



Memorandum

TO: HONORABLE MAYOR
AND CITY COUNCIL

FROM: Jeffrey Provenzano

SUBJECT: See Below

DATE: March 2, 2026

Approved

Date:

2/24/26

COUNCIL DISTRICT: Citywide

SUBJECT: San José-Santa Clara Regional Wastewater Facility Capital Improvement Program Update

RECOMMENDATION

Accept the status report on the San José-Santa Clara Regional Wastewater Facility Capital Improvement Program.

SUMMARY AND OUTCOME

This memorandum provides a programmatic update on the San José-Santa Clara Regional Wastewater Facility (RWF) Capital Improvement Program (CIP), focusing on the next 10 years. The update summarizes the current condition of the RWF's process areas and presents an overview of capital needs, scope, and costs for each area.

No specific projects or funding are being requested at this time. The information is provided to update City Council on current priorities and ongoing efforts to maintain reliable operations, ensure regulatory compliance, and guide long-term system resilience.

BACKGROUND

RWF History and Description

The RWF began operations in 1956 as a small primary treatment plant serving San José. Over time, the facility expanded to meet growing municipal and regional demands and evolving regulatory requirements. Secondary treatment was added in the 1960s,

followed by tertiary treatment in the late 1970s, enabling additional cities and sanitation districts to connect to the system.

The RWF is jointly owned by the Cities of San José and Santa Clara and operates under a long-standing Joint Powers Agreement originally executed in 1959, which established shared ownership and responsibilities. Santa Clara holds a 20-percent ownership share, and San José serves as the administering agency, with its Environmental Services Department managing day-to-day operations, maintenance, regulatory compliance, and capital improvements on behalf of both owners. Oversight of the RWF's activities is provided through multiple governance bodies, including the city councils of San José and Santa Clara, the San José Transportation and Environment Committee, the Treatment Plant Advisory Committee, and the Technical Advisory Committee, which advise on operational, policy, and long-range planning matters. This regional ownership and governance structure enables coordinated decision-making, shared investment, and alignment of operational priorities across the partner agencies.

Today, the RWF is one of the largest advanced wastewater treatment facilities in the United States, serving approximately 1.5 million residents and more than 17,000 commercial and industrial customers across eight South Bay cities. The RWF treats an average of 110 million gallons per day through a comprehensive process that includes screening, grit removal, primary and secondary treatment, filtration, and disinfection. Treated effluent is primarily discharged to the San Francisco Bay, with a portion conveyed to the South Bay Water Recycling Facility for further treatment and reuse for irrigation and cooling tower applications. Residual solids are stabilized through anaerobic digestion, and beginning in summer 2026, biosolids will be mechanically dewatered and transported off-site for beneficial use.

A detailed description of these process areas, their condition, completed improvements, and planned improvements is contained in the Analysis section of this memorandum.

2013 Plant Master Plan and Progress to Date

In 2007, an infrastructure condition assessment confirmed significant underinvestment in capital assets, finding that historical capital reinvestment levels had been well below what is required to sustain reliable wastewater treatment facilities over their lifecycle.¹ Much of the RWF's core liquids treatment infrastructure, constructed between the 1950s and 1970s, has exceeded its expected service life, and reinvestment that should have begun in the mid-1990s was deferred, resulting in a growing backlog of capital needs and increasing operational and compliance risk.

¹ San José-Santa Clara Water Pollution Control Plant Infrastructure Condition Assessment, CH2M Hill, May 2007

To address these issues, the City adopted the 2013 Plant Master Plan (2013 Plan), which established a comprehensive roadmap to restore, modernize, and maintain the RWF. The 2013 Plan identified over one hundred capital projects and approximately \$2.2 billion in investments over a 30-year planning horizon.²

Over the past decade, the CIP has invested approximately \$1.2 billion in improvements and completed 31 projects, significantly improving the reliability, safety, and resilience of the RWF. Through the successful use of alternative delivery methods, the program has received multiple industry awards and delivered major accomplishments, including headworks modernization, solids treatment upgrades, secondary treatment improvements, and construction of new energy recovery facilities.

