontoons were not addressed. This project will replace or rehabilitate the DVL marina boat dock and/or anchoring system consisting of galvanized steel cables, associated connectors, anchor blocks, associated dock components, and other appurtenances to ensure the continued operation of the boat launching facilities at the marina.

**Diamond Valley Lake Domestic Water System Improvements**

Potable water used in the Diamond Valley Lake (DVL) facility is conveyed through a 16-inch diameter pipeline, sized to meet fire system demand. This configuration is oversized for domestic water usage and often results in low chlorine residual levels that requires regular flushing of the system. A volume of approximately 700,000 gallons of potable water is flushed into the DVL Forebay each month to ensure adequate disinfectant is available to inactivate pathogens and prevent recontamination. This project will install approximately 2,500 linear feet of 4-inch domestic water pipe to convey potable water to the DVL facility to address the ongoing low chlorine residual caused by high detention time in the existing larger diameter potable water line that currently serves the facility.

**Diamond Valley Lake East Marina Utilities**

Diamond Valley Lake (DVL) offers recreational opportunities to the region including boating, fishing, hiking, and biking. The facility supports 4,500 acres of on-water activity, 28 miles of trails, and 13,500 acres of protected open space. This project will extend the existing water, sewer, gas, and communication facilities from the intersection of Searle Parkway and Angler Avenue to the DVL East Marina to support existing operations and future development. The construction of the new infrastructure will replace existing failing tanks which are filled with trucked-in water to service the Marina store, enhance utility service reliability, and serve to comply with flows and pressures required to develop the Marina into a self-sustainable recreational facility.

**Diamond Valley Lake Floating Restroom Replacement**

The floating sanitation facilities at Diamond Valley Lake (DVL) are 18 years old and are at the end of their service life. The restroom equipment requires constant maintenance, particularly because failure of the holding tanks could lead to sewage leaking into the reservoir. New facilities would eliminate these concerns. This project is also needed for Metropolitan to continue to provide operable floating restroom facilities to recreational boaters in accordance with the Recreation Activity Plan approved by the Department of Drinking Water.

**Diamond Valley Lake Floating Wave Attenuator**

The existing floating wave attenuator (FWA) has been operational since 2006 as part of a two-stage approach. Stage 1 was completed by installing one 800-foot FWA. Stage 2 was to provide an additional attenuation system but was not implemented. Water levels at Diamond Valley Lake have fluctuated with severity and frequency for the last several years due to draw-down activities during drought conditions, then rebounding during the rainy seasons. Due to age and changing conditions, the concrete sections of the FWA have significantly degraded and the reinforcing bars are exposed to the elements which have accelerated corrosion of the existing FWA system. The original FWA has been refurbished to original condition in Spring of 2021. This project will construct the additional attenuation system originally planned under Stage 2.

**Diamond Valley Lake-Lake Skinner Trails**

This project will create a recreational link between Diamond Valley Lake (DVL) and Lake Skinner as identified in the initial reservoir planning documents and will connect to the existing network of trails that includes the North Hills Trail at DVL and Riverside County's Salt Creek Trail. Metropolitan jointly funded a trails study with Riverside County Regional Park and Open-Space District to investigate the feasibility of connecting trail alignments that would expand public access to the area's natural resources in an environmentally sustainable manner. The proposed trail alignment minimizes impacts to the Southwestern Riverside County Multi-Species Reserve through the joint use of the east side of the San Diego Canal Patrol Road. This trail will provide parking at several locations, amenity areas and improved fencing along the San Diego Canal. Planned trail uses will include hiking and bicycling.

**Districtwide & Additional Facilities & Systems Project Group****Apprentice Training Center Facility**

The current apprentice training center has come to the end of its useful life and lacks the needed space for break rooms and training without reconfigurations. As a result, some training modules are outsourced to other vocational training colleges and programs. This project will refurbish and make modifications to the former Diamond Valley Lake Visitor Center building to enable its use as Metropolitan's apprentice training center facility. The former visitor center building was completed in 2008 and shares several building components with the adjacent Western Science Center Museum. The project will address the need for additional space dedicated to individual apprentice training center functions such as break rooms, classrooms, restrooms with added capacity and ample space for library and storage areas. The project will also address the aging and obsolete building systems that are currently shared with the adjacent Western Science Center Museum. To meet Metropolitan building standards, upgrades will be made to security, access, architectural, mechanical, electrical, plumbing systems, and other building features and equipment. Completion of this project will provide the necessary facilities for apprentice training well into the future for the development of the workforce that will operate and maintain Metropolitan's conveyance, distribution, and treatment systems.

**CRA Aircraft Facility Improvements**

Metropolitan owns and operates several airstrips along the Colorado River Aqueduct (CRA) that are deteriorating with age. There is also no designated landing area for helicopters or an enclosed area to store aircraft. Currently, planes must be taken offsite for hangar storage in Lake Havasu. The project will design and construct various improvements to runway pavement and landing communication systems at the four aircraft facilities located near the CRA Pumping Plants (Gene, Iron Mountain, Eagle Mountain, and Hinds). This includes (1) rehabilitation of the existing asphalt paved runway, (2) rehabilitate the existing asphalt paved access road leading to the runway and construct new asphalt paved access road to replace the existing access road without asphalt pavement, (3) replacement of the existing incandescent bulb lighting along the runways at Iron Mountain and Eagle Mountain with energy efficient Light Emitting Diode (LED) bulbs, (4) installation of a weather reporting station at Eagle Mountain and Hinds Pumping Plants, (5) construction of a new helipad at Eagle Mountain Pumping Plant and, (6) construction of a new aircraft hangar and parking area at the runway facility near Gene Pumping Plant.

**Data Protection to Enhance Resilience and Emergency Response**

This project will install smaller fire and moisture resistant containers at the entrance of all Metropolitan essential facilities to securely store physical memory drives that contain digital files of design drawings and documents. In the event of a natural disaster, such as a major seismic event, the information contained in the memory drives will help the first responders assess facility conditions and develop restoration measures if facilities are not accessible.

**Districtwide Fall Protection Improvements**

Working at elevated areas within 6-feet of an edge that have 6-feet falling height, requires fall protection per California Occupational Safety and Health Administration (Cal-OSHA) regulations. The current procedures require that when employees need to enter a rooftop area to service equipment, they must develop and implement a specific plan for safe access; complete a job safety hazard checklist to address all fall hazards; and utilize safety belts, lanyards, or other approved fall protection systems as required. This project will construct guardrail and skylight fall protection on building rooftops, and other types of fall abatement projection for other serviceable areas on facilities with fall protection deficiencies at the District's five Colorado River Aqueduct pumping plants, five water treatment plants, and other miscellaneous facilities throughout the service area per Cal-OSHA Title 8 requirements. Engineered controls such as guardrails and skylight screens will provide the highest level of protection ensuring safety, limiting District liability, improving staff productivity, and ensuring compliance with Cal-OSHA requirements.

**Districtwide Pressure Vessel Rehabilitation and Improvements**

Metropolitan has over 500 pressure vessel containers used for functions such as surge suppression, chemical storage, or valve actuation. California regulates pressure vessels as they hold gasses or liquids above the ambient pressures. Certain pressure vessels can have a long lead time to procure or may require custom engineering work to fabricate. Approximately 40 of Metropolitan's pressure vessels are over 25 years old, roughly ten percent are over 60 years old, and the oldest pressure vessel found was built in 1937. Failure of a single vessel can cause the pumping station to be inoperable. Other vessel failures can reduce operational flexibility and put facilities at risk of violating water quality requirements. This project will establish a method to systematically assess the condition of all pressure vessels and supporting infrastructure throughout Metropolitan's conveyance, distribution, and water treatment systems; identify pressure vessels that require rehabilitation or replacement; and implement a rehabilitation or replacement plan.

**Districtwide Underground Storage Tank and Fueling System Upgrades**

Metropolitan currently has 39 underground storage tanks (USTs). Metropolitan's fleet is reliant on these USTs to provide fuel for vehicles and equipment to maintain Metropolitan's infrastructure throughout its service area. The USTs also service emergency generators to provide backup power in case of a loss of electrical power or black/brown out at each facility. Most of Metropolitan's USTs have exceeded their service life, and they or their associated components can fail anytime. This project will assess and upgrade 39 underground storage tank (UST) systems and their related sensors, probes, alarms, and fuel dispensers, under dispenser containment, piping, vent systems, tank monitoring systems, and other appurtenances to keeping the USTs reliable.

**Eagle Rock Security Upgrade**

The Eagle Rock Operations Control Center (OCC) was built in 1995 in the City of Pasadena. The OCC coordinates and controls Metropolitan's water conveyance and distribution system throughout its entire service area. As the main hub of this system, the OCC is pivotal for the management of water deliveries through Metropolitan facilities. The site currently consists of (1) a two-story building that houses the OCC, the Emergency Operations Center, and several staff offices, (2) a two-story older structure that holds the Business Incident Command Post, Security Water Center, several offices, and a Control Systems shop, and (3) several concrete structures used for transporting water. A vulnerability assessment of the OCC site was conducted in 2017. This assessment identified several security issues of concern as a result of trespassing onto the property. A security assessment identified the site's use by hikers in the area, site accessibility by individuals who have established homeless encampments in the area, and illegal dumping. Proposed site improvements include replacement of the main and lower entrance gates, and existing intercom system at the gates; replacing existing software, existing cameras and associated equipment, such as card readers, door contacts, communication fiber, switches, control panels, and control room monitors; and installation of additional security cameras, lighting fixtures, flood lights with motion detectors, fencing, gates around the perimeter of building, signage, new electrical and communication conduits, and other related security features.

**Etiwanda Test Facility**

Metropolitan had previously used its Yorba Linda Facility to evaluate equipment, test operational concepts and qualify equipment. The water used for testing was obtained from the Santiago Lateral and discharged into the Santa Ana River. Environmental constraints on the discharge of water made the facility's use impractical, and the test facility was shut down. This project constructs a new test facility at Etiwanda Reservoir to test new emerging technologies, emerging regulations related to metering, and to validate non-standard service connections. Specifically, a new facility would allow staff to test equipment such as valves, meters, coatings, and other treatment and distribution devices; conduct expedited tests to maintain a pre-approved equipment list for low bid procurement; simulate problematic flow meter installations and low flow conditions; and test the accuracy of existing flow meter installations.

**Headquarters Building Automation System Upgrades**

The building automation system controls all lighting, carbon monoxide monitoring system, HVAC, and associated mechanical equipment in Metropolitan's Headquarters Building. The system is required to operate the building in an energy efficient manner, consistent with Title 24 energy efficiency standards. In the event of a building automation system failure, thermal control within the data center would be lost and garage exhaust fans within the parking garage would become inoperable, resulting in damage to critical facilities and unsafe conditions, respectively. The existing building automation system is obsolete and is no longer supported by the manufacturer.

This project will replace the existing building automation system with a new nonproprietary system and will support integration of the new fire and smoke control systems that will be installed under the Headquarters improvements project.

**Headquarters Building Interior and Exterior Lighting and Control System Upgrade**

The existing fluorescent lighting fixtures in the Metropolitan Headquarters building are 23 years old and past their service lives. In July 2019, a fire incident occurred on the first floor due to the deterioration of fixture components. As the fixtures and components continue to age, the risk of fire hazard will increase. This project will replace and upgrade interior and exterior lighting with new energy efficient light emitting diode (LED) fixtures controlled by a new lighting control system which allows for programmable on/off, dimming, daylight harvesting, and occupancy sensing. This project will bring the building lighting up to the current California Title 24 building standards and may qualify for Los Angeles Department of Water and Power's Commercial Lighting Incentive Program.

**Headquarters Building Physical Security Improvements - Stage 3**

The comprehensive security upgrades for Metropolitan's Union Station Headquarters have been prioritized and staged to minimize rework and impacts to operations. The Stage 1 work is complete, which enhanced perimeter windows and doors by providing needed blast protection. The Stage 2 work is complete and provides security system upgrades inside the building with entry validation, surveillance and intrusion protection, and additional security features in the main entry rotunda area, board room, executive dining lounge, and security control room. Stage 3, currently in construction, will enhance perimeter security along the exterior of the building and courtyard including bollards and gates.

