San José-Santa Clara Regional Wastewater Facility

Capital Improvement Program
Monthly Status Report: October 2018

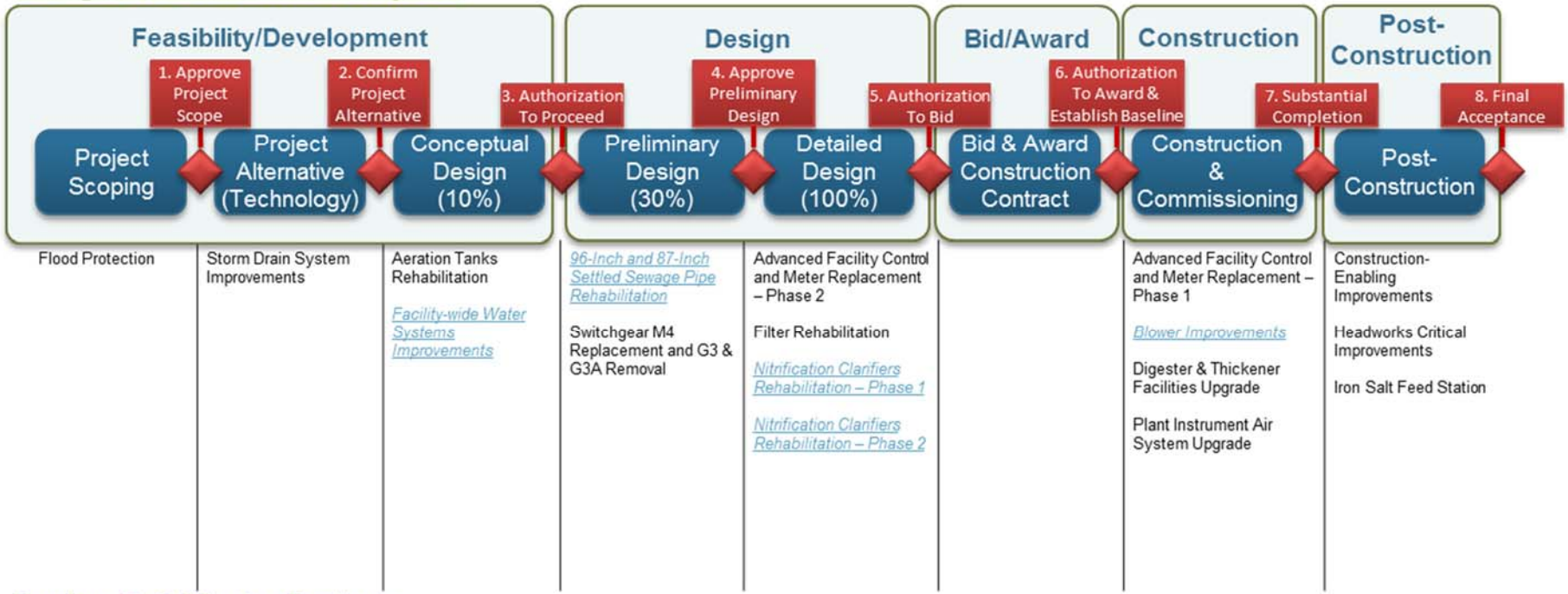
December 6, 2018

This report summarizes the progress and accomplishments of the Capital Improvement Program (CIP) for the San José-Santa Clara Regional Wastewater Facility (RWF) for October 2018.

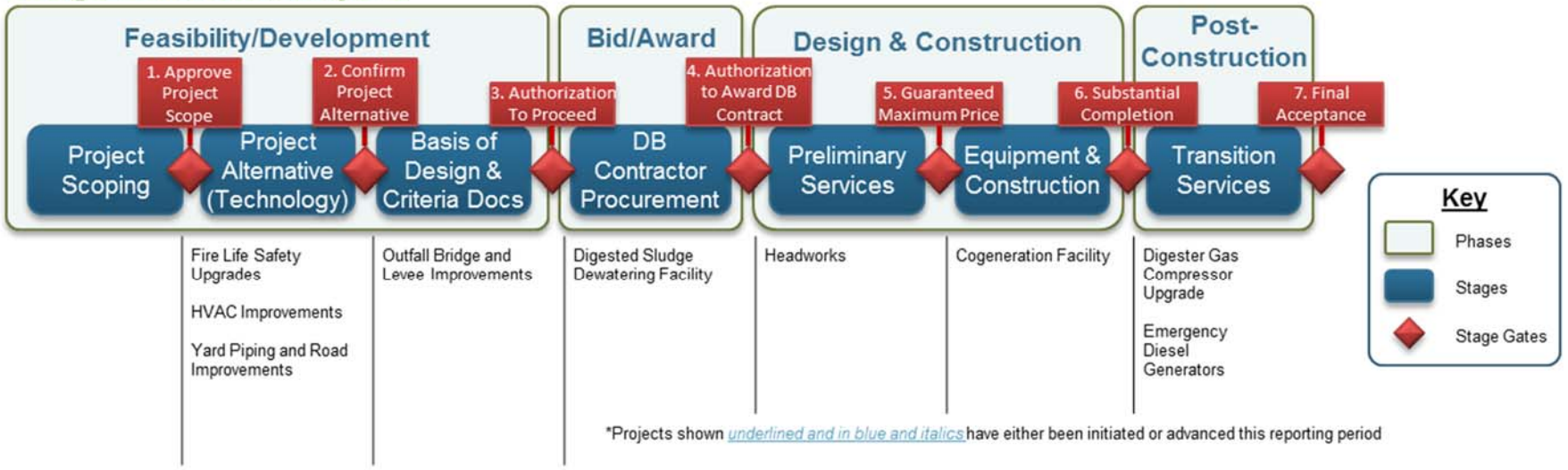
Report Contents

Project Delivery Model

Design-Bid-Build Active Projects



Design-Build Active Projects



*Projects shown underlined and in blue and italics have either been initiated or advanced this reporting period

Program Summary

October 2018

In October, the City of San José Council (Council) awarded the Blower Improvements Project construction contract to Monterey Mechanical Company for $29.5 million. This project will improve RWF operational reliability and efficiency by upgrading the ancillary equipment for 10 of the Facility's 14 blowers. Upgraded equipment will include new high-efficiency motors, instrumentation and controls, valves, and electrical equipment. The upgrades will allow the blowers to match the demands of the aeration system more effectively.

