San José-Santa Clara
Regional Wastewater Facility

CIP Program
Project Packages

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Summary Project Descriptions

A "project validation" process was conducted over a four month period from late October 2013 through early February 2014. The purpose of this effort was to develop cost and schedule information that could be used to generate the five-year and ten-year Capital Improvement Plans (CIPs). In development of these CIPs, information on existing needs and associated future projects at the San José – Santa Clara Regional Wastewater Facility's (Wastewater Facility) were reviewed and compiled from a number of existing documents including the current Plant Master Plan (PMP), 16 additional related plant studies, and a review of projects initiated after completion of the PMP. Based upon a series of workshops, meetings and consultations, 33 capital projects were identified and grouped into four major process areas:

- Energy and Automation (PA-01 and PE-01 to PE-05)
- Plant-wide Facilities (PF-01 to PF-07)
- Liquids Processing
    - Disinfection (PLD-01 to PLD-03)
    - Filtration (PLF-01 to PLF-02)
    - Headworks (PLH-01 to PLH-02)
    - Primary Treatment (PLP-01 to PLP-02)
    - Secondary Treatment (PLS-01 to PLS-04)
- Solids Processing (PS-01 to PS-07)

This indexed pdf file provides summary descriptions of each project. Information contained within these includes:

- Basic project identification and prior studies reference projects
- Estimated costs (in 2013 dollars)
- Schedule and phasing
- Packaging
- Identified need
- Background
- Description of facilities
- Predecessor efforts required (if appropriate)
- Benefits
- Scope (for purposes of the cost estimate)

The information in these descriptions should be viewed as preliminary in nature, providing the basic data to be used for CIP planning and should not be extrapolated beyond this objective. The initial implementation step for each project will involve scoping which includes more detailed analysis of project needs and alternative approaches. All information on costs, schedule and scope will be refined accordingly.

These project descriptions reflect the analysis performed in other studies, principally the PMP. Additional process area specific studies and analysis were beyond the scope of validation. The data presented reflects the current (February 2014) understanding of the Wastewater Facility needs and associated projects. These projects may be modified and/or further defined as the CIP process progresses.

CIP Program

San José-Santa Clara Regional Wastewater Facility

CIP Validation
Final Project Packages

Project ID	Project Name	
Energy and Automation		page 1
PA-01	Advanced Facility Control Package and Meter Replacement	
PE-01	Emergency Diesel Generator	
PE-02	Cogeneration	
PE-03	Digester Gas Compressor	
PE-04	Digester Gas Holder	
PE-05	Electrical Reliability	
Plant-wide Facilities		page 14
PF-01	Tunnel Rehabilitation	
PF-02	Support Building Improvements	
PF-03	Handrail Replacement	
PF-04	Yard Piping and Road Improvements	
PF-05	Record Drawings	
PF-06	Facility Wide Water Systems	
PF-07	Facility Instrument Air System	
Liquid Processing		page 30
Disinfection		
PLD-01	New Disinfection Package	
PLD-02	Outfall Bridge and Levee Improvements	
PLD-03	Final Effluent Pump Station and Stormwater Channel Improvements	
Filtration		
PLF-01	Filter Repair and Rehabilitation Package	
PLF-02	Alternative Filter Technology Field Verification Package	
Headworks		
PLH-01	Near-Term Headworks Improvements Package	
PLH-02	New Headworks Package	
Primary Treatment		
PLP-01	Iron Salt Facilities	
PLP-02	East Primaries Rehabilitation and Repair	
Secondary Treatment		
PLS-01	Aeration Tanks and Blowers Rehabilitation and Repair	
PLS-02	Secondary Clarifier Rehabilitation and Repair	
PLS-03	Aeration Basin Future Modifications	
PLS-04	BNR1 Clarifier Rehab Demonstration	

Solids Processing page 61
PS-01 Digester and Thickener Facilities Upgrade Project
PS-02 Additional Digester Facility Upgrades
PS-03 Digested Sludge Dewatering Facility
PS-04 FOG Receiving
PS-05 Thermal Dryer Facility
PS-06 Greenhouse Demonstration (solids drying)
PS-07 Lagoons and Drying Bed Retirement

