

San José-Santa Clara Regional Wastewater Facility Capital Improvement Program



Semiannual Status Report July - December 2013



San José -
Santa Clara
Regional
Wastewater
Facility



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Eastward view of the secondary treatment tanks, which use bacteria to clean wastewater.

San José-Santa Clara Regional Wastewater Facility Capital Improvement Program Semiannual Status Report July - December 2013

I. Introduction

Report Objective and Contents

This report provides information on the implementation of capital improvement projects at the San José-Santa Clara Regional Wastewater Facility* (Facility). All projects discussed in the report are guided by the Plant Master Plan (PMP) and included in the 2014-2018 Adopted Capital Improvement Program (CIP). South Bay Water Recycling projects, which are not considered Facility projects, are not part of this report.

The projects discussed in the report are tracked in the Capital Project Management System (CPMS) database and fall under one of three classifications:

- **Construction Projects:** Capital improvement projects that are designed by City staff or consultants, then bid to a contractor for construction. Such projects may also be built by City staff, or by other entities through an agreement.
- **Non-Construction Projects:** Non-construction projects that may lead to the construction of capital improvements such as feasibility studies, pilot studies, and master planning efforts.
- **Public Art Projects:** The CIP also funds projects that involve public art installations; these projects may be associated with a specific capital improvement or may be part of a larger public art strategy with funding support from the CIP.

This report also describes the policy context that guides decision making; outlines accomplishments and specific issues; provides detailed summaries of project schedules and budgets; and highlights key projects in the CIP.

Facility Background

The Facility is a regional advanced wastewater treatment plant that serves eight South Bay cities and four special districts, including:

- City of San José
- City of Santa Clara
- City of Milpitas
- Cupertino Sanitary District (Cupertino)
- West Valley Sanitation District (Campbell, Los Gatos, Monte Sereno and Saratoga)
- County Sanitation Districts 2-3 (unincorporated)
- Burbank Sanitary District (unincorporated)

Jointly owned by the cities of San José and Santa Clara, the Facility is managed and operated by the City of San José's Environmental Services Department (ESD).



Facility groundbreaking, 1956

The Facility is the largest tertiary wastewater treatment plant in the western United States. Operating on a 24-hour schedule, 365 days per year, the Facility treats an average of 110 million gallons per day (mgd) of wastewater, has an average dry weather flow design capacity of 167 mgd, and peak hourly flow capacity of 271 mgd. The Facility's operational area occupies 180 acres of a 2,600-acre site at the southern edge of the San Francisco Bay.

Constructed in 1956 as a primary treatment plant for agricultural wastewater and a growing population, the Facility subsequently expanded in response to continued population and economic growth and to meet state regulations. Facilities for secondary treatment were constructed in 1964, followed by another expansion to tertiary treatment in 1979 to meet Clean Water Act regulations. Additional expansions included the South Bay Water Recycling facility in 1998, and the Silicon Valley Advanced Purification Center (SVAPC) in 2014, scheduled to commence operations this year in partnership with the Santa Clara Valley Water District (SCVWD).

** The legal, official name of the facility remains San Jose/Santa Clara Water Pollution Control Plant, but beginning in early 2013, the facility was approved to use a new common name, the San José-Santa Clara Regional Wastewater Facility.*

Importance to the Region and Environment

As the South Bay has grown, so has the critical importance of the Facility to the region. The Facility ensures that the wastewater it receives is cleaned to meet strict standards to protect public health and the environment. The Facility serves more than 1.4 million residents and approximately 17,000 businesses in an area greater than 300 square miles. South Bay communities depend on it to reliably protect their quality of life as well as safeguard wildlife habitat and Bay water quality. Businesses such as food service, automotive, metal finishing, photo processing, and manufacturing rely on the Facility to ensure that their wastewater is further treated to meet regulations. In protecting residents, businesses, and the environment, the Facility supports the local economy.

The Facility recycles about 10 mgd of its highly treated wastewater annually for use in landscape irrigation, industrial processes, cooling towers, and toilet flushing in certain commercial areas of San José, Santa Clara, and Milpitas. The recycled water program saves an average of 2.2 billion gallons of drinking water each year. This number is likely to grow as advanced treatment for recycled water becomes available through the SVAPC.

Facility Energy Accomplishments

- **2010:** The Facility was honored with a Green California Leadership Award for its energy innovations.
- **2009:** The federal Environmental Protection Agency included the Facility in a nationwide list of the top 10 on-site alternative energy producers and users.

The Facility generates up to 75 percent of its own energy, an important contribution to local air quality and energy reliance efforts. Like other similar plants, the Facility is a large energy user. Its secondary treatment aeration process, followed by pumping and heating, represent two major sources of demand. The Facility's daily energy demand can range from 8 to 11 megawatts (MW). By using on-site power generation equipment and a blend of digester, landfill, and natural gases, the Facility can produce as much as 8 MW of power daily. In the future, new biosolids dewatering and thermal drying facilities will create additional power demands; however, these increases can be largely offset by secondary treatment improvements to reduce aeration demands. The Facility has been recognized for its energy accomplishments, and will continue working towards the City's Green Vision goal of 100 percent energy self-sufficiency by 2022, to the extent feasible.

Infrastructure Condition Assessment and PMP

Most of the Facility's infrastructure is now more than 50 years old and has exceeded its useful life, with repairs needed to every process area. Still, the Facility must continue to provide uninterrupted service and meet the strict requirements of more than 18 federal, 13 state, and four regional regulations for treated wastewater discharge, use of recycled water, disposal of biosolids, air emissions, safety requirements, and land use controls. The Facility's key role as protector of public and environmental health underscores the critical need for infrastructure rehabilitation and replacement.

In 2007, the Facility completed an Infrastructure Condition Assessment report that identified nearly \$1 billion in needed projects to refurbish its aging electrical, mechanical, and structural assets. The report recommended \$250 million in immediate critical repairs to the Facility's electrical and solids digestion systems and \$750 million in other significant but lower-priority capital replacements. The report also identified a funding gap of approximately \$40 million annually, based on a recommended capital reinvestment level of \$250 million per five-year CIP cycle to address decades of deferred maintenance.

Rebuilding and improving the Facility is among the largest public works efforts in the South Bay's history.

As the assessment study focused only on existing condition deficiencies, staff recommended the development of a master plan that would address how the different treatment processes interrelate, the impacts of future regulations, changes to flow and loads, risks from rising sea levels, and opportunities for implementing new technology or process optimization.

In late 2007, the San José City Council and the Treatment Plant Advisory Committee (TPAC) approved a consultant agreement to develop a Plant Master Plan (PMP). A Steering Committee comprised of staff from the cities of San José, Santa Clara, and the tributary agencies guided the three-year planning process, with extensive technical oversight and stakeholder input. The project team provided regular updates to TPAC and San José's Transportation and Environment Council Committee (T&E). This work resulted in the Draft PMP Preferred Alternative, approved by TPAC and the City Council in April 2011.

A Draft Environmental Impact Report (DEIR) on the Draft PMP was circulated for public review and amended in 2013. In November 2013, San José's Planning Commission certified the EIR, and the San José City Council formally adopted the EIR and the PMP. The Santa Clara City Council adopted the documents in December 2013. The PMP is now being implemented.

II. Program Overview

The PMP envisions approximately \$2 billion in investments over the next 30 years to rebuild and modernize the Facility, with more than \$1 billion occurring in the first 10 years.

Project Criteria. Capital projects recommended by the PMP were evaluated and prioritized based on six criteria:

1. **Infrastructure condition:** Risk of failure requires repairs or rehabilitation
2. **Regulatory requirements:** Future regulations require new or modified infrastructure
3. **Economic benefit:** Opportunities exist to save operations and maintenance costs by modifying or replacing infrastructure
4. **Improved performance benefit:** Modifying or replacing existing infrastructure improves reliability or treatment performance
5. **Increased flows or increased loading:** Increased flows trigger the need for additional infrastructure
6. **Policy decision:** Policy direction triggers improvements

Capital Improvement Program

The table below summarizes all PMP-recommended projects by process area over the 30-year planning period. These recommendations are considered each year as part of five-year CIP development. Over the next six months, a program management consultant hired by the City in September 2013 will perform a detailed review and validation of PMP projects. The consultant will also recommend updated five- and 10-year CIPs and a long-term rate and financing strategy for the capital program. The 2014-2018 Adopted CIP for the Facility is shown on page 25, with highlights of selected capital projects on page 18.