**Headquarters Chiller Plant Upgrade**

Metropolitan's Headquarters' original central plant cooling equipment was installed in 1997 when the building was constructed. This equipment provides the comfort cooling requirements for the Metropolitan Headquarters Building. Chillers and cooling tower equipment typically have a lifespan of 10 to 25 years and the existing equipment in the building is no exception. Costs to maintain the aging, obsolete, and inefficient equipment continue to increase. This project will replace the central plant cooling equipment with new chillers, cooling towers and related mechanical, electronic and electrical systems that meet today's energy efficiency and seismic standards.

**Headquarters Elevator Modernization**

The 13 vertical lift elevators at the Metropolitan's Headquarters Building are 25 years old, and the elevator control systems have reached the end of their service life. Moreover, the existing elevator components are obsolete and no longer manufactured. Equipment failure may render the elevator out of service indefinitely. This project will modernize the aged and obsolescent operating equipment and elevator door closures on all elevators, replace the HVAC heat pump that services the 6-bay elevator machine room, and other appurtenances to reliability operate the elevators.

**Headquarters Facility Replacement of Modular Furniture**

The service life of office modular furniture is about 20 years and the existing furniture in Metropolitan Headquarters Building predates the building since it was originally purchased and used when Metropolitan worked out of Cal Plaza. Additionally, the furniture supplier has discontinued this line of products. This project includes space planning, which will develop new furniture standards and guidelines that address changing organizational needs; replacement of obsolete modular furniture; installation of new common use space/privacy rooms/meeting rooms/storage; additional enclosed offices; associated power, communication and network installations in walls, ceilings, and floors; and other work to comply with safety codes.

**Headquarters Improvements**

The Headquarters Building is over 22 years old, and some of its features need to be upgraded or replaced. These features include the fire/life safety systems including existing fire sprinkler piping at the parking garage, some of the kitchen equipment and ceiling/wall finishes, HVAC system equipment including cooling towers, air handler units, chillers, air disinfection systems, and associated mechanical, electrical, and control systems, restroom facilities on several floors, and video rooms and video production equipment.

**Headquarters Landscape Improvements**

The exterior landscaping irrigation system at Metropolitan's Headquarters Building is beyond its useful life and increasingly requires component repairs and replacement. The system is less efficient compared to drip irrigation systems. The irrigation nozzles and underground lines are outdated and not correctly oriented to maximize plant growth and minimize water waste. In addition, the flora surrounding the headquarters is not native to California and thus is not optimal for California's climate conditions. The outdated irrigation system, combined with the non-optimal plant life and sprinkler type/orientation, needs immediate replacement. This project will include the installation of a bioswale infiltration area, installation of a high-efficiency drip line irrigation system, landscape grading, and planting with California native drought tolerant plants with guidance from Metropolitan's Water Resource Management, and in alignment with the Model Water Efficient Landscape Ordinance (MWELO) established by the Green Building Code.

**HVAC System Assessments & Upgrades - Field Facilities**

Metropolitan's facilities include nearly 700 structures with over 2,000 pieces of heating, ventilation, and air conditioning (HVAC) equipment. Approximately 80% of the HVAC equipment used by Metropolitan supports process systems that are required to treat or distribute water, and for regulatory compliance. The majority of Metropolitan's HVAC equipment is over 32 years old, requiring more corrective maintenance to remain operational, and consuming more electricity than newer, more energy efficient units. This project consists of a five-year, phased replacement of outdated HVAC infrastructure with certified energy efficient equipment, and will address regulatory changes in EPA guidelines, which are phasing out the refrigerants currently used in most of Metropolitan's HVAC systems. The project will also (1) modernize HVAC controllers into a cohesive building automation network to allow Metropolitan staff to more efficiently respond to HVAC interruptions, more quickly troubleshoot problems, provide early detection of problems before catastrophic failures, and ensure optimal performance of the HVAC systems; and (2) upgrade existing or install new air filtration systems with high efficiency particulate air (HEPA) filtration and germicidal equipment such as UV disinfection to occupied buildings to provide enhanced protection from airborne viral and bacterial particulates.

**La Verne Conveyance and Distribution Region Service Center Building**

The La Verne Conveyance and Distribution Team currently occupies shop facilities scattered throughout the Weymouth plant. This project will construct a new centralized service center facility. The facility will include a central meeting area, computer room, offices, kitchen, restrooms, and shop areas. Shops will include welding, machining, coating, valve rehabilitation, and storage.

**La Verne Field Engineering Building Replacement**

This project provides a new Field Engineering Building to replace the existing one, which does not meet Metropolitan's current seismic building standards, and is limited in function due to HVAC deficiencies and workspace constraints. The Field Engineering Building, located at Metropolitan's La Verne Facility, was designed and built over 52 years ago in accordance with building codes current at that time.

This project will include a detailed value engineering study to confirm the recommended approach to construct a new building in lieu of retrofits to the existing structure. This project will also include a comprehensive siting study to ensure that the proposed footprint of the new building does not interfere with the current and future requirements of Metropolitan's La Verne Facility. This project will enhance infrastructure safety, security, and resiliency.

**La Verne Shops Improvements**

The La Verne Shops are located on the grounds of the Weymouth plant and have been in service since 1941. The shops were expanded in the 1960s, and were expanded again in the 1980s to support a major rehabilitation of the pumps along the CRA.

A shop modernization program was started in 2002, and included building expansions and upgrades, and shop equipment replacement or refurbishment. Most of the shop equipment is 29 to 39 years old, with a few pieces close to 49 years old, and a 20-year-plan to replace and refurbish the shop equipment has been developed. The building expansions and upgrades included expanding the existing shop buildings, upgrading portions of the existing buildings, and replacing and refurbishing shop equipment. The first four stages of this project are complete, which included building expansion and refurbishment/replacement of most of the equipment.

The fifth and sixth stages focus on the procurement and installation of new fabrication and machine shop equipment, including a hydraulic shear, hydraulic press brake, waterjet cutting system, horizontal band saw, and vertical machining center. This new equipment will replace existing equipment that is up to 37 years old and is not viable to refurbish. These stages will also include refurbishment of various remaining existing machines; safety upgrades to roof ladders and walkways; and installation of new electrical circuit, unit power center for an uninterruptible power supply, ductbanks for various utilities, shop heaters, air compressors, various utilities, and other appurtenances to support the shop operations.

**La Verne Support Buildings Seismic Improvements**

As part of Metropolitan's seismic upgrade program, a rapid evaluation was conducted and identified seismic deficiencies in Weymouth Softener Buildings Nos. 1, 2, and 3, Weymouth Central Stores Storage/Paint Shop - Building 32/32A, and the Weymouth General Storage Building - Building No. 33. This project will evaluate future uses of these structures, construct improvements to address these deficiencies as well as, should it provide value to the District, improve non-structural features in each building such as roofing, insulation, and other building characteristics.

**La Verne Water Quality Laboratory Building Upgrades**

Metropolitan's Water Quality Laboratory at the La Verne site was constructed in two phases, with the original portion of the building being constructed nearly 40 years ago. While the building was constructed in accordance with the building codes at the time of construction, industry knowledge of earthquakes and seismic design has greatly improved over the years, leading to the development of more stringent, modern seismic codes for this type of facility. In addition, future regulations and newly identified contaminants of emerging concern such as per- and polyfluoroalkyl substances and microplastics, will require dedicated facilities such as clean-rooms and properly separated work areas to avoid cross-contamination, which are not available within the current open concept building configuration.

This project will provide seismic upgrades, a building expansion and functional layout improvements such as laboratory and office space reconfiguration, lab equipment replacements, accessibility improvements, HVAC and roof replacements, and other related building improvements necessary, including technology components to renovate and upgrade the building to support Metropolitan to meet current and future water quality regulations.

**Lake Mathews Aboveground Storage Tank Replacement**

The Lake Mathews existing diesel aboveground storage tank does not conform to current regulations and needs to be removed from service. In its present condition, the tank cannot be operated in a safe manner. The Lake Mathews Spill Prevention Countermeasure and Control Plan cannot be certified if the diesel aboveground storage tank remains in service. This project will replace the existing 10,000-gallon diesel fuel aboveground storage tank (AST) with its associated containment dike, venting, fill system, level monitoring, fuel dispensing system, catwalk, and continuous release detection system with a new 6,000-gallon AST system, and design and construct a roof over the storage tank containment and unloading area. This project will also install an eyewash station.

**Lake Mathews Facility Office Modernization**

Lake Mathews was constructed in 1940. Since the 1960s, the facility has been modified and is centrally used for various disciplines. It contains multiple buildings which house essential large equipment related to water operations. Moreover, the facility has become more critical with the additions of the administration and data center buildings. Most of the Lake Mathews buildings are reclaimed buildings left over from the contractor who completed the second lift of the Lake Mathews dam in 1961. The existing buildings are subject to weather intrusion and have over-extended their useful life. This project will improve, centralize, and modernize the staffing buildings by constructing a new office complex at the Lake Mathews Facility.

**Metropolitan Water District Headquarters Museum**

The Metropolitan Water District of Southern California was formed in 1928 to provide a reliable and sustainable water source to the rapidly growing population of Southern California. In 2028, Metropolitan will celebrate its 100th Anniversary, and this proposal outlines the construction of a museum to commemorate this important milestone in the organization's history. This project will identify a potential museum site at the headquarters, select objects, imagery, and artifacts to display in the museum and construct and install exhibits, displays, walkways, security, and lighting.

**New La Verne Warehouse**

The Central Stores Warehouse at La Verne is Metropolitan's main warehouse for storing materials, supplies and equipment used by field personnel to support Metropolitan's operations. It is comprised of four main buildings (Buildings 30, 31, 32A, and 33). A recently completed seismic evaluation found that the buildings may be damaged from a maximum credible earthquake. The cost to retrofit all four buildings is prohibitive. In addition, the buildings lack the storage space necessary to house Metropolitan's materials, supplies and equipment. The buildings are also not suitable to safely store adequate supplies of medical grade supplies and essential commodities for emergency preparedness, such as for pandemics. Furthermore, they lack equipment to handle large assets like the large-diameter specialty valves. This project will construct a new warehouse, which will provide approximately 55,000 square feet of indoor floor space with approximately 30,000 square feet of outdoor storage yard covered under canopies. This project will also demolish Buildings 30 and 31 and restore and seismically retrofit Buildings 32A and 33 to meet the current building code. The new warehouse and retrofitted buildings will support Metropolitan's ongoing operations and maintenance, capital construction efforts, and emergency preparedness.

**Orange County Region Service Center Storage Yard**

The existing Orange County Region Service Center Storage Yard storage area is gravel-based and is challenging to use in its current condition. Metropolitan's maintenance team is placing heavy equipment on the crushed aggregate base and moving it around. In doing so, the gravel needs to be spread out and maintained to ensure even distribution. Furthermore, the equipment being used is not rated for all-terrain use, causing it to get stuck in the gravel and increasing the need to maintain the equipment. Placing a concrete pad will ensure less maintenance for the area and the equipment. The storage area also stores valves and other materials needed for operations and maintenance needs. The material is subject to the elements that cause wear on them before they are installed. This project constructs a concrete pad and installs a canopy at the Orange County Service Center.

**Power Switch Yard Protection**

Several of Metropolitan's switch yard facilities fall under North American Electric Reliability Corporation (NERC) and Federal Energy Regulatory Commission (FERC) oversight and must adhere to infrastructure regulations set by these agencies. This project will install ballistic barriers and chain link roofs at all power switch yards throughout Metropolitan to protect equipment from projectiles and drone attacks.

**Security System Upgrade**

The electronic security system is the backbone of Metropolitan's physical security system. Studies indicate that replacement of the 17-year-old system is not yet required; however, incremental upgrades are needed to extend the life of the system. Work includes hardware and software upgrades to network controllers, computer servers, card readers, and the video management system.

**System-wide Paving & Roof Replacements**

Similar to infrastructure throughout Metropolitan, pavements and roofs deteriorate over time due to wear and tear from use, weathering and precipitation. The planned pavement and roofing rehabilitation projects will encompass water treatment plants, pumping plants, various maintenance facilities and access roads within Metropolitan's service areas. These projects will also improve the subgrade and drainage systems as required.

This project will allow various paving and roof replacements throughout Metropolitan's facilities to be authorized by the General Manager similar to the Minor Capital Projects Program. Establishing a project to fund a limited amount of paving and roof replacement on an annual basis will allow these needed replacement projects to proceed expeditiously.

**Western Region Security System Upgrade – Area 10**

This project will replace the existing security system with new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at Sacramento Headquarters.

