San José-Santa Clara Regional Wastewater Facility

Capital Improvement Program
Monthly Status Report: June 2018

August 2, 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 June 2018.

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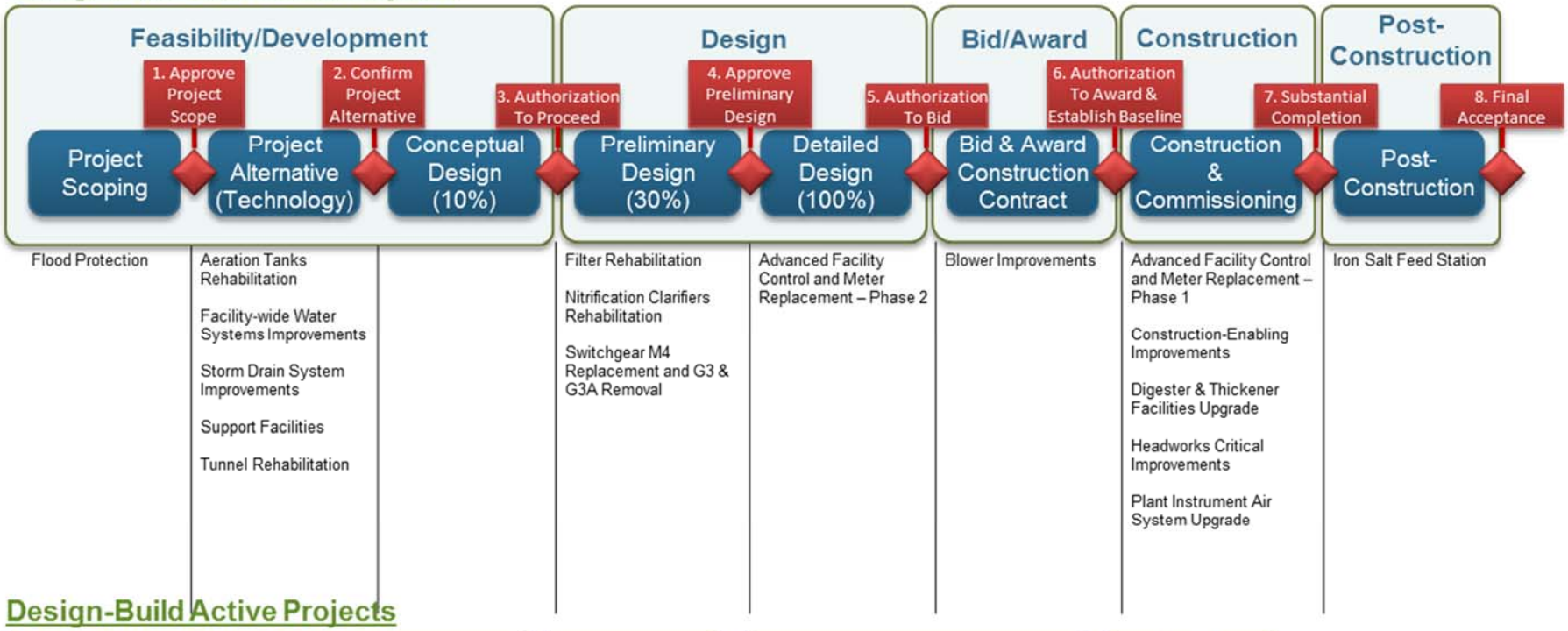
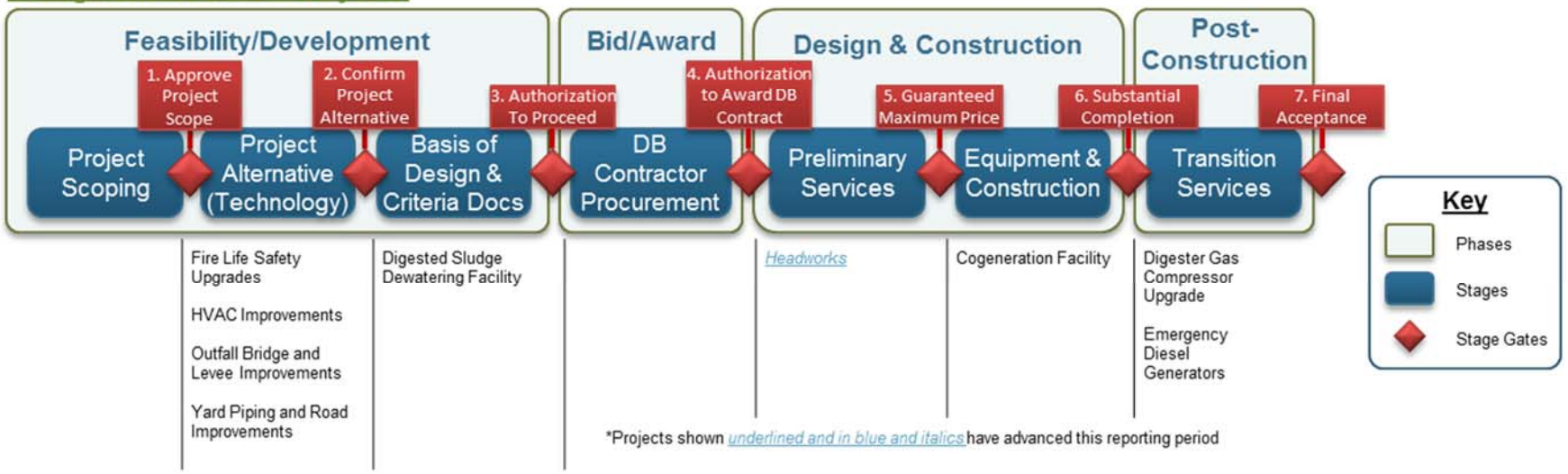
Project Delivery Model

Design-Bid-Build Active Projects



Design-Build Active Projects



*Projects shown underlined and in blue and italics have advanced this reporting period

Program Summary

June 2018

This month, the Treatment Plant Advisory Committee (TPAC) and San José City Council (Council) approved three items:

- A design-build (DB) contract for preliminary services for the Headworks Improvements and New Headworks projects, referred to jointly as the Headworks Project;
- Three master consultant agreements for special inspection and materials testing services for various capital improvement projects at the RWF; and
- A $25 million increase to the Digester and Thickener Facilities Upgrade Project construction contingency to address the seismic redesign and polychlorinated biphenyl (PCB) mitigation issues, and associated delay costs.

