San José-Santa Clara Regional Wastewater Facility

Capital Improvement Program

Monthly Status Report: February 2020

April 2, 2020

This report summarizes the progress and accomplishments of the Capital Improvement Program (CIP) for the San José-Santa Clara Regional Wastewater Facility (RWF) for February 2020.

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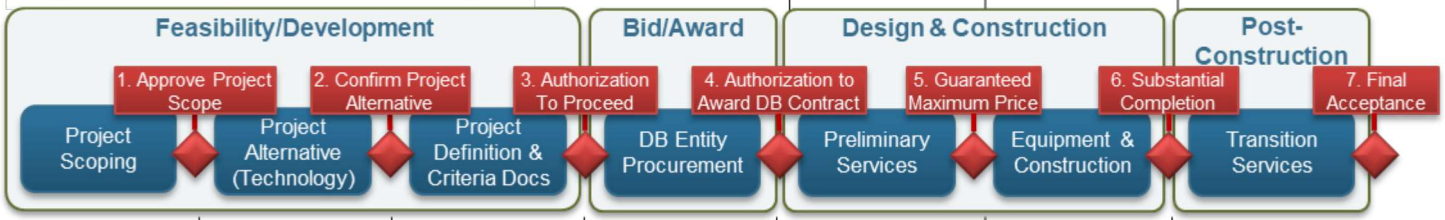
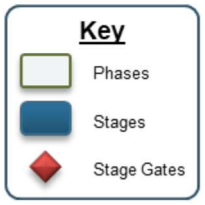


Digested Sludge Dewatering Facility

Cogeneration Facility

Headworks



*Projects shown *underlined and in blue and italics* have either been initiated or advanced this reporting period
**Project will move to the next stage once the Plans and Specification Authorization to Advertise Memorandum is signed by the Director of Public Works.

Program Summary

February 2020

In February, the Treatment Plant Advisory Committee (TPAC) and the San José City Council (Council) approved the amended and restated design-build contract with CH2M HILL Engineers, Inc. (CH2M) for final design and construction of the Headworks Project. The award was a major project and CIP milestone. For the project, it was the culmination of several months of negotiations with the design-builder. For the CIP, it was the award of the program's largest construction contract. CH2M will now continue design and prepare for major construction to begin this summer.

Two projects advanced through the Project Delivery Model (PDM). The Filter Rehabilitation Project was approved to proceed to the Bid and Award Construction Contract stage. The Storm Drain Systems Improvement Project was approved to proceed with conceptual design after conducting additional flood risk analysis and sensitivity analysis of critical infrastructure, refining the design criteria, and conducting a more robust assessment of the alternative strategies for meeting the design criteria.

Figure 1: Aerial view of the Digester 5 (left) and Digester 6 (right) gas withdrawal system

The Digester and Thickener Facilities Upgrade Project contractor continued remaining work on Digesters 5 through 8, installing sludge flow equipment concrete pads, electrical conduits, roof gas piping, gas domes, and stairways. At the new Sludge Screening Building, the contractor completed HVAC ductwork on the roof and screening bin room. The contractor also installed the hot water supply, return piping, and digester gas piping on the elevated pipe rack along C Street.

The Cogeneration Facility Project design-builder installed and tested the backup battery system; cleaned and tested the medium voltage (4160 V) switchgear; and finished the site paving.

The Blower Improvements Project contractor demolished the last of the five Tertiary Blower Building air baghouses.

The Advanced Facility Control and Meter Replacement – Phase 1 Project contractor replaced and installed three new total suspended solids (TSS) meters and verified performance.

The Nitrification Clarifier Rehabilitation – Phase 1 Project team reviewed and returned the contractor's submittals, including slide gate and telescoping valves, butterfly valves, stainless steel pipe, flow meters, electrical components, temporary facilities, and controls.

The City issued the Notice to Proceed (NTP) for the 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation Project.

The City received two construction bids for the Advanced Facility Control and Meter Replacement – Phase 2 Project; both bids below the engineer's estimate. The CIP will recommend that Council award the construction contract in June 2020.

The design-builder for the Digested Sludge Dewatering Facility Project continued a study to compare centrifuge performance for final centrifuge selection. Two manufacturers completed performance testing for the study. CIP and operations and maintenance (O&M) representatives visited East Bay Municipal Utility District and the Union Sanitary District centrifuge facilities to learn more about the conveyor systems used at these facilities.