**Wildfire Smoke Control at Eagle Rock Operations Control Center, Mills, Skinner, and Weymouth Water Treatment Plants**

During recent wildfire events, it was observed that existing heating, ventilating, and air conditioning (HVAC) systems do not meet the objective of reliably maintaining air quality in the control rooms that must be staffed at all times. This project will improve air quality at Eagle Rock Operations Control Center (OCC), Mills, Skinner, and Weymouth plants control rooms to ensure these facilities can be reliably operated during poor outdoor air quality periods such as wildfires. This project will install a dedicated high-efficiency HVAC system for control rooms and provide other appurtenances to ensure safety of staff during wildfire events.

## Prestressed Concrete Cylinder Pipe (PCCP) Program

Fiscal Year 2024/25 Estimate: \$16.9 million

Fiscal Year 2025/26 Estimate: \$49.6 million

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

### Accomplishments for FY 2022/23 and FY 2023/24

- New projects initiated:
  - Allen-McColloch Pipeline Urgent Relining – 2023
  - Allen-McColloch Pipeline Urgent Relining – 2024
  - Electromagnetic Inspections of PCCP Lines - Fifth Cycle
  - Foothill Feeder Acoustic Fiber Optic PCCP Monitoring System
  - Second Lower Feeder Reach 3B
  - Sepulveda Feeder PCCP Urgent Relining at Stations 569+40, 760+33, and 921+69
- Major milestones achieved or estimated to be achieved:
  - Allen-McColloch Pipeline PCCP Rehabilitation – preliminary design completed
  - Allen-McColloch Pipeline Urgent Relining – 2023 – design and construction to be completed
  - Allen-McColloch Pipeline Urgent Relining – 2024 – design and construction to be started
  - Electromagnetic Inspection of PCCP Lines – Fifth Cycle – pipeline inspection agreement authorized
  - Electromagnetic Inspections of PCCP Lines – Fourth Cycle – pipeline inspections completed
  - Lake Mathews PCCP Rehabilitation Valve Storage Building – construction to be completed
  - Second Lower Feeder PCCP Rehabilitation Reach 3A – construction completed
  - Second Lower Feeder PCCP Rehabilitation Reach 3B – final design completed and construction started
  - Sepulveda Feeder PCCP Urgent Relining at Stations 569+40, 760+33, and 921+69 – final design completed and construction to be completed

### Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Electromagnetic Inspections of PCCP Lines	\$ 8,900,000	Ongoing	Continue inspections in conjunction with pipeline shutdowns
Second Lower Feeder PCCP Rehabilitation - Reach 3B	\$ 105,600,000	2025	Complete construction
Sepulveda Feeder PCCP Rehabilitation Reach 2	\$ 94,800,000	2026	Complete final design and begin construction

## Allen-McColloch Pipeline Project Group

### Allen-McColloch Pipeline PCCP Rehabilitation

The planned rehabilitation work involves lining the existing PCCP segments with steel liner pipe or with other materials such as carbon fiber reinforced polymer (CFRP) designed as a stand-alone pipeline which can accommodate full internal and external pressures on the line. The project includes restoring the Allen-McColloch Pipeline to as close as possible to a “Like New” condition. This would include relocation of all air release and vacuum valves (AR/VV) that have not already been relocated above ground and evaluating and possible replacement of all valves associated with the pipeline, including but not limited to sectionalizing, service connection turnout, pumpwell, AR/VV, shutoff, and blowoff valves. In addition, the project includes procurement of any needed permanent or temporary right of way and evaluation and possible replacement or modification of all pressure control structures, master meters, and meter structures.

## Calabasas Feeder Project Group

### Calabasas Feeder PCCP Rehabilitation

The planned rehabilitation work involves lining the existing PCCP segments with steel liner pipe or with other materials such as carbon fiber reinforced polymer (CFRP) designed as a stand-alone pipeline which can accommodate full internal and external pressures on the line. The project includes restoring the Calabasas Feeder to “Like New” condition. This would include relocation of all air release and vacuum valves (AR/VV) that have not already been relocated above ground and evaluating and possible replacement of sectionalizing, service connection turnout, pumpwell, AR/VV, shutoff, and blowoff valves, etc. In addition, the project includes procurement of any needed permanent or temporary right of way and evaluation and possible replacement or modification of all pressure control structures, master meters, and meter structures.

## Rialto Feeder Project Group

### Rialto Pipeline PCCP Rehabilitation

The planned rehabilitation work involves lining the existing PCCP segments with steel liner pipe or with other materials such as carbon fiber reinforced polymer (CFRP) designed as a stand-alone pipeline which can accommodate full internal and external pressures on the line. The project includes restoring the Rialto Pipeline to “Like New” condition. This would include relocation of all air release and vacuum valves (AR/VV) that have not already been relocated above ground and evaluating and possible replacement of sectionalizing, service connection turnout, pumpwell, AR/VV, shutoff, and blowoff valves, etc. In addition, the project includes procurement of any needed permanent or temporary right of way and evaluation and possible replacement or modification of all pressure control structures, master meters, and meter structures.

## Second Lower Feeder Project Group

### Second Lower Feeder PCCP Rehabilitation

The planned rehabilitation work involves lining the existing PCCP segments with steel liner pipe or with other materials such as carbon fiber reinforced polymer (CFRP) designed as a stand-alone pipeline which can accommodate full internal and external pressures on the line. The project includes restoring the Second Lower Feeder to “Like New” condition. This would include relocation of all air release and vacuum valves (AR/VV) that have not already been relocated above ground and evaluating, installation of new isolation valve structures, construction of bypasses, and possible replacement of sectionalizing, service connection turnout, pumpwell, AR/VV, shutoff, and blowoff valves, etc. In addition, the project includes procurement of any needed permanent or temporary right of way and evaluation and possible replacement or modification of all pressure control structures, master meters, and meter structures.

## Sepulveda Feeder Project Group

### **Sepulveda Feeder PCCP Rehabilitation**

The planned rehabilitation work involves lining the existing PCCP segments with steel liner pipe or with other materials such as carbon fiber reinforced polymer (CFRP) designed as a stand-alone pipeline which can accommodate full internal and external pressures on the line. The project includes restoring the Sepulveda Feeder to “Like New” condition. This would include relocation of all air release and vacuum valves (AR/VV) that have not already been relocated above ground and evaluating and possible replacement of sectionalizing, service connection turnout, pumpwell, AR/VV, shutoff, and blowoff valves, etc. In addition, the project includes procurement of any needed permanent or temporary right of way and evaluation and possible replacement or modification of all pressure control structures, master meters, and meter structures.

## PCCP - Other Project Group

### **Electromagnetic Inspections of PCCP Lines – Fifth Cycle**

All PCCP lines within the distribution system are inspected every three to seven years. The frequency is based on the condition and history of repairs for each feeder. Four cycles of electromagnetic testing have been completed to date on Metropolitan’s PCCP feeders. This project will perform the fifth cycle of inspections over the six-year period. Planned activities for the inspections include: scheduling and coordination of shutdowns; conducting the electromagnetic inspections; conducting internal visual inspections; shutting down and dewatering the feeders and returning them to service; analyzing the inspection results; and preparing comprehensive inspection reports.

### **Foothill Feeder Acoustic Fiber Optic PCCP Monitoring System**

Prestressed concrete cylinder pipe (PCCP) is well-known in the waterworks industry to be at risk of sudden failure from loss of strength due to the breaking of pre-stressed wires. Currently, staff must dewater the Foothill Feeder to inspect the pipeline’s condition manually. The proposed project installs an innovative acoustic fiber optic system that will provide continuous condition monitoring over approximately 11 miles of the Foothill Feeder without having to dewater and enter the pipeline, along with other associated monitoring work.

### **West Valley Feeder No. 1 PCCP Rehabilitation**

An electromagnetic inspection conducted in April 2021 identified an increase in wire breaks since the previous 2014 inspection of the 54-inch Prestressed Concrete Cylinder Pipe (PCCP) portion of the West Valley Feeder No. 1. The planned rehabilitation work involves lining the existing PCCP segments with steel liner pipe designed as a stand-alone pipeline which can accommodate full internal and external pressures on the line and replacing any identified damaged lining in non-PCCP segments. The project includes restoring the West Valley Feeder No. 1 from approximately Station 1277+27.68 to the De Soto Avenue Sectionalizing Structure at Station 1290+16.70 to “as like new condition.”

## Water Treatment Plants Program

Fiscal Year 2024/25 Estimate: \$57.1 million

Fiscal Year 2025/26 Estimate: \$65.7 million

**Program Information:** *The Water Treatment Plants Program is comprised of projects to replace or refurbish facilities and components at Metropolitan's five water treatment plants and chlorine unloading facility to continue to reliably meet treated water demands.*

### Accomplishments for FY 2024/25 and FY 2025/26

#### Diemer Plant

- New projects initiated:
  - Diemer Helicopter Hydrant Facility
  - Western Region Security Camera System Upgrade – Area 6
- Major milestones achieved or estimated to be achieved:
  - Diemer Filter Rehabilitation – preliminary design completed

#### Jensen Plant

- New projects initiated:
  - Jensen Administration Building Column Panel Replacement
  - Jensen Electrical Upgrades – Stage 3
  - Jensen Sulfuric Acid Tank Farm Rehabilitation
- Major milestones achieved or estimated to be achieved:
  - Jensen Site Security Upgrade – final design to be completed
  - Jensen Administration Building Column Panel Replacement – construction to be completed
  - Jensen Vehicle Maintenance Building Roof Replacement – construction completed
  - Jensen Ozone Critical Components Upgrade – Stage 1 – construction to be completed

#### Mills Plant

- New projects initiated:
  - Eastern Region Security Camera System Upgrade – Area 2
- Major milestones achieved or estimated to be achieved:
  - Mills Ozone PLC Control and Communication Equipment Upgrade – construction completed
  - Mills Maintenance Building Roof Replacement – construction to be completed
  - Mills Modules 3 & 4 Flash Mix Chemical Containment Upgrades – construction completed

### Skinner Plant

- New projects initiated:
  - Eastern Region Security Camera System Upgrade – Area 1
  - Skinner Area Paving– construction completed
  - Skinner Sodium Hypochlorite Tank Replacement
  - Skinner Sulfuric Acid Transfer Line Rehabilitation
- Major milestones achieved or estimated to be achieved:
  - Skinner Ozone Contactors 1-2 and Influent Channel Concrete Refurbishment – construction completed

### Weymouth Plant

- New projects initiated
  - Western Region Security Camera System Upgrade – Area 8
- Major milestones achieved or estimated to be achieved:
  - Weymouth Administration Building Upgrades – preliminary design completed
  - Weymouth Wheeler Gate Security Improvements – preliminary design completed
  - Weymouth Hazardous Waste Staging and Containment Facility – final design completed

### Water Treatment - General

- New projects initiated
  - CUF Dechlorination System Upgrade

## Objectives for FYs 2024/25 and 2025/26

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Diemer Chemical Feed Systems Improvements	\$ 17,700,000	2027	Complete design
Diemer Filter Rehabilitation	\$ 84,300,000	2027	Complete design
Diemer Helicopter Hydrant Facility	\$ 1,000,000	2025	Complete construction
Diemer Power and Distribution Panel Upgrade	\$ 1,300,000	2026	Complete construction
Jensen Electrical Upgrades – Stage 3	\$ 77,000,000	2028	Complete Stage 3 preliminary design
Jensen Modules 2 & 3 Basin Solids Removal System Rehabilitation	\$ 34,800,000	2029	Complete preliminary design
Jensen Site Security Upgrade	\$ 10,900,000	2025	Complete construction
Jensen Solids Mechanical Dewatering Facility	\$ 48,400,000	2029	Complete design
Mills Basin Solids Removal System Rehabilitation	\$ 8,900,000	2028	Complete preliminary design
Mills Electrical Upgrades - Stage 2	\$ 16,800,000	2025	Complete construction of Stage 2
Mills Fluorosilicic Acid Tank Replacement	\$ 3,100,000	2026	Complete construction
Mills Perimeter Security and Erosion Control Improvements	\$ 10,200,000	2027	Begin construction
Skinner Fluorosilicic Acid Tank Replacement	\$ 1,300,000	2027	Begin construction
Skinner Sodium Hypochlorite Tank Farm Rehabilitation	\$ 1,500,000	2027	Begin construction
Skinner Ozone Contactor Roof Elastomeric Coating	\$ 2,900,000	2026	Complete construction
Skinner Sulfuric Acid Transfer Line Rehabilitation	\$ 1,700,000	2027	Complete design
Weymouth Administration Building Upgrades	\$ 33,600,000	2027	Complete design
Weymouth Basin 5-8 and Filter Building No. 2 Rehabilitation	\$ 116,100,000	2025	Complete construction

Project	Total Project Estimate	Estimated Construction Completion	Major Milestones
Weymouth Filter Valve Replacement	\$ 16,700,000	2028	Complete design of filter valve replacement for Filter Building No. 1
Weymouth Hazardous Waste Staging and Containment	\$ 3,200,000	2025	Complete construction

## Diemer Project Group

### Diemer Administration Building HVAC Replacement

The existing HVAC system in the Diemer plant's Administration Building consists of two 20-ton, chilled and hot water coiled air-handling units, which maintain multi-zone work-space environments on both floors. The 59-year-old units are beyond their expected operating life and have caused issues with regular maintenance activities. This project will replace the existing HVAC units with new energy efficient units and upgrade the temperature control system for the building. The project will also replace chiller, boiler, compressor, and make ductwork modifications. Seismic anchorage of the equipment will be incorporated to meet the current building code.