The Facility Wide Water Systems Improvements Project team selected a preferred alternative for each of the four water systems and the design consultant began drafting the alternatives analysis report documenting the process and resulting recommendations.

The Filter Rehabilitation Project design consultant submitted the draft preliminary design report and cost estimate. The project team completed a value engineering (VE) study.

The City advertised the construction contract for the Blower Improvements Project. Bids are due in August and construction award is anticipated in November. The City also shortlisted four design-build contractors for the Digested Sludge Dewatering Facility Project and anticipates issuing the Request for Proposals (RFP) this fall.

The City executed the construction contract for the Advanced Facility Control and Meter Replacement Phase 1 Project. This project will replace flow meters, valves and actuators, and sensors in the secondary battery B and nitrification battery B areas to improve equipment and data reliability and integrity. The project is anticipated to reach Beneficial Use in December 2020.

The City participated in factory acceptance testing of the four new cogeneration engines for the Cogeneration Facility Project. The purpose was to confirm that the engines' performance met contract specifications prior to shipping. All tests were successfully completed, and the engines are expected to be delivered to the RWF by mid-September.

The Digester and Thickener Facilities Upgrade Project contractor made progress on the sludge screening building, pipe rack, and digester tanks, and continued to remove PCB-contaminated soils and replace the deteriorated 78-inch settled sludge line.

Look Ahead

The following key activities are forecast for July and August of 2018:

- The Headworks Project design-builder and the Yard Piping and Road Improvements Project owner's advisor will hold project kickoff meetings.
- The project teams for the Facility Wide Water Systems Improvements and Outfall Bridge and Levee Improvements projects anticipate receiving final Alternative Analysis Reports.
- The Aeration Tanks Rehabilitation Project team will seek Stage Gate 2: Confirm Project Alternative approval
- The Nitrification Clarifiers Rehabilitation Project team will receive the draft preliminary design report and cost estimate and perform a VE study.
- The Filter Rehabilitation Project consultant will submit the final preliminary design report and cost estimate.;
- The City will issue the Notice to Proceed (NTP) to Overaa Construction for the Advanced Facility Control and Meter Replacement Phase 1 Project; and
- The Headworks Critical Improvements, Plant Instrument Air System Upgrade, and Construction-Enabling Improvements projects will reach Beneficial Use.

Program Highlight – Drones

The CIP team continuously looks for opportunities to implement innovative solutions to deliver the program's 30-plus projects. One recent solution has been the use of drones to record ongoing construction activity, collect survey data, and perform condition assessments.

Figure 1: Drone in flight

Over the last few years, drones have become increasingly popular and affordable; however, their use at the RWF presents unique challenges which needed to be addressed before they could be used. The operational nature of the facility combined with multiple active CIP projects in construction requires a flightpath to be flown that does not impact either construction or operations and is also safe for all personnel working at ground level. Another consideration is the use of a drone capable of providing a high level of control and accuracy for survey-grade work, piloted by an experienced and qualified drone operator. In addition, because the RWF is situated under the Norman Y. Mineta San José International Airport flightpath, a Certificate of Waiver or Authorization is required from the Federal Aviation Authority (FAA) before a drone can be flown over the RWF.

Leveraging the expertise of CIP program management consultant, Stantec, two experts qualified and licensed to fly drones were brought in to assist with planning the flightpath, selecting the right equipment, and obtaining FAA clearance. A Certificate of Waiver or Authorization was successfully obtained, and an initial drone flight was arranged in April 2018.

Figure 2: Photograph of digesters taken by the drone

The initial visit had two objectives: first, to test flightpaths to best capture photographs and videos of the ongoing construction work; and second, to demonstrate how drones could be used to collect survey data. Drone flights were conducted over two days with the cooperation of the Construction Management team, Operations, and construction contractors. Figure 1 shows the pilot controlling the drone in flight, and Figures 2 and 3 show drone photographs of the digesters currently being rehabilitated under the Digester and Thickener Facilities Upgrade Project.

The initial visit confirmed that RWF drone operations can be performed safely and effectively. The drone photographs, videos, and survey data provide a unique perspective of CIP projects now underway. Following this successful trial, the CIP will be performing drone flights on a bimonthly basis. The photographs and videos will be used for monitoring construction progress and reporting purposes.

In addition, the CIP program recently approved the use of drones to perform condition assessment work on the Aeration Tanks Rehabilitation Project. The design consultant successfully used drones to complete a detailed condition assessment of the aeration tanks; the consultant was able to complete the work faster and avoided the need for confined space entry and complex shutdowns, thereby saving time and cost. (Figure 4).