2025 Updated Plant Master Plan

In 2024, the CIP initiated a technical update to the 2013 Plan to reflect current conditions, regulatory requirements, changing market conditions, and lessons learned from project delivery that inform how projects must be prioritized, scoped, phased, and delivered. This 2025 Updated Plant Master Plan (2025 Updated Plan) preserves the long-term planning framework and guiding principles of the 2013 Plan, while refining priorities, phasing, and cost assumptions to reflect present-day conditions. The 2025 Updated Plan is guided by the following planning priorities and key updates:

- **Asset Rehabilitation and Investment Prioritization:** Addressing aging and deteriorating infrastructure by refining project scopes and priorities based on updated asset condition assessments, operational experience, and risk, including facility needs not identified in the 2013 Plan.
- **Regulatory Compliance:** Incorporating new and emerging federal, state, and regional requirements and aligning capital investments with long-term compliance objectives.
- **Operational Reliability and Resilience:** Maintaining safe, efficient, and resilient treatment processes and support systems to reduce operational risk and extend asset life.
- **Phased Implementation and Adaptive Project Delivery:** Updating project sequencing, delivery approaches, and resource allocation based on lessons learned from the first decade of CIP implementation, while maintaining continuous plant operations.
- **Cost-effectiveness and Long-Term Affordability:** Delivering required capital investments in a manner that supports long-term affordability and rate stability.
- **Market-Responsive Planning:** Explicitly incorporating current market conditions, including labor availability, material costs, and supply chain constraints, into cost estimates and phasing.
- **Extended Planning Horizon:** Extending the master planning horizon through 2050 to reflect completed and ongoing work and identify remaining long-term capital needs.

² <https://www.sanjoseca.gov/your-government/departments-offices/environmental-services/water-utilities/regional-wastewater-facility/capital-improvement-program/plant-master-plan>

ANALYSIS

Ten-year Capital Focus

Although the 2025 Updated Plan provides a planning-level list of recommended projects over a 25-year horizon, near-term implementation is focused on the 10-year period through FY 2035-2036. This timeframe reflects the most immediate critical asset condition risks, regulatory drivers, and operational priorities. Building on the improvements delivered over the past decade, the next phase of the CIP focuses on targeted rehabilitation and modernization of key treatment facilities, solids processing systems, power and energy infrastructure, and essential support facilities.

Process Area Overview

The following sections provide an overview of the RWF’s major process areas and summarize existing conditions, completed improvements, and the capital investments needed over the next decade to maintain reliable operations and regulatory compliance.

Liquids – Preliminary Treatment

The RWF receives wastewater from San José, Santa Clara, Milpitas, and the four sanitation districts (West Valley, Cupertino, CSD 2-3, and Burbank) through a combination of major gravity interceptors and force mains. These flows enter junction structures that direct influent to the headworks, where debris and heavier materials such as sand and gravel are removed and transported to Newby Landfill for disposal.

Over the past decade, the RWF’s headworks have been modernized into a state-of-the-art, award-winning system that improves reliability, capacity, and operational performance. Headworks 1, built in 1956, has been decommissioned. Headworks 2, constructed in 2008, was rehabilitated and now serves as backup during wet-weather events. Headworks 3, completed in 2023 as a design-build project, serves as the primary duty headworks, treating up to 400 million gallons a day of peak wet-weather flow. These upgrades deliver a highly efficient and resilient headworks system, with no additional capital projects anticipated over the next ten years beyond routine maintenance.

Table 1: Preliminary Treatment Projects summarizes key preliminary treatment projects, including completed, ongoing, and planned improvements over the next decade. Cost shown in this table and subsequent process areas reflects total estimated project costs.

Table 1: Preliminary Treatment Projects

Completed Projects	Active / Planned Projects (FY 2026-2036)
<ul style="list-style-type: none"> • Headworks Critical Improvements (\$2.4m) • Headworks (\$167.8m) 	<ul style="list-style-type: none"> • None

Liquids – Primary Treatment

Primary treatment removes settleable solids and skimmed fats, oils, and grease through gravity settling, producing wastewater that is approximately 50 percent cleaner prior to secondary treatment. At the RWF, wastewater flows from raw sewage pump stations to primary settling tanks, which include the West Primary Clarifiers (constructed in 1956) and the East Primary Clarifiers (constructed in the 1960s and 1970s).