Look Ahead

The following key activities are forecast for March and April 2020:

- The City will issue an NTP to the contractor for the Switchgear M4 Replacement and G3 & G3A Removal Project.
- Two projects will seek to advance through the following stage gates:
  - Flood Protection Project – Stage Gate 1: Approve Project Scope
  - Yard Piping Improvements – Phase 1 Project – Stage Gate 3: Authorization to Proceed
- Two studies will seek to advance through the following stage gates:
  - Process Optimization Study – Stage Gate 1: Approve Project Scope
  - Energy Management Strategic Plan Update Study - Stage Gate 1: Approve Project Scope

Program Highlight – Construction Activity

The following photographs show the progress made on several major RWF construction projects over the past six months.

Blower Improvements Project

Figure 2: Reoriented and refurbished mechanical system, including a new motor and various utilities connections, for one of the blowers in the Power and Air Building.

Figure 3: The contractor prepares the existing electrical conduit system maintenance access point for additional conduit connections. The existing rebar locations are marked on the outside of the concrete junction structure to guide new conduit positioning.

Advanced Facility Control and Meter Replacement – Phase 1 Project

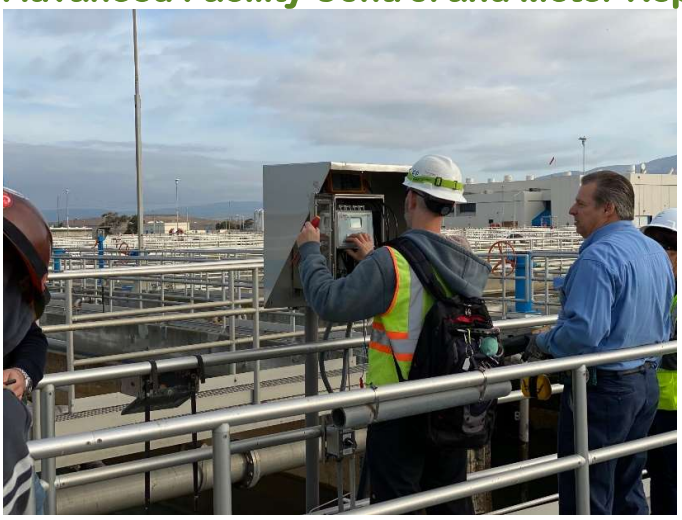


Figure 4: The contractor performs electrical instrumentation adjustments and verifies readings with an existing distributed control system (DCS) node.

Figure 5: The contractor verifies a new DCS node located in one of the many tunnels during functional testing.

Cogeneration Facility Project

Figure 6: New gas treatment system which cleans impurities from the digester gas prior to being used by the internal combustion engines to produce electricity and heat.

Figure 7: The electricity generated by the new engines will use this medium voltage (4160 Volt) switchgear to distribute power to equipment throughout the RWF. The workers shown are testing the wiring and protective relay settings prior to putting the switchgear into service.

Figure 8: The new engine generators' high exhaust heat is used to produce hot water, which is then used to provide heat to the digesters and other facilities. The exhaust gas is cleaned through a treatment system before being discharged through the exhaust stacks.

Figure 9: The upgraded foam suppression and withdrawal pumps and visible piping for thermophilic Digesters 5 and 7.

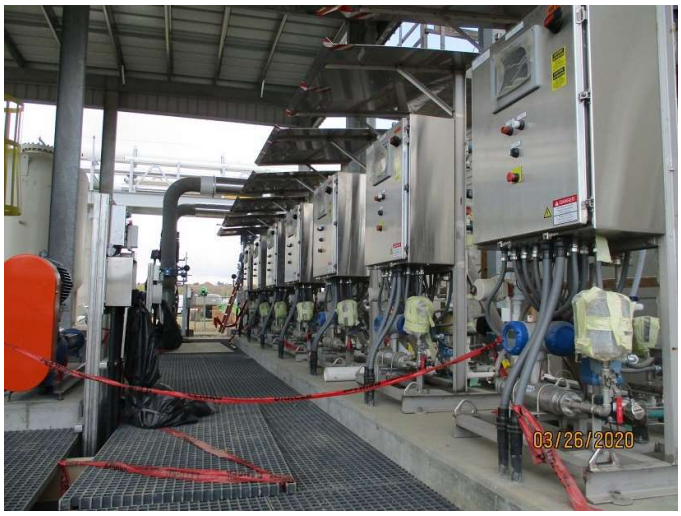


Figure 10: The automated polymer blending system will feed polymer to the blended sludge prior to entering the dissolved air flotation thickener tanks.