### Diemer Basin 8 Slope Toe Rehabilitation

At the Diemer plant, a relatively small mass of soil near the toe of the fill downslope north of Basin 8 was found to have mobilized, slumped, and displaced downslope. Since Basin 8 is within the State of California Department of Water Resources Division of Safety of Dams (DSOD)'s jurisdiction, Metropolitan has coordinated with DSOD an action plan to stabilize the slope toe and rehabilitate the slump failure. This project will implement DSOD recommended rehabilitation work at the top of the slope supporting Basin 8, which includes slope benching completed with engineered backfill, strengthening of the upper Basin 8 slope, and drainage improvements along Basin 8 slope.

### Diemer Chemical Feed System Improvements

The chemical feed equipment for ammonia, alum/ferric chloride, sodium hydroxide, fluorosilicic acid, liquid polymer, and dry polymer at the Diemer plant has aged and its reliability has deteriorated over the years. Most equipment is over 24 years old and has experienced failures. Some of the repair parts are no longer manufactured and are difficult to obtain. Loss of chemical feed or inadequate feeding capacity could disrupt plant operations. In addition, design criteria for some of the chemicals have changed and the existing equipment is unable to cover the required range for chemical feed. This project will replace the worn-out feed equipment and optimize the system design to improve system reliability and to protect treated water quality.

A canopy over the caustic soda tank farm and a new fluoride tank farm is needed to improve operations at the Diemer plant. Heat tracing around caustic feed lines is required to feed 50% caustic soda during the winter months. However, rainwater trapped within the chemical containment area could submerge the heat tracing wires. A canopy will minimize rainwater accumulation within the containment area and eliminate electrical hazards. The plant's fluoride tanks have reached the end of their service life and lack access for inspection and maintenance. This project will install a canopy over the existing caustic soda feed equipment; and replace the two fluoride storage tanks, associated feed equipment, and the roof over the fluoride tank farm.

**Diemer Chemical Tank Farm Rehabilitation**

The Diemer plant uses tanks to store the chemicals used during the treatment process. Most chemical tank farms were installed or rehabilitated between 2000 and 2010. Polymer and fiber reinforced plastic (FRP) tanks are past the end of the design life of 10 years. The expected life for steel tanks can be several decades long, but once corrosion begins, it rapidly worsens when the chemical and metal are exposed to air. Many of the Diemer plant chemical storage tanks and associated equipment are near or have already reached the end of their life. Changes in water use and related flows outside of the original design intent shorten the expected life of the equipment. This project will rehabilitate the chemical storage tanks, equipment, and support infrastructure located within the vicinity chemical tank farms at the Diemer plant.

**Diemer Erosion Control Improvements**

The Diemer plant is located on the top of a hill in the city of Yorba Linda and consists of numerous fill slopes. Due to the large water-bearing structures at the Diemer plant, some of these slopes are within the State of California Department of Water Resources Division of Safety of Dams (DSOD)'s jurisdiction. Some slopes within the Diemer plant have eroded and are in need of rehabilitation. This project will provide site improvements for grading, drainage, and erosion/sediment control to erosion-damaged slopes at the plant site.

**Diemer Filter Rehabilitation**

The Diemer plant has 48 independent filter units that are normally operated from the main control room, although they also have the capability to be operated locally if needed. Over the life of the Diemer plant, staff has performed regular maintenance on the filters to support reliable plant operation. However, as regulations and source water conditions have changed, filter performance reliability has decreased. Metropolitan's Water Quality recently developed recommendations for the rehabilitation of all Weymouth filters, including reconfiguration of underdrains, media, troughs and surface wash systems. This project will rehabilitate all of the Diemer plant's filters to improve their performance and enhance treatment plant reliability. The planned rehabilitation work includes replacing the filter media with optimized size and depth specifications; replacing the surface wash system with larger piping and improved flow configuration; replacing the underdrains; modifying flow distribution flumes; and raising and replacing the existing troughs to accommodate a higher depth of filter media.

**Diemer Filter Valve Actuator Refurbishment**

As part of the Diemer plant's filter valve rehabilitation work completed in recent years, the existing SMB-00 actuators from the plant's west side filter valves were removed. These actuators were installed in 1969 and have components which are still being manufactured, and they are in satisfactory condition for continued operation. To extend their service life, some of their parts need to be refurbished or replaced with parts provided by the original equipment manufacturer (OEM). This project will refurbish the 131 actuators removed from the Diemer plant's west filter valves. Once refurbished by the OEM, the actuators will return to the Diemer plant for installation onto the recently installed east valves. This project will also implement needed improvements for actuator installation, including replacement of the transformer in control consoles to power space heaters with 120V, installation of dedicated heaters on transformer, and upgrades to control consoles with local readouts, gauges, push buttons, to match the recently completed improvements at the Diemer plant's west side filters.

**Diemer Helicopter Hydrant Facility**

In November 2008, the Freeway Complex Fire burned westward from Corona past the Diemer plant. Slopes on the east, north, and west sides of the plant were burned, which prompted the Orange County Fire Authority (OCFA) to classify the Diemer site as a high fire hazard risk area. Metropolitan continuously implements feasible initiatives to enhance safety and reduce the risk of damage or disruption to plant operations in the event of fire, in coordination with the OCFA. This project will design and construct a new helicopter hydrant facility at the Diemer plant site, including an engineered water tank system to allow water-dropping helicopters to fill up with water while the helicopters are in the air during a fire event, site preparation and installation of a premanufactured tank with a concrete tank foundation, a helicopter pad, and other related infrastructure to operate the hydrant tank.

**Diemer Industrial and Potable Water System Upgrades**

The Diemer plant uses raw, industrial, and potable water sources to support the treatment processes throughout the plant. However, raw water is not ideal to use at the filter inlet since it bypasses the ozonation, flocculation, and sedimentation stages of the treatment process. Industrial water is used as an additional water source for chlorine ejectors, power generator cooling, belt presses, and hose bibs in the contactor galleries on the roofs of the ozone and contactor buildings. The industrial water system consists of a network of piping, valves, and pumps installed throughout the plant. The current industrial water system is undersized and unreliable. When an industrial water pump is in service, it must operate at over 95 percent speed to maintain pressure. The Diemer plant cannot perform simultaneous tasks that require industrial water, causing it to be an unreliable source. This project will remove the raw water system at the filter influent chlorine ejectors and upgrade the industrial and potable water systems to support the treatment processes throughout the Diemer plant. The work will include replacing the filter-influent chlorine ejectors' raw water system with potable water. This includes demolishing the raw water system and installing new piping, pipe supports, valves, pumps, and appurtenant equipment.

**Diemer Ozone Network Upgrade**

Ozone is the primary disinfectant at Metropolitan's water treatment plants. At the Diemer plant, the programmable logic controllers (PLCs), which control the ozone process, have exceeded their service lives, are discontinued, and the existing firmware has security flaws. This project will replace the PLC processors, upgrade the network modules to ethernet, modify the existing fiber optic cable infrastructure to support the new district standard ethernet, and other appurtenances necessary to complete the upgrade. The existing PLC configuration will be migrated to the new processors and the operations manual will be updated to reflect the associated changes.

**Diemer Power and Distribution Panel Upgrades**

Power and distribution panels that were installed during the original Diemer plant construction, are more than 59 years old. These panels, circuit breakers, and feeder conductors (wires that feed the panels) have exceeded their normal life span and have deteriorated. This project will upgrade the aged electrical equipment to meet the current electrical code and enhance the plant's reliability. The improvements will allow the electrical equipment to be taken out of service for preventive maintenance, replacement, and testing in a safe working condition.

**Diemer Sewer Metering Upgrades**

The Diemer plant has two metered sewer discharge points, one located at the main entrance, and the second one on the south slope. Diemer's current sewer flow meters do not use technology approved by Orange County Sanitation District (OCSD) and require frequent intervention to maintain performance. The new sanitation requirements specify enhanced metering functions, which the current meters lack. Upgrading the sewer metering system to a magnetic flow type is essential to comply with new OCSD permitting requirements, meet regulatory accuracy requirements, and enhance safety and metering reliability. This project will upgrade the Diemer plant's main and south sewer metering structures. Upgrades include the demolition of existing meters, modifications to piping and structures, and installation of new structures, flow meters, and associated equipment.

**Diemer Turbidimeter Replacement**

The Diemer plant uses turbidimeters to monitor turbidity and comply with water quality regulatory compliance requirements. Most of the turbidity instrumentation in the Diemer plant is deployed at the filtration phase of the water treatment process. A dedicated turbidimeter is deployed at each of the 48 parallel filter units, which comprise the Diemer filtration phase of treatment. These turbidity indications are closely monitored, and the resulting data is subject to compliance requirements. Additional turbidity monitoring points include the plant influent and effluent, the settling basins, the reservoir, and the washwater reclamation plant. The existing turbidimeters were installed between 2009 and 2014 and are no longer supported by the original equipment manufacturer. This project will procure and replace obsolete turbidimeters, controllers, and appurtenant equipment at the Diemer plant to comply with regulatory requirements.

**Diemer Washwater Reclamation Facilities Reliability Improvement**

Approximately 40 percent of Diemer plant's existing Washwater Reclamation Plant (WWRP) is constructed on long slender piles and earthen fill, which form a level surface at the top of a slope. Seismic rehabilitation is required to ensure reliability of the WWRP facility. In addition, submerged WWRP equipment is continually subjected to abrasive and corrosive operating conditions caused by the solids in the used filter backwash water. The WWRP's two identical treatment trains share a common influent channel and both must be removed from service during maintenance. This project will retrofit the WWRP with reliability improvements, including a new coal grit removal facility and new headworks to allow independent shut-down of each individual process trains. This project will add an L-shaped caisson wall to stabilize the seismically vulnerable fill portion of the pad. The project also includes modifications to the existing chemical feed system, sludge line, and utilities at the west slope.

**Western Region Security System Upgrade – Area 6**

This project will replace the existing security system with a new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at the Diemer plant.

**Jensen Project Group****Jensen Administration Building Column Panel Replacement**

The structure of the Jensen plant administration building was strengthened in 2010 to withstand a major seismic event. During the seismic strengthening project, the eight columns which support a clerestory roof at the entrance of the building were reinforced and covered with glass fiber-reinforced concrete (GFRC) panels. These panels are made of a cement-based composite material, reinforced with alkali-resistant glass fibers. The GFRC panels have cracked due to weathering, expansion, and contraction caused by temperature fluctuations, and due to movement caused by seismic vibrations. While these cracks do not impact the structural integrity of the building, the GFRC panels require replacement to protect the steel columns from corrosion and maintain the appearance of the building entrance. This project will replace the GFRC panels with new panels that have an upgraded material specification that reduces the likelihood of future cracking, an increased strength requirement, and new panel connection details.

**Jensen Aqua Ammonia Tank Farm Upgrades**

The Aqua Ammonia Tank Farm at Jensen is located on the west side of the plant near the Module 3 basins. This tank farm was constructed in 1998 and houses four chemical storage tanks. Aqueous ammonia is injected into the Combined Filter Effluent channel after chlorine injection to form chloramines. Metropolitan practices chloramination to meet federal and state water quality standards for the total trihalomethane maximum contaminant level. A seismic preliminary assessment recently conducted by Metropolitan staff, revealed that the steel moment frames and braced frame connections, including their lateral bracings, will not withstand a major earthquake. Further detailed seismic evaluation will be conducted to develop upgrade options. This project will upgrade the tank farm structural component to meet current seismic standards and retrofit the Jensen aqua ammonia feed system.