The City advanced three projects through the Project Delivery Model (PDM) stage gate process:

- The Facility-wide Water System Improvements Project passed Stage Gate 2: Confirm Project Alternative.
- The Nitrification Clarifiers Rehabilitation Project passed Stage Gate 4: Approve Preliminary Design, which included direction to split the project into two phases triaging the repairs between the two phases.
- The 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation Project passed Stage Gate 2: Confirm Project Alternative.

The Headworks Project team completed several key activities this month. The team held workshops with stakeholders to continue developing the Basis of Design and refine the project's scope of work. The program held Stage Gate 4.1: Revisit Site Selection and Budget where the project team sought approval for the proposed project site location and revised budget. The panel approved the site location but asked the project team to further refine the project cost estimate and return with additional cost information.

The Filter Rehabilitation Project team began detailed design and reviewed initial results of the ongoing filter column testing to start discussions of potential filter media types and operational considerations.

The Storm Drain System Improvements Project commenced condition assessment work, which is scheduled to be complete in November. The Advanced Facility Control and Meter Replacement - Phase 2 Project team received the 90-percent design submittal and scheduled a review workshop for November. The City advertised the Request for Proposals (RFP) for design-builders for the Digested Sludge Dewatering Facility Project.

The Cogeneration Facility Project finished preparation and poured the base slab for the generator building. The design-builder continuously poured concrete for nine hours accepting delivery from 115 concrete trucks, then an additional six hours finishing the covering the slab. The Digester and Thickener Facilities Upgrade Project contractor continued installing the digester seismic uplift ring beam foundations, roof decks, gas domes, pipe rack, sludge screening building walls, and odor control scrubber vessels.

The City accepted the Iron Salt Feed Station Project and filed the Notice of Completion and Acceptance (NOCA) with the County on October 23.

Look Ahead

The following key activities are forecast for November/December 2018:

- The Plant Instrument Air System Upgrade Project will complete the 28-day operational testing and reach Beneficial Use.
- The City will file the NOCA for the Headworks Critical Improvements Project completing the project on-time and under budget.
- The Headworks Project team will present additional cost information at the interim Stage Gate 4.1: Revisit Site Selection and Budget second attempt.
- The Cogeneration Facility Project's four 60-ton combustion engine generators will be set on the base slab.
- The City will receive proposals from potential design-builders for the Digested Sludge Dewatering Facility Project.
- A meeting will be held with the U.S. Army Corps of Engineers to discuss and coordinate the Santa Clara Valley Water District's Shoreline Levee Project and the future Final Effluent Pump Station Project.
- The Outfall Bridge and Levee Improvements Project team will receive the conceptual design report.

Program Highlight – O&M Staff Engagement

Engagement between CIP project teams and RWF Operations and Maintenance (O&M) staff is integral to successful capital projects. This engagement takes place in many forms through all stages of a project's life. CIP project teams interview O&M staff to gather background information; invite O&M staff to witness condition assessments and attend project meetings and workshops; have O&M staff review plans and specifications; and include O&M staff in start-up testing and commissioning activities.

A high level of participation on CIP projects is necessary from O&M staff, in addition to their critical around-the-clock operations and maintenance responsibilities. Four key roles help facilitate O&M staff engagement on CIP projects. They are filled by individuals with many years of experience and broad RWF knowledge, as described below:

- O&M Liaison –Assists project teams in coordinating with the appropriate O&M staff, particularly on process shutdowns, and helps elevate issues for resolution.
- O&M Lead Subject Matter Expert (LSME) – Acts as the primary point of contact between a project team and O&M staff. At initiation, each project has an O&M LSME assigned as well as an alternate O&M LSME. The LSME represents and communicates O&M's interests on project-related matters.
- O&M Subject Matter Expert (SME) – Supports the LSME and provides trade-specific feedback on project-related matters. Trades include operations; maintenance; energy and automation; electrical; instrumentation; and process control. CIP project teams may engage with multiple SMEs depending on a project's size or complexity.
- O&M Oversight Division Manager – Oversees the O&M LSME and intervenes when an issue needs resolution.

Every other week, the O&M Liaison, O&M division managers, and Wastewater Management Deputy Director meet to discuss LSME and SME assignments, the overall status of O&M staff engagement, and outstanding project issues. Issues that require further discussions with CIP staff are raised and resolved at monthly CIP and O&M coordination meetings. The goal of the various meetings and elevation/resolution process is to reach agreement promptly and prevent or mitigate issues that could impact RWF operations.

An example of O&M staff engagement leading to CIP success was the rerouting of primary effluent flows from mid-April through mid-October 2018 (see Figure 1) to facilitate the replacement of a 200-foot section of a severely corroded 78-inch diameter pipe for the Digester & Thickener Facilities Upgrade Project. Extensive O&M staff engagement was vital prior to the installation, operation, and decommissioning of a temporary pumping system that rerouted up to 100 million gallons per day of primary effluent. The CIP project team (including designer and contractor), RWF construction management staff, and O&M staff (particularly LSME and SMEs) spent thousands of hours planning and developing the best approach and design for the reroute system. The system was a regular topic at project team meetings, construction progress meetings, process shutdown request meetings, and CIP and O&M coordination meetings from November 2016 through October 2018. This intensive planning and preparation enabled the contractor to complete the replacement of the corroded pipe section within the RWF's dry weather season (April 15 to October 15). Aside from shutdowns required for the condition assessment and construction activities involving the reroute, no other RWF operations were impacted by the rerouting of primary effluent flows.