Figure 11: The Digester 5 gas withdrawal system is comprised of injection piping shown nearest, and pressure relief valves and digester gas separators in the distance. The digester gas will be used by the new Cogeneration Facility engines to generate electricity and heat for the RWF.

Figure 12: The new electricity load center at 5th and Center Streets will reduce the grid voltage to power the digester equipment.

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%	93% 14/15[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 90%; 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 90%; Red: < 75%							
Expenditure	$370M	$226M	▲	↑	$408M[5]	●	↓
Measurement: CIP FY19-20 committed costs. Target: Committed costs meets or exceeds 70% of planned budget. 70% of $528M = $370M. Therefore Fiscal Year End Green: >=$370M; Red: < $370M							
Procurement	80%	67% 4/6	◆	→	100% 6/6	●	→
Measurement: Number of consultant and contractor procurements advertised compared to planned for the fiscal year. Target: Green: >= 80%; Amber: 70% to 80%; 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[6]	0	1	▲	→	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[7]	10%	14% 12/86	▲	→	9% 8/86	●	→
Measurement:+B3:I25 Ratio of the number of vacant approved positions to approved positions. Target: Green: <= 10%; Amber: 10% to 20%; Red: > 20%							

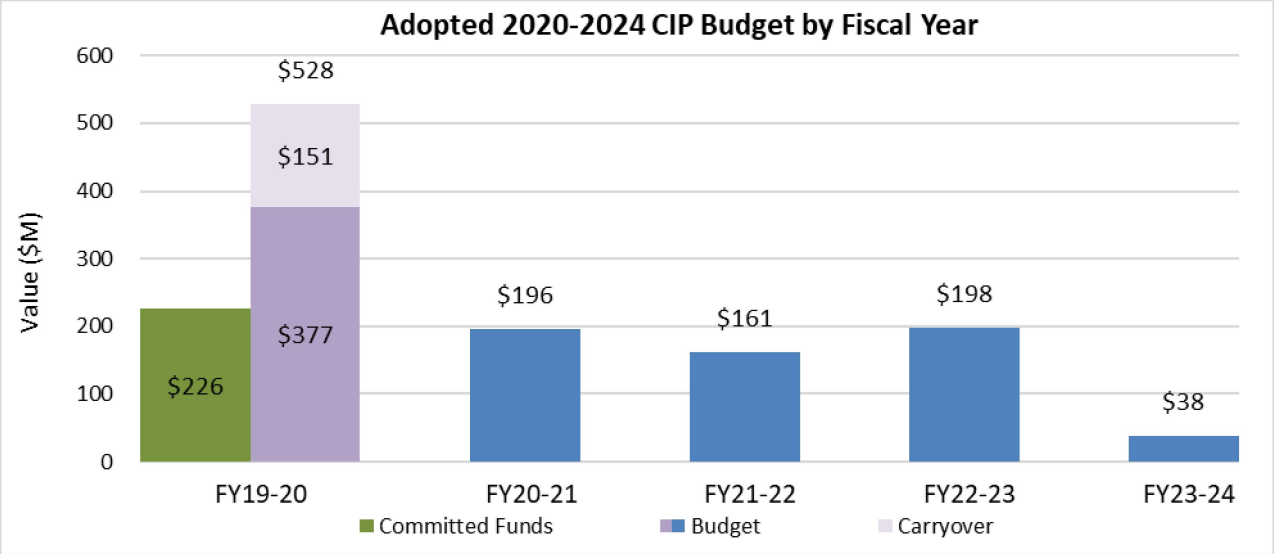
Notes

1. The Filter Rehabilitation and Storm Drain System Improvements projects passed Stage Gate 5: Authorization to Bid and Stage Gate 2: Confirm Project Alternative, respectively.
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 CIP does not anticipate accepting any projects this fiscal year.
5. The program fiscal-year-end value decreased as encumbrance timing on several projects shifted.
6. The City has appealed the environmental violation and is awaiting a response from the issuing agency.
7. 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.