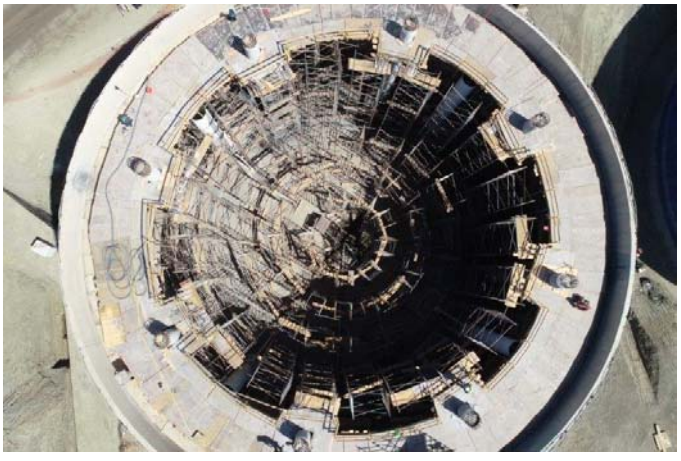


Figure 3: Photograph of digesters taken by the drone

Figure 4: Drone inspection of Aeration Tanks

Program Performance Summary

Eight 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 2017-2018

KPI	Target	Fiscal Year to Date			Fiscal Year End		
		Actual	Status	Trend	Forecast	Status	Trend
Stage Gates	80%	100% 16/16	●	→	100% 16/16	●	→
Measurement: Percentage of initiated projects and studies that successfully pass each stage gate on their first attempt. Target: Green: >= 80%; Amber: 70% to 80%; Red: < 70%							
Schedule	90%	0% 0/2	◆	→	0% 0/2	◆	→
Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone.[1] Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Budget	90%	67% 2/3	◆	→	67% 2/3	◆	→
Measurement: Percentage of CIP projects that are accepted by the City within the approved baseline budget.[1] Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Expenditure	$251M[2]	$306M	●	↑	$306M[3]	●	↓
Measurement: CIP FY17-18 committed costs. Target: Committed cost meets or exceeds 70% of planned Budget. 70% of $358M = $251M. Therefore Green: >=$251M; Amber: $197M to $251M; Red: < $197M							
Procurement	80%	100% 4/4[4]	●	→	100% 4/4	●	→
Measurement: Number of consultant and contractor procurements advertised compared to planned for the fiscal year. Target: Green: >= 80%; Amber: 70% to 79%; Red: < 70%							
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							
Staffing[5]	80%	113% 17/15[6]	●	↑	113% 17/15	●	↑
Measurement: Number of planned positions filled for the fiscal year. Target: Green: >= 80%; Amber: 70% to 79%; Red: < 70%							

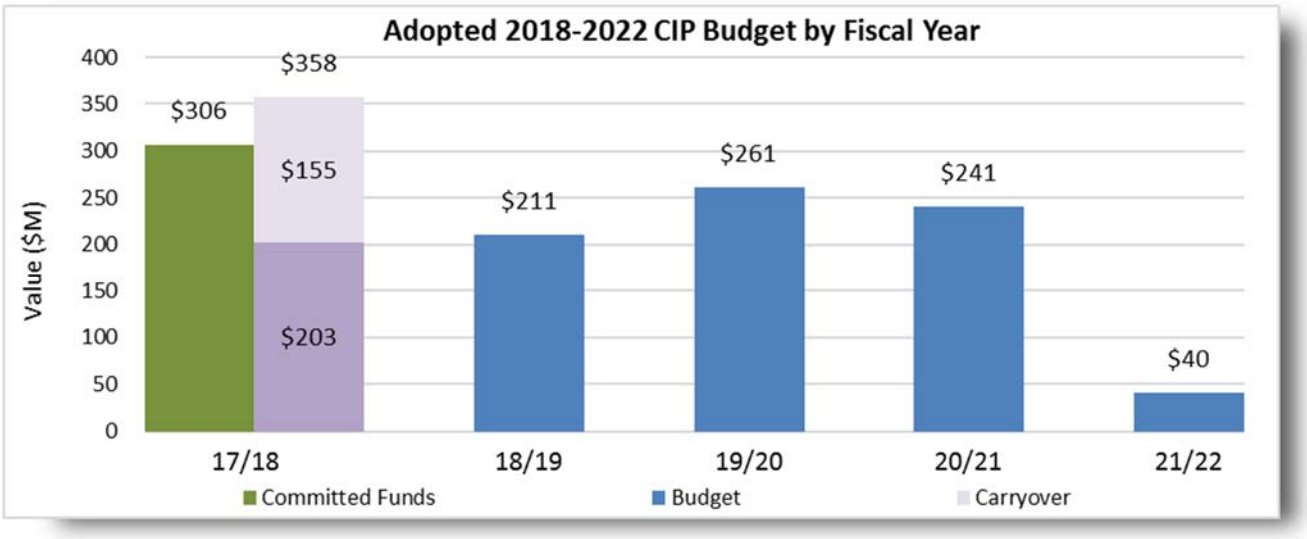
Notes

1. The baseline Beneficial Use date and the baseline budget for each project are established at construction contract award and execution.
2. The fiscal year budget and resulting target were increased due to Council's approval to transfer funds for the Digester and Thickener Facilities Upgrade Project's construction contingency increase.
3. The fiscal year-end actual was reduced $2 million primarily due to a lower than anticipated debt services repayment this fiscal year.
4. The City advertised the construction contract for the Blower Improvements Project.
5. The staffing KPI is measured quarterly and represents CIP recruitments for the fiscal year.
6. The program was successful in filling two more vacancies than originally planned for the fiscal year: one principal engineer and one senior engineer were added in the fourth quarter.

Program Budget Performance Summary

This section summarizes the cumulative monthly budget performance for fiscal year (FY)17-18 based on the 2018-2022 CIP.

Adopted 2018-2022 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.