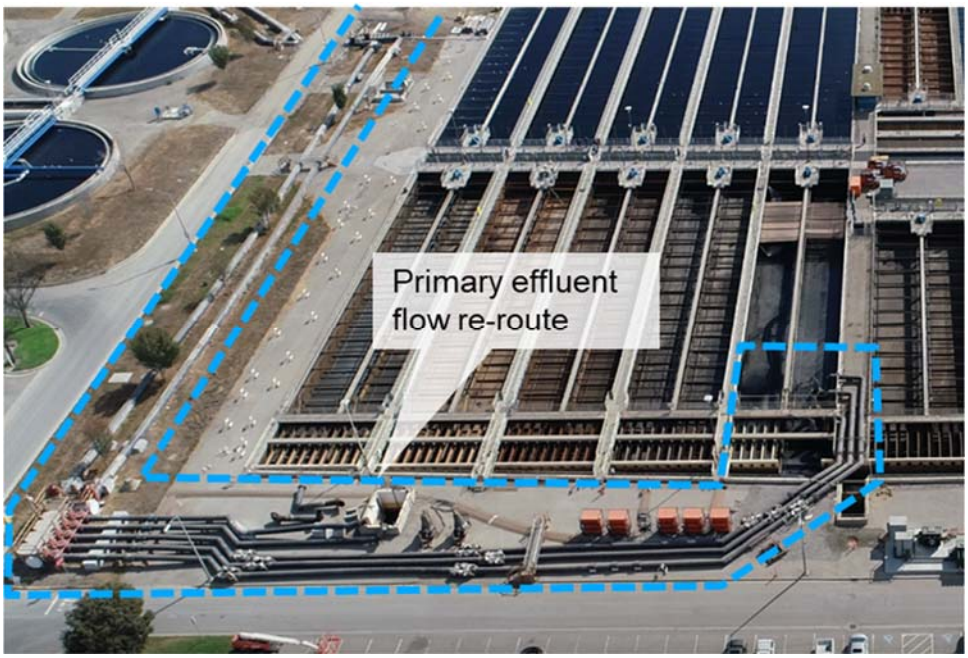


Figure 1: Primary Effluent Re-Route

Program Performance Summary

Seven key performance indicators (KPIs) have been established to measure overall CIP success. Each KPI represents a metric that will be monitored on a regular frequency. Through the life of the CIP, KPIs that best reflect the current program will be selected and measured. KPIs have been reset for the current fiscal year.

Program Key Performance Indicators – Fiscal Year 2018-2019

KPI	Target	Fiscal Year to Date			Fiscal Year End		
		Actual	Status	Trend	Forecast	Status	Trend
Stage Gates	90%	90% 9/10[1]	●	↓	95% 18/19	●	↓
Measurement: Percentage of initiated projects and studies that successfully pass each stage gate on their first attempt. Target: Green: >= 90%; Amber: 75% to 90%; Red: < 75%							
Schedule	90%	50% 1/2	◆	→	33% 1/3	◆	→
Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone.[2] Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Budget	90%	100% 1/1	●	↑	75% 3/4	▲	→
Measurement: Percentage of CIP projects that are accepted by the City within the approved baseline budget.[2] Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Expenditure	$253M[3]	$228M	●	↑	$296M[4]	●	↓
Measurement: CIP FY18-19 committed costs. Target: Committed cost meets or exceeds 70% of planned Budget. 70% of $362M = $253M. Therefore Green: >=$253M; Amber: $199M to $253M; Red: < $199M							
Safety	0	0	●	→	0	●	→
Measurement: Number of OSHA reportable incidents associated with CIP delivery for the fiscal year. Criteria: Green: zero incidents; Amber: 1 to 2; Red: > 2							
Environmental	0	0	●	→	0	●	→
Measurement: Number of permit violations caused by CIP delivery for the fiscal year. Target: Green: zero incidents; Amber: 1 to 2; Red: > 2							
Vacancy Rate[5]	10%	18% 15/84	▲	→	6% 5/84	●	→
Measurement: Ratio of the number of vacant approved positions to approved positions. Target: Green: <= 10%; Amber: 10% to 20%; Red: > 20%							

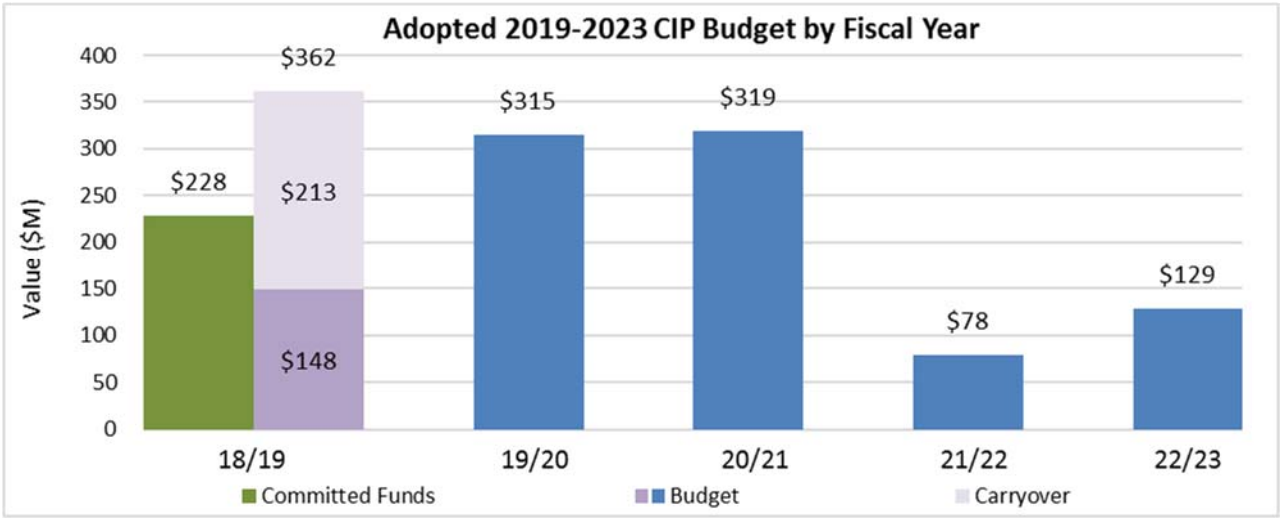
Notes

1. The 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation Project and Facility-wide Water Systems Improvements Project both successfully passed Stage Gate 2 - Confirm Project Alternative and the Nitrification Clarifiers Rehabilitation Project successfully passed Stage Gate 4 - Approve Preliminary Design. The Headworks Project was unsuccessful at passing interim Stage Gate 4.1 - Revisit Site Selection and Budget on their first attempt.
2. The baseline Beneficial Use date and the baseline budget for each project are established at construction contract award and execution.
3. The expenditure target increased due to fall cleanups being incorporated into the CIP budget.
4. The fiscal year-end forecast was decreased approximately $1 million due to revised encumbrance estimates.
5. The Vacancy Rate KPI measures City CIP-approved positions (ESD and Public Works) and program management consultant full-time staff.

Program Budget Performance Summary

This section summarizes the cumulative monthly budget performance for fiscal year (FY)18-19 based on the Adopted 2019-2023 CIP.

