San José-Santa Clara Regional Wastewater Facility

Capital Improvement Program

Monthly Status Report: August 2019

October 3, 2019

This report summarizes the progress and accomplishments of the Capital Improvement Program (CIP) for the San José-Santa Clara Regional Wastewater Facility (RWF) for August 2019.

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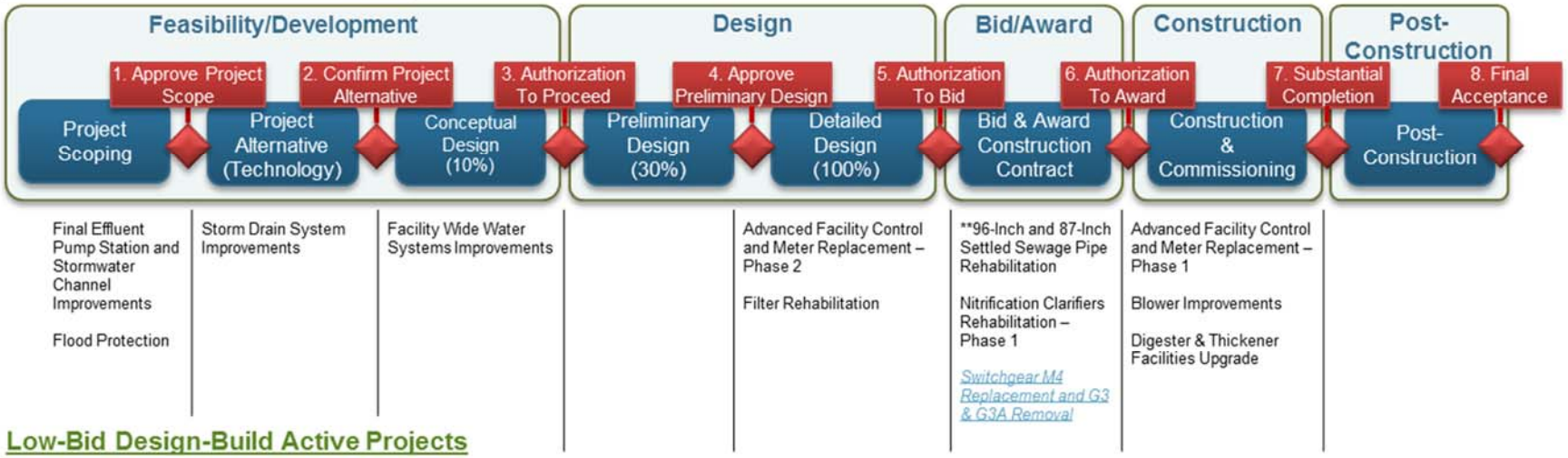
Project Delivery Models

Design-Bid-Build Active Projects



- Final Effluent Pump Station and Stormwater Channel Improvements
- Flood Protection
- Storm Drain System Improvements
- Facility Wide Water Systems Improvements
- Advanced Facility Control and Meter Replacement – Phase 2
- Filter Rehabilitation
- **96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation
- Nitrification Clarifiers Rehabilitation – Phase 1
- *Switchgear M4 Replacement and G3 & G3A Removal*
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- Fire Life Safety Upgrades
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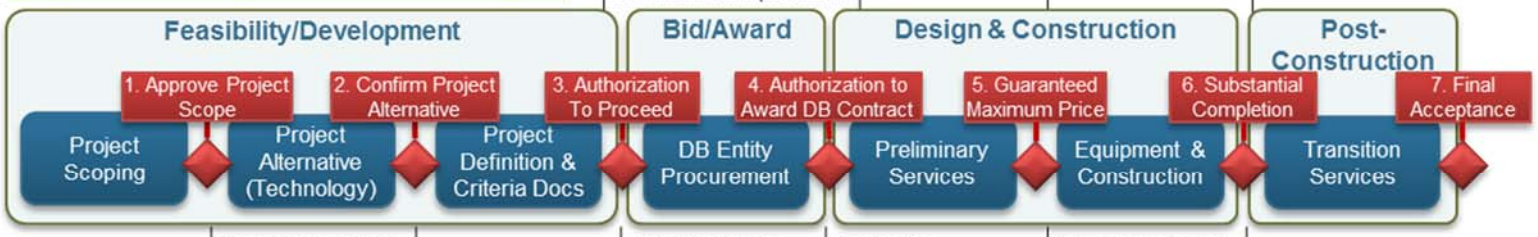
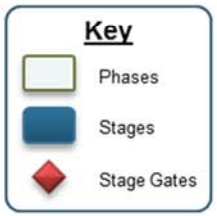
- Outfall Bridge and Instrumentation Improvements

Progressive Design-Build Active Projects



- Yard Piping and Road Improvements
- **Digested Sludge Dewatering Facility
- Headworks
- Cogeneration Facility



*Projects shown *underlined and in blue and italics* have either been initiated or advanced this reporting period
**Project passed the Authorization to Award stage gate and will move to the next stage if City Council awards the construction contract.
***The Plant Instrument Air System Upgrade Project was accepted by the City in June and has been removed from the PDM.

Program Summary

August 2019

In August, the Switchgear M4 Replacement and G3 & G3A Removal Project passed the Project Delivery Model (PDM) Stage Gate 5: Authorization to Bid and the City advertised the construction contract for bids, which will be opened in late September. In addition, the Digested Sludge Dewatering Facility Project passed Stage Gate 4: Authorization to Award DB Contract. Staff will recommend the design-build contract for award to the Treatment Plant Advisory Committee (TPAC) and City Council (Council) in September.