Process Area	PMP Cost Estimate
1. Preliminary Treatment Projects	\$151.2 M
2. Primary Treatment Projects	\$150.4 M
3. Secondary Treatment Projects	\$240.0 M
4. Tertiary Treatment Projects	\$201.0 M
5. Biosolids	\$518.6 M
6. Electrical Systems and Power Generation	\$198.8 M
7. Advanced Process Control and Automation Systems	\$9.8 M
8. Site Facility Improvements	\$599.5 M

Program Management Strategy

In September 2013 ESD began implementing a program management strategy designed to meet the objectives outlined in the PMP. The strategy, which builds on earlier work, serves as a transition between the high-level PMP and an implementable capital program. It moves forward with new tools to develop a validated program that gains efficiencies with greater consistency, control, and monitoring. Key tools include a project delivery model and a project validation process, described in detail below.

The strategy uses outside consultants and technical experts to:

- Develop alternative implementation strategies;
- Address construction sequencing for uninterrupted Facility operations; and
- Provide additional expertise in light of current staff vacancies at the Facility.

Strategy elements include:

- Partnering with the City's Public Works Department to optimize capital project delivery;
- Hiring expert consultants to advise and assist with program management, provide technical direction and coordinate design/bid/build and design/build procurements; and
- Implementing a phased approach that schedules CIP projects to minimize disruptions to Facility operations, lower the risk of permit violations, meet the Facility's good neighbor goals, and manage rate impacts.

A program management team comprised of City staff and consultants is now located at the Facility to manage the program, share knowledge, and coordinate with Facility staff. This integrated team provides program support, including design and construction management, cost estimating, scheduling, document management, budgeting, and reporting.



Don Edwards National Wildlife Refuge

New project delivery tools will help bring critical projects to reality with greater efficiency.

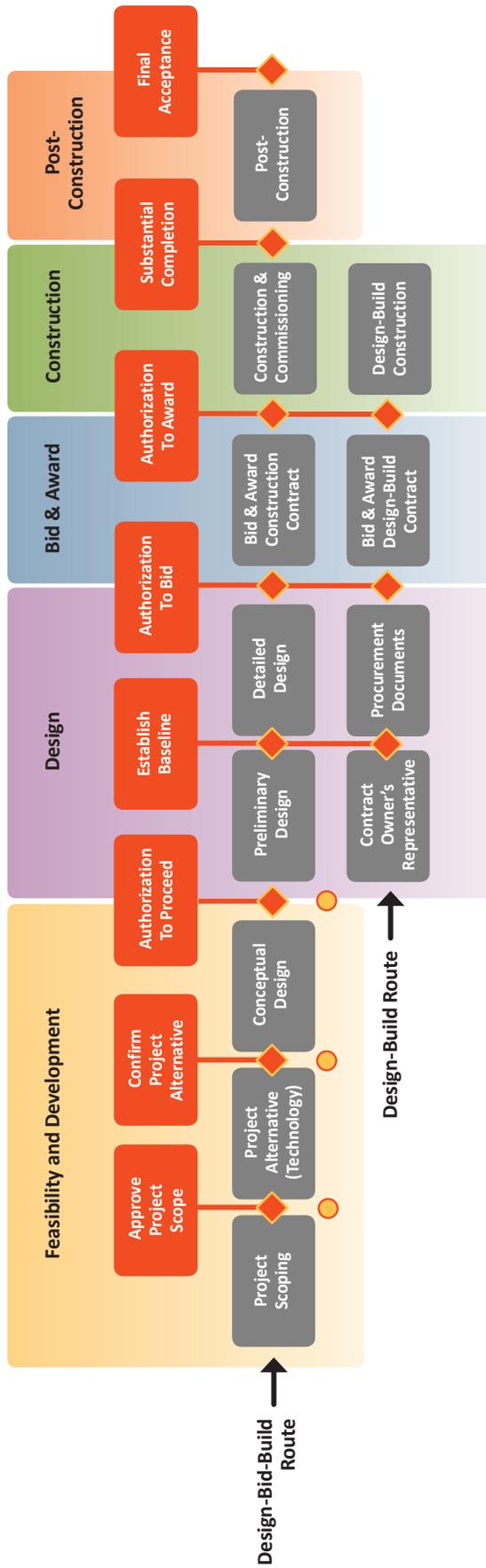
Project Delivery Model

For the CIP, which has multiple complex projects, an over-arching project delivery model (PDM) is needed to ensure a consistent approach to planning, approval, alignment, and control. As shown in Figure 1 on page 8, the PDM established by ESD consists of the following components:

- **Life cycle:** A series of project stages laid out in chronological order, with each stage broken down into individual activities.
- **Governance framework:** Approval points, or “gates,” between stages that confirm project alignment with CIP goals and objectives and provide clear direction for advancement to the next stage.
- **Value management:** Points in the life cycle that ensure the project scope and solution provide the maximum value for the project and overall CIP.

All CIP projects are required to follow the PDM, which is designed to improve project delivery consistency and create efficiencies across the CIP.

Figure 1 — CIP Project Delivery Model



Key

- Stage Gates
- Stages
- Optional Points to Hire Consultant and/or Redirect Project

Project Validation

The project validation process, launched in October 2013, is a systematic approach to project identification, prioritization, and sequencing that uses combined knowledge from City and consultant engineering, the Facility's Operations and Maintenance Division (O&M), and executive leadership. The integrated program management team is applying the process to all 114 of the PMP's recommended projects.

The objective of project validation is to decide which PMP projects will be included in the Facility's capital program. The goal: revised five- and 10-year CIPs.

As part of the process, the program management team is reviewing current PMP studies, as well as other projects initiated since the PMP was completed. The team also obtained additional input on Facility needs to develop the revised CIPs. The project validation process schedule is being driven by ESD's five-year CIP budget submittal deadline of February 5, 2014.

A validation team with representation from staff and the CIP program consultant is leading the process in each of four key areas:

- Liquid treatment
- Solids treatment
- Energy and automation
- Plant-wide facilities

Working Groups for each of these areas will lead project development and review activities throughout the validation process. To develop the revised CIPs, these groups will use a six-step process that includes workshops at each step to review progress and receive input from senior leaders.



Team members collaborate in a working group meeting.

III. Program Accomplishments and Challenges

Several capital program milestones were achieved during the first two quarters of FY 2013-2014, including completion of two projects:

RSM Supernatant Ammonia Management

Start date: April 2010

Baseline completion date: August 2013 **Actual completion date:** November 2013

Baseline budget: \$507,900 **Actual expenses:** \$504,875

Original contract amount: \$298,900 **Approved change orders:** \$43,720

This project installed flow measuring devices, flow control valves, and other instrumentation to improve efficiency in monitoring and managing the supernatant flow from the residual sludge management area to the headworks. Supernatant is the liquid layer that naturally forms over the sludge lagoons as a result of precipitation and settling of solids.

Street Rehabilitation – Phase 2

Start date: July 2012

Baseline completion date: April 2014 **Actual completion date:** December 2013

Baseline budget: \$443,600 **Actual expenses:** \$450,046

Original contract amount: \$279,598 **Approved change orders:** \$23,379

This project was the second phase of a multi-phased rehabilitation of the Facility's five miles of streets and access roads. Phase 2 rehabilitated approximately 2,600 linear feet (LF) of pavement along Main Street, from the main gate to Center Street.



Rehabilitated Facility street provides safer access.

Additional Accomplishments

- Two service orders totaling \$800,000 were awarded under existing master agreements to initiate consultant work on Filtration Building B2 and B3 Valve and Pipe Replacement, and on a feasibility study and contracting strategy for Biosolids Transition.
- On September 24, 2013, the City Council approved a consultant contract for a program management firm to provide a broad array of services and program tools to manage the capital program. Key services in the contract include validating existing and proposed CIP and PMP projects and establishing program-wide standards and systems, including budgetary and schedule controls.
- On October 8, 2013, the City Council approved a consultant contract for engineering design, construction support, testing, and commissioning services for the Digester and Thickener Facilities Upgrade project.
- In December 2013 the project definition report for the New Cogeneration Facility was completed.
- On December 16, 2013, the City Manager approved a one-year extension to a consultant contract for a program technical coordinator to lead coordination and communication between the Facility's O&M and CIP staff for optimal CIP implementation.
- Staff made significant design progress on several projects including Digester Gas Compressor Upgrade, Digester Gas Storage Replacement, Emergency Diesel Generators, BNR 2 Clarifier Guardrail Replacement, and Fire Main Replacement - Phase 3.
- As part of the intense program startup phase, the program management team and staff conducted or participated in more than 25 workshops to develop the PDM, program execution plan, and various program systems and tools.
- On August 28, 2013, ESD hosted a career exploration fair to provide information about job opportunities at the Facility. Facility and Human Resources staff met with 121 attendees to provide information on specific positions and how to apply for them.