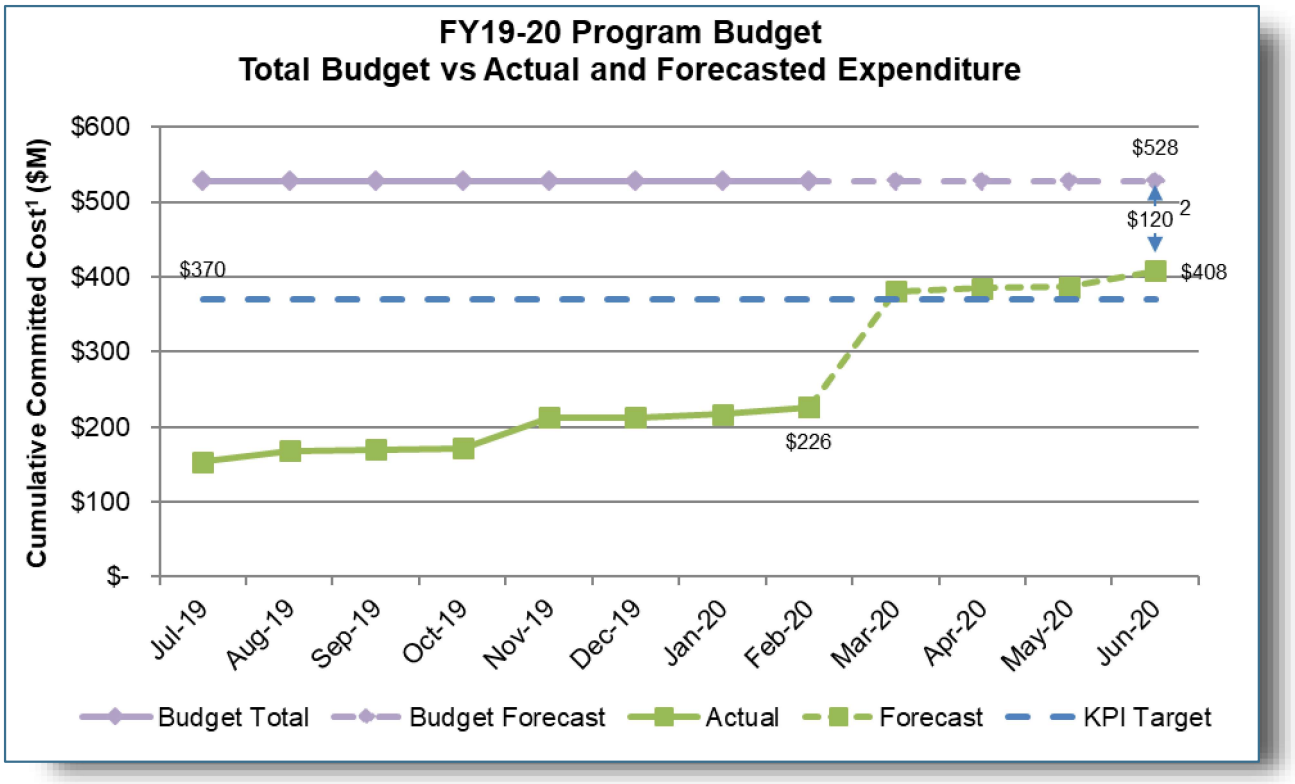
The FY19-20 budget is $401.5 million, which consists of $339.6 million in new funds, $61.9 million in rebudgets. For purposes of this monthly report, the adopted FY19-20 budget is adjusted from $401.5 million to $377.2 million due to the exclusion of certain appropriations that are not measured as part 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; City Facilities Emergency Power, 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 $151.0 million.

Budget of $377.2 million and carryover of $151.0 million totals $528.2 million for FY19-20.

Fiscal Year 2019-2020 Program Budget Performance

The FY19-20 CIP budget is comprised of approximately $377.2 million in new and rebudgeted funds, plus encumbered carryover of $151.0 million, for a total of $528.2 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; City Facilities Emergency Power; and Urgent and Unscheduled Treatment Plant Rehabilitation items. Overall, the forecast fiscal year-end committed funds exceed the fiscal year-end target by $40 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. Three construction contracts are now anticipated to be awarded in FY20-21 instead of FY19-20, based on updated schedules:
      i. Filter Rehabilitation Project
      ii. HVAC Improvements
      iii. 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. Facility Wide Water Systems Improvements Project preliminary engineering and value engineering
      iii. Flood Protection Project alternatives analysis and conceptual design
   c. The Yard Piping and Road Improvements Project was divided into multiple design-bid-build phases, resulting in different encumbrance points and values.
   d. Construction bids for the Nitrification Clarifiers Rehabilitation – Phase 1 and Advanced Facility Control and Meter Replacement - Phase 2 projects came in under budget.
   e. Several other minor encumbrances for consultant services are either lower than budgeted or are not anticipated to be awarded in FY19-20.
   f. Several authorized positions remain vacant, resulting in lower personal services expenses than budgeted.