The Digester and Thickener Facilities Upgrade Project contractor completed the exterior insulation on Digester 5 (see Figure 1) and installed gas dome lids and set the sludge circulating heat exchanger equipment for Digesters 5 and 6. Ten of the remaining 13 elevated pipe rack footings and columns were constructed and several hundred feet of gas pipeline was tested. The contractor will construct the final three footings and columns in October 2019.

Figure 1: Recently applied insulation on Digester 5

The Cogeneration Facility Project design-builder completed the medium voltage electrical duct banks and continued working on the Power and Air Operations Center fire suppression system and supports for hot water piping. They also continued to install the cooling towers and gas cleaning equipment. In addition, the design-builder began construction of the building that houses the motor control center (MCC) and is due to be delivered in early September 2019.

The Blower Improvements Project contractor mobilized temporary shower trailers at Building 40 to enable demolition of locker rooms. The contractor completed construction of the concrete masonry unit (CMU) walls for the new electrical room.

The Advanced Facility Control and Meter Replacement – Phase 1 Project contractor continued to conduct pre-operational testing in preparation for functional testing in October 2019 and full operational testing in November 2019. For a more detailed update on projects in construction, refer to the Program Highlight (pages 4-5).

The City received two bids for the 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation Project. Both bids were higher than the engineer's estimate of $3.4 million. Staff evaluated the bids, assessed the reasons for the price variance, and will be recommending the construction contract for award to TPAC and Council in November.

For the Advanced Facility Control and Meter Replacement – Phase 2 Project, staff evaluated the three statements of qualification (SOQ) received and determined that all three contractors are qualified to bid on the project. The City also received and began evaluating the pre-qualification SOQs for the Filter Rehabilitation Project.

Look Ahead

The following key activities are forecast for September and October 2019:

- The City will open bids for the Switchgear M4 Replacement and G3 & G3A Removal Project.
- The City will issue a notice of determination of pre-qualified contractors for the Filter Rehabilitation Project.
- Staff will recommend the following to TPAC and Council: (1) amend three general engineering master consultant agreements for various CIP projects to extend their terms; (2) award the design-build contract for the Digested Sludge Dewatering Facility Project; and (3) award the construction contract for Nitrification Clarifier Rehabilitation - Phase 1 Project.
- Five projects will seek to advance through stage gates, including:
    - Advanced Facility Control and Meter Replacement – Phase 2 – Stage Gate 5: Authorization to Bid;
    - Fire Life Safety Upgrades - Stage Gate 4: Authorization to Bid;
    - Headworks Critical Improvements – Stage Gate 8: Final Acceptance;
    - Iron Salt Feed Station - Stage Gate 8: Final Acceptance; and
    - Yard Piping and Road Improvements – Stage Gate 2: Confirm Project Alternative.

Program Highlight – Construction Activity

Construction on the **Digester and Thickener Facilities Upgrade Project** reached 78 percent completion as of August 2019. Contractor Walsh Construction (Walsh) continued to make significant progress at several project work sites – Digesters 5 through 8; pipe rack footings and columns; pipe rack sections; dissolved air flotation thickener (DAFT) tanks 1 through 6; thickened sludge pump area; sludge screening building; polymer and odor control structures; east and west electrical buildings; load center; new flare system; and various piping, electrical/mechanical equipment installations.

Figure 2: Pipe rack system and Digester 6

Structural and earth work for Digesters 5 through 8 is nearing completion, as is pipe rack system work around the digesters, (see Figure 2). Spray foam insulation work is complete for Digester 5 and in progress for Digester 6. Construction of the pipe rack system and the digester gas (DG) line to remote Digester 9 through 16 is complete. Functional testing of the Digester 16 connection and associated DG line on the pipe rack is complete, with operational testing in progress.

Mechanical systems for DAFT tanks 1 through 6 (drives, motors, skimmers, scrapers, cross screws, pressure retention tanks, and aluminum DAFT tank covers) are complete. Various electrical equipment (motor control centers; switchgears; instruments; rough-in/wiring; tanks and piping; HVAC and foul air ductwork; fire sprinkler and fire suppression systems; canopy systems; architectural finish; and hardware installations) for the sludge screening building, polymer and odor control structures and existing sludge control building are either complete or near completion. Installation and third-party testing of transformers and load center equipment are complete. Foundation work for the east and west electrical buildings is complete, with remaining structural work in progress.

In preparation for the upcoming phased DAFT startup, the contractor installed a new temporary pressure flow reroute pumping and piping system to facilitate the replacement of the aging pipes.

As of August 2019, the **Cogeneration Facility Project** reached 53 percent completion. Highlights since the last update include completion of the walls and roof for two main buildings, significant concrete pours for various areas, and new equipment installation.

In mid-June 2019, design-builder CH2M Hill Engineers (CH2M) completed the masonry walls around the new cogeneration and operations buildings. By early July, the buildings were enclosed with the metal roof deck installation. CH2M deployed a large crane to lift pieces of the roof joist and metal deck into place. Inside the cogeneration building, welders erected the pipe rack structure that will eventually carry water and fuel pipes to the new engines.

Figure 3: Bottom left: Pipe support structure under construction. Middle: Hydrogen sulfide and siloxane removal equipment. Middle right: Electrical ductbank concrete pour.

In the area just south of the cogeneration building, CH2M poured multiple foundation slabs that will support new switchgear, MCC, water boilers, oil storage tanks, and the butler building. Most of this equipment will be installed by mid-September and the remaining equipment will be installed this winter. In the digester gas treatment equipment outdoor area, the contractor installed the siloxane and hydrogen sulfide removal equipment to prevent corrosion of the new mechanical parts and instruments. Additionally, the contractor placed the cooling towers and chillers. Functioning as a heat sink, cooling towers capture excess heat from the engines and release it into the environment.