Adopted 2019-2023 CIP Expenditure and Encumbrances



Notes

Committed Funds: Total of expenditures and encumbrances.

Expenditure: Actual cost expended, either by check to a vendor or through the City's financial system, for expenses such as payroll or for non-personal expenses that do not require a contract.

Encumbrance**:** Financial commitments such as purchase orders or contracts that are committed to a vendor, consultant, or contractor. An encumbrance reserves the funding within the appropriation and project.

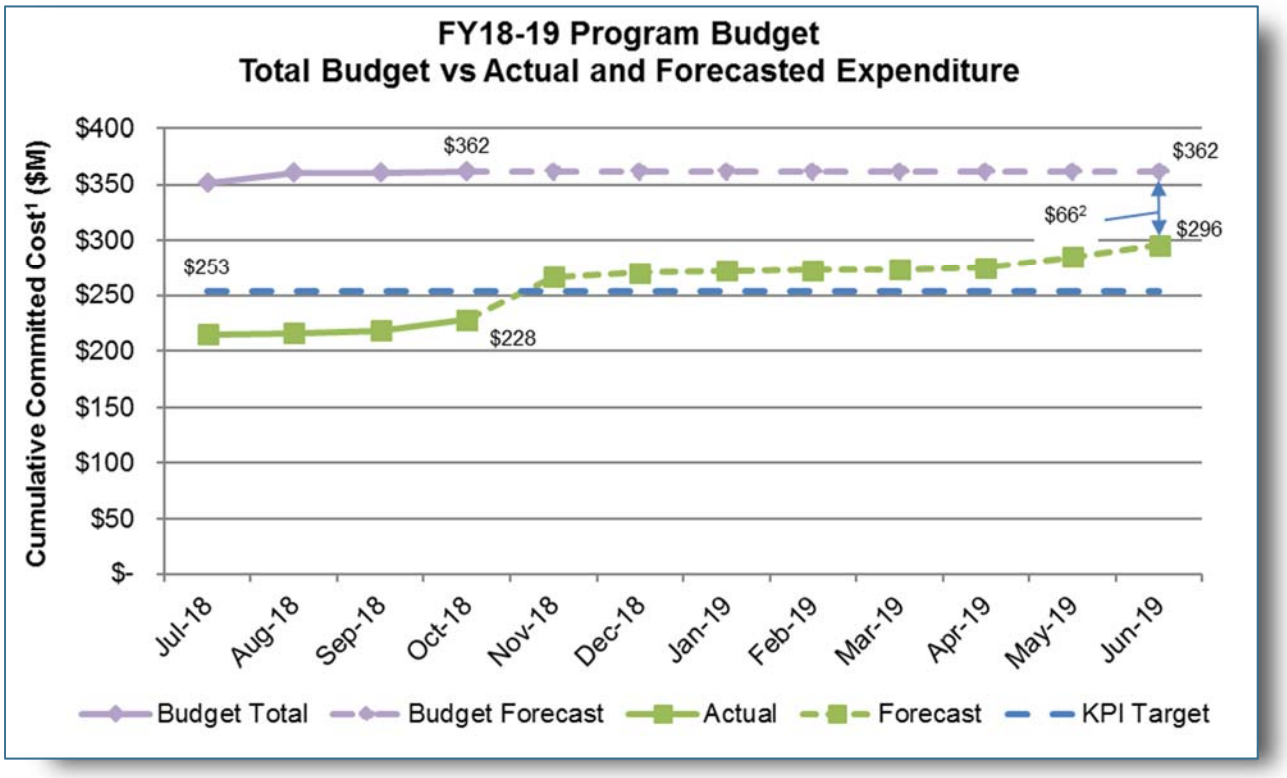
The FY18-19 budget is $185 million, which consists of $131 million in new funds and $54 million in rebudgets. For purposes of this monthly report, the adopted FY18-19 budget is adjusted from $185 million to $148 million due to the exclusion of certain appropriations that are not measured as part of the expenditure KPI. Excluded appropriations include City Hall Debt Service Fund; Clean Water Financing Authority Debt Service Payment Fund; Debt Service Repayment for Plant Capital Improvement Projects (San José only debt service); Equipment Replacement Reserve; Ending Fund Balance; Public Art; SBWR Extension; State Revolving Fund Loan Repayment; and Urgent and Unscheduled Treatment Plant Rehabilitation. Similar adjustments have been made to the budgets for FY19-20 through FY 22-23.

Carryover: Encumbrance balances at the end of the previous fiscal year are automatically carried forward to the current fiscal year as carryover funding to pay invoices for approved construction contracts and consultant agreements. FY18-19 carryover is $213 million.

Budget of $148.3 million and carryover of $213.3 million totals $361.6 million for FY18-19.

Fiscal Year 2018-2019 Program Budget Performance

The FY18-19 CIP budget is comprised of approximately $148 million in new funds, plus encumbrances carryover of $213 million for a total of $362 million. This excludes City Hall Debt Service Fund; Clean Water Financing Authority Debt Service Payment Fund; Debt Service Repayment for Plant Capital Improvement Projects (San José only debt service); Equipment Replacement Reserve; Ending Fund Balance; Public Art; SBWR Extension; State Revolving Fund Loan Repayment; and Urgent and Unscheduled Treatment Plant Rehabilitation items. Overall, the forecasted fiscal year-end committed funds exceed the fiscal year-end target by $43 million.



Notes

1. Committed costs are expenditures and encumbrance balances, including carryover (encumbrance balances from the previous fiscal year).
2. The variance between forecasted budget and forecasted commitments can be primarily attributed to the following factors:
    a. Several construction contracts are now anticipated to be awarded in FY19-20 instead of FY18-19 based on updated schedules:
        i. Fire Life Safety Upgrades Project
        ii. Switchgear M4 Replacement and G3 & G3A Removal
    b. Several consultant service orders will not be awarded in FY18-19:
        i. Aeration Tank Rehabilitation Project
        ii. Support Facilities Project
        iii. Tunnel Rehabilitation Project
    c. The Blower Improvement Project construction bids came in under budget.
    d. Several other minor encumbrances for consultant services are either lower than budgeted or are anticipated to be awarded in FY19-20.
    e. Several authorized positions remain vacant, resulting in lower predicted personal services expenses than budgeted.
    f. The payment for the annual premium budgeted for the Owners Controlled Insurance Program that was paid in FY16-17 covered through FY17-18. Funds rebudgeted from FY17-18 will be programmed in FY19-20.