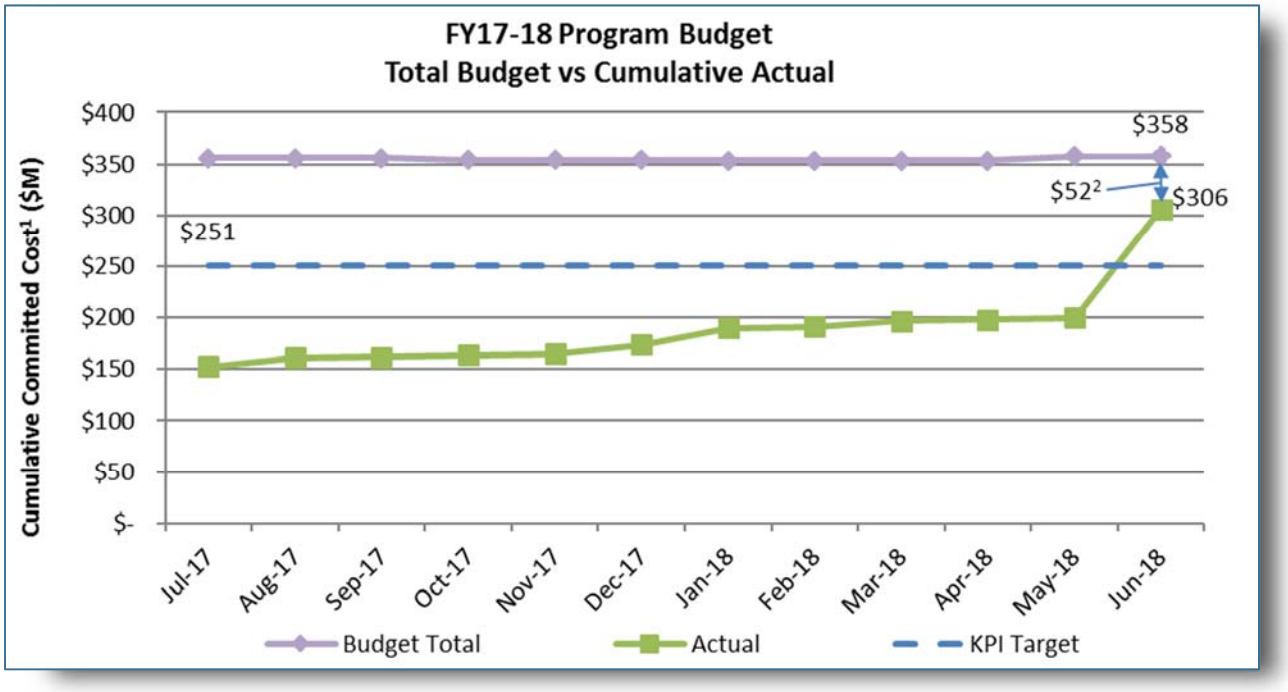
Encumbrance**:** Financial commitments such as purchase orders or contracts that are committed to a vendor, consultant, or contractor. An encumbrance reserves the funding within the appropriation and project.

The FY17-18 budget is $238 million, which consists of $198 million in new funds and $40 million in rebudgets. For purposes of this monthly report, the adopted FY17-18 budget is adjusted from $238 million to $203 million due to the exclusion of certain appropriations that are not measured as part of the expenditure KPI. Excluded appropriations include Urgent and Unscheduled Treatment Plant Rehabilitation; SBWR Extension; Debt Service Repayment for Plant Capital Improvement Projects (San José only debt service); Public Art; State Revolving Fund Loan Repayment; City Hall Debt Service Fund; Clean Water Financing Authority Debt Service Payment Fund; Equipment Replacement Reserve; and Ending Fund Balance. Similar adjustments have been made to the budgets for FY18-19 through FY 21-22. In October, the fall cleanup action increased the FY17-18 budget by $3 million.

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.

Fiscal Year 2017-2018 Program Budget Performance

The FY17-18 budget is comprised of approximately $198 million in new funds plus encumbrance carryover of $155 million for a total of $354 million. This excludes Reserves, Ending Fund Balance, Debt Service, South Bay Water Recycling, Public Art, and Urgent and Unscheduled Rehabilitation items.



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 attributed to the following factors:
    a. Construction contracts and associated construction services agreements that were not awarded in FY17-18:
        i. Blower Improvements Project
        ii. Fire Life Safety Upgrades Project
    b. Consultant service orders that were not awarded in FY17-18:
        i. Aeration Tanks Rehabilitation – conceptual design
        ii. Filter Rehabilitation Project – detailed design work
        iii. Facility-wide Water Systems Improvements Project - preliminary and detailed design work
        iv. Support Facilities – feasibility/development work
        v. Tunnel Rehabilitation Project – feasibility/development work
    c. Several other minor encumbrances for consultant services are either lower than budgeted or were not awarded in FY17-18.
    d. Several authorized positions remain vacant, resulting in lower personal services expenses than budgeted.
3. The FY17-18 budget includes three recurring appropriations (Preliminary Engineering, Equipment Replacement, and Plant Infrastructure Improvements) that total approximately $3.66 million. These appropriations are included in the budget to implement minor capital improvement projects that may be needed during the fiscal year. No major expenditures or encumbrances were made against these appropriations.

Project Performance Summary

There are currently seven active projects in the construction phase and an additional 17 projects in feasibility/development, design, or bid and award phases (see PDM, page 2). All active projects are listed in the tables below. 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	Construction	Jul 2018	●	◆
3. Headworks Critical Improvements	Construction	Jul 2018	●	●
4. Plant Instrument Air System Upgrade	Construction	Aug 2018	●	◆
5. Cogeneration Facility	Design & Construction	Mar 2020[4]	●	●
6. Digester and Thickener Facilities Upgrade	Construction	Jan 2021[6]	◆	◆
7. Advanced Facility Control & Meter Replacement - Phase 1	Construction	May 2021[5]	●	●

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 page 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.
5. The project construction Beneficial Use date has been updated following the incorporation of the contractor's baseline schedule.
6. The City authorized schedule mitigation efforts that are expected to shorten the overall construction schedule by approximately six months.