To provide power to the new instruments and equipment, CH2M built new duct banks that carry conduits from existing power sources. Hundreds of plastic conduits form a maze-like, underground network in the surrounding areas. Two notable types of equipment are the switchgear and the MCC. The switchgear offers protection from short-circuiting and provides isolation points for specific electrical circuits. The MCC controls the start-up/shut-down of equipment electrical motors (e.g., a water pump). The switchgear and MCC have been installed inside the electrical equipment indoor area within the Cogeneration Electrical and Mechanical Building, but have not been activated yet.

The new cogeneration facility connects into the digester system through the hot water supply loop and the digester gas line. The hot water pipeline collects excess heat from the engines and transfers it into the digesters. The heat promotes an ideal environment for microorganisms used in the digestion process. Cool water from the digester is transported back to the engines, and the cycle repeats. The digester gas line feeds biogas from the digesters to the engines, which creates energy for the RWF. CH2M has constructed most of these pipes in the cogeneration area and will be ready to connect to the pipes already installed by Walsh for the Digester Project. Teams from both projects will need to coordinate carefully prior to commissioning the system.

Figure 4: New VFD room in Building 40

Construction for the **Blower Improvements Project** began January 16, 2019. The project will upgrade the RWF's secondary aeration blowers in the Blower Generation Building (Building 40), Secondary Blower Building, and Tertiary Blower Building, which provide air crucial to the wastewater treatment process. Bringing innovation and greater efficiency, many of the upgrades consist of long-manufacturing-time equipment such as variable frequency drives (VFDs) and reduced voltage soft starters, which will enable the emergency diesel generators to start the equipment during an emergency. Figure 4 shows the demolition and construction of a former workshop in Building 40, where a new CMU wall is being constructed and the room prepared to house three VFDs. Large openings above the doorways are for new ductwork associated with each VFD.

The **Advanced Facility Control and Meter Replacement – Phase 1 Project** reached 67 percent completion as of August. The project will replace and/or upgrade the control equipment in the Secondary B Battery and Nitrification B Battery treatment areas. The project scope includes replacing 52 flow meters; 24 valves; 12 valve actuators; 26 sensors and transmitters; associated piping modifications; and electrical improvements. Major construction work will be performed during the planned maintenance shutdown periods for each battery in 2019 and 2020, respectively.

Contractor Overaa Construction began work on Secondary B Battery in May and is now in the final stretch of construction planned for this maintenance period. The team is starting pre-operational testing activities and working on outstanding minor items. Overaa Construction anticipates completing all Secondary B Battery testing in December 2019. Construction on the Nitrification B Battery area will start in May 2020 and be completed in November 2020.

Figure 5: Contractor tightening bolts on new meter and pipes

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 basis. Through the life of the CIP, KPIs that best reflect the current program will be selected and measured. KPIs are reset each fiscal year.

Program Key Performance Indicators – Fiscal Year 2019-2020

KPI	Target	Fiscal Year to Date			Fiscal Year End		
		Actual	Status	Trend	Forecast	Status	Trend
Stage Gates	90%	80% 4/5[1]	▲	↑	95% 19/20	●	→
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[2]	90%	N/A 0/0	N/A	N/A	N/A 0/0	N/A	N/A
Measurement: Percentage of CIP projects delivered within 2 months of approved baseline Beneficial Use Milestone.[3] Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Budget[4]	90%	N/A 0/0	N/A	N/A	N/A 0/0	N/A	N/A
Measurement: Percentage of CIP projects that are accepted by the City within the approved baseline budget.[3] Target: Green: >= 90%; Amber: 75% to 89%; Red: < 75%							
Expenditure	$369M	$168M	●	↑	$451M	●	→
Measurement: CIP FY18-19 committed costs. Target: Committed cost meets or exceeds 70% of planned Budget. 70% of $528M = $369M. Therefore Fiscal Year End Green: >=$369M; Amber: $290M to $369M; Red: < $290M							
Procurement	80%	100% 2/2[5]	●	→	100% 8/8	●	→
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							
Vacancy Rate[6]	10%	22% 19/86	◆	→	9% 8/86	●	→
Measurement: Ratio of the number of vacant approved positions to approved positions. Target: Green: <= 10%; Amber: 10% to 20%; Red: > 20%							