Challenges

For successful delivery of the large and complex Facility CIP, staff must meet the following key challenges:

- **Recruit and fill key vacancies** – Experienced project managers, designers, and process engineers; O&M staff; and additional program support staff are critical to program success. Some of these staff are already in place; however, a number of vacancies in both the CIP and O&M divisions still need to be filled. Recruitments are underway with the recognition that new staff will need time and training to become completely familiar with the Facility, its systems and operations.
- **Build foundational systems** – Key systems are required for long-term success and effective CIP oversight. Schedule and budget control, document management, and asset management systems are all needed. Development and rollout of these systems will present some initial challenges. However, with training and continued use, the systems should promote accountability, efficiency, and improved planning and decision making.
- **Develop program delivery processes** – Clear governance, processes, and procedures are needed to manage risk and provide a standard approach for effective and efficient program and project delivery. Standardized project delivery tools; design standards and specifications; control system and integration strategies; startup; commissioning; and training procedures are being developed, but will require training and practice.

To address these challenges, the integrated program management team is collaborating on efforts including:

- Establishing the program management plan and office;
- Validating and prioritizing the 114 PMP-recommended projects, including conducting gap analyses and construction sequencing reviews; and
- Developing communications and program decision-making protocols.

Other significant challenges include exploring financing options and alternative delivery methods, including obtaining design-build authority for implementation of several projects.

IV. Capital Project Performance

Performance Measures

A key goal of this Semiannual Status Report is to provide regular updates on project performance based on schedule and budget commitments. Project schedules and budgets described in this report follow the same definitions and conventions as the Citywide CIP Annual Status Report.

Schedules

Baseline schedules are established as a commitment for delivery and a measurement of on-time project delivery performance. Project schedules are set once project scope and requirements have been established, and fall into one of the following categories:

- **On schedule:** Projects are considered to be on schedule if completed within two months of the committed completion date. Projects are also in this category if no schedule commitment existed prior to this report.
- **Extended schedule:** Projects have extended schedules if they are running more than two months behind the committed delivery date.
- **Schedule reset:** Project schedules are reset when committed schedules are no longer feasible as a result of significant changes in scope, bid protests, or Council-directed reprioritization. This reset process occurs as part of the City Council's consideration of the Citywide Annual CIP Status Report.
- **Schedule pending:** Projects that do not have schedules at the time of this report are noted as pending. The schedules for these projects are uncertain due to incomplete scoping, community concerns, or funding issues.
- **Schedule on hold:** Project schedules that have been deferred are placed on hold.

Phases

CIP projects are described as progressing through the following phases:

- **Planning:** Work can include condition assessments, pilot tests, feasibility studies, scope development, preliminary engineering, and environmental clearance.
- **Design:** Work can include preparation and review of plans and specifications, selection and management of consultants, and project coordination.
- **Bridging Documents:** These documents and drawings describe all components that go into building, and are designed to give each design-build bidder a clear understanding of what the Facility requirements are on a given project.
- **Bid and Award:** Work can include bid advertisement, pre-bid meetings, preparation of addenda, evaluation of bids, and recommendation for award.
- **Construction:** Work can include execution of contract and issuance of the Notice to Proceed, construction management, and construction inspection.
- **Design-Build:** A combination of design and construction phase tasks performed by the design-build contractor, based on plans and specifications developed during the bridging documents phase.
- **Post-construction/startup:** Work can include final inspection, project closeout, warranty tracking and documentation, operations and maintenance training, startup, and commissioning.

Budgets

Baseline budgets are established as a commitment for delivery and a measurement of on-budget project delivery performance. Project budgets are generally established once the project scope is complete and a schedule has been determined. Projects are considered on budget if total project costs are within 1 percent of the established baseline budget. The baseline budget may differ from the CIP budget in that baseline budgets may include funding that has not yet been identified and appropriated by the San José City Council. Any resets of baseline budgets will occur during Council consideration of the Citywide Annual CIP Status Report.

Performance Summary

Table 2 shows active projects by phase. Nine projects are in the Conceptual Planning phase, which precedes the Planning phase. These projects do not yet have detailed scopes, schedules, or budgets. In order for a baseline schedule and budget to be established, a project in the Conceptual Planning phase will require further clarification and refinement of project goals; environmental clearance; and engineering analysis, such as feasibility studies and technology evaluations. Projects in the Conceptual Planning phase are included in **Table 3** on page 17.

In addition, a summary chart of current active projects with budgets and schedules is provided on the next page in **Figure 2**.

The Facility's CIP projects have been renumbered according to the Capital Project Management System (CPMS). This system links interested viewers to a web-based database that provides greater detail on projects. The CPMS can be accessed at: <http://sanjoseca.gov/index.aspx?NID=295>

Table 2 — Active Projects by Phase	
Project Phase	Number of Projects
Conceptual Planning	9
Planning	1
Design/Bridging Documents	11
Bid and Award	0
Construction	5
Design-Build	0
Post-Construction/Startup	1
Total	27



Clarifier tanks help settle solids during the secondary treatment process.