Project Performance Summary

There are currently seven projects in the construction and post-construction phases and an additional 11 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. 96-Inch and 87-Inch Settled Sewage Pipe Rehabilitation	Construction	Jan 2021	●	●
4. Advanced Facility Control & Meter Replacement - Phase 1	Construction	June 2021	●	●
5. Switchgear M4 Replacement and G3 & G3A Removal	Construction	Jul 2022[3]	●	●
6. Blower Improvements	Construction	Sep 2022	●	●
7. Nitrification Clarifiers Rehabilitation – Phase 1	Construction	Jan 2023[3]	●	●

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 13.
3. The project construction Beneficial Use date will be baselined once the City issues the construction contract NTP letter.

Project Performance – Pre-Baselined Projects

Project Name	Phase	Estimated Beneficial Use Date[1]
1. Headworks	Design and Construction	Jun 2023
2. Digested Sludge Dewatering Facility	Design and Construction	Jan 2024
3. Fire Life Safety Upgrades	Bid/Award	Oct 2022
4. Advanced Facility Control & Meter Replacement - Phase 2	Bid/Award	Jan 2023
5. Outfall Bridge and Instrumentation Improvements	Design	Dec 2021
6. Filter Rehabilitation	Design	Jul 2023
7. HVAC Improvements	Design	Feb 2025
8. Yard Piping Improvements – Phase 1	Feasibility/Development	Nov 2021
9. Storm Drain System Improvements	Feasibility/Development	Sep 2023
10. Facility Wide Water Systems Improvements	Feasibility/Development	Jan 2025
11. Final Effluent Pump Station and Stormwater Channel Improvements	Feasibility/Development	May 2026

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

Digested Sludge Dewatering Facility Project

- As part of the project's centrifuge performance study, two manufacturers completed their centrifuge demonstrations with RWF digested sludge. The last demonstration will be performed next month.
- CIP & O&M representatives visited East Bay Municipal Utility District and the Union Sanitary District centrifuge facilities to learn more about the conveyor systems they have used.

Digester and Thickener Facilities Upgrade Project

- Contractor Walsh installed new sludge flow equipment concrete pads; electrical conduits; digester roof gas piping; digester gas dome; digester stairway; and digester overflow piping.
- At the new Sludge Screening Building, Walsh completed the HVAC ductwork and the screening bin room rollup door.
- Walsh installed hot water supply and return piping and digester gas piping on the new elevated pipe rack.
- In the DAFT Gallery, Walsh installed a sludge pump and instrument air lines to the last of six pressure flow tanks.

Facilities Package

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

- The City issued the NTP to contractor Michels Pipeline Construction to start the construction work.

Facility Wide Water Systems Improvements Project

- Consultant Kennedy/Jenks submitted the 50 percent design submittal for an exploratory trenching construction contract that will confirm locations of existing utilities. The final trenching plans are anticipated in May 2020.

Storm Drain System Improvements Project

- The project team received approval to proceed with conceptual design, which is expected to be completed by June.

Liquids Package

Advanced Facility Control and Meter Replacement – Phase 1 Project

- Contractor Overaa replaced and installed three new TSS meters and verified their performance. Next month, the contractor will perform functional testing in the secondary tanks and secondary clarifiers.

Advanced Facility Control and Meter Replacement – Phase 2 Project

- The City received two bids below the engineer's estimate and will recommend Council award the construction contract in June 2020.

Blowers Improvements Project

- Contractor Monterey Mechanical Company completed demolition of all five Tertiary Blower Building air baghouses.

Filter Rehabilitation Project

- The project advanced through Stage Gate 5: Authorization to Bid Stage Gate and anticipates advertising the construction contract in March, with bids due at the end of April.

Headworks Project

- Council approved the amended and restated design-build contract with CH2M. The 100 percent design is expected to be completed in October 2020 with Beneficial Use in June 2023.

Nitrification Clarifier Rehabilitation - Phase 1 Project

- Staff reviewed and returned the Contractor, Overaa's submittals/resubmittals including butterfly valves, stainless steel pipe, flow meters, electrical components, slide gate and telescoping valves, temporary facilities, and controls.