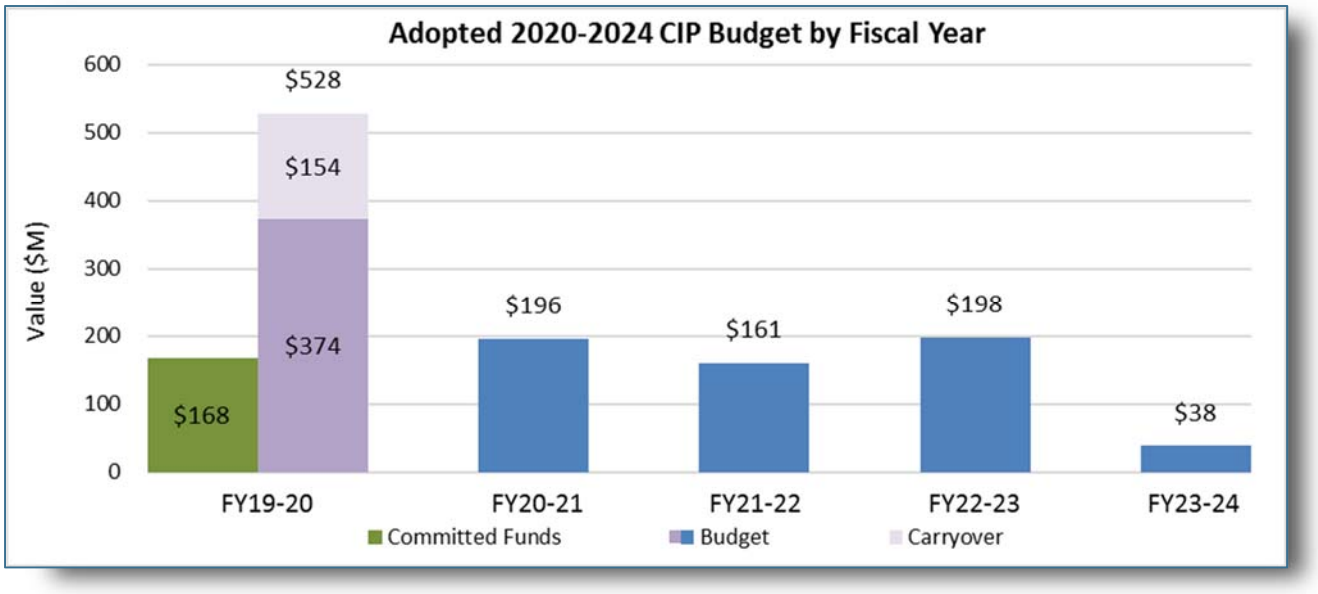
Notes

1. The 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation Project passed Stage Gate 6: Authorization to Award & Establish Baseline. The Digested Sludge Dewatering Facility Project passed Stage Gate 4: Authorization to Award DB Contract, and will recommend Council award the design-build contract in September 2019. The Switchgear M4 Replacement and G3 & G3A Removal Project passed Stage Gate 5: Authorization to Bid, and will advertise the construction contract this reporting period.
2. The CIP does not anticipate any projects reaching Beneficial Use this fiscal year.
3. The baseline Beneficial Use date and the baseline budget for each project are established at construction contract award and execution.
4. The Budget KPI has been revised to reflect the Plant Instrument Air System Upgrade Project actual acceptance date in June of last fiscal year. The CIP does not anticipate accepting any projects this fiscal year.
5. The City advertised the Switchgear M4 Replacement and G3 & G3A Removal Project construction contract.
6. The vacancy rate KPI measures CIP-approved positions, including ESD, 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)19-20 based on the Adopted 2020-2024 CIP.

Adopted 2020-2024 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.

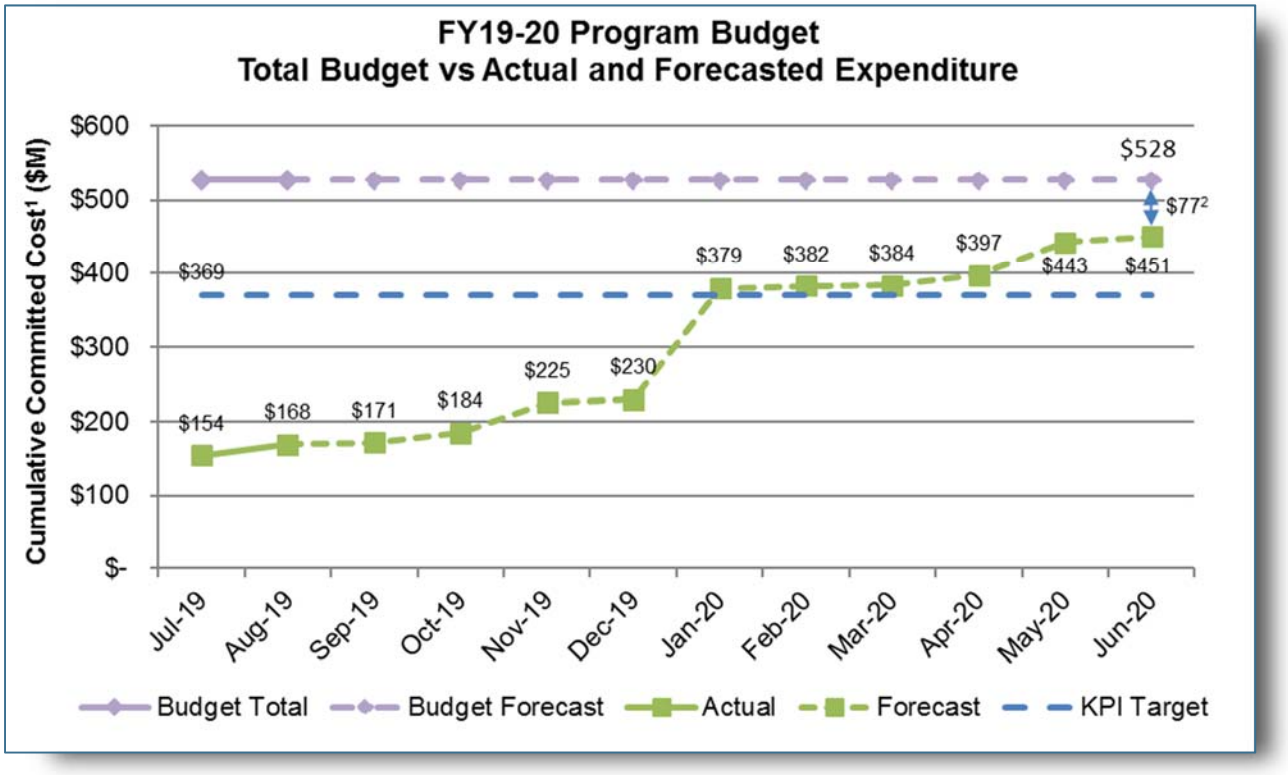
The FY19-20 budget is $399 million, which consists of $339.6 million in new funds and $59.7 million in rebudgets. For purposes of this monthly report, the adopted FY19-20 budget is adjusted from $399 million to $374 million due to the exclusion of certain appropriations that are not measured as part 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; and Urgent and Unscheduled Treatment Plant Rehabilitation. Similar adjustments have been made to the budgets for FY20-21 through FY23-24.