**Jensen Buildings Fall Protection Improvements**

The Jensen buildings were built to meet current regulations at their time of construction. Temporary fall protection, tethers and safety harnesses are currently used to provide maintenance for the skylights on several of these buildings. This project will install permanent guard rails to enhance fall protection around building edges, skylights, and process areas.

**Jensen Bull Creek Rehabilitation**

The Bull Creek channel located on the east side of the Jensen plant has suffered significant erosion from continued stormwater flow during the past wet seasons. This project will rehabilitate approximately 800 feet of the Bull Creek channel to prevent erosion through the use of biological and engineered solutions. The work includes installation of rip rap and slurry backfill along the channel, restoration of the damaged concrete liner on the channel sides, restoration of the broken apron next to the railroad bridge, and revegetation of native species to keep sediments in place and reduce erosion. In addition, a catch basin and other stormwater management infrastructure will be constructed along the San Fernando service road to the Jensen plant, to mitigate excessive erosion on the north bank of the Bull Creek.

**Jensen Chemical Feed Improvements**

This project will improve several chemical feed systems at the Jensen plant and rehabilitate facilities to maintain treatment plant reliability. Currently at the Jensen plant, sulfuric acid is added to suppress the pH and control bromate formation and then caustic soda is added to reduce corrosion in the distribution system. This project will modify the chemical feed system by adding ammonia and chlorine upstream of the ozone contactor. This approach would significantly reduce the plant's usage of both sulfuric acid and caustic and reduce overall chemical costs, which is consistent with current water quality design criteria for bromate control. To efficiently implement the ammonia-chlorine process to control bromate formation, the existing caustic soda tank farm will be decommissioned and replaced with a new facility built specifically for adding caustic soda to the filtered water line. Rehabilitation work required for the sulfuric acid tank farm includes refurbishment of the sulfuric acid storage tanks and reconfiguration of the transfer piping and basket strainer to minimize clogging and facilitate chemical transfer between the tanks. Other improvements addressed include removal of the liquid polymer building and decommissioned tanks farms.

**Jensen Chemical Tank Farm Rehabilitation**

The Jensen plant uses tanks to store the chemicals used during the treatment process. Losing a single tank would, at the minimum, reduce operational flexibility at a local level and put the plant at risk of violating water quality requirements. The Jensen chemical tank farms were installed or rehabilitated between the 1970s and 1990s. Polymer and fiber reinforced plastic (FRP) tanks are past the end of their design life of 10 years. For steel tanks, the expected life can be several decades long, but once corrosion begins, it rapidly worsens when the metal is exposed. The chemical storage tanks and associated equipment at Jensen are nearing, or have reached, the end of life. This project will rehabilitate the chemical storage tanks, equipment, and support infrastructure near the Jensen plant's chemical tank farms.

**Jensen Chlorine System Rehabilitation**

The chlorination system at the Jensen plant was originally constructed in 1972 and upgraded in 2005. The existing system components are nearly 20 years old and have reached the end of their service life. Replacement parts for equipment such as the evaporator system have become increasingly challenging to source and will soon be unavailable. Additionally, the scrubber tanks leak at the access flanges and piping has deteriorated beyond repairs. The system also lacks appropriate metering to determine the inventory within the railcars upon their return to the manufacturer. This project will rehabilitate the Jensen chlorination and feed system components, and other appurtenances to reliably operate the chlorine system.

**Jensen Control Room HVAC**

The Jensen plant was placed into service in 1972. During recent wildfire events, it was observed that existing HVAC systems do not meet the objective of reliably maintaining air quality in the control rooms that must be staffed at all times. This project will provide improved air quality in the Jensen control rooms to ensure that the plant can be reliably operated during periods of poor outdoor air quality. This project will: (1) install dedicated high-efficiency heating, ventilating, and air conditioning (HVAC) system for the main plant control room in the administration building and the secondary plant control room in the ozone generator building, and (2) seal the two control rooms from other portions of the building to reduce smoke or other air quality contaminants from entering the control room.

**Jensen Electrical Upgrades**

The Jensen plant's electrical system was designed to meet then-current electrical codes when the plant was constructed over 44 years ago. The aging electrical equipment has deteriorated through long-term continuous use, lacks redundancy, and is difficult to maintain and repair. Much of the original equipment is underrated by current standards and does not have adequate short-circuit interrupting capability, which results in an elevated risk of unplanned outages and equipment damage. This project will replace aging equipment and provide needed redundancy for critical components of the plant's electrical system. To expedite completion of the most critical electrical upgrades while minimizing impacts to plant operations, the upgrade work has been prioritized and staged. The Stage 1 work is complete and improved the medium voltage switchgear on the western portion of the plant and provided electrical infrastructure for the Jensen Solar Power Plant. Stage 2 work is also complete and included upgrades to UPC-7, UPC-9, and their associated motor control centers to support critical process equipment such as the washwater pumps, service water pumps, washwater return pumps, filters, thickeners, sludge pumps, and ammonia facilities. Stage 3 improvements are underway, and will upgrade the remaining components of the electrical system on the eastern portion of the plant, including a geotechnical seismic analysis of the east side of the plant to determine areas of seismic vulnerability.

**Jensen Entrance Improvements**

Both main Jensen plant gates at San Fernando and Balboa entrances need to be redesigned to improve security and traffic flow consistent with Metropolitan's other Treatment Plants. This project will enhance security of the Jensen plant's entrances. Project scope includes replacement of security gates; installation of traffic control devices to improve security at the entrance points of the Jensen plant; and installation of fire-resistant plants and irrigation along the west side of the plant.

**Jensen Hazardous Waste Containment Facility**

The Jensen plant currently stores its hazardous waste in a storage area that was repurposed from a general equipment storage area. The existing site has inadequate storage space for the facilities' needs. In addition, the waste containment area roof covering does not provide adequate protection from the rain and sun. This project will replace and relocate the Jensen plant Hazardous Waste Consolidation Site (commonly known as 90-day storage).

**Jensen Low Flow Capacity Improvements**

Due to persistent drought conditions and system-wide water conservation efforts to reduce State Project Water (SWP) usage, Metropolitan is implementing projects to reduce the minimum sustainable plant flow at Jensen. The existing infrastructure must be upgraded/modified to meet these turndown requirements, ensure reliable operation, and maintain regulatory compliance. If the treatment equipment and infrastructure are not upgraded/modified, the Jensen plant will not be able to reliably meet the low-flow treatment requirements, resulting in the need to utilize more SWP supplies than would otherwise be necessary. This project will upgrade critical components of the Jensen plant to reduce the minimum sustainable flow to below 90 cfs to support system-wide water conservation efforts during low SWP allocation years.

**Jensen Maintenance and Machine Shop Facility**

At the Jensen plant, the mechanical team's workstations are immediately adjacent to machine shop equipment. During maintenance activities, team members are subject to loud noises, fumes from lubrication and machining activities, and flying chips and sparks from cutting operations. In addition, mechanical storage is currently spread between the basement at the administration building, portable shipping containers, and an open canopy. None of these areas provide adequate coverage and safe storage for replacement parts and maintenance equipment. This project will construct a new building to house electrical and mechanical staff shops, a new machine shop area, equipment storage, and a dedicated chlorine maintenance room.

**Jensen Module 1 and Washwater Pump Rehabilitation**

Washwater pumps are used to pump water from the combined filter effluent to the washwater tanks. The tank water is then used to back wash filters. If washwater pumps are unavailable, the plant cannot perform filter backwashes that are necessary to maintain operation of the filtration process. Jensen's Module No. 1 washwater (WW) lift pumps were installed with the original plant construction and have been in service for 54 years. Inspection and testing has revealed significant corrosion in the pumps' housings, and diminished pump output. The pumps have reached the end of their useful life and should be rehabilitated. This project will rehabilitate or replace the Module No. 1 vertical turbine washwater lift pumps, modify the piping for the Module No. 1 service water and washwater lift pumps, replace the single-speed open motors with closed motors with VFDs or soft start function, and other appurtenances to reliably operate the service water and washwater systems.

**Jensen Modules 2 and 3 Basin Solids Removal System Rehabilitation**

This project will rehabilitate Modules Nos. 2 and 3 traveling bridges and sedimentation basins at the Jensen plant to enhance solids removal efficiency. Planned work includes replacing the existing traveling bridge end-truck structure, drive system, rails, and racks; replacing suction pumps and flexible hoses; retrofitting the suction piping; replacing sludge line piping, rehabilitating/replacing launder gates and launders; upgrading the bridge control system and power supply; replacing the existing basin inlet gate actuators; recoating bridge trusses; replacing basin guardrails; and installing improvements to prevent bird nesting within the basin.

**Jensen Ozone HVAC System Upgrade**

The current California Fire Code (CFC) requires the ozone generation building to be mechanically ventilated with no less than six air changes per hour (ACH). Additionally, it is the industry standard to provide 12 ACH during emergency operations. The HVAC system serving the ozone generation building consists of one air handling unit and six exhaust fans with a total airflow capacity that can provide 9.5 ACH. However, the existing HVAC system's regular operation is based on one air handling unit and three roof-mounted exhaust fans. The remaining three fans are off. This arrangement provides only 5 ACH, below the 6 ACH required by the current CFC. This project will rehabilitate the HVAC system serving the ozone generation building at the Jensen plant to ensure compliance with the current California Fire Code and meet industry standard for emergency operations.

**Jensen Ozone PSU and Critical Component Upgrade**

Ozone is used as the primary disinfectant at Metropolitan's water treatment plants. At the Jensen plant, the critical systems associated with ozone generation have deteriorated or have become obsolete after 17 years of operation and need to be upgraded. This project will upgrade the units that provide power to the Jensen plant's ozone generators and will replace outdated components of other critical systems associated with the plant's ozone generation, which have reached the end of their service life, and are no longer supported by the original equipment manufacturer. The systems to be upgraded include the following areas: (1) power supply unit (PSU); (2) nitrogen supply system; (3) ozone destruct units; (4) dissolved ozone; (5) cooling water loop; (6) ozone generator dielectrics; (7) liquid oxygen vaporizers; and (8) other components of the ozone system. This project also will make modifications to re-purpose one existing PSU chiller as a backup HVAC chiller.

**Jensen Ozone System Rehabilitation**

The ozone generation system at the Jensen plant has been operational since 2005 to serve as the primary disinfectant, aiming to minimize the production of disinfection by-products (DBP). Several crucial components of the ozone generation system are nearing or have surpassed the end of their useful life. This project will upgrade critical components of the ozone system at the Jensen plant to address aging infrastructure and control system improvements.

**Jensen Raw Water Emergency Bypass**

The Jensen plant is located within proximity of a number of faults, which are capable of generating large earthquakes. In the event of a large earthquake that can cause extensive damages to the plant and disables the water treatment capability, the plant does not have an emergency raw water bypass to deliver raw water under a boil water order in such a need were to occur. This project will improve resiliency against severe earthquake and enhance operational flexibility by constructing a raw water emergency bypass for the Jensen plant.

**Jensen Reservoir Bypass Gate Refurbishment**

The Jensen plant's existing reservoir bypass gates were installed in 1972 and allow the reservoirs to be isolated in case of water quality issues. The bypass gates are corroded and are currently inoperable because portions of the bronze bearings are degraded and missing. This project will enhance infrastructure safety, security, and resiliency, and will improve the reliability of water deliveries by replacing the reservoir bypass gates.

**Jensen San Fernando Road Entrance Pavement Rehabilitation**

The existing pavement from the Jensen San Fernando entrance to bridge crossing Bull Creek has not been replaced in over 50 years and has become worn over time. Large parts of the pavements have deteriorated into potholes and ruts that can damage cars and trucks. Temporary pothole repairs have become a quarterly maintenance activity that is not sustainable due to the temporary nature of the repairs. This entrance is critical for truck deliveries and the inability for chemical trucks to use this road could impact chemical deliveries. This project will remove and replace approximately 30,000 square feet of deteriorating asphalt pavement at the Jensen plant's San Fernando Road entrance. Following installation of new asphalt, entrance road will be restriped, and new rubberized speed bumpers placed along newly paved area.