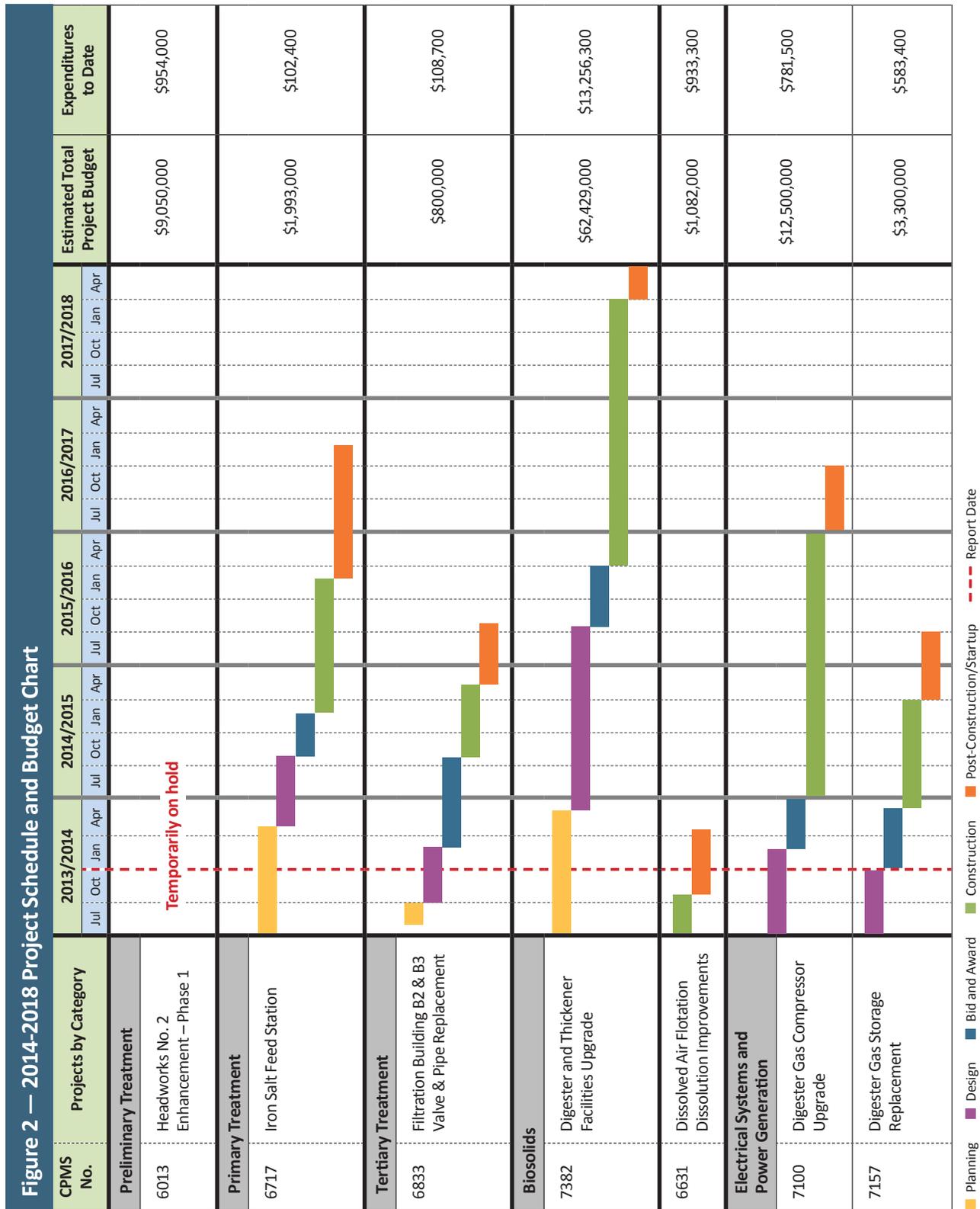
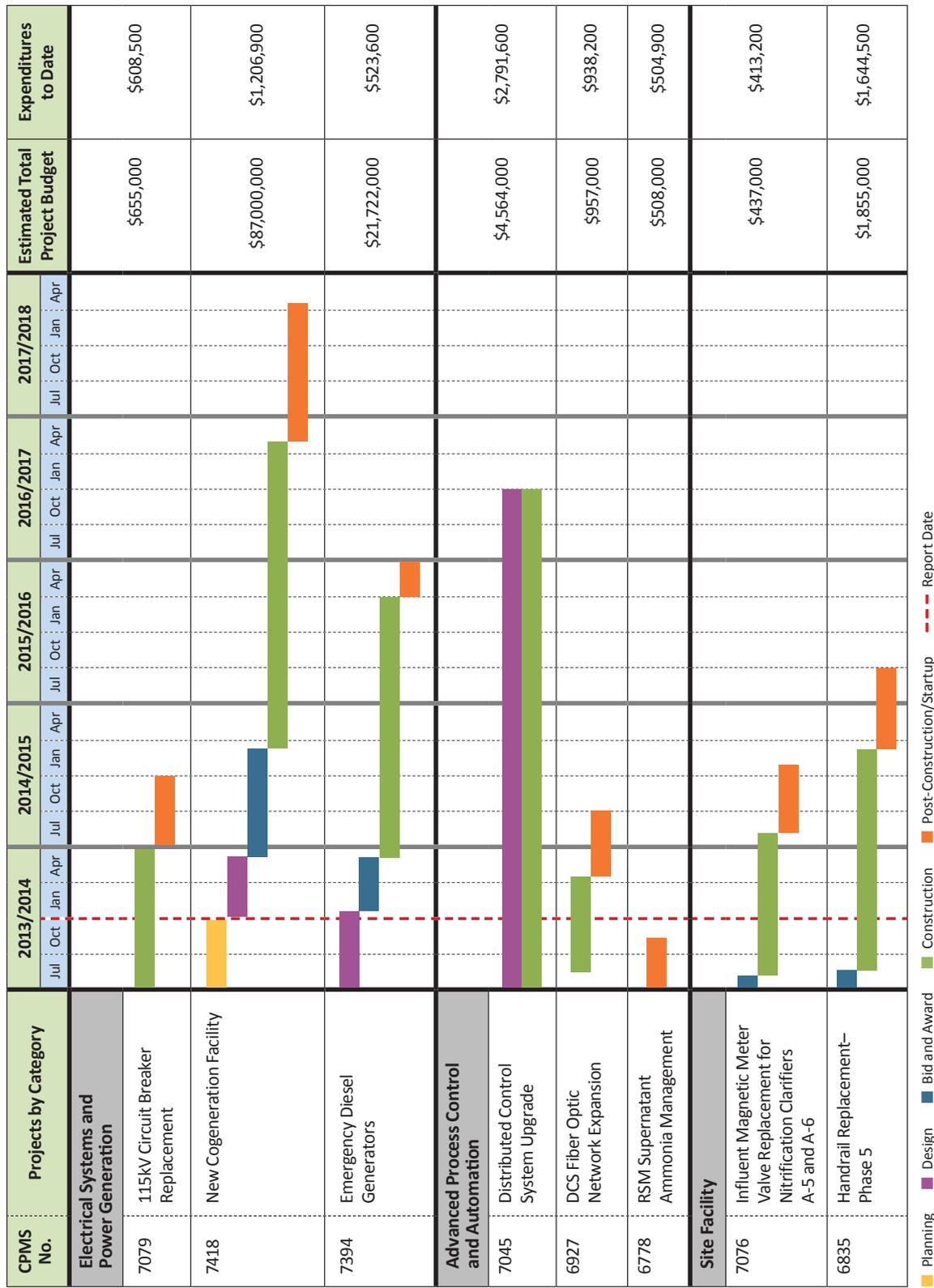


Figure 2 continued from page 14



■ Planning
 ■ Design
 ■ Bid and Award
 ■ Construction
 ■ Post-Construction/Startup
 --- Report Date

Figure 2 continued from page 15

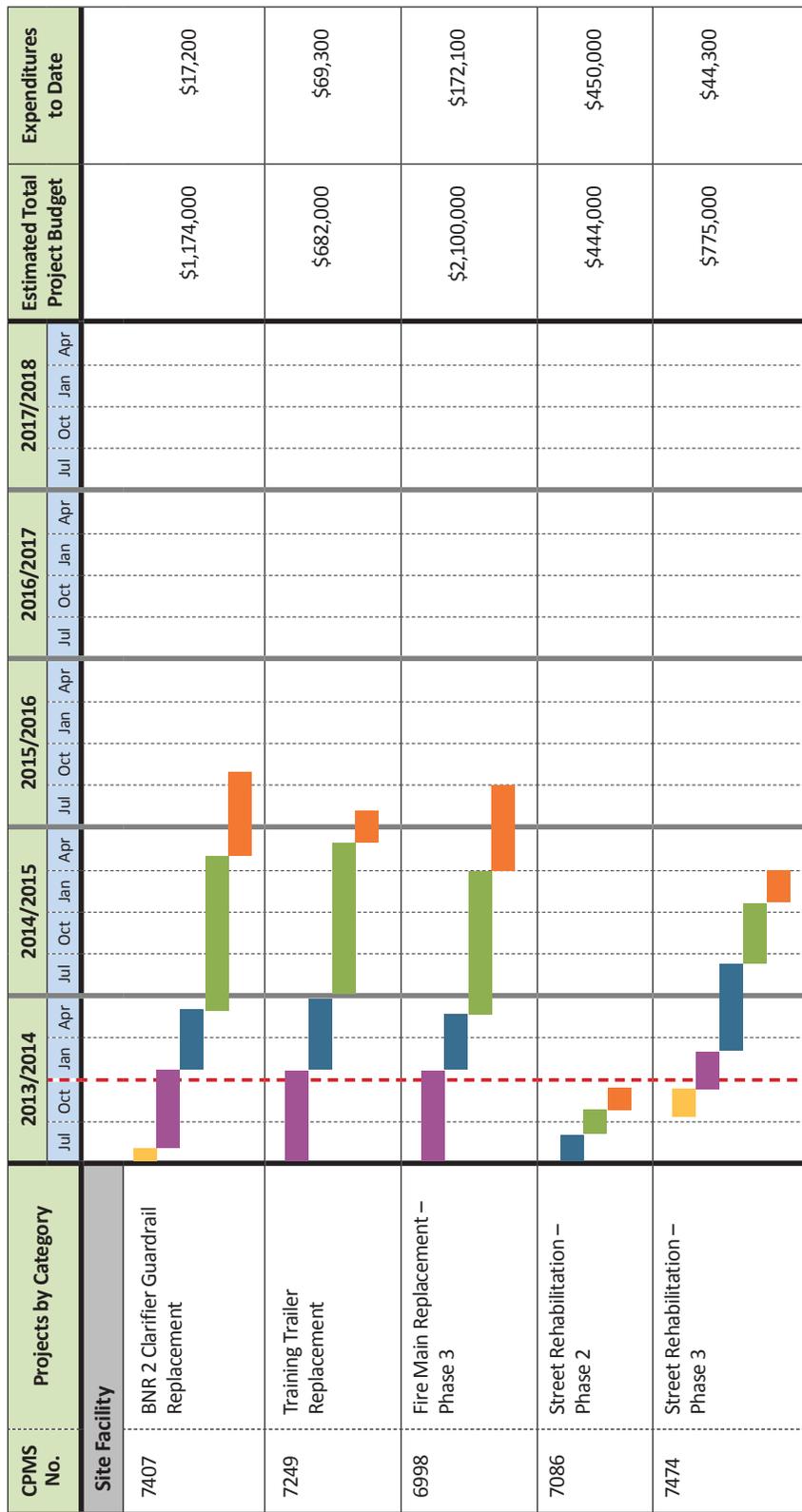


Table 3 – 2014-2018 Project Schedule and Budget – Conceptual Planning

Project by Category	Adopted Project Budget
Preliminary Treatment	
Headworks No. 1 Repair and Rehabilitation	\$5,975,000
Headworks No. 2 Expansion	\$79,400,000
Primary Treatment	
East Primary Rehabilitation	\$82,025,000
Secondary Treatment	
Biological Nutrients Removal 1 and 2 Connection	\$14,486,000
Secondary and Nitrification Clarifier Rehabilitation	\$39,724,000
Tertiary Treatment	
New Filter Complex	\$134,000,000
Biosolids	
New Biosolids Facility	\$326,000,000
Electrical Systems and Power Generation	
Switchgears S40, G3 & G3A, and M4 Controls Upgrade	\$2,500,000
Advanced Process Control & Automation	
Plant-wide Flowmeter Replacement Program	\$6,250,000