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. FY19-20 carryover is $154 million.

Budget of $374 million and carryover of $154 million totals $528 million for FY19-20.

Fiscal Year 2019-2020 Program Budget Performance

The FY19-20 CIP budget is comprised of approximately $374 million in new and rebudgeted funds, plus encumbered carryover of $154 million, for a total of $528 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; and Urgent and Unscheduled Treatment Plant Rehabilitation items. Overall, the forecast fiscal year-end committed funds exceed the fiscal year-end target by $82 million.



Notes:

1. Committed costs are expenditures and encumbrance balances, including carryover (encumbrance balances from the previous fiscal year).
2. The variance between budget and commitments can be primarily attributed to the following factors:
    a. One construction contract is now anticipated to be awarded in FY20-21 instead of FY19-20, based on updated schedules:
        i. Outfall Bridge and Instrumentation Improvements Project.
    b. Several consultant service orders are not anticipated to be awarded in FY19-20:
        i. Aeration Tank Rehabilitation Project conceptual through final design.
        ii. Flood Protection Project alternatives analysis and conceptual design.
    c. The Yard Piping and Road Improvements Project design and first phase of construction will no longer occur this fiscal year.
    d. The Nitrification Clarifiers Rehabilitation – Phase 1 construction bids came in under budget.
    e. Several other minor encumbrances for consultant services are either lower than budgeted or are anticipated to be awarded in FY20-21.
    f. Several authorized positions remain vacant, resulting in lower personal services expenses than budgeted.

Project Performance Summary

There are currently four projects in the construction and post-construction phases and an additional 15 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. Cogeneration Facility	Design & Construction	Sep 2020	●	●
2. Digester and Thickener Facilities Upgrade	Construction	Nov 2020	◆	◆
3. Advanced Facility Control & Meter Replacement - Phase 1	Construction	June 2021	●	●
4. Blower Improvements	Construction	Sep 2022	●	●

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 12.
3. Actual Beneficial Use date.
4. The Plant Instrument Air System Upgrade Project was removed from the table as the City accepted the project in June.

Project Performance – Pre-Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]
1. 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation	Bid/Award	Nov 2020
2. Nitrification Clarifiers Rehabilitation – Phase 1	Bid/Award	Dec 2022
3. Digested Sludge Dewatering Facility	Bid/Award	Apr 2023
4. Outfall Bridge and Instrumentation Improvements	Design	Dec 2021
5. Switchgear M4 Replacement and G3 & G3A Removal	Design	May 2022
6. Advanced Facility Control & Meter Replacement - Phase 2	Design	Dec 2022
7. Filter Rehabilitation	Design	Mar 2023
8. Fire Life Safety Upgrades	Design	Mar 2023
9. HVAC Improvements	Design	Mar 2023
10. Headworks	Design and Construction	Jan 2023
11. Storm Drain System Improvements	Feasibility/Development	Nov 2023
12. Flood Protection	Feasibility/Development	Feb 2024
13. Facility Wide Water Systems Improvements	Feasibility/Development	Aug 2024
14. Final Effluent Pump Station and Stormwater Channel Improvements	Feasibility/Development	Feb 2025
15. Yard Piping and Road Improvements	Feasibility/Development	Nov 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.

Project Significant Accomplishments

Biosolids Package

Digester and Thickener Facilities Upgrade Project

- Contractor Walsh Construction installed the exterior insulation for Digester 5. On Digesters 5 and 6, they installed the gas dome lids and set the sludge circulating heat exchanger equipment.
- Near the DAFT gallery, Walsh installed a temporary reroute of waste activated sludge from the secondary treatment process to the DAFT tanks allowing multiple deteriorated pipes to be replaced.
- Walsh completed 10 of the remaining 13 elevated pipe rack footings and columns, and they installed and tested several hundred feet of natural gas pipeline. The remaining three footings and columns will be completed in October 2019.

Facilities Package

96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation Project

- The City received two bids both higher than the engineer's estimate. Staff evaluated the bids, assessed the reasons for the price variance, and will recommend that Council award the construction contract to the lowest bidder in November.

Fire Life Safety Upgrades Project

- Design consultant Kennedy/Jenks (K/J) submitted the final 30 percent design and the project team began reviewing the final submittal.

Liquids Package

Advanced Facility Control and Meter Replacement – Phase 1 Project

- Contractor Overaa Construction continued to conduct pre-operational testing and address installation issues. The project team anticipates completing functional testing in October 2019 and full operational testing in November 2019.

Advanced Facility Control and Meter Replacement – Phase 2 Project

- The City completed the evaluation of pre-qualification submittals and determined that all three contractors are qualified to bid on the project. Design consultant Black & Veatch will complete the 100 percent design in September.

Blowers Improvements Project

- Contractor Monterey Mechanical continued Building 40 VFD room modifications including the completion of the CMU wall for the new electrical room and mobilized temporary shower trailers to enable demolition of the locker rooms.

Filter Rehabilitation Project

- The City received and began evaluating pre-qualification SOQs. Staff will issue a notice of contractors qualified to bid on the project in September.

Headworks Project

- The design-builder CH2M submitted the 60 percent design documents and will hold a review workshop next month.