Project Performance Summary

There are currently eight projects in the construction and post-construction phases and an additional 16 projects in feasibility/development, design, bid and award, or design and construction phases (see PDM, page 2). Projects in the construction phase have established cost and schedule baselines and are monitored using the City's Capital Project Management System (CPMS). Green/red icons are included in the table below to indicate whether these projects are on budget and schedule.

Project Performance – Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]	Cost Performance[2]	Schedule Performance[2]
1. Iron Salt Feed Station	Post-Construction	May 2018[3]	●	◆
2. Construction-Enabling Improvements	Post-Construction	Aug 2018[3]	◆	◆
3. Headworks Critical Improvements	Post-Construction	Aug 2018[3]	●	●
4. Plant Instrument Air System Upgrade	Construction	Nov 2018	●	◆
5. Cogeneration Facility	Design & Construction	Mar 2020[4]	●	●
6. Digester and Thickener Facilities Upgrade	Construction	Jan 2021	◆	◆
7. Advanced Facility Control & Meter Replacement - Phase 1	Construction	June 2021	●	●
8. Blower Improvements	Construction	Nov 2021[4]	●	●

KEY:

Cost:	● On Budget	◆	>1% Over Budget
Schedule:	● On Schedule	◆	>2 months delay

Notes

1. Beneficial Use is defined as work that is sufficiently complete, in accordance with contract documents, that it can be used or occupied by the City. Beneficial Use dates are reviewed as part of project schedule reviews.
2. An explanation of cost and schedule variances on specific projects identified in this table is provided on pages 11 and 12.
3. Actual Beneficial Use date.
4. The project construction Beneficial Use date will be baselined once the City accepts the contractor's construction schedule.

Project Performance – Pre-Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]
1. 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation	Design	Sep 2019
2. Switchgear M4 Replacement and G3 & G3A Removal	Design	Feb 2022
3. Nitrification Clarifiers Rehabilitation – Phase 1	Design	Apr 2022
4. Advanced Facility Control & Meter Replacement Phase 2	Design	Dec 2022
5. Headworks Project	Design and Construction	Dec 2022
6. Filter Rehabilitation	Design	Mar 2023
7. Nitrification Clarifiers Rehabilitation – Phase 2	Design	Dec 2024
8. Outfall Bridge and Levee Improvements	Feasibility/Development	Feb 2021
9. Fire Life Safety Upgrades	Feasibility/Development	Sep 2022
10. Digested Sludge Dewatering Facility	Feasibility/Development	Oct 2022
11. Storm Drain System Improvements	Feasibility/Development	Nov 2022
12. Flood Protection	Feasibility/Development	Mar 2023
13. HVAC Improvements	Feasibility/Development	Mar 2023
14. Facility-wide Water Systems Improvements	Feasibility/Development	May 2024
15. Aeration Tanks Rehabilitation	Feasibility/Development	Apr 2027
16. Yard Piping and Road Improvements	Feasibility/Development	June 2027

Notes

1. Beneficial Use is defined as work that is sufficiently complete, in accordance with contract documents, that it can be used or occupied by the City. Beneficial Use dates are reviewed as part of project schedule reviews.

Significant Accomplishments

Biosolids Package

Digested Sludge Dewatering Facility

- The City advertised the RFP for a design-builder. Proposals are due in December 2018.

Digester and Thickener Facilities Upgrade

- The contractor Walsh Construction made progress on the digester seismic uplift ring beam foundations and began the roof decks and gas domes for the first of four digesters.
- Walsh continued the installation of the dissolved air flotation tanks mechanical systems, the Sludge Screening Building concrete walls, odor control scrubber vessels, and pipe rack.

Facilities Package

96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation

- Owner's Advisor Black & Veatch completed the conceptual design report.
- The project passed Stage Gate 2: Confirm Project Alternative. Next, the project team will develop the 50 percent design.

Cogeneration Facility

- Design-build entity CH2M Hill completed the Cogeneration Building slab-on-grade, including all under-slab conduits and embedded engine generator anchors. CH2M Hill will install the four engine generators in November.

Facility-Wide Water Systems Improvements

- Design consultant Kennedy/Jenks completed the alternative analysis technical memorandum.
- The project passed Stage Gate 2: Confirm Project Alternative. The project team anticipates completing the conceptual design in fall 2019.

Yard Piping and Road Improvements

- Owner’s Advisor Black & Veatch completed the condition assessment of the existing 78-inch, 84-inch, and 96-inch primary effluent pipelines and the 60-inch equalization basin supply/return pipeline. The project team expects to complete the condition assessment technical memorandum in January 2019.

Liquids Package

Advanced Facility Control and Meter Replacement – Phase 1

- Contractor Overaa Construction submitted key construction submittals for long-lead time equipment.

Advanced Facility Control and Meter Replacement – Phase 2

- Design consultant Black and Veatch submitted the 90 percent design and will conduct a design workshop in November.

Blowers Improvements

- Council awarded the construction contract to Monterey Mechanical. Construction will begin in January 2019.

Filter Rehabilitation

- The project team held a kickoff meeting for detailed design with design consultant Kennedy/Jenks and O&M staff.

Headworks

- The DB entity CH2M Hill led workshops on process alternatives; electrical and instrumentation systems; and site planning, architectural, and structural design.
- The City held a formal partnering session with CH2M Hill.
- The project team presented at Stage Gate 4.1: Revisit Site Selection and Budget confirming the project site location. The team will return to the stage gate panel in November with additional cost information.

Iron Salt Feed Station

- The City filed the NOCA with the County and closed the project.

Nitrification Clarifiers Rehabilitation

- The team passed Stage Gate 4: Approve Preliminary Design. The project team concluded that the original defined project scope was beyond the currently available budget and recommended dividing the project into two phases and begin detail design of the first phase. The second phase delivery schedule is currently under review.

Explanation of Project Performance Issues

Iron Salt Feed Station

Project construction was delayed by eight months due to a combination of heavy winter rain in 2016-17; longer than anticipated time to fabricate the double containment pipeline and leak detection system; piping modifications to resolve a pump operational issue at the ferric chloride station; and installation of additional piping to allow O&M staff to temporarily dose polymer at an alternate location. In addition, operational testing and commissioning of the new equipment has taken longer than anticipated, specifically, fine-tuning the control program; identifying and resolving pump operational issues; and addressing problems with the new flow meter and level sensor.