V. Capital Project Highlights

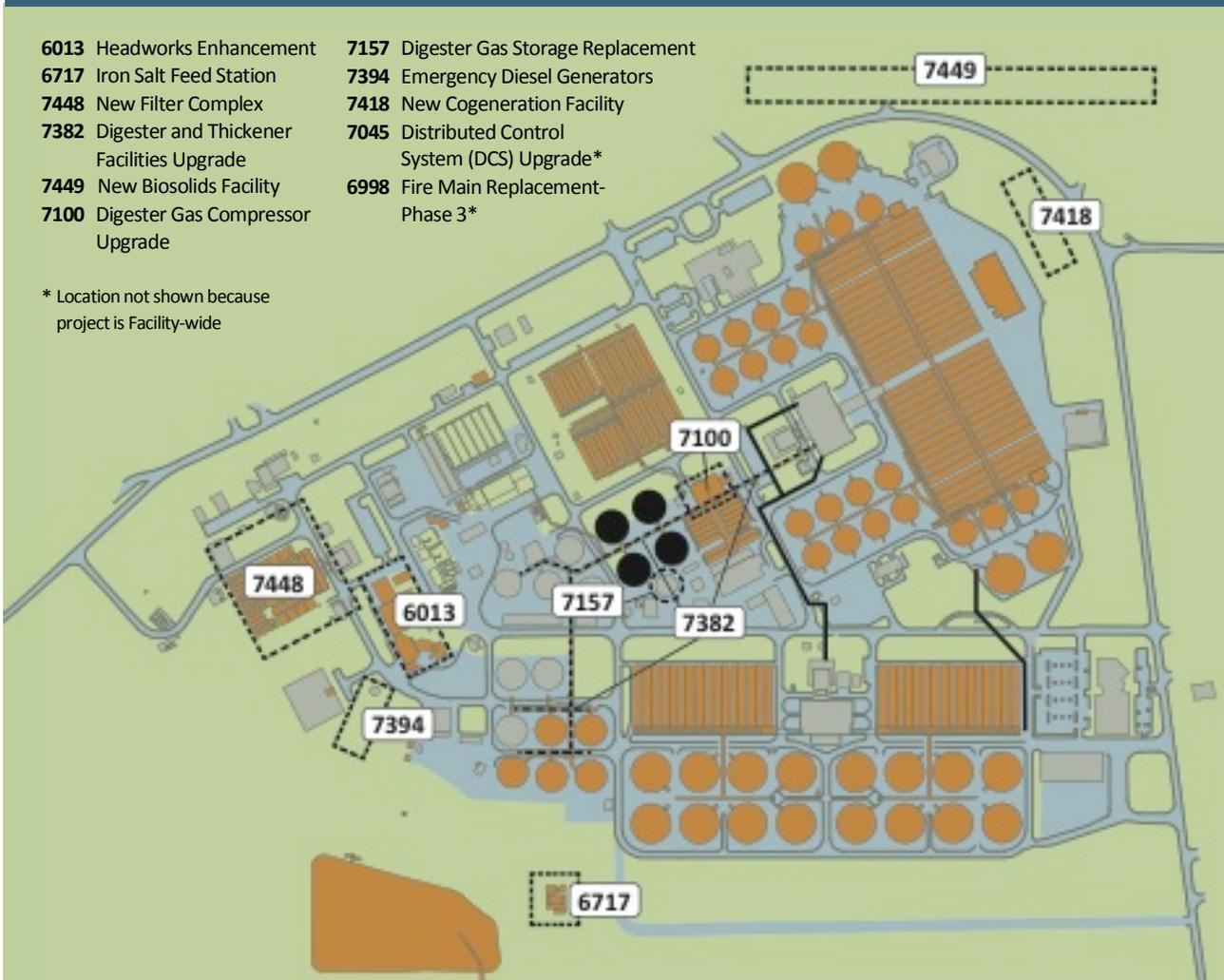
This section provides a detailed look at selected CIP projects and key Facility improvements. These projects showcase work that is critical to ongoing Facility operations. Some, like the New Cogeneration Facility project, also pave the way for continued innovation and efficiency in how the Facility produces and uses energy.

Figure 3 below shows the location of each project at the Facility site.

In addition to information on project description, benefits, status, schedule, and budget, each page in the highlights section shows a budget estimate level. Capital project budget estimate levels are defined as:

- **Program level:** Created for long-term planning and initial feasibility studies; level of certainty plus or minus 35 percent.
- **Preliminary level:** Based on planned sizes of buildings and functional areas, not formal engineering work; level of certainty plus or minus 20 percent.
- **Budget level:** Based on current scope and schematic design work derived from previous similar projects; level of certainty plus or minus 10 percent.
- **Engineer's level:** Based on final construction plans and specifications; level of certainty plus or minus 5 percent.

Figure 3 – Locations of Highlighted Projects





Headworks bar screens

Headworks No. 2 Enhancement Phase 1

Estimate Type: Budget Level
Current Project Budget: \$9,050,000
CPMS No. 6013

Description

This project will make enhancements to Headworks No. 2 so that it can serve as the main headworks until a new headworks facility comes online. Phase 1 work will include mechanical upgrades, construction of a new connection pipeline, and rerouting of recycle and other process water flows that currently connect to Headworks No. 1.

Current Status

A third-party feasibility report completed in December 2013 identified improvements to Headworks No. 2 for reliable short- and long-term preliminary treatment, and alternatives for future expansion of the headworks capacity. This project is currently on hold while staff evaluate these alternatives and consider how to incorporate the report's recommendations.

Next Milestone

Complete project definition report: *Fall 2014*



Dosing station

Iron Salt Feed Station

Estimate Type: Program Level
Current Project Budget: \$1,993,000
CPMS No. 6717

Description

This project will design and construct a chemical dosing station to add iron salt and polymer to incoming wastewater. Iron salt helps control the formation of hydrogen sulfide gas, reduce corrosion and odor, and enhance the settling of sludge. Hydrogen sulfide gas is sometimes present at high levels in the Facility's digesters, and is a potential air quality problem. Work will include construction of a chemical feed station and a concrete containment structure, as well as installation of pumps, piping, and instrumentation to dose and deliver the iron salt solution.

Current Status

Negotiations for consultant services are underway.

Next Milestone

Issue service order for design services: *Spring 2014*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>



Disc filters

New Filter Complex

Estimate Type: Program Level
Current Project Budget: \$134,000,000
CPMS No. 7448

Description

The Facility's 1970s-era gravity filters need to be refurbished or replaced with more efficient and advanced filter technologies. This project will evaluate and potentially pilot test one or more new replacement filter technologies in advance of a full-scale transition to a new filter complex.

Current Status

An October 2013 feasibility study evaluated new filter technologies and compared costs for a new filter complex with refurbishing the existing building. The study found these costs to be equivalent and recommended a detailed condition assessment to further evaluate the refurbishment requirements for the existing building.

Next Milestone

Detailed condition assessment of the existing filter complex: *Fall 2014*



Digesters

Digester and Thickener Facilities Upgrade

Estimate Type: Budget Level
Current Project Budget: \$62,429,000
CPMS No. 7382

Description

The Facility has 16 anaerobic digesters constructed between 1956 and 1983. Six of these digesters are out of service due to age and condition; all are more than 30 years old. The first phase of this project will rehabilitate four digesters (Nos. 5, 6, 7, and 8), including installing new covers and mixing systems; heating system and gas collection system upgrades; structural and seismic retrofits; electrical, instrumentation, and control system upgrades; and dissolved air flotation thickeners modifications to allow for sludge co-thickening, including new odor control.