Power and Energy Package

Cogeneration Facility Project

- Design-builder CH2M completed the medium voltage electrical duct banks and continued working on the interior of the Power and Air Operations Center (Building 46), including the fire suppression system, supports for hot water piping, and painting.
- CH2M continued installing the hot water and digester gas piping in the secondary aeration area and working on the cooling towers and gas cleaning equipment. In addition, CH2M began construction of the butler building that houses the electrical equipment.

Switchgear M4 Replacement and G3 & G3A Removal Project

- On August 14, the City advertised the project construction documents for bid. Bids will be opened in September 2019.

Explanation of Project Performance Issues

Digester and Thickener Facilities Upgrade Project

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 have amounted to 273 working days. The original construction completion and Beneficial Use date of September 2019 has been delayed and rescheduled to November 2020.

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

- Major corrosion of an underground, 78-inch settled sewage pipeline and junction structure required construction of a temporary reroute so that the pipeline could be replaced during the 2018 dry season. In May of 2018, the contractor started full-time operation of this temporary pumping and pipeline system and began replacing the 78-inch settled sewage pipeline. This work 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 prior to foundation construction.
- 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 (BAAQMD) venting restrictions also delayed digester work. The contractor completed the temporary digester gas connections, and the temporary system became operational in February 2018.

The City has negotiated contract change orders for the following issues discovered in 2017 and 2018:

- Digester structural redesign: The design consultant revised the structural drawings to address seismic concerns by enlarging the foundation ring beam at the base of each of the four digesters. The City issued a final, global change order in February 2019 to cover work activities.
- Distributed control system architectural changes: The design guidelines for the distributed control system were developed after the project plans were completed. Several changes were required for fiber optic cable, electrical wiring, patch panels, converters, communications instrumentation, and emergency power supply. Drawings, color-coding labeling, and process diagrams needed to be revised to reflect these changes.
- Fire Department requirements: Fire permit requirements changed after the design was completed. The Fire Marshal required additional alarms and electrical connections. A new electrical fire suppression system was installed to meet current environmental requirements. At one structure, the Fire Marshall required a full discharge test of the system.
- Structural issues: Designer Brown and Caldwell (B&C) modified the west electrical building foundation design to avoid an unforeseen conflict and protect the structural integrity of an existing underground tunnel; provided a new design to anchor the pressure flow pipes in the DAFT gallery to the ceiling and floor slabs to avoid conflicts with multiple existing pipes; and redesigned structural supports to meet code regulations.
- During construction, Walsh discovered that the DAFT gallery under-slab drains were not functioning properly. The City directed Walsh to replace the drain and pump system.
- Construction delays required the contractor to pay for a warranty extension on six liquid ring gas compressors.

Once mitigation of PCB-impacted soils and concrete was completed, the federal Environmental Protection Agency (EPA) issued a final conditional approval in late 2018. In compliance with the EPA-approved, risk-based management plan, removal and disposal of all contaminated materials in all four affected digesters and all tunnel joints was completed. All contaminated soils have been removed and disposed of and the impacted concrete has been encased or removed. The last portion of the work was finished in August 2019. The project team anticipates submittal of final work reports to the EPA in September 2019.

In November 2017, Council approved a construction 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 construction contingency increase of $25 million for additional costs associated with the seismic redesign, hazardous material remediation, and extended construction duration.

To minimize further delays, the contractor is executing several tasks concurrently that originally had been planned in series.

Project Profile – Plant Instrument Air System Upgrade

The RWF's pneumatic operations and valve and instrument controls utilize a high-pressure instrument air supply system. The former system was comprised of three water-cooled air compressors located in the basement of the Secondary Blower Building (SBB) (see Figure 6). This below-ground location made the system vulnerable to flooding and consequential power loss. The source of the system's cooling water will also become unavailable in the near future, due to the decommissioning of the existing engine generators and chillers, once the new cogeneration facility was commissioned in 2020.

Figure 6: Site Map

New Air Compressors

The project replaced the old, water-cooled air compressors with three new, air-cooled air compressors, which were completed and commissioned in late 2018 (see Figure 7). The new air system has sufficient reservoirs to provide suitable redundancy in the event of extended power loss. Its flow capacity is 620 cubic feet per minute, sufficient to meet RWF requirements.

Figure 7: New Air Compressors

Figure 8: New Plant Air Compressor Building

Reliable Instrument Air System

The new compressors are housed in a new building located above the 100-year flood elevation, greatly reducing the risk of flooding (see Figure 8). The compressors' electrical panel is fed from two independent 4160-volt power sources (switchgear S2 in the Sludge Control Building and switchgear S3 in the SBB, improving the system's reliability.

This $4.6 million project was delivered using the traditional design-bid-build approach. The project scope was approved in August 2014, with design consultant CH2M completing the design in April 2016. Council awarded the construction contract to Anderson Pacific Construction, Inc. in August 2016. The project achieved Beneficial Use in November 2018 and the City accepted the completed project in June 2019.