The project team resolved all issues and completed the commissioning test in May 2018. Beneficial Use was achieved on May 14, 2018. The contractor has completed the remaining work and the City filed the NOCA on October 23, 2018.

Construction-Enabling Improvements

This project was originally scheduled to be substantially complete by mid-February 2017. Due to the extremely wet in the 2016-17 winter season, contractor Teichert Construction was unable to perform site work for several weeks from October 2016 through April 2017. Teichert was granted 47 extra work days for weather-related delays. Teichert was also granted additional time to remove and replace asphalt pavement in damaged areas of Zanker Road; install traffic-rated pull boxes for the streetlight system; install underground conduits for the fiber optic system; and make additional changes.

Delays in completing the installation of the project's portable trailers impacted the schedule. In early August 2018, the contractor completed installation of the utilities (electrical, communications, and wastewater) required to obtain a temporary Certificate of Occupancy permit for the trailers. The temporary certificate was received in August 2018 and substantial completion was issued. The project team provided the contractor with a list of remaining contract work to be completed. Staff is working with Teichert to complete the outstanding work and has conducted an initial meeting to begin negotiating project closeout and liquidated damages. The project team anticipates accepting the project in December 2018.

Plant Instrument Air System Upgrade

Project construction has been delayed by seven months due to four issues: 1) Staff discovered that the planned construction site access route crossed a large settled sludge pipeline, requiring an alternative access route to be developed and constructed; 2) the contractor was temporarily unable to install a section of the conduit from the sludge control building to the new compressor building due to other work being performed in the area by a different contractor; 3) development of the 28-day commissioning test procedure took longer than anticipated; and 4) the project team discovered oxidized (rusted) carbon steel shavings in an existing condensate tank unrelated to the project construction during the eight-hour functioning test. The material was removed, and the test was successfully completed. The project is expected to achieve Beneficial Use in November 2018.

Digester and Thickener Facilities Upgrade

This project encountered numerous unforeseen conditions at the beginning of construction in 2016, described below. In 2017, design modifications were required to address seismic risks, and discovery of hazardous materials required extensive cleanup. Delays for these conditions are still being discussed and evaluated.

The City has negotiated contract change orders for the following unforeseen conditions discovered in 2016:

- Major corrosion of a below-ground, 78-inch settled sewage pipeline and junction structure delayed the construction of dissolved air flotation tank piping connections, two new pressurization flow boxes, and utility relocation work. The contractor postponed all repairs until a temporary pumping and pipeline system could be designed and safely installed to enable replacement of the pipeline in the 2018 dry season. In May of 2018, the contractor started full-time operation of this temporary pumping and pipeline system and began replacement of the 78-inch settled sewage pipeline, which was completed in late September 2018.
- A 36-inch biochemical oxygen demand pipe was found to be obstructing the new sludge screening building foundation. The contractor removed this pipe and relocated several gas drain vaults and associated piping before the foundation construction began.
- Multiple conflicts between contract work and existing utilities required numerous relocations including water, natural gas, digester gas, landfill gas, storm drains, and sanitary sewer pipelines. The contractor completed necessary relocations and rerouting, especially near the new digester gas pipe rack footings. Many of these modifications also required design changes.
- Bay Area Air Quality Management District venting restrictions also delayed digester work. The contractor completed the temporary digester gas connections and the system became operational in February 2018.

The following outstanding issues are currently being evaluated and are expected to result in additional costs and delays:

- Digester structural redesign: The design consultant revised the structural drawings to address seismic issues by enlarging the foundation ring beam at the base of each of the four digesters. The contractor provided a cost proposal

associated with this revision and the City issued a change order for a portion of the proposal. Work associated with the new foundations is ongoing.

- Hazardous material mitigation: Testing of soils and concrete for polychlorinated biphenyls was completed and a final conditional approval was issued by the Environmental Protection Agency (EPA). All removal and disposal of contaminated materials has been completed to comply with the risk-based management plan approved by the EPA. All contaminated soils have been removed and disposed and most of the impacted concrete has been encased. The last portion of the work will be finalized once all foundation work is complete. At that time, final reports on the work will be submitted to the EPA.

In November 2017, Council approved a contingency increase of $15 million. The City issued change orders against the increased contingency for delays associated with the conditions discovered in 2016.

In June 2018, Council approved a second contingency increase of $25 million for additional costs associated with the seismic redesign, hazardous material remediation, and extended construction duration.

An estimated delay of approximately 145 working days is currently reflected in the revised Beneficial Use date of January 2021. Staff are working with Contractor Walsh to evaluate the estimated delay days and anticipate an updated schedule by late November.

Project Profile – Filter Rehabilitation

The RWF's tertiary filtration unit process consists of 16 granular media filters and associated ancillary equipment. The filtration process is one of the final treatment steps and is responsible for producing effluent in compliance with the RWF's discharge permit, as well as recycled water in compliance with Title 22 requirements. Built in the 1970s and 1980s, the filters and ancillary components are nearing the end of their useful lives.

Figure 2: Existing valves in filter gallery to be replaced

The project's objective is to perform a detailed evaluation of the tertiary filtration unit process and implement critical improvements to the filtration process. These improvements will enable continued regulatory compliance and operational reliability by rehabilitating structural, mechanical, electrical, and instrumentation/control elements.

In December 2015, Council awarded an agreement to Kennedy Jenks Consultants, Inc. (K/J) to provide engineering services for the project.

In November 2016, K/J completed the condition assessment of the entire tertiary filtration unit process identifying various issues with the aging infrastructure. These issues were translated into recommendations for repair. The recommendations were evaluated and formed the basis of the alternatives analysis process.

K/J also developed alternatives for implementing necessary critical and key process improvements and completed an analysis of alternatives prior to commencing the project's conceptual design (10 percent) in August 2017. The conceptual design phase further developed the concepts discussed during the alternatives analysis process and confirmed key scope items, including:

- Replacement of all valves and actuators in the filter gallery;
- Replacement of the granular filter media;
- Replacement of the existing surface wash system with a new air scour system;
- Rehabilitation of three electrical switchgears, including related motor control consoles; and
- Concrete repairs.