Due to their age and condition, the West Primaries are expected to be decommissioned in the future; however, interim repairs are required to maintain reliable operations while portions of the East Primaries undergo rehabilitation. This treatment area also includes pump stations and equalization basins that regulate flow to secondary treatment.

While targeted improvements, such as the 2017 Iron Salt Feed Station, have enhanced odor control and operational performance, the primary treatment facilities remain among the oldest assets at the RWF. Major rehabilitation of the primary clarifiers, as listed in Table 2: Primary Treatment Projects, is therefore needed to maintain reliable operations and complements the odor control strategy approved by City Council in 2015, which remains an important initiative for future implementation.

Table 2: Primary Treatment Projects

Completed Projects	Active / Planned Projects (FY 2026-2036)
<ul style="list-style-type: none">• Iron Salt Feed Station (\$8.3m)	<ul style="list-style-type: none">• Primary Rehabilitation Phase 1 (\$118.8m)• Primary Effluent Pump Station Rehabilitation (\$61.7m)• Additional 14-MG Primary Effluent Equalization Basin (\$39.0m)

Liquids – Secondary Treatment

Secondary treatment uses aeration tanks and clarifiers to biologically remove organic pollutants. Air is introduced into wastewater to support the growth of naturally occurring aerobic bacteria that break down organic pollutants before settling in the secondary clarifiers. A portion of the settled material is returned to the aeration tanks to sustain the biological process, while the rest is conveyed to digesters for further treatment. After this stage, the wastewater is approximately 95 percent cleaner and ready for tertiary treatment.

This treatment area consists of two parallel systems: Secondary and Nitrification. The secondary treatment system includes 16 aeration tanks and 26 clarifiers, constructed in the 1960s and 1970s. The nitrification treatment system includes eight aeration tanks and 16 clarifiers built in the 1970s and 1980s. The aeration process relies on 10 electric blowers, with associated motors, instrumentation, and controls rehabilitated in 2023 to improve efficiency and reliability. Seven nitrification clarifiers were rehabilitated in 2024 to address aging infrastructure and improve secondary treatment performance.

Additional capital investment, as listed in Table 3: Secondary Treatment Projects, is required to address the age and condition of the aeration tanks and secondary clarifiers and to meet new regulatory requirements. The 2024 Regional Nutrient Watershed Permit establishes limits on total inorganic nitrogen discharges to protect San Francisco Bay water quality, with interim and full compliance milestones, with full compliance required by 2034. This permit represents a Bay-wide regulatory requirement, meaning many agencies will be undertaking similar nutrient-related upgrades. As a result, demand for specialized contractors, materials, and equipment is expected to rise, potentially increasing project costs and extending delivery timelines. across the region.

Table 3: Secondary Treatment Projects

Completed Projects	Active / Planned Projects (FY 2026-2036)
<ul style="list-style-type: none"> • Blower Improvements (\$48.6m) • Nitrification Clarifiers Rehabilitation Phase 1 (\$51.1m) 	<ul style="list-style-type: none"> • Aeration Basin Modifications – Phase 1 (\$332.3m) • Secondary Clarifiers Rehabilitation (\$135.8m)

Liquids – Tertiary Treatment

In 1979, the RWF expanded its facilities to add tertiary treatment in order to comply with Clean Water Act requirements. During this stage, wastewater is filtered through beds of gravel, sand, and anthracite coal to remove remaining fine suspended solids and then routed through serpentine tanks where chlorine is applied for disinfection and subsequently neutralized to protect aquatic life, resulting in water being approximately 99 percent cleaner.

The tertiary treatment area includes a Filter Building, which contains four batteries with a total of 16 filters, as well as serpentine tanks, and chemical storage for sodium hypochlorite and sodium bisulfate. After disinfection, approximately 90 percent of the treated water is conveyed to the outfall channel leading to Coyote Creek and the South San Francisco Bay, while the remaining 10 percent flows is sent to the South Bay Water Recycling system.