Figure 9: Refrigerated Air Driers

Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

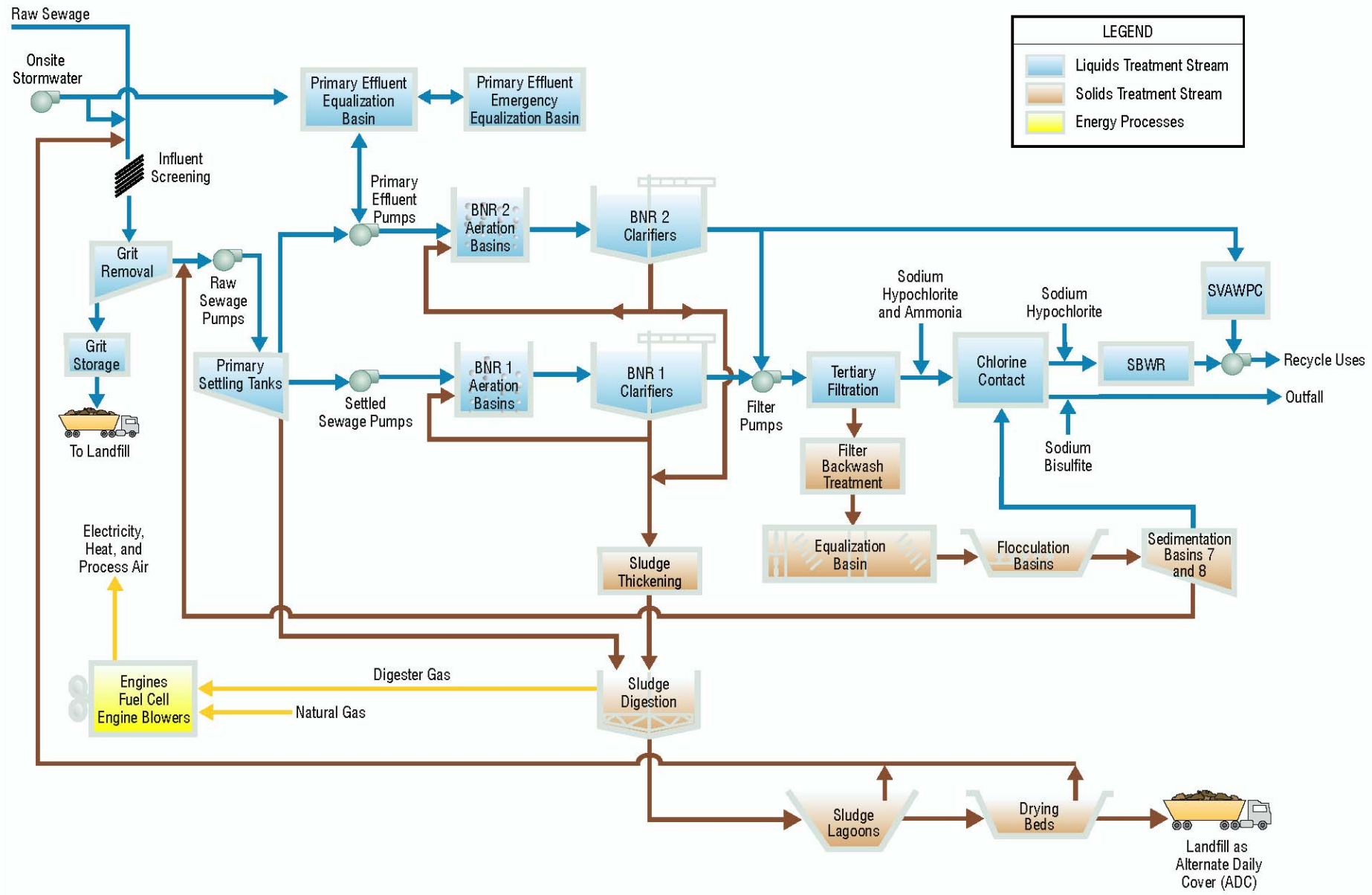


Figure 10 – Current Treatment Process Flow Diagram

Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