Current Status

A design contract was awarded in October 2013. The conceptual design phase for the project is underway.

Next Milestone

Design completion: *Fall 2015*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

BIOSOLIDS



Lagoon for drying sludge

New Biosolids Facility

Estimate Type: Program Level
Current Project Budget: \$326,000,000
CPMS No. 7449

Description

The Facility currently manages its post-digestion biosolids through stabilization lagoons and open-air drying beds prior to shipping the sludge to a nearby landfill for use as an alternative daily cover. With the imminent closure of the landfill, the City is studying its disposal options. Covered mechanical dewatering and drying of sludge, coupled with new odor treatment technologies, would increase these options and reduce odor impacts to surrounding communities.

Current Status

A consultant has been hired to assist with scope definition and project delivery approach. Because this project is being evaluated as part of the project validation process, a detailed schedule and budget is not yet available.

Next Milestone

Complete project definition report: *Summer 2014*

ELECTRICAL SYSTEMS AND POWER GENERATION



Existing digester gas compressor

Digester Gas Compressor Upgrade

Estimate Type: Budget Level
Current Project Budget: \$12,500,000
CPMS No. 7100

Description

The Facility operates three digester gas compressors located in the Sludge Control Building: two smaller gas compressors installed in 1964, and one installed in 1984. The two older compressors are increasingly unreliable and difficult to maintain. The newer compressor is also nearing the end of its useful life due to continuous use. This project will construct an approximately 4,400 square-foot (SF) structure to house two new gas compressors.

Current Status

The prequalification process to select design-builders has been completed.

Next Milestone

Award project: *Spring 2014*
Construction start: *Summer 2014*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>



Gas holder

Digester Gas Storage Replacement

Estimate Type: Budget Level
Current Project Budget: \$3,300,000
CPMS No. 7157

Description

The Facility has an existing digester gas holding tank that was originally built in 1984. The tank's gas holder experienced two failures, one in 2002, and one in 2012. A structural evaluation during the 2012 failure revealed the gas holder cover skirt was damaged beyond repair. This project will demolish and replace the existing wet seal gas holder with a new dry seal gas holder. The new gas holder will be located at the same site as the existing gas holder.

Current Status

The design was completed in December 2013. Contract documents have been developed and a request for bids is scheduled to advertise in January 2014. Bid opening will be in February 2014.

Next Milestone

Award project: *Spring 2014*
 Construction start: *Summer 2014*



1.5 MW standby generator

Emergency Diesel Generators

Estimate Type: Program Level
Current Project Budget: \$21,722,000
CPMS No. 7394

Description

This project was recommended in the 2012 Energy Management Strategic Plan for energy reliability in the event of power loss. The project will install four emergency diesel generators with capacity of 3 MW each. The generators will automatically start and energize the Facility's ring bus electrical distribution system within five minutes after a power outage. The generators will be located south of Substation 1, in the southwest area of the Facility, and will connect to the M3 switchgear.

Current Status

The project will be bid as low-bid/design-build. The contractor prequalification process was completed in December 2013 and bridging documents were completed in January 2014. The project bid process is underway, with bid opening scheduled for March 2014.

Next Milestones

Award project: *Spring 2014*
 Construction start: *Summer 2014*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

ELECTRICAL SYSTEMS AND POWER GENERATION



4 MW advanced internal combustion engines

New Cogeneration Facility

Estimate Type: Program Level
Current Program Budget: \$87,000,000
CPMS No. 7418

Description

Improvements will include a new cogeneration building that will house four advanced 4 MW internal combustion engines. The engines' fuel source will be a blend of Facility digester gas and natural gas. Additional improvements include a gas treatment system, a new gas conveyance pipeline, emissions controls, system controls, and maintenance spaces.

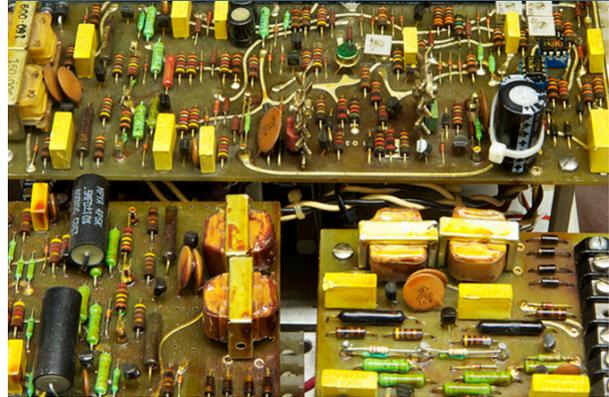
Current Status

The project definition report was completed in December 2013. Staff are currently developing the request for qualifications/proposals (RFQ/RFP) documents for a design-builder to construct the project.

Next Milestone

Obtain design-build authority:	Spring 2014
Issue RFQ/RFP for design-builder:	Summer 2014

ADVANCED PROCESS CONTROL AND AUTOMATION



Distributed control system

Distributed Control System (DCS) Upgrade

Estimate Type: Budget Level
Current Project Budget: \$4,564,000
CPMS No. 7045

Description

This project upgrades the Facility's DCS, which monitors and controls many operational areas. The DCS is comprised of software and hardware components that have been in place since the early 1990s. The existing operating system platform is nearing obsolescence and will be phased out by the manufacturer in 2015. This upgrade includes the system software and hardware, user interface, technical training, and system testing.

Current Status

The contractor has completed assembling server cabinets; setting up servers, computers, and monitors; and configuring console operations.

Next Milestone

Project completion:	Summer 2016
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For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

SITE FACILITY IMPROVEMENTS



Fire main trench

Fire Main Replacement - Phase 3

Estimate Type: Budget Level

Current Project Budget: \$2,100,000

CPMS No. 6998

Description

This project will replace approximately 7,800 LF of pipe along with associated valves, fire hydrants, and appurtenances. The Facility's fire protection system has more than 15,000 LF of fire mains consisting of cast iron and ductile iron pipes installed in stages over the past 50 years. A 2007 condition assessment revealed corrosion and potential piping failure throughout the system. As a result, a phased approach for replacement of the existing fire main system with corrosion-resistant plastic piping was initiated in FY 2007-2008.

Current Status

Final design drawings and specifications were completed in December 2013.

Next Milestone

Award project: *Spring 2014*

Construction start: *Summer 2014*

For more information on CIP projects, visit <http://ca-sanjose.civicplus.com/index.aspx?NID=295>

VI. Financial Summaries

The following Financial Summaries Chart reflects project costs as adopted in the 2013-2014 CIP Budget. The chart also includes reserves, transfers, and non-construction elements that are not discussed in this status report.

2014-2018 Adopted Capital Improvement Program – Use of Funds (Combined)

	Estimated 2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	5-Year Total
Construction Projects							
Public Art							
Public Art	171,000	457,000	30,000	3,000			490,000
Total	171,000	457,000	30,000	3,000			490,000
Preliminary Wastewater Treatment							
1. Headworks No. 1 Repair and Rehabilitation	150,000	1,450,000	200,000				1,650,000
2. Headworks No. 2 Enhancement	337,000	7,874,000	3,000,000	300,000			11,174,000
3. Headworks No. 2 Expansion	300,000	200,000					200,000
Total	787,000	9,524,000	3,200,000	300,000			13,024,000
Primary Wastewater Treatment							
4. East Primary Rehabilitation, Seismic Retrofit, and Odor Control	1,000,000	715,000			2,000,000	5,000,000	7,715,000
5. Iron Salt Feed Station	18,000	1,900,000					1,900,000
Total	1,018,000	2,615,000			2,000,000	5,000,000	9,615,000
Secondary Wastewater Treatment							
6. Biological Nutrients Removal 1 and Biological Nutrients Removal 2 Connection		876,000					876,000
7. Secondary and Nitrification Clarifier Rehabilitation	8,000	3,162,000			1,400,000	4,000,000	8,562,000
Total	1,008,000	4,038,000			1,400,000	4,000,000	9,438,000