Project Performance – Pre-Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]
1. Headworks[2]	Bid and Award	Sep 2022
2. Blower Improvements	Design	Nov 2021
3. Filter Rehabilitation	Design	Oct 2022
4. Advanced Facility Control & Meter Replacement Phase 2	Design	Dec 2022
5. Nitrification Clarifiers Rehabilitation	Design	Dec 2023
6. Outfall Bridge and Levee Improvements	Feasibility/Development	Dec 2020
7. Switchgear M4 Replacement and G3 & G3A Removal	Feasibility/Development	Jan 2022
8. Fire Life Safety Upgrades	Feasibility/Development	Sep 2022
9. Storm Drain System Improvements	Feasibility/Development	Sep 2022
10. Digested Sludge Dewatering Facility	Feasibility/Development	Oct 2022
11. Flood Protection	Feasibility/Development	Nov 2022
12. HVAC Improvements	Feasibility/Development	Mar 2023
13. Facility-wide Water Systems Improvements	Feasibility/Development	Sep 2023
14. Aeration Tanks Rehabilitation	Feasibility/Development	Feb 2026
15. Support Facilities	Feasibility/Development	Dec 2026
16. Yard Piping and Road Improvements	Feasibility/Development	Jan 2027
17. Tunnel Rehabilitation	Feasibility/Development	Mar 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.
2. The Headworks Improvements and New Headworks projects are reported as the single Headworks Project.

Significant Accomplishments

Biosolids Package

Digested Sludge Dewatering Facility

- The City short-listed four qualified firms for the design-build contractor procurement and will issue an RFP in fall 2018.

Digester Thickener and Facilities Upgrade

- Contractor Walsh Construction completed installation of the foundation for the odor control equipment; lights and conduit on 28 pipe rack supports; the first-floor deck falsework for the sludge building; and the subgrade for the polymer area. They continued to excavate and dispose of the PCB-contaminated soils around the digesters; post-tension the digester cables and install shotcrete; and replace the deteriorated 78-inch settled sludge line.

Facilities Package

Cogeneration Facility

- The project team attended the factory acceptance testing of the four new cogeneration engines. The testing was successful, and the engines will be shipped in July 2018.
- Design-build contractor CH2M Hill Engineers, Inc (CH2M) is continuing to install underground conduits and piping before pouring the concrete pad in August.

Facility Wide Water Systems Improvements

- The project team completed the alternative analysis scoring workshop with the stakeholders and selected a preferred alternative for each of the four water systems for further development.

HVAC Improvements

- Design consultant Kennedy/Jenks conducted a condition assessment workshop to review findings and recommendations. The project team anticipates the final condition assessment technical memorandum in August.

Storm Drain System Improvements

- The project team and design consultant AECOM conducted a kickoff meeting for the condition assessment and conceptual design work. The condition assessment is anticipated to conclude in October 2018.

Liquids Package

Aeration Tank Rehabilitation

- Design consultant Brown and Caldwell submitted the final alternatives report. The findings will be presented as part of Stage Gate 2: Confirm Project Alternatives in July.

Blower Improvements

- The City advertised the construction contract and bids are due in August. The project team anticipates awarding the construction contract in November 2018.

Filter Rehabilitation

- Design consultant Kennedy/Jenks conducted a preliminary design workshop. Next, the project team will finalize the preliminary design report and opinion of probable construction cost and prepare for Stage Gate 3: Authorization to Proceed.
- VE consultant Hazen and Sawyer completed the VE study this month.

Headworks

- Council approved the design-build contract with CH2M for the performance of preliminary services and subsurface investigations. The City issued a NTP to CH2M, authorizing work on the condition assessment, basis of design report, and 30 percent design.

Nitrification Clarifiers Rehabilitation

- Design consultant HDR Engineering, Inc. completed the hazardous material inspection field work. Staff expects to receive the final report next month.

Explanation of Project Performance Issues

Construction-Enabling Improvements

This project was originally scheduled to be substantially complete by mid-February 2017. Due to the extremely wet 2016-17 winter season, contractor Teichert Construction was unable to perform site work efficiently 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 continue to impact the schedule. The contractor has completed installation of the canopy and is continuing to install the trailer utilities. The contractor is also working to obtain required materials and to schedule necessary subcontractors to complete trailer installation and setup. Schedule delays now place the Beneficial Use date in July 2018. The City has notified Teichert that the number of contract work days has been exceeded and that liquidated damages are in effect. By the end of this reporting month, liquidated damages were $259,000.

Digester and Thickener Facilities Upgrade

This project encountered numerous unforeseen conditions, including required design modifications to address seismic risks and the discovery of hazardous materials.

These unforeseen conditions are impacting the project schedule and cost. The City negotiated contract change orders for the following conditions, resulting in an estimated six-month delay to the Beneficial Use date:

- Major corrosion of a below-ground, 78-inch settled sewage pipeline and junction structure is impacting the dissolved air flotation tank piping connections, two new pressurization flow boxes, and utility relocation work. The contractor had postponed all repairs until a temporary pumping and pipeline system could be safely installed to enable replacement of the pipeline in the 2018 dry season. In May, the contractor started full-time operation of this temporary pumping and pipeline system and commenced replacement of the 78-inch settled sewage pipeline.
- A 36-inch biochemical oxygen demand pipe was obstructing the new sludge screen building foundation. The contractor removed this pipe and relocated several gas drain vaults and associated piping.
- Multiple conflicts between contract work and existing water, natural gas, digester gas, landfill gas, storm drains, and sanitary sewer pipelines require numerous relocations. The contractor completed necessary relocations and modifications, including rerouting and other design changes to the new digester gas pipe rack footings.
- Bay Area Air Quality Management District (BAAQMD) venting restrictions delayed digester work by approximately six months. The contractor completed the temporary digester gas connections and the system is now operational.

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 above conditions, including an increase of 140 working days to the project schedule.

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

- Digester structural redesign: The design consultant completed the revised structural drawings to address seismic issues. The contractor provided a cost proposal associated with the revised structural drawings for the City's review.
- Hazardous material mitigation: Testing of soils and concrete for PCBs is complete. The consultant prepared a hazardous material survey report summarizing the results. In addition, the project team determined disposal options. The contractor completed excavation and removal of PCB-contaminated soil at digester 5 and is in the process of completing the same work for digesters 6, 7, and 8. The contractor completed the installation of the bottom post tension cables at digester 5.