Power and Energy Package

Cogeneration Facility Project

- Design-builder CH2M installed and tested the backup battery system; cleaned and tested the new switchgear; and finished the site paving.

Explanation of Project Performance Issues

Digester and Thickener Facilities Upgrade Project

This project encountered numerous unforeseen conditions at the beginning of construction in 2016, including corroded underground pipe and other obstructions for new building foundations. A temporary reroute system was installed to enable replacement of a 78-inch settled sewage pipeline and junction structure during the 2018 dry season.

In 2017, design modifications were required to address seismic risks, control system changes, additional underground obstructions, pipe anchorage, and new fire department requirements. Discovery of hazardous materials required submittal of an extensive cleanup proposal to the federal Environmental Protection Agency (EPA) for approval. Once mitigation was completed in 2019, the City submitted another report to the EPA that detailed how it met each EPA cleanup permit requirement.

To pay for the additional work to address unforeseen conditions, Council approved a construction contingency increase of $15 million in November 2017 and another contingency increase of $25 million in June 2018.

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. To minimize further delays, the City and contractor have worked together to sequence several tasks so that they could be completed more quickly and efficiently.

Regional Wastewater Facility Treatment – Current Treatment Process Flow Diagram

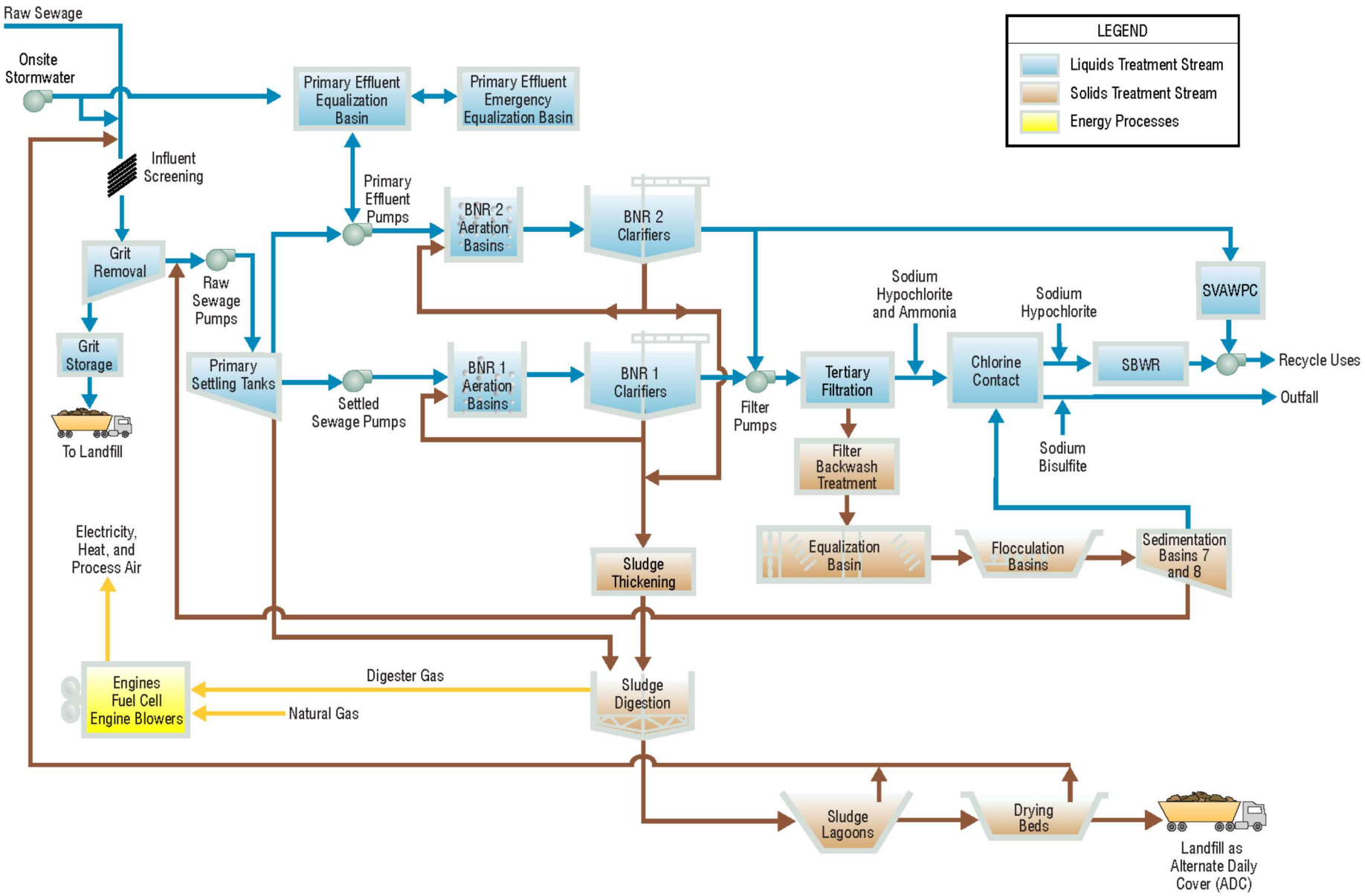


Figure 13 – Current Treatment Process Flow Diagram

Regional Wastewater Facility Treatment – Proposed Treatment Process Flow Diagram

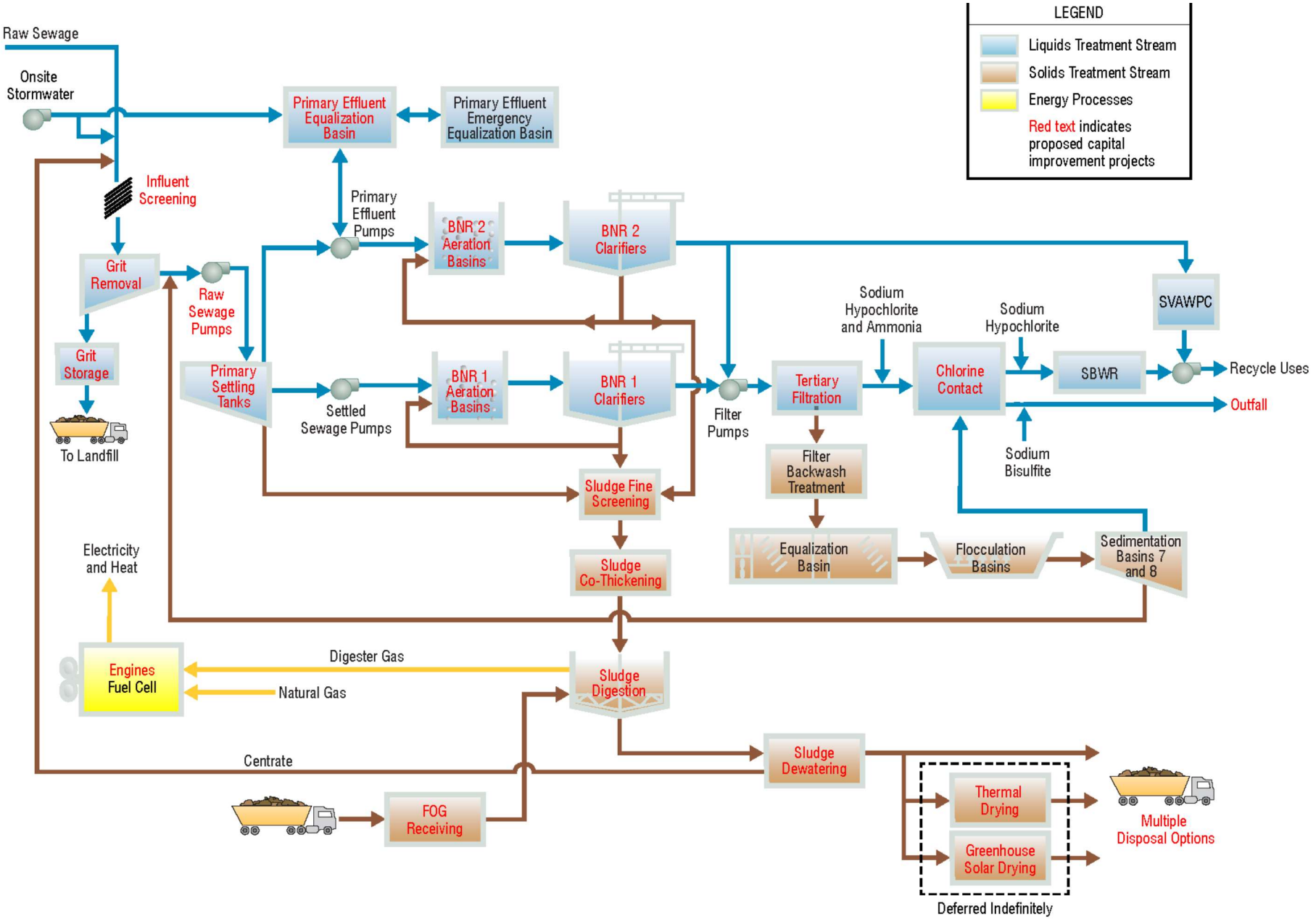


Figure 14 – Proposed Treatment Process Flow Diagram

Active Construction Projects – Aerial Plan

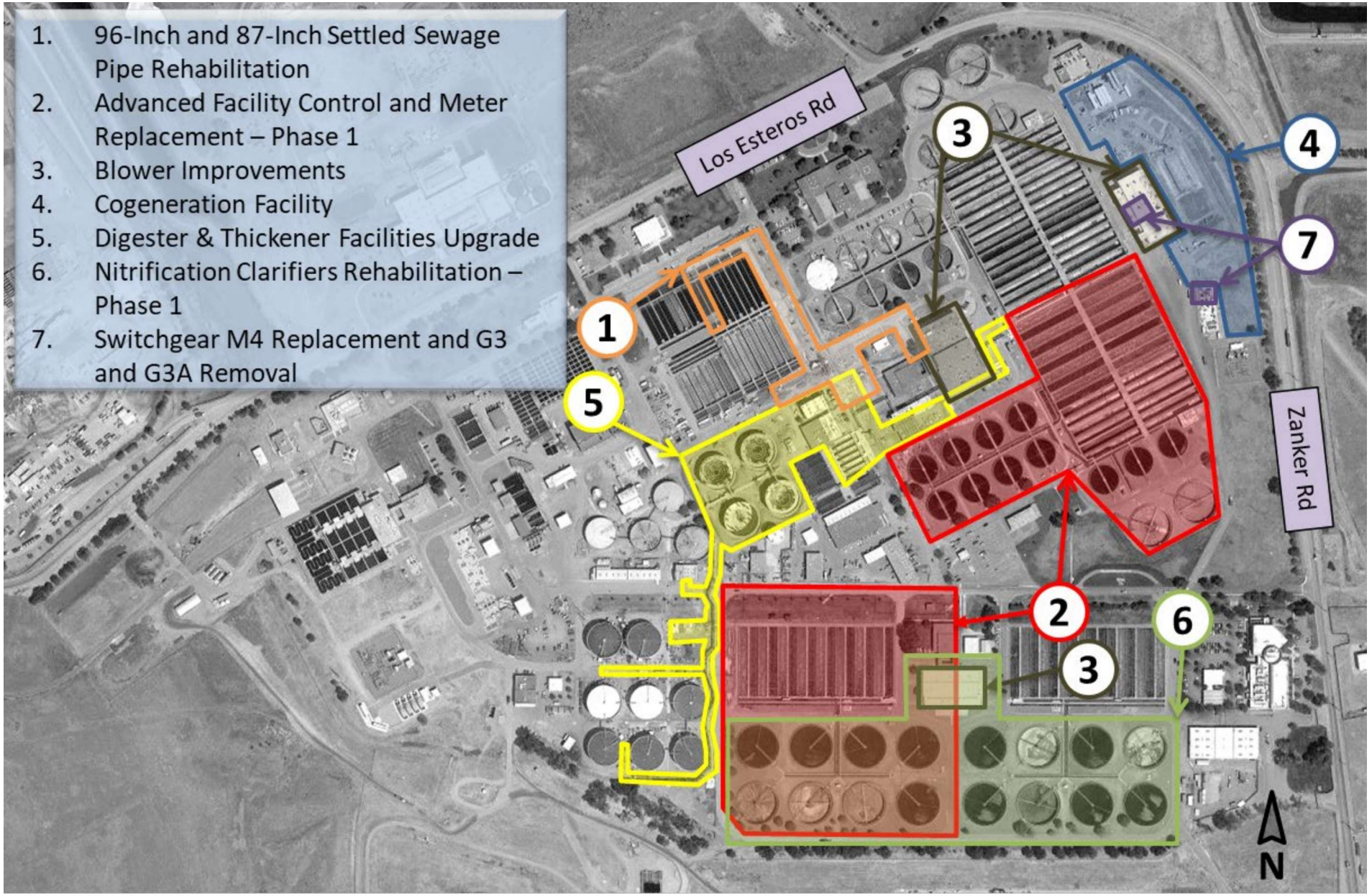


Figure 15: Active Construction Projects