Critical equipment was rehabilitated under the Filter Rehabilitation project, completed in 2025, which extended the facility’s useful life by approximately 10 years ahead of constructing a new filter complex as identified in the 2013 Plan. Additional targeted improvements have since been identified and will be implemented in the next 10 years. These projects will further extend service life for the filter complex by up to 20 years, allowing the original replacement project, with an estimate of more than \$300 million, to be deferred beyond 2050, while maintaining reliable operations. Table 4: Tertiary Treatment summarizes these tertiary treatment projects.

Table 4: Tertiary Treatment

Completed Projects	Active / Planned Projects (FY 2026-2036)
<ul style="list-style-type: none"> • Filter Rehabilitation (\$59.7m) 	<ul style="list-style-type: none"> • Additional Filter Improvements (\$34.3m)

Following completion of primary, secondary, and tertiary treatment processes, solids generated throughout the plant are sent to the digestion and dewatering systems for further processing.

Solids Handling and Treatment

Solids generated from the primary and secondary processes are managed through an integrated biosolids treatment system that includes dissolved air flotation thickeners, anaerobic digesters, lagoons, drying beds, and energy recovery facilities. Primary sludge is conveyed to the digesters, while secondary sludge is thickened prior to digestion. Anaerobic digestion stabilizes the solids and produces methane gas, which is captured and used to support the RWF’s on-site energy needs.

Following digestion, stabilized sludge is transferred to lagoons for long-term stabilization and odor control, then moved to drying beds, where it is sun-dried for up to six months. The resulting Class A biosolids are hauled to Newby Island Landfill and used as daily cover. Gas produced in the digesters is compressed and routed to cogeneration engines that produce electricity and heat for the plant operations.

The RWF currently operates 10 dissolved air flotation thickeners and Digesters 5–8, which were rehabilitated and upgraded to thermophilic operation under capital projects completed in 2022, including upgraded mixing and heat exchange systems, fixed covers, modernized digester gas collection and flaring, and upsized gas piping to accommodate future demands. These investments provide a modern, reliable, and energy-efficient biosolids treatment system that meets current operations and regulatory requirements. The remaining mesophilic Digesters 9-16 have reached the end of their useful life and need either rehabilitation or replacement. A project to finalize these upgrades will be part of the next 10-year program.

Beginning in summer 2026, the RWF will transition to a new mechanical dewatering process, which will haul biosolids for off-site beneficial reuse. This change will improve operational efficiency and sustainability and will allow the cleanup and decommissioning of 750 acres of existing lagoons and open-air drying beds once the dewatering facility is fully operational. Access ramps to these areas will be needed to facilitate the work. Together, these improvements position the RWF as a state-of-the-art biosolids treatment facility that meets operational, environmental, and regulatory requirements. Table 5: Solids Handling and Treatment Projects summarizes key projects.

Table 5: Solids Handling and Treatment Projects

Completed Projects	Active / Planned Projects (FY 2026-2036)
<ul style="list-style-type: none"> • Digester and Thickener Facilities Upgrade (\$217.8m) 	<ul style="list-style-type: none"> • Digested Sludge Dewatering Facility (\$177.1m) • Additional Digester Facility Upgrades (\$223.4m) • Access to Lagoons and Drying Beds (\$6.4m)

The operation of these solids treatment facilities relies heavily on the plant’s power and energy systems, which provide electricity for mechanical equipment and capture energy from digester gas.

Power and Energy Systems

The RWF’s electrical system provides electricity to blowers and other facility equipment, as well as heat to the digester tanks. It also enables the capture and delivery of digester gas to the cogeneration engines.

The system consists of roughly two dozen switchgears, 60 motor control centers (MCCs), a ring bus system, four 2-megawatt (MW) emergency diesel generators (commissioned in 2019), and four 3.5 MW cogeneration engines (commissioned in 2020) that use digester gas to produce a significant portion of the RWF’s electricity and heat. Over the past decade, improvements including replacement of MCCs and switchgears, a new gas holder, a digester gas compressor, and a new award-winning cogeneration facility have increased capacity, improved redundancy, lowered energy costs, reduced reliance on external power, cut greenhouse gas emissions, and enhanced operational reliability and sustainability. These projects are listed in Table 6: Power and Energy Systems Projects.