	Estimated 2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	5-Year Total
Construction Projects							
Tertiary Wastewater Treatment							
8. Alternative Disinfection	20,000	980,000					980,000
9. Filter Improvements	22,000	800,000					800,000
10. New Filter Complex	146,000	854,000					854,000
Total	188,000	2,634,000					2,634,000
Biosolids							
Inactive Lagoons Biosolids Removal	624,000						
11. Digester Rehabilitation	398,000	12,445,000	47,000,000	700,000	9,750,000	1,000,000	70,895,000
12. Dissolved Air Flotation Rehabilitation and Odor Control	736,000	264,000					264,000
13. New Biosolids Facility	1,000,000	3,000,000	70,000,000	115,000,000	97,000,000	40,000,000	325,000,000
Total	2,758,000	15,709,000	117,000,000	115,700,000	106,750,000	41,000,000	396,159,000
Electrical Systems and Power Generation							
Fuel Cell	20,000						
14. Combined Heat and Power Equipment Repair and Rehabilitation	1,166,000	9,934,000	250,000				10,184,000
15. Energy Generation Improvements	1,300,000	40,000,000	60,000,000				100,000,000
16. Plant Electrical Reliability	1,430,000	2,672,000					2,672,000
Total	3,916,000	52,606,000	60,250,000				112,856,000
Advanced Process Control & Automation							
17. Advanced Process Control and Automation	652,000	2,736,000					2,672,000
18. Plant-wide Flowmeter Replacement Program		1,000,000	5,000,000	250,000			6,250,000
19. Treatment Plant Distributed Control System	2,500,000	500,000	500,000	500,000	500,000		2,000,000
Total	3,152,000	4,236,000	5,500,000	750,000	500,000	500,000	10,986,000

	Estimated 2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	5-Year Total
Construction Projects							
Site Facility Maintenance and Improvements							
Plantwide Facilities	645,000						
Unanticipated/Critical Repairs	250,000						
20. Equipment Replacement	2,133,000	2,522,000	1,663,000	1,663,000	1,663,000	1,663,000	9,174,000
21. Plant Infrastructure Improvements	4,433,000	2,410,000	1,000,000	1,000,000	1,000,000	1,000,000	6,410,000
22. Treatment Plant Engine Rebuild	1,868,000	1,000,000					1,000,000
23. Treatment Plant Fire Main Rehabilitation	1,301,000	1,533,000					1,533,000
24. Treatment Plant Street Resurfacing	524,000	810,000	500,000	500,000	500,000	500,000	2,810,000
25. Urgent and Unscheduled Treatment Plant Rehabilitation	2,237,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	7,500,000
Total	13,391,000	9,775,000	4,663,000	4,663,000	4,663,000	4,663,000	28,427,000
South Bay Water Recycling							
Recovery Act - South Bay Water Recycling Phase 1C	68,000						
SBWR Reservoir Facility	464,000	10,000					10,000
27. Plant Backup Water Supply	1,656,000	1,200,000					1,200,000
28. SBWR Extension	4,905,000	3,787,000					3,787,000
29. SBWR System Reliability and Infrastructure Replacement		2,300,000	1,500,000	1,500,000			5,300,000
Total	8,293,000	7,297,000	1,500,000	1,500,000			10,297,000
TOTAL CONSTRUCTION PROJECTS	34,682,000	108,891,000	192,143,000	122,916,000	115,313,000	54,663,000	593,926,000

	Estimated 2012/2013	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	5-Year Total
Non-Construction Projects							
General Non-Construction							
2014 Bond Cost of Issuance			1,700,000				1,700,000
2014 Transfer to Clean Water Financing Authority Debt Service			6,000,000	6,000,000	6,000,000	6,000,000	24,000,000
Capital Program and Public Works Department Support Service Costs	574,000	653,000	660,000	667,000	674,000	681,000	3,335,000
Transfer to Clean Water Financing Authority Debt Service Payment Fund	6,947,000	6,953,000	6,915,000	6,943,000	6,788,000	5,881,000	33,480,000
29. Payment for Clean Water Financing Authority Trustee	5,000	5,000	5,000	5,000	5,000	5,000	25,000
30. Plant Master Plan	1,565,000	276,000					276,000
31. Preliminary Engineering	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	5,000,000
32. Program Management	1,077,000	4,498,000	3,590,000	3,605,000	3,275,000	2,800,000	17,768,000
33. SBWR Master Plan	2,027,000	419,000					419,000
34. State Revolving Fund Loan Repayment	4,464,000	4,464,000	4,464,000	4,464,000	4,464,000	4,464,000	22,320,000
Total	17,659,000	18,268,000	24,334,000	22,684,000	22,206,000	20,831,000	108,323,000
Contributions, Loans and Transfers to Special Funds							
Transfer to the City Hall Debt Service Fund	77,000	76,000	82,000	85,000	91,000	97,000	431,000
Total	77,000	76,000	82,000	85,000	91,000	97,000	431,000
Reserves							
Reserve for Equipment Replacement		5,000,000					5,000,000
Total		5,000,000					5,000,000
TOTAL NON-CONSTRUCTION	17,736,000	23,344,000	24,416,000	22,769,000	22,297,000	20,928,000	113,754,000
Ending Fund Balance	118,373,157	51,245,157	139,503,157	79,008,157	26,834,157	17,447,157	17,447,157*
TOTAL USE OF FUNDS	170,791,157	183,480,157	356,062,157	224,693,157	164,444,157	93,038,157	725,127,157*

* The 2013-2014 through 2016-2017 Ending Balances are excluded from the FIVE-YEAR TOTAL USE OF FUNDS to avoid multiple counting of the same funds.

VII. Looking Ahead



Aerial view of Facility site looking eastward.

Over the next six months, the integrated program management team will complete the CIP project validation process and finalize program management office staffing. The team will also roll out and begin rigorous implementation of systems and tools designed to achieve cost savings and improved decision making for future CIPs. Key upcoming activities include:

- Completion of project validation and input into the City's budgeting and financing process;
- Implementation of the PDM across all active and new projects;
- Launch of a collaborative, web-based portal for project delivery and document management;
- Completion of a biosolids treatment and disposal options analysis;
- Initiation of the Headworks Rehabilitation Project, along with a number of technical studies needed for future projects;
- Bidding and construction on several projects, including Emergency Diesel Generators, Digester Gas Compressor Upgrade, Digester Gas Storage Replacement, and Fire Main Replacement-Phase 3; and
- Staffing of five capital program vacancies to help deliver CIP projects, including two senior engineer positions and three associate engineer positions.

Glossary

Biogas	A renewable energy source produced by the breakdown of organic matter, such as sewage or green waste, in the absence of oxygen. Biogas is comprised of methane, carbon dioxide, and small amounts of hydrogen sulfide and other components.
Biosolids	Treated sewage sludge.
Bufferlands	Open acreage used by wastewater treatment plants as a buffer between facility operations and nearby communities. Bufferlands minimize odor and operational impacts on neighboring communities, and often serve as wildlife habitat.
Cogeneration	The process of recovering and reusing industrial waste heat to produce electricity.
CPMS	The Capital Project Management System, a web-based database updated regularly to provide San José councilmembers, administrators, and the public access to current information on CIP projects.
DCS	A Distributed Control System, or DCS, is a computerized system that allows treatment facility staff to remotely monitor and control treatment processes.
Effluent	Treated wastewater that is discharged from a treatment facility.
EIR	An Environmental Impact Report (EIR) is a public document required under the California Environmental Quality Act to describe potential environmental impacts associated with a project. An EIR also describes measures to mitigate the impacts.
Headworks	Facilities that first receive incoming wastewater at a treatment plant. The headworks screen and remove sticks, grit, and other solid material from influent to protect downstream equipment in the treatment process.
Influent	Untreated wastewater that flows into a treatment facility.
mgd	Million gallons per day.
Preliminary treatment	The preparatory wastewater treatment stage, in which influent passes through headworks, which screen and remove sticks, rocks and debris; and grit chambers, which remove sand and gravel.
Primary treatment	The initial treatment for incoming wastewater, in which gravity settles solid material and rotating bars skim floating fats, oil, and grease from influent.
Ring bus system	An electrical substation switching arrangement of breakers connected in a closed loop.
Secondary treatment	The second stage of wastewater treatment, in which aeration tanks pump air into wastewater to promote the growth of naturally-occurring bacteria that remove organic pollutants.
Tertiary treatment	The final stage in advanced wastewater treatment, in which wastewater flows through filter beds, then through sodium bisulfite tanks to become 99 percent clean.
Wastewater	Water that enters the sanitary sewer system for processing at a treatment plant.