Energy & Automation

Package ID:	PA-01	**Project ID(s):**	A-03, A-04, A-02	**Other Ref. ID:**	CPMS: 7045; PMP: 89, 91, 92
Package Name:	Advanced Facility Control Package and Meter Replacement		**Process Area:**	Facility Wide	
Function:	R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	28,800,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	2	
Current Schedule- Start Dates:					
Planning Date:	Feb 2014 (Phase 1), Dec 2015 (Phase 2)	**Design Date:**	Aug 2014 (Phase 1), Mar 2017 (Phase 2)	**Bid Date:**	Nov 2014 (Phase 1), Mar 2018 (Phase 2)
Construction Date:	May 2015 (Phase 1), Sep 2018 (Phase 2)	**Startup Date:**	Sep 2023		
Packaging Criteria:	Process and/or systems inter-dependency, Similar priority rating, Bundling of small projects where possible, Incorporate O&M projects into larger packages				
Package Need:	This package upgrades and replaces outdated and inaccurate flow meters throughout the plant in order to extend the recent work on the overall plant DCS system and add reliable flow data to the already extensive collection of available operating data, and creates and implements advanced facility control algorithms to operate the facility more effectively and efficiently going forward. The control panels for EG2 and EG3 need to be upgraded because the existing Rossmont alarm panel is dated and the pneumatic logic has parts that are obsolete. The key drivers to the projects in this package include a need to improve data reliability and integrity, and then use available data to improve overall facility operations and efficiency.				
Background:	<u>History</u> This project combines projects 89, 91, 92 from the Plant Master Plan in order to implement an advanced facility control approach that will actually make use of the more reliable metering information that becomes available as the meter replacement activities proceed. This project is also intended to address other I&C needs such that a reliable set of operating data becomes available to serve as the basis for advanced facility control. <u>Future Roadmap</u> The Automation Master Plan is a required pre-cursor project which will define an overall advanced control strategy for the facility. The Master Plan project will also identify other monitoring equipment that will need to be assessed and repaired or replaced in order to provide reliable operating data which will be the basis for advanced "predictive analytics" as well as improved asset management practices with more basis on actual operating performance data. This project will not replace the need for new projects to provide their own instrumentation and controls components, which will need to be compatible with the overall strategies identified in the Automation Master Plan.				

	Alternative Delivery Methods The extensive meter evaluation and replacement efforts would be an ideal candidate for a Job Order type of contract. Likewise, the actuator replacements could also be effectively delivered by a Job Order type contract. Meanwhile, the project will be approached as design-bid-build.
Package Description:	This project consists of a facility wide meter validation and replacement, a facility wide process control and automation upgrade. This project will be broken in two phases - the first phase will replace critical meters. The second phase will replace the remaining meters, as well as include the process control and automation upgrade.
Required Predecessor Effort:	Study S04 - Automation Master Plan is a precursor to Phase 2 of this project.
Benefits of Project:	The project will improve plant reliability, mitigate failure risk, leverage new technology to improve automation and process control and also replace obsolete equipment. It will also generate cost savings by minimizing maintenance requirements.

Scope of Work:	• Review and evaluate process flow meters to determine if they are still fit for purpose
	  ○ Repair salvageable meters
	  ○ Evaluate new meter options and create a testing plan
	  ○ Anticipate approximately 150 new liquid mag meters to be installed
	  ○ Anticipate approximately 25 new gas meters to be installed
	• Field investigation and remediation of operating data acquisition systems (meters, sensors, gauges, tie-in to fiber optic / DCS, etc.)
	• Field investigation and repair or replacement of unreliable actuators throughout the wastewater facility; anticipate approximately 250 actuators will need to be replaced
	• Design and implementation of new facility control algorithms; with a push toward "predictive analytics" using available operating data and other data
	• Updated reporting systems, including dashboard-type operational reports and remote status reporting
	• Replace obsolete EG2/EG3 control components with PLC
	• Upgrade up to 15 PLCs
	• Need for more temperature monitors

Author:	Mahama N, AMB	**Reviewer:**	EDW
Date:	01/15/2014	**Date:**	12/08/2013

Attachments:

No Entries

Package ID:	PE-01	**Project ID(s):**	E-06	**Other Ref. ID:**	CPMS: 7394
Package Name:	Emergency Diesel Generator		**Process Area:**		
Function:	New		**Priority:**	High	
Estimated Project Cost($):	20,600,000.00		**Source of Estimate:**	GHD/City (2014$)	
Delivery Method:	Low-bid DB				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Nov 2013	**Design Date:**	Apr 2014	**Bid Date:**	
Construction Date:	Aug 2014	**Startup Date:**	Jun 2016		
Packaging Criteria:	Previously packaged by City, Project implementation already underway, Process and/or systems inter-dependency, Similar priority rating				
Package Need:	The City of San José completed a 2012 Energy Management Strategic Plan ("EMSP"), which assessed the energy systems of the RWF. The EMSP identified the need for emergency power in the event no power is available from the local utility company, and recommended that emergency power facilities be built at the RWF for both critical loads and secondary loads in the event of a utility power outage of up to two (2) days (48 hours).				
Background:	History The Emergency Diesel Generator Project was specifically recommended in the Energy Strategic Plan. The project is sized to allow the plant to operate in "island" mode in the event that purchased power is unavailable. Future Roadmap This project is underway. The project is proceeding as a low bid design build project, and Project Award is planned for April 15. NTP and construction will begin later in the summer of 2014. Completion of construction and startup is expected in mid-2016. Alternative Delivery Methods The project is already underway, and is being delivered as a low bid design build project.				
Package Description:	The Package consists of a backup or emergency power generation system for the Plant. The City is seeking to prequalify responsible D-B Entities for this project. Following bid solicitation, the City will award a construction contract to the lowest responsible and responsive bidder. The new Emergency Diesel Generators will be located adjacent to the RWF Substation 1 on the south side of the RWF, and connected to the 4.16KV M3 switchgear. The package also includes upgrades to the governor and voltage regulator controls for EG1, EG2 and EG3 at building 40.				
Required Predecessor Effort:					

Benefits of Project:	Reliability in the event of a simultaneous loss of purchase power and cogen power.
Scope of Work:	• Design and construct four emergency diesel generators with 3-Megawatt (3-MW) each and connect to the new remote control panels in the new 4.16KV switchgear and Building 40 and to existing Distributed Control System (DCS). These generators will automatically start, synchronize and energize the RWF's electrical distribution system within two (2) minutes. • The emergency generators will have diesel storage tank or tanks with sufficient fuel storage to maintain full operation for two (2) days before requiring refueling. 2 Tanks with 22,000 gallons capacity • Ability to monitor generator equipment from the RWF's remote location and central control system. • Able to re-synchronize the generators to Pacific Gas and Electric's (PG&E) system when PG&E power is available again following a power outage or shortage. • An expandable system to meet future back-up power requirements. • Use EPA Tier 4i Diesel Generator technology. • Design and construct controls for the diesel fuel system and leak detection monitoring • Design and construct the interconnection between the field instrumentation and the control panels in the 4.16 KV Switchgear at Building 40 • Connect to/relocation of existing undeground utilities • Provide new asphalt concrete pavement around the perimeter of the project (30 square foot) • Design and install a foundation and concrete pad for four generators, switchgear, storage shed and two diesel storage tanks • Design and construct a mechanical piping system, diesel pump skids, interconnection piping between the diesel storage tank and individual generator day-tank. • Emergency generators will be located about 500 feet from 2 existing breakers

Author:	Mahama N	**Reviewer:**	EDW
Date:	12/04/2013	**Date:**	12/08/2013

Attachments:

No Entries

Package ID:	PE-02	**Project ID(s):**	E-03	**Other Ref. ID:**	CPMS: 7418; PMP: 74, 75, 76
Package Name:	Cogeneration		**Process Area:**	Heat and Power	
Function:	Capacity Increase, New		**Priority:**	High	
Estimated Project Cost($):	87,170,000.00		**Source of Estimate:**	B&V/City (2014$)	
Delivery Method:	Progressive DB				
Phasing of project:	Yes		**No. of Phases:**	2	
Current Schedule- Start Dates:					
Planning Date:	Nov 2013	**Design Date:**	Apr 2014	**Bid Date:**	
Construction Date:	Feb 2015	**Startup Date:**	Apr 2017		
Packaging Criteria:	Previously packaged by City, Project implementation already underway				
Package Need:	This project is needed to replace existing engines and generators that have become less reliable and efficient than modern equipment. The existing engines have suffered several catastrophic failures over recent years, and it has become more difficult to obtain parts for repairs. Additionally, more stringent air emission thresholds require that the facility discontinue use of the out-dated engine-driven blowers engine-generator sets that can't be cost-effectively retrofitted to meet the new emission requirements. However, the City is committed to also preserve and reuse plant energy sources and achieve energy self-sufficiency, as well as optimizing operating costs. The new cogen facility will best satisfy these competing needs.				
Background:	History The Cogeneration Project was recommended in the Plant Master Plan, but the scope and timing of the project have been altered since that time. Specifically, the recommended technology has changed from gas turbine generators to internal combustion engine generators. Also, the Plant Master Plan anticipated the generators being installed in three phases, but the current plan calls for all generating capacity to be installed at the same time; namely in this project. The project is currently underway, with conceptual design having been completed by Black and Veatch in late 2013. Future Roadmap This project is underway. The project delivery strategy is to pursue Progressive Design Build, and efforts are underway to develop a scope and enter an agreement with an "owner's representative", which would then assist the City is preparing the RFQ and RFP package that will be used to select a design-build contractor. Selection of the design-build contractor is planned for early 2015, with facility construction completion and start-up planned for early 2017. Alternative Delivery Methods The project is already underway, and is planned to be delivered as a progressive design build project.				

Package Description:	This package consists of the installation of internal combustion engines to replace existing engines; using low speed internal combustion engines that can use blended digester gas and natural gas. The new cogen facility provides electric power to the plant, as well as providing digester heating and other plant heating needs (e.g., chillers, building heat, etc.) The package includes the installation of four (4) engine generators each rated at a minimum of 4,000 kilowatts, including control panel, heat recovery, cooling system, cooling system, starting air system, lube oil, emission control equipment, electrical switchgear and other accessory items located inside a new cogeneration facility.
Required Predecessor Effort:	• Digester gas compressor (CPMS 7100) [not *required;* but compressor project is underway and will improve overall reliability] • Digester gas storage (CPMS 7157) [not *required;* but storage project is underway and will improve overall reliability] • Digester gas piping to new cogen building (scope is included in this package, but may be moved to another project) • Hot water piping from new cogen building to digester complex (scope is included in this package, but may be moved to another project)
Benefits of Project:	• Increased reliability with new engines. • Reduced maintenance costs compared to old engines. • Improved efficiency from a higher percentage total energy recovery from digester gas heat content. • Reduced plant emissions.

Scope of Work:	• Digester gas booster compression for engines
	  ○ Sliding vane gas compressors
	  ○ up to 2,100 SCFM from 40 psig to 90 psig
	• Gas cleaning / conditioning system
	  ○ up to 2,100 SCFM inlet gas with up to 550 ppm H2S
	  ○ Assume moisture saturated at 100 degrees
	  ○ H2S removal by iron sponge type system
	  ○ Siloxane removal using mol sieve vessels
	• Gas blending system (blend digester gas with purchased natural gas)
	• Four (4) internal combustion engine/generator sets; rated at 4.2 MW each
	  ○ package to include starting air system, lube oil, jacket heat recovery, cooling system, control panel and emission control
	• Catalytic converter for NOx emission controls
	• Exhaust waste heat recovery system
	  ○ Hot oil heat recovery for 2.7 MMBtu/hr per unit

	• Yard piping as required for utilities
	  ○ Natural gas (assume 500 l.f. of 3-inch pipe)
	  ○ Digester gas (assume 4,000 l.f. of 4-inch pipe)
	  ○ Hot water return and supply (assume 4,000 l.f. of 4-inch pipe each)
	  ○ Sanitary sewer (assume 500 l.f. of 6-inch pipe)
	  ○ Storm drainage system
	• New landscaping
	• New cogeneration building; 2 separate areas
	  ○ 28,500 s.f., single-story industrial area (that houses four internal combustion engine generators, ancillary equipment, includes shop and storage)
	  ○ 10,900 s.f., two-story administration/personnel area
	  ○ The building areas shall have a Type II-B construction
	  ○ New building to be LEED certified (or equivalent industrial standard)
	  ○ HVAC, wet pipe fire protection system, water piping, space heating, natural gas piping and pressure regulation for engine generator operation
	• Provide a new main 4.16kV switchgear line-up to connect, synchronize and distribute power from the cogen engine generators to the Regional Wastewater Facility
	• New MCCs as required to distribute power to new loads associated with cogeneration equipment
	• Install new fire alarm system
	• Provide a dedicated control system that is designed for safe and reliable operation of equipment; These should be based on networked microprocessor controls