Future electrical system improvements are contingent on the findings of the ongoing Emergency Power Study, which is comprehensively evaluating the condition, capacity, and performance of the RWF’s existing emergency power infrastructure.

Table 6: Power and Energy Systems Projects

Completed Projects	Active / Planned Projects (FY 2026-2036)
<ul style="list-style-type: none"> • Cogeneration Facility (\$113.1m) • Advanced Facility Control and Meter Replacement³ (\$25.2m) • Plant Electrical Reliability Projects⁴ (\$16.8m) • Emergency Diesel Generators (\$18m) • Digester Gas Compressor Upgrade (\$15.2m) • Switchgear M4 Replacement and G3/G3A Removal (\$8.4m) • Digester Gas Storage Replacement (\$2.8m) 	<ul style="list-style-type: none"> • Pending Emergency Power Study results

Beyond power and energy systems, the RWF relies on numerous support buildings and utility infrastructure to maintain safe, reliable, and efficient operations.

³ Includes Phases 1 and 2.

⁴ Includes 115-kV circuit breaker replacement; M1, M2, and M3 switchgear replacement; administration building standby generator; MCC H1, H2, J1, and J2; MCC Phase II replacements; and S40 and G3 switchgear updates.

Facilities - Buildings

The RWF includes more than two dozen support buildings that serve several functions, including offices and work areas for operations, maintenance, engineering, laboratory, and administrative staff. Buildings also house critical electrical equipment, blowers, gas compressors, vehicle maintenance, and electric carts. Larger buildings include the Administration Building, Environmental Services Building, and the main warehouse.

As with other buildings throughout the City, RWF structures require ongoing maintenance and periodic capital improvements. Over the next decade, the CIP will focus on improvements to Heating Ventilation and Air Conditioning systems, enhanced security across the campus, and much-needed improvements to the Environmental Services Building’s award-winning laboratory. Table 7: Facilities – Buildings Projects lists key projects.

Table 7: Facilities - Buildings Projects

Completed Projects	Active / Planned Projects (FY 2026-2036)
<ul style="list-style-type: none"> • Fire Life Safety Upgrades (\$8.3m) 	<ul style="list-style-type: none"> • Camera and Card Reader Upgrades (\$18.5m) • Building 40 HVAC Improvements (\$6.8m) • Environmental Services Building Laboratory Improvements (\$22.6m) • Filter and Nitrification Roof Replacement (\$9.3m) • HVAC Improvements (\$35.4m)

Facilities – Infrastructure

The RWF is home to a complex network of process pipes, with diameters ranging from a few inches up to nine feet, along with water systems, tunnels, and roads. Over the past decade, the CIP has focused on rehabilitating the most critical yard piping, with the final phase of this work scheduled for completion later this year. Improvements to the RWF’s various water systems are expected to be completed in the first half of 2027.

Looking ahead, the CIP over the next decade will focus on upgrades to pump stations that support critical liquids treatment processes, as well as sanitary system lift stations. Key infrastructure projects are summarized in Table 8: Facilities – Infrastructure Projects. These investments will maintain and enhance essential utility infrastructure, ensuring continued reliable operations and compliance with regulatory requirements.

Table 8: Facilities – Infrastructure Projects

Completed Projects	Active / Planned Projects (FY 2026-2036)
<ul style="list-style-type: none"> • Yard Piping Improvements⁵ (\$33.5m) • Miscellaneous Infrastructure Improvements (\$13.0m)⁶ • Storm Drain System Improvements (\$11.6m) • Outfall Channel and Instrument Improvements (\$10.3m) 	<ul style="list-style-type: none"> • Facility Wide Water Systems Improvements (\$92.3m) • Yard Piping Improvements Phase 3 (\$32.6m) • Pump Stations Improvements Ph. 1 (\$145.0m) • Sanitary Lift Stations Improvements Ph. 1 (\$6.3m) • Tunnel Rehabilitation (\$35.3m)

Overview

Over the past decade, the RWF has delivered a series of major capital improvements that have strengthened system reliability, enhanced treatment performance, and improved operational resilience. These investments include modernizing the headworks system, upgrading thermophilic digesters, rehabilitating dissolved air flotation thickeners, constructing a new cogeneration facility and emergency diesel generators, rehabilitating secondary treatment assets, and replacing aging yard piping. Collectively, these major projects addressed the most critical needs identified in the 2013 Plan and substantially improved the RWF’s ability to manage peak flows, process solids more efficiently, and maintain a reliable power and electrical system.