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

Based on the contractor's latest submittal incorporating City authorized schedule mitigation efforts, an updated estimated delay of approximately 145 additional working days is now reflected in the revised Beneficial Use date of January 2021. City staff is evaluating the updated schedule.

Iron Salt Feed Station

Project construction has been 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, fine-tuning the control program; identifying and resolving pump operational issues; and addressing issues with the new flow meter and level sensor have taken additional time.

The project team resolved all issues and completed the commissioning test in May 2018. Beneficial Use was achieved on May 14, 2018.

Plant Instrument Air System Upgrade

Project construction has been delayed by three months due to three 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; (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; and (3) the commissioning test standard operating procedure that is required for the contractor to perform the 28-day commissioning test is still being finalized. The project is expected to achieve Beneficial Use in August 2018.

Project Profile – Construction-Enabling Improvements

The increased volume in CIP construction activity at the RWF over the next ten years requires dedicated contractor staging areas. The $3.8 million Construction-Enabling Improvements Project, which is anticipated to reach Beneficial Use in July 2018, includes improvements to handle these demands. The project, which features a new dedicated construction entrance, staging area, contractor parking area, and additional construction management office space, will minimize impacts to ongoing facility operations while helping staff coordinate traffic, security, and space needs.

The new dedicated construction entrance is located south of the Environmental Services Building. This new entrance will allow construction staff and truck traffic to enter the RWF more safely and efficiently from Highway 237, without disrupting daily operations or the normal flow of traffic at the main entrance site. In addition, a dedicated left-turn lane will assist construction-related vehicles entering the site, while an acceleration lane will aid trucks exiting the site, allowing them to safely merge back onto Zanker Road. The entrance guard shack will implement security, safety, and environmental protocols specific to CIP consultants and construction contractors.

New fencing along the southern border of the site secures the illuminated staging area that consists of eight acres of improved surface for storage and staging of equipment and material, parking for personal vehicles, and up to 12 temporary contractor trailers. Power and potable water connections have been installed in the locations identified for the temporary construction trailers.

A new construction management trailer has been installed north of the existing temporary construction management trailer adjacent to the Environmental Services Building. It will provide office space and meeting room for an additional 15 staff.

The City's Public Works staff designed the project along with GHD, a local electrical consultant. The project is being constructed by Teichert Construction.