Author:	Mahama N	**Reviewer:**	Kvasnicka, Wetzel
Date:	12/04/2013	**Date:**	12/08/2013
Attachments: *No Entries*			

Package ID:	PE-03	**Project ID(s):**	E-04	**Other Ref. ID:**	CPMS: 7100
Package Name:	Digester Gas Compressor		**Process Area:**	Digesters	
Function:	Capacity Increase, R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	10,420,000.00		**Source of Estimate:**	CDM/MWHC (Class 2) (2014$)	
Delivery Method:	Low-bid DB				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Nov 2013	**Design Date:**	Feb 2014	**Bid Date:**	
Construction Date:	Nov 2014	**Startup Date:**	Aug 2015		
Packaging Criteria:	Location proximity on plant site, Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Maintain plant compliance through phasing, Bundling of small projects where possible				
Package Need:	The need for the facility to become more energy independent was highlighted in the plant master plan (PMP). The digester gas will be a key important input for the new cogeneration project, which is expected to increase the energy generated within the facility. However, existing gas compressors are dated and need to be upgraded.				
Background:	History The Digester Gas Compressor replacement project was recommended in the 2012 Energy Strategic Plan. The project will replace the existing digester gas compressors, which have experienced reliability issues due to age of equipment and parts availability. The project is already underway, and is proceeding as a low bid design build project. Future Roadmap This project is underway. The project is proceeding as a low bid design build project. Project Award is planned for May 20, 2014. NTP and construction will begin later in the summer of 2014. Completion of construction and startup is expected in late summer, 2016. Alternative Delivery Methods The project is already underway, and is being delivered as a low bid design build project.				
Package Description:	This package is for the upgrade of the existing digester gas compressor.				
Required Predecessor Effort:					
Benefits of Project:	• Improves plant reliability. • Replaces aging equipment. • Replaces inefficient systems. • Maximizes use of available biogas. • Improves gas compression performance.				

Scope of Work:	• Two new screw-type digester gas compressors; rated at 2,000 SCFM at 60 psig discharge pressure • Construction of 4,400 SF building to house the new gas compressors • Two 45-ton digester gas precoolers to be installed outdoors • Two cooling tower packages, each sized for 1,963 MBtu/hr heat rejection; and associated equipment and piping to circulate cooling fluid to the compressors • Associated digester gas piping from digesters and to digester gas storage facility • Associated utility tie-ins as needed for building and for new equipment		
Author:	Mahama N	**Reviewer:**	Kvasnicka, Wetzel
Date:	12/04/2013	**Date:**	12/08/2013
Attachments: *No Entries*			

Package ID:	PE-04	**Project ID(s):**	E-05	**Other Ref. ID:**	CPMS: 7157
Package Name:	Digester Gas Holder		**Process Area:**		
Function:	R&R, Upgrade, New		**Priority:**	High	
Estimated Project Cost($):	3,320,000.00		**Source of Estimate:**	B&C/City (Class 1) (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Nov 2013	**Design Date:**	Nov 2013	**Bid Date:**	Jan 2014
Construction Date:	May 2014	**Startup Date:**	Mar 2015		
Packaging Criteria:	Previously packaged by City, Project implementation already underway				
Package Need:	The reliability of the digester gas storage will be a key part of the facility's quest for energy independence because the gas is an important input for the new cogeneration plant. However, existing gas holders are old, have maintenance issues and have become unreliable resulting in ever higher maintenance cost. The package therefore addresses the need to replace the existing digester gas holding tank built in 1984 due to multiple failures and safety considerations. This package will help provide a comprehensive/systemic approach to the facility's digester gas related needs while increasing the availability of digester gas.				
Background:	<u>History</u> The Digester Gas Holder project was internally generated based on reliability issues identified by O&M staff. The project will replace the existing digester gas holder, which have experienced reliability issues due to age and parts availability. The project is already underway, and is proceeding as a design-bid-build project. <u>Future Roadmap</u> This project is underway. Design has been completed and Bid / Award phase is underway. Project Award is planned for April 15, 2014. NTP and construction will begin later in the summer of 2014. Completion of construction and startup is expected in spring, 2016. <u>Alternative Delivery Methods</u> The project is already underway, and is being delivered as a design-bid-build project.				
Package Description:	This project consists of the replacement of the existing digester gas holder.				