**Jensen Seepage Water Collection Improvements and Beneficial Reuse**

There are currently two ways to dispose of seepage water at the Jensen plant: (1) discharge to the sewer system or (2) beneficial reuse through irrigation. The current plant-wide irrigation system is not tied into the seepage water system; only a minor portion of the irrigation system is tied in. The irrigation system is undersized for the amount of seepage water being used, creating the potential for environmental restrictions. Using the seepage water for the plant-wide irrigation system will increase the amount of seepage water that can be beneficially reused and provide a sustainable way to irrigate the landscape at Jensen. This project will install facilities needed to support the beneficial reuse of seepage water at the Jensen plant.

**Jensen Site Security Upgrade**

The outdated Jensen plant's security system needs an upgrade to minimize risk of an intrusion. The existing camera system is undersized and aged. Planned upgrade includes installation of additional card readers and motion-activated lights in sensitive areas; replacement of existing aging security cameras with high resolution cameras; addition of new cameras, motion detection devices, and public announcement speakers to monitor the perimeter of the plant and deter intruders; replacement of security signage to meet current code; security upgrades of first floor windows; addition of horizontal structural support to strengthen the existing gates; and addition of new defensive barrier plants and trees to screen the west side of the Jensen plant.

**Jensen Solids Mechanical Dewatering Facility**

Efficient recovery of water from residual solids is critical for the operation and efficiency of the Jensen plant, the current system consisting of solids thickeners on the Jensen site, and solids lagoons located at the adjacent Los Angeles Department of Water and Power (LADWP) site.

The solids thickeners play a key role in the recovery of water from the residual solids. During thickener operation, operators rotate valves daily to divert flow of residual solids to different thickeners. These valves leak and are difficult to access. This project will reconfigure Solids Pump Station No. 2 to allow better access to the valves; and upgrade the solids splitter vault to facilitate remote operation.

Metropolitan has an ongoing lagoon use agreement with LADWP, which allows for Metropolitan's use of four of the lagoons located at the Los Angeles Aqueduct Filtration Plant (LAAFP) to process solids generated and conveyed from the Jensen plant. Under this agreement, two of the lagoons can be used until October 1, 2062, and the other two until October 1, 2022. To reliably support the Jensen plant operation and provide operational flexibility during unfavorable source-water quality or higher water demand, it was recently determined that construction of two new lagoons to replace the two existing lagoons that must be returned to LADWP is not sufficient. This project will design and construct a new mechanical solids handling facility at the Jensen plant instead of constructing two new lagoons to replace the ones that must be returned to LADWP. This new mechanical facility will be sized to handle all of Jensen plant's solids handling needs when treating as much as 500 mgd.

**Jensen Wastewater Reclamation Plant Flocculator Rehabilitation**

The Jensen plant's wastewater reclamation plant 2 (WWRP-2) was constructed during the plant expansion in 1995. WWRP-2 is the only reclamation plant currently operational at Jensen, and its two treatment trains (Sides 3 and 4) must be reliable at all times to support Jensen plant's capacity of 500 mgd. Rehabilitation work for the flocculator basins on Side 4 was completed in 2017. This project will provide similar rehabilitation of flocculator basins on Side 3 to maintain its reliability. The work will include replacing bearings and stuffing boxes, replacing wood components of the flocculator paddles and baffle walls, and rehabilitating other appurtenances to maintain the reliability of the plant at all times.

**San Fernando Road Rail Crossing Rehabilitation**

The Jensen plant receives water treatment chemical supply by rail. Metropolitan's chlorine vendor is transitioning to heavier chemical railcars which require heavier gauge rails to meet Federal Railroad Administration regulations for hazardous chemical transportation requirements. This project will rehabilitate the deteriorated railroad crossing at San Fernando Road, upgrade the strength of the rails and turnout, add concrete crossing panels to handle heavy truck traffic, replace damaged asphalt, and install crossing arms and signage.

**Mills Project Group****Eastern Region Security System Upgrade – Area 2**

This project will replace the existing security system with a new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at the Mills plant and Etiwanda HEP/PCS.

**Mills Basin Solids Removal System Rehabilitation**

Currently, the Mills plant removes solids from each sedimentation basin using a bridge-mounted siphon system and discharges the solids to the retention basins. However, the flow cannot be adequately controlled. As a result, excessive amounts of water are often siphoned to the retention basins, causing increased solids drying time and reduced retention basin capacity. This project will upgrade the traveling bridges' solids removal equipment and controls to improve the solids removal process at the Mills plant's Modules Nos. 3 and 4. The new equipment and controls will allow the plant to optimize its solids removal process by simultaneously reducing the amount of water removed from the basin and reducing excessive solids build-up in the basins.

**Mills Chemical Tank Farms Rehabilitation**

The Mills plant uses tanks to store the chemicals used during the treatment process. Losing a single tank would, at the minimum, reduce operational flexibility at a local level and put the plant at risk of violating water quality requirements. The Mills chemical tank farms were installed or rehabilitated between the 1970s and 1990s. Polymer and fiber reinforced plastic (FRP) tanks are past the end of their design life of 10 years. For steel tanks, the expected life can be several decades long, but once corrosion begins, it rapidly worsens when the metal is exposed. The Mills chemical storage tanks and associated equipment are nearing or have reached the end of life. This project will rehabilitate the chemical storage tanks, equipment, and support infrastructure located near the chemical tank farms at the Mills plant.

**Mills Electrical Upgrades**

The electrical system at the Mills plant has deteriorated through long-term use, is difficult to maintain and repair, and needs improved backup capability. Failure of a single electrical device could impact the treatment process. 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. The electrical upgrades at the Mills plant will be completed in three stages. Stage 1 is complete and included replacement of obsolete circuit breakers, expansion of the electrical building for UPC-9, installation of new air conditioning system, installation of MCCs and distribution of power feed to chemical feeds systems, washwater return pumps, modules 3 and 4 filter surface wash pumps, and improvement of power reliability for key process equipment. Stage 2 upgrades is underway and will add a second incoming 12 kV service from Riverside Public Utilities and upgrade the plant's main switchgear and standby generator switchgear. Stage 3 upgrades will install climate control systems and doors at two electrical buildings, modify electrical manholes, replace digital metering modules for all motor control centers, and add fiber optic cabling.

**Mills Enhanced Bromate Control Facilities**

The Mills plant is currently using a temporary system built for bromate reduction. This system has been running successfully and has proven the effective use of chloramines in bromate control and the reduced operational costs over a wider range of influent water quality conditions. This project will replace the temporary feed, metering, monitoring, and injection (chlorine and ammonia) system with a permanent system which will incorporate new doubled-walled piping, double-wall containment, new flow metering, new chlorinators, new analyzers, and new ammonia feed tank. The full implementation of this project will significantly reduce the current operational costs of bromate control as well as provide greater control of bromate formation over a wide range of influent water quality conditions. The project also includes replacement of two existing chlorinators with new units for lower chlorine dosage control flexibility.

**Mills Filter Valve Rehabilitation**

The Mills plant Modules 3 & 4 were constructed in 1996 and are utilized in coagulation, flocculation, sedimentation, and filtration. During the filtration process, water settles through the filter media and is then collected in the combined filter effluent channel and conveyed to the finish water reservoirs. Modules 3 & 4 have 32 biologically active filters (16 each). The filters are designed for high filtration flow rates while reducing turbidity to ensure a high-quality filtrate. The treatment effluent must also meet water quality regulatory compliance. These filters and their associated equipment are over 26 years old. Due to age and usage, the filter, drain, and backwash valves have corroded, leading to unscheduled maintenance and failures. This project rehabilitates the filter valve systems in Modules 3 & 4, including filter, backwash, drain valves, actuators, and associated equipment.

**Mills Fluorosilicic Acid Tank Replacement**

The Mills plant relies on two 6,250-gallon cross-linked high-density polyethylene (HDPE) tanks for the storage of fluorosilicic acid. These tanks have a recommended service life of 10 years and have been in service since 2007. Recent inspections have identified leakage at the bolted connections of both tanks. This project will replace the fluorosilicic acid storage tanks with capacity of 7,900-gallon and improved mechanical properties to provide an expected service life of 20 years. The project will also replace coating in the containment area as necessary.

**Mills Operations Building Upgrade**

The Mills Plant Operations Building was constructed as a one-story building in 1976, and a two-story annex was added in 1992. The building houses equipment and storage rooms, a small control room, a laboratory facility, a dedicated treatment plant control center, and office and meeting spaces. Due to the age of the building, the current infrastructure is obsolete and does not meet today's security standards. The building does not have smoke detection and fire alarm monitoring, and there are also no fire sprinklers installed. The HVAC software, controllers, and mechanical equipment are also obsolete, lacking any controls, and have no way for staff to access the programming. This project will upgrade the Mills Operations Building, including replacement of plumbing fixtures, restoration of damaged areas, replacing the HVAC systems to meet Title 24 with temperature monitoring and control, and upgrading security features to meet Metropolitan standards and Department of Homeland Security recommendations.

**Mills Ozone Critical Components Upgrade**

Metropolitan's five water treatment plants use ozone as the primary disinfectant to reduce the formation of disinfection by-products (DBP) for compliance with the U.S. Environmental Protection Agency's Disinfectant/DBP rule. The Mills plant was the first treatment plant to incorporate ozone into the water treatment process. The ozone generation system at the Mills plant has operated since 2003, and several critical components of the system have exceeded their service life and are no longer supported by the original equipment manufacturer. Continued deterioration of the ozone system could require the plant to switch to chlorine as the primary disinfectant, which would increase the regulated disinfection by-products, trihalomethanes, and halo acetic acid levels. This project will upgrade the critical components of the ozone generation system at the Mills plant.

**Mills Pavement Refurbishment**

The asphalt pavement and concrete joint sealants at the Mills plant have deteriorated over time or have been damaged by heavy equipment during the construction of capital improvement projects. Severely cracked asphalt and potholes increase the maintenance costs to repair District vehicles and may damage other service vehicles. Asphalt pavement typically has a service life of approximately 20 years. The asphalt in most areas needing rehabilitation is over 30 years old and has reached the end of its expected life. This project will remove, haul away, replace, re-strip, and improve deteriorating pavement areas of the Mills plant.

**Mills Perimeter Security and Erosion Control Improvements**

The Mills plant has approximately 14,500 linear feet of perimeter fencing that is primarily a chain link with a height of six to eight feet. The fencing and several of the entry gates are deteriorating and may be vulnerable to security breaches. In addition, stormwater runoff has eroded an area on the southern boundary of the plant. This project will replace 7,700 feet of the existing fence with security fencing along the plant's southern, northern and western boundaries, replace existing guard shack and motorized sliding gate at the Barton Street entrance with motorized double swing gate with associated controls, replace three existing secondary gates with taller security gates with security cameras, and install one security camera at each of the sliding gates. Grading and erosion control improvements, such as installation of v-ditches and flow re-direction, will also be performed to prevent sediment from leaving the site. All improvements will be consistent with Mills plant's architectural design guidelines, and with Metropolitan's approach to facility security.

**Mills Raw Water Emergency Bypass**

The Mills plant is located within proximity of a number of faults, which are capable of generating large earthquakes. In the event of a large earthquake that can cause extensive damages to the plant and disables the water treatment capability, the plant does not have an emergency raw water bypass to deliver raw water under a boil water order in such a need were to occur. This project will improve resiliency against severe earthquake and enhance operational flexibility by constructing a raw water emergency bypass for the Mills plant.

## Skinner Project Group

### **Eastern Region Security System Upgrade – Area 1**

This project will replace the existing security system with a new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at the Skinner plant.

### **Skinner 480V Circuit Breakers Rehabilitation**

The Skinner plant's 480 volt (V) breakers protect equipment and personnel by cutting power to an electrical circuit when the circuit is overloaded or fails. They are a critical component of the electrical power supply system. Electrical lines, which include 480V circuit breakers, supply power to the ozonation facilities, the sulfuric acid tank farm, washwater reclamation plants, and peroxide tank farm. The circuit breakers are reaching the end of their life, and some mechanisms within the breakers are failing. Failing breakers would disrupt water treatment related to those systems. This project will refurbish or replace all existing 480V Eaton Magnum breakers and other appurtenances to keep the Skinner plant reliable.