With these foundational improvements now complete, the next decade of the CIP will focus on targeted reinvestment in the primary and secondary treatment systems, upgrades to solids management facilities, and modernization of essential facility and support infrastructure. These investments will ensure compliance with evolving regulatory requirements, extend the life of aging assets, reduce operational risks, and maintain long-term reliability of the RWF. As scopes are refined through condition assessments, technical studies, and design development, individual projects will continue to be presented to City Council for review and approval prior to implementation.

Based on the comprehensive cost model developed as part of the 2025 Updated Plan, the capital improvements needed over the next ten years are estimated to be approximately \$1.6 billion. The project tables presented in this memorandum do not sum precisely to this amount, as they reflect completed, ongoing, and planned projects across multiple fiscal years and planning horizons, including projects still being refined through ongoing studies and condition assessments. It should be noted that these are planning-level cost estimates, which could change as project designs evolve or economic changes occur. As this happens, staff will continue to review project priorities to minimize impacts to ratepayers, while reducing the risk of equipment failure, unplanned outages, emergency repairs, and potential permit violations.

⁵ Includes Yard Piping Phases 1 and 2 and 96-inch and 87-inch Settled Sewage Pipe Rehabilitation.

⁶ Includes New Headworks Access Road, Construction Enabling Improvements, Handrail Replacement and Plant Instrument Air System Upgrades.

Planned improvements over the next decade will be supported through a balanced funding strategy that considers rate stabilization and generational equity. CIP staff will work with the City's Finance Department to optimize the use of reserves, short-term and long-term financing, such as revenue notes and/or bonds, and pursue external funding opportunities such as government loans and state or federal grants. These strategies are intended to support the timely delivery of projects, maintain affordability for ratepayers, and ensure the long-term sustainability of the RWF. Beyond the next decade of improvements, the City will need to continue to invest in the capital assets of the RWF in cost-effective ways to ensure the continued protection of the environment while keeping in mind the best interests of the residents and businesses in the region.

EVALUATION AND FOLLOW-UP

Staff will continue to provide regular updates to the Treatment Plant Advisory Committee and City Council to keep them informed of significant changes or issues, particularly those affecting utility rates, as the CIP implementation progresses.

COORDINATION

The updated Plan and this memorandum have been coordinated with the City Attorney's Office, City Manager's Budget Office, Finance Department, and Planning, Building, and Code Enforcement Department.

PUBLIC OUTREACH

This memorandum will be posted on the City's Council Agenda website for the March 24, 2026 City Council meeting.

BOARD, COMMISSION, COMMITTEE RECOMMENDATION AND INPUT

This item is scheduled to be heard at the March 12, 2026 Treatment Plant Advisory Committee meeting. A supplemental memorandum with the Committee's recommendation will be included in the City Council's Amended meeting agenda.

CEQA

Not a Project, File No. PP17-009, Staff Reports, Assessments, Annual Reports, and Informational Memos that involve no approvals of any City action.

HONORABLE MAYOR AND CITY COUNCIL

March 2, 2026

Subject: San José-Santa Clara Regional Wastewater Facility Capital Improvement Program Update

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PUBLIC SUBSIDY REPORTING

This item does not include a public subsidy as defined in section 53083 or 53083.1 of the California Government Code or the City's Open Government Resolution.

/s/

Jeffrey Provenzano, P.E.

Director, Environmental Services

For questions, please contact Kapil Verma, Deputy Director, Environmental Services Department, at Kapil.Verma@sanjoseca.gov or 408-635-4045.