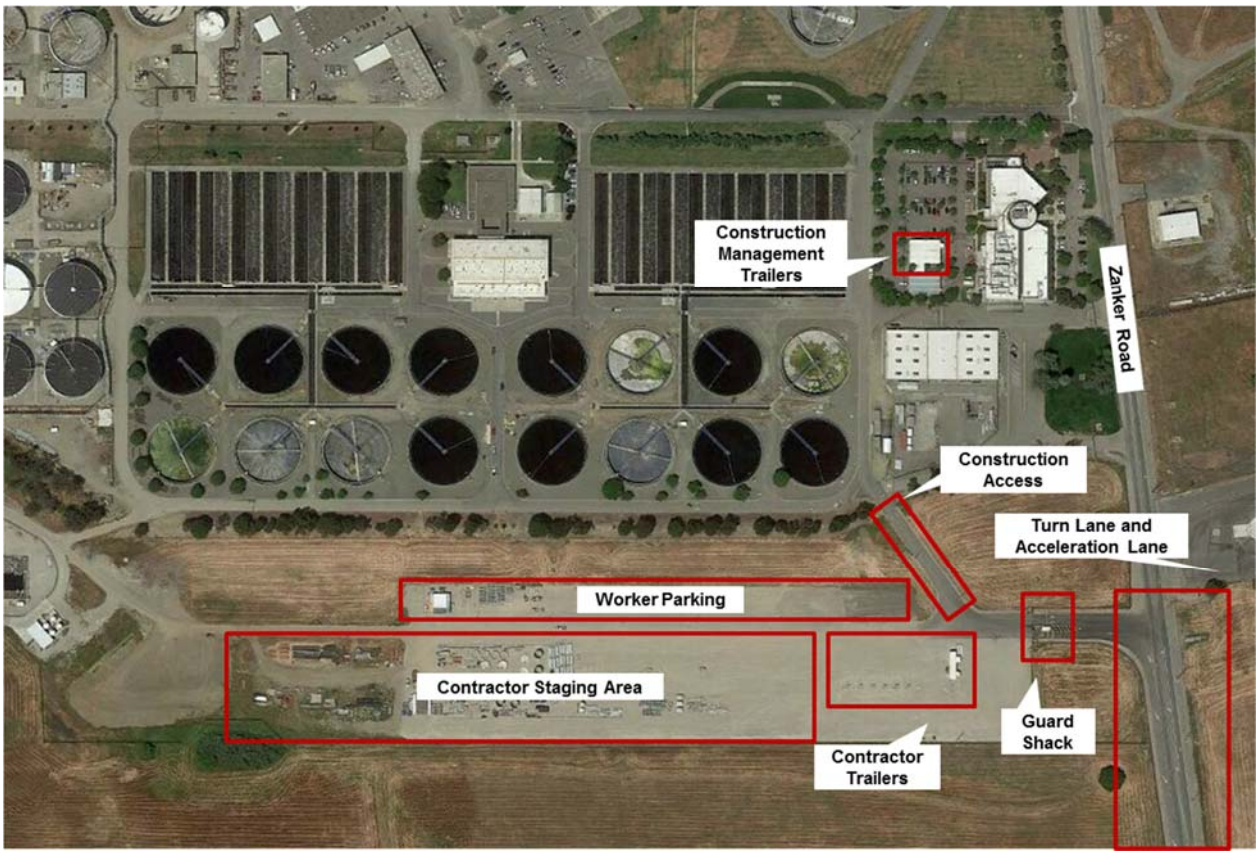


Figure 5: Construction-Enabling Improvements Project Site Layout

Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

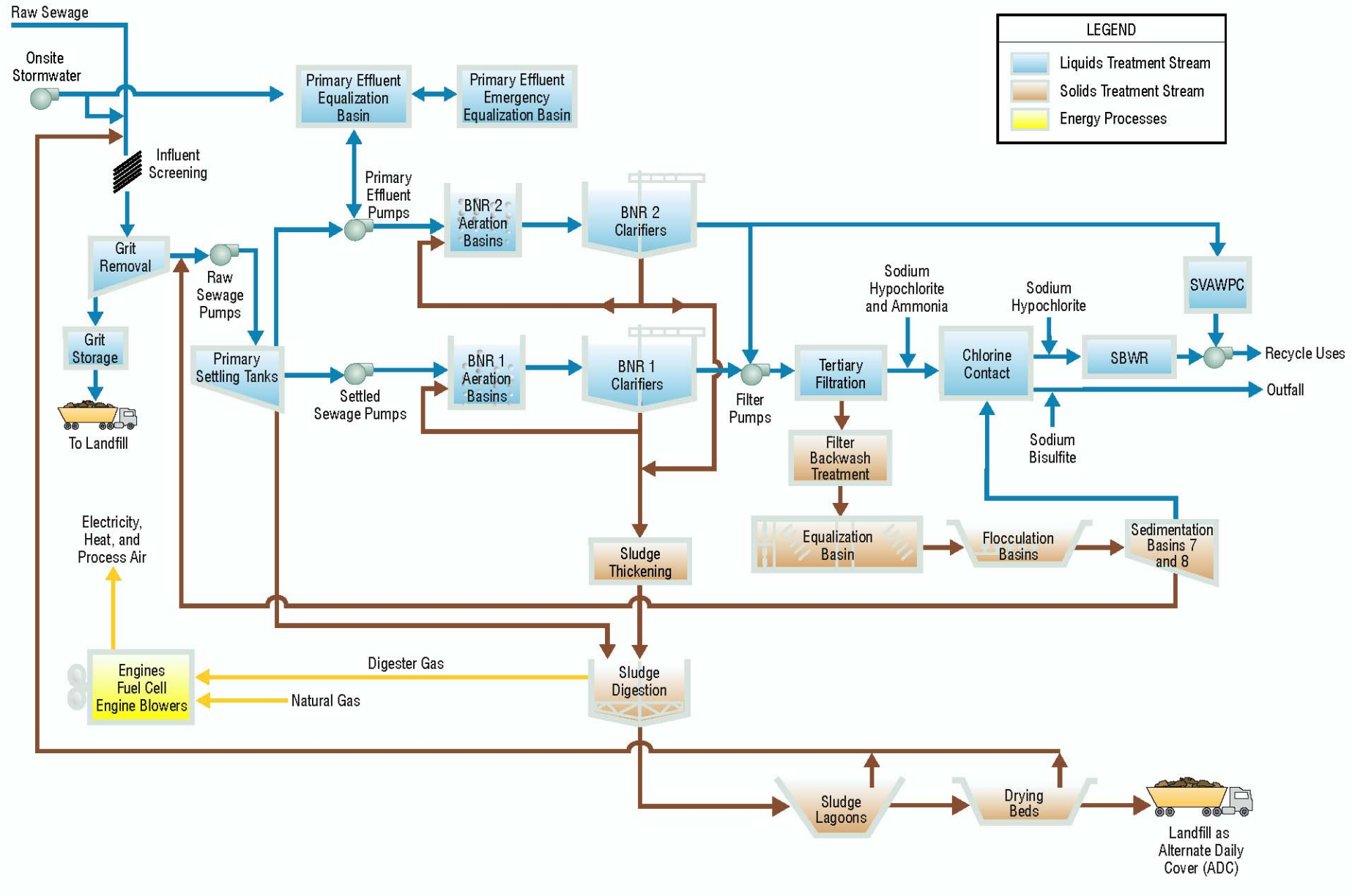


Figure 6 – Current Treatment Process Flow Diagram

Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

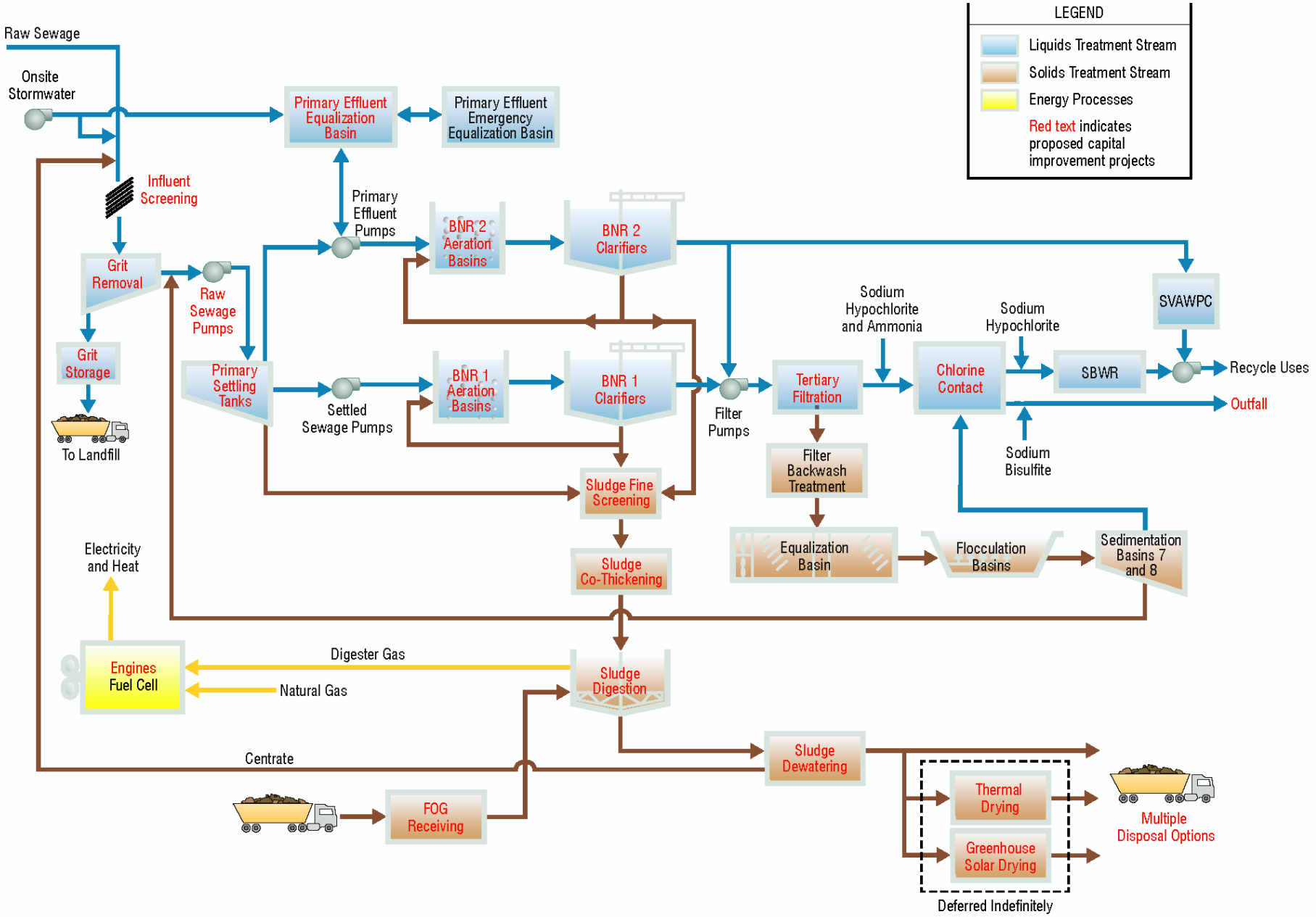


Figure 7 – Proposed Treatment Process Flow Diagram

Active Construction Projects – Aerial Plan

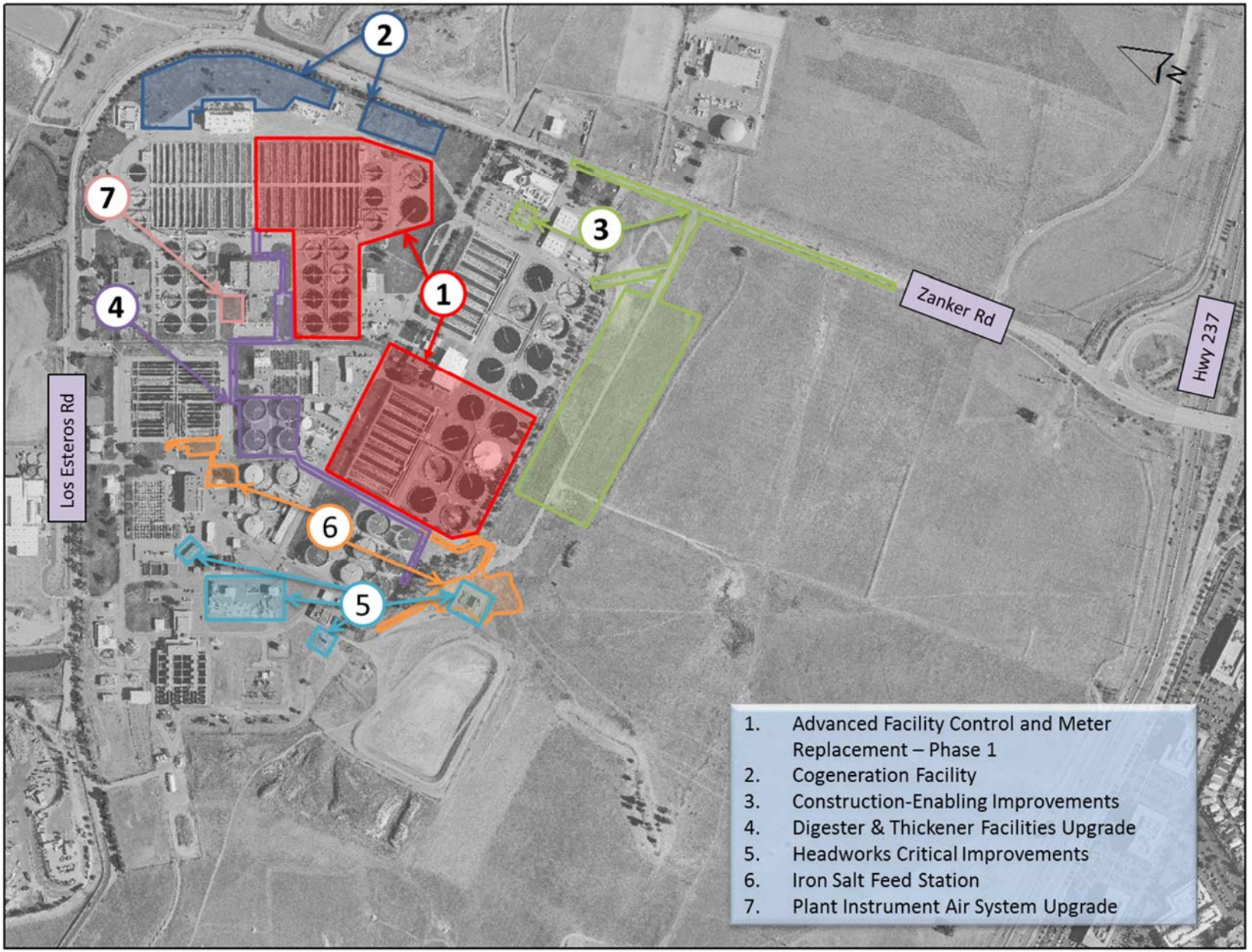


Figure 8: Active Construction Projects