### **Skinner Chemical Flow Meter Replacement**

The chemical flow meters at the Skinner plant were installed in 2007 with a plant-wide chemical system upgrade and chlorine building construction. The manufacturer no longer supports these flow meters. As a result, replacement parts are no longer available, significantly affecting the staff's ability to maintain each flow meter. The Skinner plant's chemical flow meters operate in real-time and report current chemical flow and feed rates to the SCADA system. The operators use flow meter readings to adjust the chemical dosages. This project will procure and install replacements for all remaining obsolete chemical flow meters within the Skinner plant.

### **Skinner Chemical Tank Farm Rehabilitation**

The Skinner plant uses tanks to store the chemicals used during the treatment process. Losing a single tank would, at the minimum, reduce operational flexibility at a local level and put the plant at risk of violating water quality requirements. The Skinner chemical tank farms were installed or rehabilitated between the 1970s and 1990s. Polymer and fiber reinforced plastic (FRP) tanks are past the end of their design life of 10 years. For steel tanks, the expected life can be several decades long, but once corrosion begins, it rapidly worsens when the metal is exposed. The Skinner chemical storage tanks and associated equipment are nearing or have reached the end of life. This project will rehabilitate the chemical storage tanks, equipment, and support infrastructure located near the chemical tank farms at the Skinner plant.

### **Skinner Electrical Equipment Building No. 3 Roof Upgrade**

The Skinner Electrical Equipment Building No. 3 was constructed during the second plant expansion in 1983 and houses two critical unit power centers, which power the chlorine building and two chemical tank farms. The building has a screw type metal roof whose life span ranges from 40 to 70 years. Recent inspections of the roof have identified several water leaks through the ceiling. This project will replace the roof of the building with a reliably leak free roof to improve reliability of Skinner's continued operations.

### **Skinner Fire Protection System Expansion**

The installation of a new Battery Energy Storage System (BESS) at the Skinner plant requires improvements to the plant's fire protection system. This project constructs a new fire hydrant, water pipes, and other improvements to provide a permanent fire protection water source for the Skinner's solar facility and BESS to comply with the fire codes.

**Skinner Fluorosilicic Acid Tank Replacement**

Fluorosilicic acid tanks will be removed and replaced with two 8,200-gallon above-ground (Fluoride) tanks at the Skinner Plant. New extrusion-molded linear HOPE tanks will be installed. To minimize changes in the tank farm, the new tanks will match the dimensions and capacity of the existing tanks. Scope will include modification to the tank farm to provide access during construction and associated piping work to connect the new storage tanks to the existing chemically compatible PVDF tank farm piping. The new tanks will be mounted on the existing tank pads.

**Skinner Ozone Contactor Roof Elastomeric Coating**

Leakage through cracks in Skinner plant's ozone roof deck was found in 2010. Cracks in the concrete roof deck can allow rain and nuisance water to be drawn down into the contactors which then mixes with the freshly ozonated water, creating a potential cross-connection. The water and air penetrating through the existing concrete roof decks exposes the rebar and structural steel in the decks, creating the potential of eventual structural failure to the roof decks. In addition, to keep the constant vacuum in the contactors, the Ozone Destruct Units have to work excessively which consumes additional electricity and affects the Destruct Units reliability and long-term life span. This project will abrasive blast, apply primer, and coat 61,000 square-feet of the Ozone Contactor Building concrete roof deck with an elastomeric coating to reduce potential structural damage and operational impact.

**Skinner Ozone Critical Components Upgrades**

Metropolitan's five water treatment plants use ozone as the primary disinfectant to reduce the formation of disinfection by-products (DBP) for compliance with the U.S. Environmental Protection Agency's Disinfectant/DBP rule. Several critical components of the ozone generation system at the Skinner plant have exceeded their service life and are no longer supported by the original equipment manufacturer. Continued deterioration of the ozone system could require the plant to switch to chlorine as the primary disinfectant, which would increase the regulated disinfection by-products known as trihalomethanes and haloacetic acids. As a result, this could lead to a violation of drinking water regulations and requirements. This project will rehabilitate and upgrade the critical components of the ozone generation system at Skinner plant.

**Skinner Plant 1 - Concrete Joint Sealant Replacement**

Concrete joint sealant throughout Skinner Plant 1 is cracked, delaminating, degraded, or missing as it has exceeded its service life. The degradation has allowed vegetation growth and moisture, sediment, and other outside contaminants to enter into and penetrate the concrete joints. This project will remove severely degraded concrete joint sealant throughout Plant 1, prepare and primer the existing joints, and replace with new concrete joint sealant.

**Skinner Plant 1 and Ozone Lab Turbidimeter Replacement**

Turbidity meters are required for water quality reporting. The current turbidimeters at Skinner Plant 1 and the ozone laboratory were installed in 2014. The original equipment manufacturer no longer supports the current turbidimeter model and the plant will no longer be able to maintain the existing turbidimeters when spare part supplies run out. Regulatory requirements do not allow turbidity meters to be out of service for 72 hours. Long lead times may mean a reduction in plant capacity if a turbidity meter fails. This project will replace all remaining obsolete turbidimeters and controllers within the Skinner plant.

**Skinner Plant 1 Filter Rehabilitation**

Skinner Plant 1 consists of three treatment modules each featuring flocculation, sedimentation, and filtration unit processes. Plant 1 was constructed in 1977 and is rated to treat flows as high as 240 mgd. Several filter system components in Plant 1 have become obsolete or have deteriorated over time. Filters are a necessary part of the treatment process. Failure of systems at a single filter will reduce the treatment capacity at Plant 1. This project will rehabilitate and upgrade the structure, equipment, and systems inside and adjacent to Skinner Plant 1 Filters.

**Skinner Potable Pumps VFD Rehabilitation**

The Skinner plant's variable frequency drive (VFD) potable pumps are essential to multiple plant systems, including service water for required and critical treatment chemical injections, water for safety showers and facilities such as bathrooms and kitchens plant-wide, and surface washwater, which is needed every time a filter is backwashed. The VFD pumps were installed in 2006 and some of their parts, such as the circuitry and the capacitors, are expected to last about 10 to 15 years. The existing VFD pumps are now obsolete, and parts will eventually become unavailable. Of primary concern is that the control platform is proprietary, and plant staff cannot modify, repair, or adjust it. This project replaces all obsolete VFD pumps at the Skinner Plant.

**Skinner Raw Water Emergency Bypass**

The Skinner plant is located within proximity of a number of faults, which are capable of generating large earthquakes. In the event of a large earthquake that can cause extensive damages to the plant and disables the water treatment capability, the plant does not have an emergency raw water bypass to deliver raw water under a boil water order in such a need were to occur. This project will improve resiliency against severe earthquake and enhance operational flexibility by constructing a raw water emergency bypass for the Skinner plant.

**Skinner Sodium Hypochlorite Tank Replacement**

The Skinner plant relies on two cross-linked high-density polyethylene (HDPE) tanks for the storage of sodium hypochlorite, which serves as initial backup disinfection to ozone treatment and ensures that primary disinfection requirements are continuously met during unexpected events such as power outages. The tanks are 10 feet in diameter and 12 feet tall, with a storage capacity of 6,250 gallons each. The tanks have been in service since 2007 and have exceeded their recommended service life of 15 years. Recent inspections discovered leakage from a propagating crack in one of the two tanks, which was repaired on a temporary basis. This project will replace the two existing sodium hypochlorite tanks with tanks of the same size.

**Skinner Sulfuric Acid Transfer Line Rehabilitation**

The sulfuric acid transfer system at the Skinner plant is used to move chemical between tanks and is also used to homogenize the chemical within individual tanks. This critical water treatment system recently experienced a leak in a transfer pipeline. This project will replace degraded transfer and recirculation pipes with pipe made from more appropriate material, and includes adding pressure relief valves and alarms, and other appurtenant work to improve the safety and reliability of the sulfuric acid transfer system.

**Skinner Washwater Reclamation Plant Rehabilitation**

The Washwater Reclamation Plant 2 (WWRP-2) processes wash water from the treatment modules at Skinner Plant. It reclaims water used in filter backwashes and sedimentation basin sludge processing during treatment. Solids settle out of the water, and the reclaimed water is returned to the inlet control structure at the ozone contactor building to be put through the treatment process. The WWRP-2 is the oldest working reclamation plant on site. Much of the equipment and infrastructure has deteriorated with time. The WWRP-2 was modified during the Skinner ORP project around 2011. The flocculators were redesigned, and solids pumps were replaced. The solids pumps are now obsolete. The other equipment was not rehabilitated then and is 30 years old. This project rehabilitates the WWRP-2 at the Skinner Plant, including replacement of return wash pumps and improvements on associated systems in the area.

**Skinner WTP Service Building 1 Rehabilitation**

Service Building 1 Rehabilitation will replace the sanitation facilities and roofing system and improve the staff work/meeting/lunch areas of the building. The scope includes the following: replace the roofing system; replace/upgrade all MEP and HVAC systems (mechanical; electrical; plumbing, heating, and air conditioning) to current building codes; upgrade IT requirements; comply with ADA requirements; improve employees shared facilities and offices (bathroom, locker rooms, break rooms, meeting rooms, cubicles); and abate all hazardous materials. Option to replace the building will be considered during the early phases of this project.

## Weymouth Project Group

### **Water Quality Demonstration Plant Rehabilitation**

The Water Quality Demonstration Plant (WQDP), formerly known as the Oxidation Demonstration Plant was placed into service in 1992 to perform demonstration-scale testing of ozone processes in advance of ozone retrofits at Metropolitan's water treatment plants. Since testing to support the ozone implementation was completed, this facility has been used continuously to determine the feasibility and application of emerging water treatment processes. The facility will continue to provide Metropolitan with a critical applied research platform to conduct numerous water quality studies before implementing full-scale treatment plant retrofits. The 5.5 MGD plant provides a demonstration-scale test facility that is approximately a 1:100 scale version of Metropolitan's full-scale plants and is needed to ensure that Metropolitan continues to meet all current and future drinking water regulations. Following 30 years of continuous use, many equipment items at the testing facility have deteriorated and become less reliable. This project will remove obsolete equipment; install new ozone generators, a new liquid oxygen (LOX) storage tank, and associated equipment; install variable frequency drives (VFDs) for the backwash pumps; rehabilitate secondary containment system for all chemicals used at the plant; and upgrade other electrical, mechanical, and control systems to make the plant operation more efficient.

### **Western Region Security System Upgrade – Area 8**

This project will replace the existing security system with a new enhanced system and install other security related equipment in this region to enhance the theft and trespassing detection and deterrence, lower maintenance costs, and better leverage the available bandwidth and data storage capabilities to provide better video feeds and recordings at the Weymouth plant and La Verne Water Quality Laboratory Building.

### **Weymouth Aqua Ammonia and Caustic Tank Farm Upgrades**

The Aqua Ammonia and Caustic Tank Farm at Weymouth is located on the northwest side of the plant. This tank farm was completed in 1997 and houses three aqua ammonia tanks and four caustic soda tanks. Aqueous ammonia is injected into the Combined Filter Effluent channel after chlorine to form chloramines to disinfect the water. Metropolitan practices chloramination to meet federal and state water quality standards for the maximum contaminant level of the total trihalomethane. Caustic soda is also injected into the Combined Filter Effluent channel to aid in preventing corrosion problems in the distribution system and to adjust and stabilize the pH. A rapid seismic evaluation recently conducted by Metropolitan staff, revealed that the steel moment frames and braced frame connections, including their lateral bracings, will not withstand a major earthquake. Further detailed seismic evaluation will be conducted to develop upgrade options. This project will upgrade the Weymouth Aqua Ammonia and Caustic Tank farm to meet current seismic standards. This project will also include mechanical, instrumentation, and electrical upgrades at the tank farm.

### **Weymouth Asphalt Refurbishment**

Over the past 80 years, the paved roads around the Weymouth plant have begun to deteriorate due to aging and surface wear. The roads are used to perform routine operation and maintenance activities and have received heavy use during rehabilitation efforts by Metropolitan forces and construction contractors. The deteriorated pavement exhibits raveling caused by wear and tear under traffic loads, surface deterioration, and fatigue and edge cracking caused by saturated subgrades from poor drainage and standing water. This project will remove the existing deteriorated paving, perform grading, install surface concrete gutters to improve drainage and asphalt paving to provide all-weather paved surfaces, and new pavement markings for the Weymouth plant.