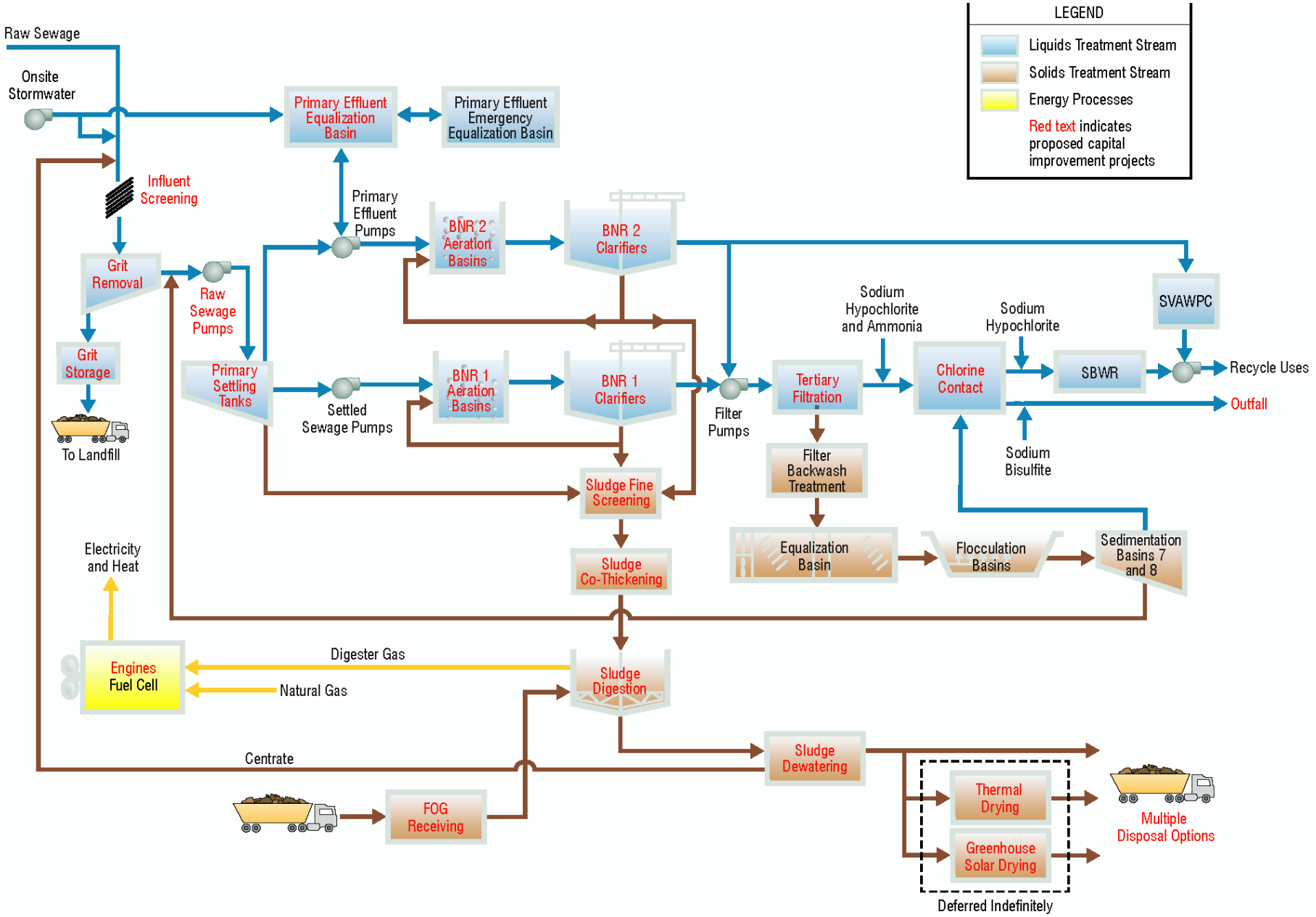


Figure 11 – Proposed Treatment Process Flow Diagram

Active Construction Projects – Aerial Plan

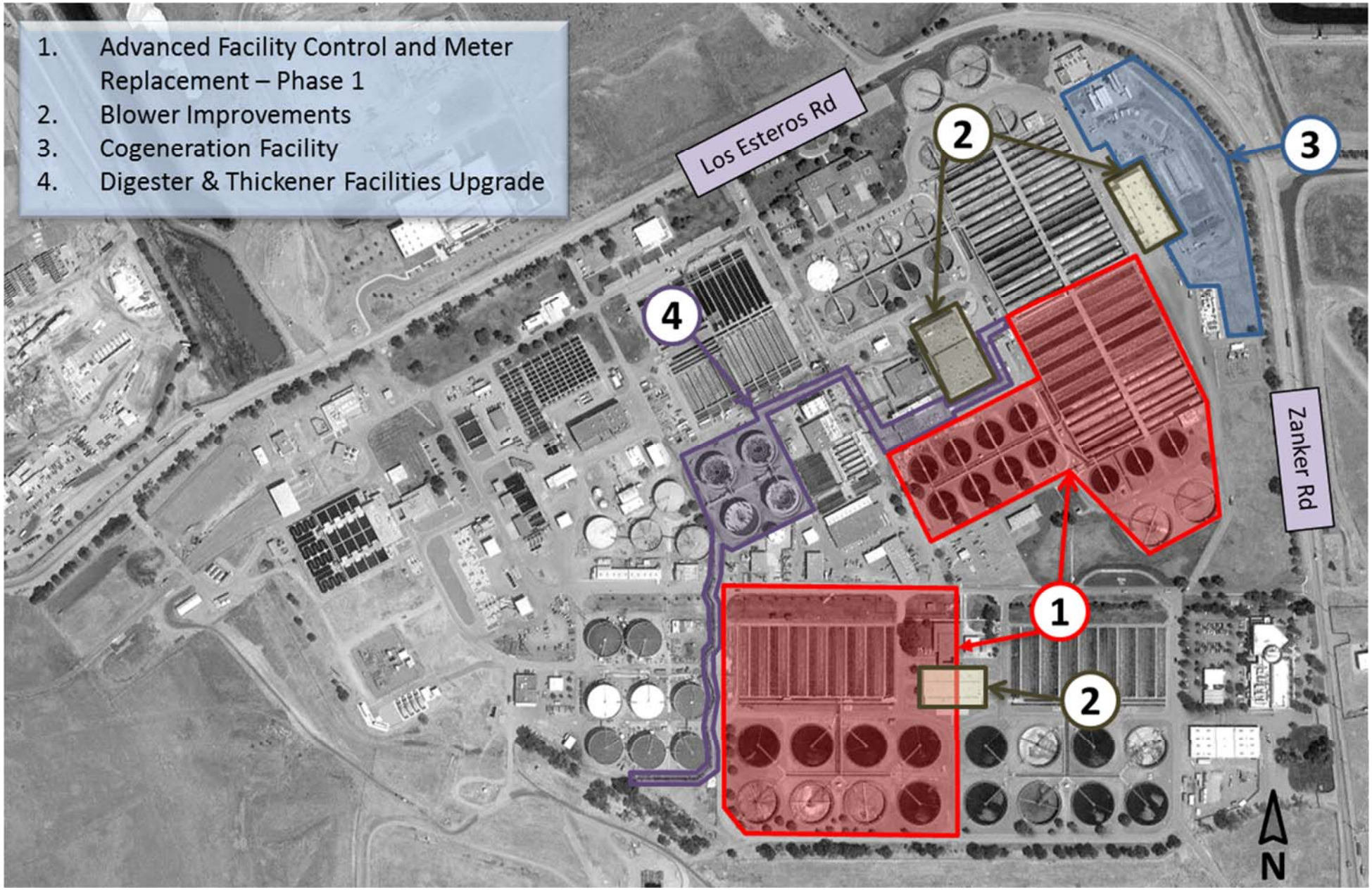


Figure 12: Active Construction Projects