Appendix

Preliminary Treatment Projects		
PMP ID #	Project	PMP Cost Estimate* (in millions)
1	Headworks Enhancements Phase 1 and Phase 2	\$6.7 ±
2	Miscellaneous Headworks 1 Repairs	\$5.9 ±
3	Headworks 2 Modifications	\$62.6 ±
4	Headworks Odor Control	\$22.7 ±
5	Expand and Line Raw Equalization Basin to 10 MG	\$9.0 ±
6	Demo Headworks 1	\$11.5 ±
7	Refurbish/Demo P&E Building	\$11.3 ±
8	Consolidate Influent Piping	\$21.5 ±
Program Subtotal		\$151.2 ±
Primary Treatment Projects		
9-10	East Primaries Steel Conversion, Coating Rehabilitation, Concrete Repair, and Seismic Modification for Odor Control	\$50.1 ±
11	Primary Treatment Odor Control	\$49.9 ±
12	Tunnel Rehabilitation: West Primaries	\$1.8 ±
13	Tunnel Rehabilitation: East Primaries	\$2.4 ±
14	Iron Salt Facilities	\$2.5 ±
15	Demo West Primaries	\$22.1 ±
16	Additional 12 MG PE Equalization Basin	\$21.6 ±
Program Subtotal		\$150.4 ±
Secondary Treatment Projects		
17	Secondary Air Plenum Filtration	\$1.7±
18	Connect BNR1 and BNR2 Clarifiers	\$14.6 ±
19	Connect Aeration Headers	\$4.7 ±
20	Aeration Tank Rehabilitation (BNR 1 and BNR 2)	\$62.1 ±
21	Rehabilitation of Remaining Secondary Clarifiers (BNR 2)	\$13.2 ±
22	CFD Modeling and Rehabilitation of 1 Secondary Clarifier	\$1.2 ±
23	Rehabilitation of Remaining Secondary Clarifiers (BNR 1)	\$28.9 ±
24	Conversion to Fine Bubble Diffusers	\$35.4 ±

Secondary Treatment Projects		
PMP ID #	Project	PMP Cost Estimate* (in millions)
25	Foam and Scum Control	\$1.4 ±
26	Nocardia Control	\$7.7 ±
27	Field Verification of Foam and Scum Control Options	\$1.1 ±
29	Conversion to NAS (TN < 8mg/L regulation) – Alternative 2	\$68.0 ±
28, 30	Other Alternatives	—
Program Subtotal		\$240.0 ±
Tertiary Treatment Projects		
31	Underdrain and Media (Remaining Bank A7 filters)	\$3.2±
32	Miscellaneous Filtration Repairs	\$12.2 ±
33	Field Verification of Alternative Filter Technology	\$3.2 ±
34	Underdrain and Media (1 filter) + Field Verification	\$0.4 ±
35	New Filters: 128 mgd Tetra Denite plus 52 mgd New Tertiary (NAS mode only) – Alternative 1	\$132.6 ±
39	New Ultraviolet Disinfection Facilities – Alternative 3	\$49.4 ±
36-38, 40-41	Other Alternatives	—
Program Subtotal		\$201.0 ±
Biosolids Digestion		
44	WAS and Primary Sludge Fine Screening	\$11.8 ±
45	Digester Gas Manifold and Tunnel Improvements	\$14.7 ±
46	Tunnel Rehabilitation: Digesters and DAFT	\$6.8 ±
47-49	Digester Cover and Mixing Upgrades (4 digesters)	\$30.1 ±
50	Digester Cover and Mixing Upgrades (3 digesters)	\$26.0 ±
51	Digester Cover and Mixing Upgrades (3 digesters)	\$27.9 ±
52	DAFT Final Upgrades (6 DAFTs)	\$4.6 ±
53	Digester Heating Upgrades	\$0.7 ±
54	Struvite Control Chemical Feed	\$0.2 ±
55	Digestion Pre-Treatment Field Verification	\$11.4 ±
56	FOG Receiving Station and 1/2-Mile Access Road	\$9.2 ±
57	Fourteen-inch Digested Sludge Line Replacement (parallel pipe)	\$12.9 ±
Program Subtotal		\$156.3 ±

Biosolids Residual Sludge Management		
PMP ID #	Project	PMP Cost Estimate* (in millions)
42	Inactive Lagoons Rehabilitation Phase 1	\$13.9 ±
43	Inactive Lagoons Rehabilitation Phase 2	\$13.9 ±
58	Sludge Dewatering Field Verification	\$2.3 ±
59	2/3 Full Mechanical Dewatering (Centrifuges) Plus Feed Storage Tank	\$84.7 ±
60	Cake Storage	\$15.1 ±
61	1/3 Full Mechanical Dewatering (Centrifuges)	\$41.9 ±
62	Lagoons/Drying Bed Retirement	\$3.0 ±
63	2/3 Covered Lagoons (180 days storage)	\$32.0 ±
64	Emergency Biosolids Storage	\$7.6 ±
65	1/3 Covered Lagoons (180 days storage)	\$19.8 ±
66	Sludge Drying Field Verification	\$1.8 ±
67	2/3 Thermal Drying for 20 Percent of Solids Stream	\$68.5 ±
68	1/3 Thermal Drying for 20 Percent of Solids Stream	\$27.7 ±
69	Biosolids Greenhouse Demonstration Project (w/ BFPs)	\$9.0 ±
70	2/3 Greenhouse: Full Scale (w/o dewatering)	\$13.3 ±
71	1/3 Greenhouse: Full Scale (w/o dewatering)	\$7.8 ±
Program Subtotal		\$362.3±
Power Generation		
72	Energy Strategic Plan	\$0.4 ±
73	Fuel Cell	\$1.4 ±
74	Facility Electrical Reliability (PER) – 4.6 MW Gas Turbine Phase 1 (w/o gas storage)	\$36.0 ±
75	Gas Turbine Phase 2 (9.2 MW) (2 turbines)	\$39.0 ±
76	Gas Turbine Phase 3 (4.6 MW)	\$23.7 ±
77	Digester Gas Storage, Compressors, and Piping	\$15.3 ±
78	Solar Power Facility Phase 1 (1 MW) – PPA	\$0.8 ±
79	Solar Power Facility Phase 1 (1 MW) – Direct Purchase	\$7.3 ±
80	Solar Power Facility Phase 2 (5 MW)	\$42.3 ±
Program Subtotal		\$166.2 ±

Electrical Systems		
PMP ID #	Project	PMP Cost Estimate* (in millions)
81	PER – 115 kV Breaker Replacement	\$2.9 ±
82	PER – M1, M2, M3 Switchgear Replacement	\$0.5 ±
83	PER – MCC H1, H2, J1, J2	\$0.2 ±
84	PER – MCC Phase II Replacements	\$0.3 ±
85	PER – S11 Switchgear Replacement	\$9.9 ±
86	PER – S40 and G3 Switchgear Update	\$14.2 ±
87	PER – Standby Generator (Admin Building)	\$0.6 ±
88	Double-ended Substation with Switchgear for Solids Handling Processes	\$4.0 ±
Program Subtotal		\$32.6 ±
Advanced Process Control Systems Projects		
89-91	Advanced Process Control and Automation	\$9.6 ±
92	EG2 and EG3 Engine Control Panel Upgrade	\$0.2 ±
93	Side Stream Nitrogen Removal	—
Program Subtotal		\$9.8 ±
Site Facility Improvements		
94-96	Miscellaneous Heating and Cooling Upgrades	\$3.0 ±
97	Handrail Replacement	\$5.0 ±
98	Site Facility Improvements – Phase 1 (through 2025)	\$9.1 ±
99	Site Facility Improvements – Phase 2 (2026 through 2040)	\$12.2 ±
100	Yard Piping	\$16.5 ±
101	Unanticipated/Critical Repairs	\$25.4 ±
102	Unspecified Remaining Repair and Rehabilitation (2025 through 2040)	\$416.0 ±
103-104	Tunnel Rehabilitation: BNR 1 and BNR 2	\$10.3 ±
105	3W Pump Station Improvements	\$1.1 ±
106-109	Warehousing Facility Additions and Support Building Improvements	\$100.9 ±
110-112	Public Art Reserve – 2010 to 2040	TBD
Program Subtotal		\$599.5 ±

* Cost estimates follow the American Associate of Cost Engineering International (AACE International) Recommended Practice No. 18R-97 estimate classes 5 and 4. Typical accuracy range for Class 5 estimates are -20 percent to -50 percent on the low side, and +30 percent to +100 percent on the high side. Class 4 estimates are -15 percent to -30 percent on the low side, and +20 percent to +50 percent on the high side. Cost estimates for engineering, construction, and contingencies are escalated to the midpoint construction at 2 percent per annum.