**Weymouth Administration Building Upgrades**

The Weymouth Administration Building has been in service since 1941 and is an essential facility that supports treatment plant operations. The building is comprised of two separate reinforced concrete structures: a two-story structure of approximately 15,200 square feet that houses offices, support spaces, restrooms, a demonstration room, and a water quality laboratory; and an adjacent, four-story structure (typically referred to as the Control Building) of approximately 20,000 square feet that houses the plant control room, chemical piping systems, lockers, conference rooms, and an equipment storage area. The plant's outlet conduit passes underneath the building. This project will strengthen the two structures that comprise the Administration Building to increase their capability to withstand a major earthquake and retain its functionality as an essential facility. Seismic upgrades include addition of micro-piles to supplement existing caisson footings, reinforcement of the walls for the plant's filter outlet channel; filling of below-ground openings with structural concrete, and addition of new shear walls and drag beams. Electrical, mechanical, and plumbing components impacted by the upgrades will also be reconfigured and modernized. The plant's water quality sampling laboratory and office space will also be updated and optimized where required. This project will also upgrade the Weymouth plant's natural gas system, which serves all buildings throughout Metropolitan's La Verne site, and install a new fire protection system consistent with California Fire Code Standards.

**Weymouth Basins 1 & 2 Rehabilitation**

Basins Nos. 1 & 2 were built in 1939 as part of the original Weymouth plant construction. Each basin has a treatment capacity of 57.5 million gallons per day. These basins were originally designed to treat Colorado River Water (CRW). With the addition of State Project Water (SPW), the plant periodically requires higher coagulant dosages than CRW. As a result, the basins operated at a higher solids loading rate than the rate for which the basins were originally designed. This situation has dramatically increased run time on the basins' circular sludge rakes, which remove sludge from the basins. As originally designed, the sludge rakes only operated 1 to 2 hours every 4-7 days. Under current conditions, the sludge rakes are operated 6 to 12 hours each day which results in more frequent maintenance. These basins also have had issues with low solids-settling rates within the basins and high particle loading to the filters, or short-circuiting. The project includes the rehabilitation of the flocculation basins, settling basins, sludge collection equipment, baffling, and edge weirs.

**Weymouth Basins 5 - 8 and Inlet Channel Refurbishment**

The basin inlet channels deliver water to each of the Weymouth plant's eight flocculation/sedimentation basins. The inlet channel serving Basins Nos. 1-4 is a concrete box culvert constructed in 1940, while the inlet channel serving Basins Nos. 5-8 was constructed in 1962. A structural assessment of the basin inlet channels has found that they should be upgraded to reduce the risk of damage from a major seismic event. Inspections have also identified that wooden baffle walls have deteriorated after repeated wet and dry cycles and have shown a propensity to support algae and microbial growth.

For the inlet channel serving Basins Nos. 1-4, this project will strengthen the conduit and will reconfigure the channel to provide additional flexibility. For the Basins Nos. 5-8 refurbishment, the project includes refurbishing the steel guides; replacing the drive and paddle shaft assemblies; replacing the baffle boards, supports, and paddle wheel boards in the flocculation section. The project also includes filling the interior corners of each cell with sloping concrete fillets to direct residual solids into the path of the rotating scrapers; refurbishing the structural members of the catwalks; replacing the sedimentation basin sludge collector rakes, drives, and pumps; replacing launders, launder isolation gates, and drains; installing utilities, handrails, and other work necessary to complete the basin refurbishment. Replacement of inlet channel gates for Basins 1 through 8 and inlet channel seismic structural upgrades for Basins 5 through 8 are also part of this project.

**Weymouth Chemical Tank Farm Rehabilitation**

The Weymouth plant's chemical tank farms house the chemicals, feed equipment, and analytical instruments necessary to treat water. The chemical storage tanks and associated equipment are nearing the end of service life. Most chemical tank farms rehabilitated between 2000 and 2010. Polymer and fiber reinforced plastic (FRP) tanks are past the end of the design life of 10 years. The expected life for steel tanks can be several decades long, but once corrosion begins, it rapidly worsens when the chemical and metal are exposed to air. Losing a single tank would, at the minimum, reduce operational flexibility at a local level and put the plant at risk of violating water quality requirements if anything happened to the remaining tanks or the delivery. This project will rehabilitate the chemical storage tanks, equipment, and support infrastructure located within the vicinity chemical tank farms at Weymouth Plant.

**Weymouth Chlorine Delivery Railroad Tracks Replacement**

The Weymouth plant receives chlorine deliveries via rail cars. The railroad spur to the Weymouth plant was originally installed in the 1930s to transport material and equipment for the construction of the Weymouth plant. This project will replace the track dedicated to the Weymouth plant, improve traffic control and intersections as necessary, and install new rail car scales.

**Weymouth Chlorine Maintenance Shop Expansion**

With the completion of the Weymouth Chlorine System Upgrades project, the amount of equipment to maintain has increased, resulting in insufficient space in the existing shop to perform necessary maintenance and accommodate storage of equipment and spare parts. Storage cabinets and electrical panels have been added where desks and workspaces were located. Also, due to the space limitations, spare equipment is currently stored in the two storage bays, which poses the potential of the equipment being compromised in the event of a leak. This project will expand the existing Chlorine Maintenance Shop, including a room addition to ensure adequate working space and storage exist to address these space, storage, and maintenance needs to reliably maintain the chlorine equipment for the expanded chlorine process.

**Weymouth Dry Polymer System Upgrade**

Cationic polymers are used as a coagulant aid for the washwater reclamation plant, and nonionic polymers are needed to meet filter performance regulations when treating high State Project Water (SPW) blends. Depending on the quality of the source water, both dry polymers may need to be applied simultaneously. However, the current dry polymer system only has one mixing train available. Since these feed systems share a common polymer mixer, it is difficult to operate both systems at the same time. Additionally, the existing dry polymer mixer uses a type of batch mixer that can only make a single batch at a time and frequently clogs. The mixer is housed in a metal structure that does not meet current seismic codes although it was constructed to meet the codes at that the time of construction.

The project will construct a new dry polymer mixing facility to replace the existing facility. The scope of the project includes construction of a new building designed to meet current seismic standards, installation of a dry polymer mixing system to allow simultaneous mixing and feeding of cationic and nonionic polymers, independently; and construction of a covered containment area to house feed equipment and new polymer storage tanks.

**Weymouth Filter Valve Replacement**

The original filter valves in Building No. 1 were installed in two stages in 1941 and 1949, and were replaced in the early 1970s with similar valves. These valves are not consistent with modern American Water Works Association (AWWA) standards. The filter valves in Building No. 2 were installed during the second plant expansion in 1962 and are similar in dimension to the valves in Building No. 1. The existing filter valve bodies exhibit corrosion, the rubber seats are worn, and many valves leak after 49 to 59 years of continuous operation. In addition, the frequency of repairs to the actuators is increasing, and spare parts are difficult to obtain. This project will replace all filter valves and actuators in both Filter Building Nos. 1 and 2 with Metropolitan furnished AWWA-standard valves and current industry-standard actuators. This project will also replace or refurbish appurtenant equipment which is ancillary to the reliable operation of the filter valves, such as flow meters, underdrain valves, electrical and control systems, pipes, and other equipment.

**Weymouth Hazardous Waste Staging and Containment Facility**

The existing hazardous waste storage area requires a number of upgrades to enhance compliance with current codes and to provide enhanced safety measures, such as providing spill containment, eyewashes and safety shower, a canopy, leak detection, and sump. These utilities are all available at the existing sulfuric acid tank farm, which is no longer utilized. As the existing hazardous waste storage area does not provide containment to capture spills or leaks, there is potential for hazardous waste to run off to the storm drain system as well as exposure to plant personnel.

This project will relocate the existing Hazardous Waste Staging and Containment Facility to the existing sulfuric acid tank farm to account for deficiencies at the existing facility. The existing sulfuric acid tank farm, located approximately 100 feet from the existing hazardous waste area, is a 30-foot by 30-foot containment area with a roof, sump, SCADA controls, eyewash station, power, and potable water that can be cost effectively utilized to relocate the hazardous waste facility.

**Weymouth Ozone Contactor Building Ozone Off-Gassing Improvements**

The Weymouth plant's ozone contactor building features four 10-chamber ozone contactors for ozone disinfection. Ozone gas is generated in the ozone generator building and routed to the main header on the roof of the ozone contactor building, which then splits into individual contactor headers. Ozone is fed into each chamber through a diffuser array at the bottom of the chambers within the contactor. This allows the ozone gas to spread throughout all the chambers in a pattern of fine bubbles for contact with raw water. The excess ozone not being used in the contactors is being released into the atmosphere through the effluent gates or vents on the roof of the contactor building. This results in ozone lingering on the roof deck and wafting over the side of the building, down to the ground level, and into the building gallery, which prevents plant staff from performing preventive and corrective maintenance on the roof or in the gallery, as it's unsafe for staff to be around high levels of ozone. This project will determine the location of ozone off-gassing and develop and implement solutions to reduce ozone off-gassing, including modifications to the Weymouth plant's ozone contactor building.

**Weymouth Solids Handling Rehabilitation**

Residual solids generated during the water treatment process are sent to the gravity thickeners to separate water from the solids before being sent to belt presses in the solids handling facility for further dewatering. Dewatered solids are then pumped to elevated hoppers for storage prior to offsite disposal. Mechanical equipment at the solids handling facility has experienced frequent failures, and the facility itself requires full-time staffing to operate. Regular failures occur with the system's bridge breakers, which break apart dewatered solids so that they can be pumped to the hoppers. The facility also experiences frequent issues with the hoppers. After the belt presses dewater the solids, polymer solution is added to the discharge side of the cake pumps to facilitate pumping. This produces a cake-like material that often sticks to the hoppers' mechanical components and impedes opening and closing of the hopper gates. Rehabilitation of the solids handling facility is necessary to maintain its long-term function, reduce maintenance and operational labor costs, and reduce chemical costs.

This project will identify and implement the most feasible rehabilitation of the facility and to evaluate the capacity of the facility's decant lines. Options for rehabilitation include: (1) eliminating the existing cake pumps and installing a conveyor belt system to transfer the dewatered solids to the hopper system without the addition of liquid polymer; (2) transferring solids to a separate storage area where the solids are held prior to being hauled offsite. This project will also evaluate modifications within the building that would facilitate future equipment repairs and replacement; and (3) constructing sludge lagoons that would replace the belt press facility as the main solids handling facility to process residual solids.

**Weymouth Solids Thickeners Upgrades**

The Weymouth plant solids thickeners receive residual solids from the water treatment plant collector system and the washwater reclamation plant (WWRP). There are two identical 58-foot diameter thickeners and two newer identical 60-foot diameter thickeners located at the north end of the plant. Each thickener comprises an inlet well, circular basin, sweep arms and drive motor, a sludge removal hopper, and supernatant weirs. Residual solids enter the thickeners in the inlet well, settles, and accumulates at the bottom of the basin. The thickened solids are then scraped into the sludge removal hopper and pumped into one of the three belt presses at the solids handling facility. A rapid seismic evaluation of the thickeners and thickened solids pump room was recently conducted by Metropolitan staff, confirmed that the supports of the scraper blades comply with the strength design. However, the perimeter wall does not meet the strength design criteria under the current standards and is inadequate in the flexure capacity. This project will upgrade the Weymouth thickeners to meet current seismic standards. This project will also include mechanical, instrumentation, electrical, and associated upgrades.

**Weymouth Wheeler Gates Security Improvements**

Construction vehicles and chemical delivery trucks access the Weymouth plant through the Wheeler entrance gate. This project will provide safety and security improvements to the Weymouth plant's Wheeler gate, including construction of a new guard enclosure; improved lighting, security cameras, and communication features; crash-rated gates at vehicle and train entrances; perimeter wall and fencing along Wheeler Avenue; two traffic lanes at the entrance and exit; chemical delivery staging and containment area; and vehicle rejection turn-about outside the plant entrance gate.

**Water Treatment - General Project Group****CUF Dechlorination System Upgrade**

The chlorine unloading facility (CUF) is used to transfer liquid chlorine from rail cars to cargo trailers for delivery to Metropolitan facilities. The goal of this project is to enhance compliance with discharge regulations and allow the transfer of liquid chlorine from rail cars to cargo trailers to occur over a wide range of operating conditions. This project will evaluate available technologies; perform a pilot study, if needed, to determine the best technology; and will explore methods and technologies of neutralizing chlorine to improve chlorine transloading ability throughout the year. This project will upgrade the existing system that neutralizes chlorine at CUF.