Figure 3: Filter Building, Filter Beds, and Serpentine Tanks

K/J completed conceptual design and commenced preliminary design in January 2018, advancing the design to the 30 percent completion stage by July 2018.

The latest construction cost estimate prepared at the 30 percent design stage is approximately $30 million. A value engineering analysis performed in June 2018 by independent firm Hazen & Sawyer produced several design suggestions and ideas that the project team evaluated, but ultimately decided not to incorporate into the design as they did not provide any significant cost savings for the project.

The project will be delivered using the conventional design-bid-build approach. The project is scheduled to complete 60 percent detailed design by spring 2019, and 100 percent design by fall 2019. The team anticipates awarding the project in summer 2020 and beginning construction in fall 2020. Beneficial Use is expected to be achieved in spring 2023.

Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

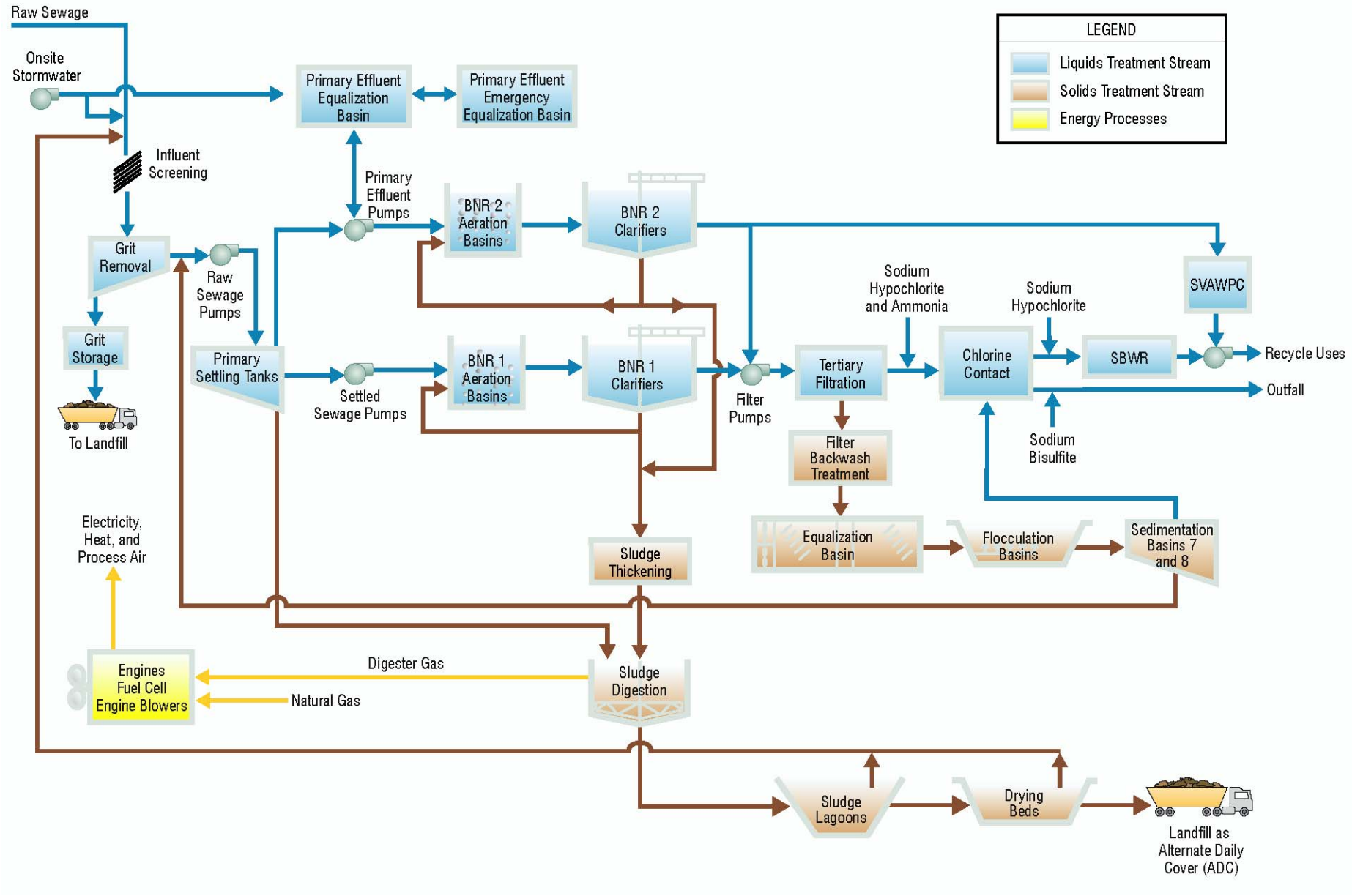


Figure 4 – Current Treatment Process Flow Diagram

Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

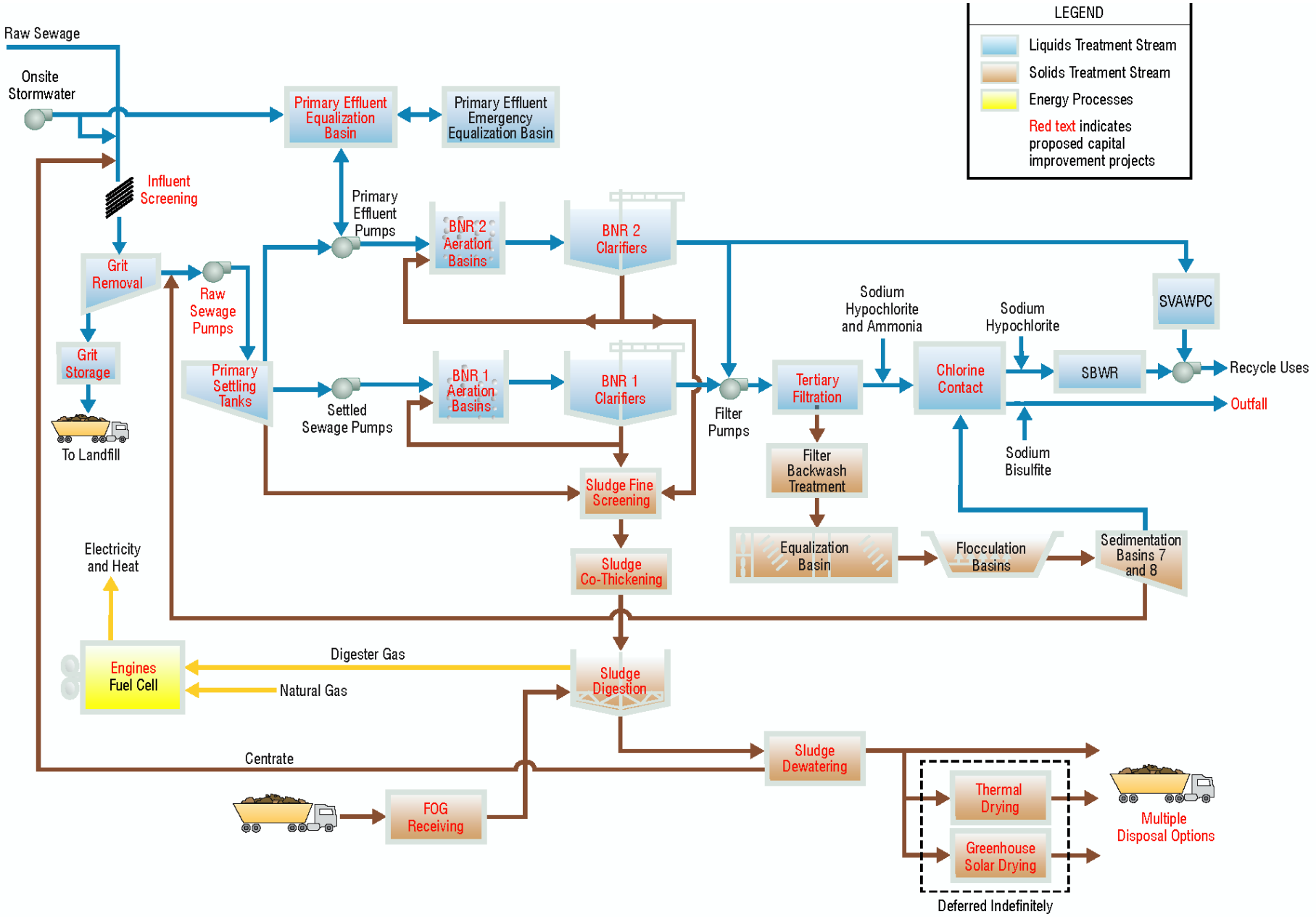


Figure 5 – Proposed Treatment Process Flow Diagram

Active Construction Projects – Aerial Plan

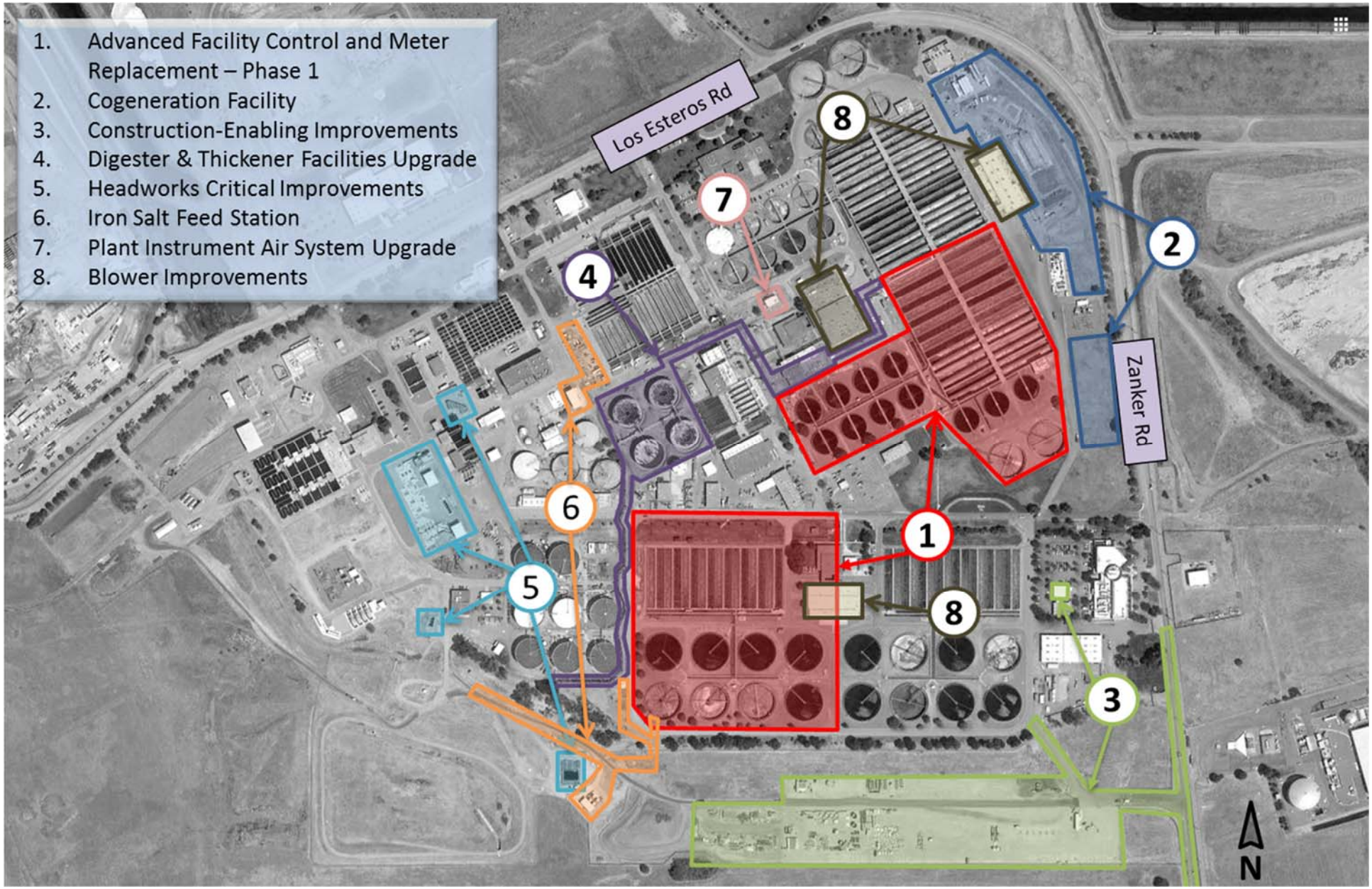


Figure 6: Active Construction Projects