Required Predecessor Effort:	
Benefits of Project:	• Improves facility reliability. • Provides facilities for continued resource recovery. • Aligns with the "Green Vision" goals.
Scope of Work:	• Demolish existing digester gas holder tank including floating cover • Replace with floating piston gas holder at the existing digester gas holder location

Author:	Mahama N	**Reviewer:**	
Date:	12/19/2013	**Date:**	

Attachments:

No Entries

Package ID:	PE-05	**Project ID(s):**	E-15	**Other Ref. ID:**	OM: 32
Package Name:	Electrical Reliability		**Process Area:**	Electrical	
Function:	Capacity Increase, R&R, Upgrade, New		**Priority:**	High	
Estimated Project Cost($):	8,610,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Nov 2013	**Design Date:**	Jul 2014	**Bid Date:**	Nov 2014
Construction Date:	May 2015	**Startup Date:**	Nov 2015		
Packaging Criteria:	Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Bundling of small projects where possible				
Package Need:	This package is to improve reliability of electrical equipment including Switchgear upgrades. The component parts in these Switchgears are obsolete and hard to replace.				
Background:	History The Electrical Reliability project includes several reliability aspects that were recommended in the Plant Master Plan as well as the Energy Strategic Plan. However, other aspects of the project have been bundled into CIP projects that are more directly related. Specifically, VFDs for aeration blowers have been removed from this project and included in PLS01 and PLS02, where the VFD requirements will be matched to the future aeration needs. The Electrical Reliability project now focuses solely on switchgear upgrades and other power distribution enhancements to improve system reliability. Future Roadmap This project will be designed internally beginning in the summer of 2014, with construction expected to begin in early 2015, and project completion planned for late 2015. Alternative Delivery Methods The project is will be managed as a design-bid-build project.				
Package Description:	Package consists of upgrades to the S40/G3 Switchgear. The G3 Switchgear connects to the facility's engine driven generators and the S40 Switchgear connects to the electric driven blowers.				
Required Predecessor Effort:					
Benefits of Project:	• Provides continued reliability for existing switchgear facilities.				

Scope of Work:	• Replace existing protective relays with modern relays • Upgrade governor and excitation controls		
Author:	Mahama N	**Reviewer:**	EDW
Date:	12/04/2013	**Date:**	12/08/2013
Attachments: *No Entries*			

Plant-wide Facilities

Package ID:	PF-01	**Project ID(s):**	LP-03, LP-04, F-09, F-10, S-06	**Other Ref. ID:**	PMP: 12, 13, 46, 103, 104
Package Name:	Tunnel Rehabilitation		**Process Area:**	Facilities	
Function:	R&R		**Priority:**	High	
Estimated Project Cost($):	21,910,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	4	
Current Schedule- Start Dates:					
Planning Date:	Jun 2015	**Design Date:**	Aug 2016	**Bid Date:**	Sep 2017
Construction Date:	Mar 2018 (Phase 1), Aug 2019 (Phase 2), Jan 2021 (Phase 3), Jun 2022 (Phase 4)	**Startup Date:**			
Packaging Criteria:	Avoid interferences by multiple contractors, Similar priority rating, Bundling of small projects where possible				
Package Need:	The wastewater facility has an extensive tunnel system that houses piping, equipment, valves , pumps, and controls. Many of these tunnels were constructed beginning in the 1960s, and are in need of new HVAC systems, structural repair, coatings, and the removal of obsolete pipelines to keep them operational.				
Background:	History: The PMP had originally identified various Tunnel Rehabilitation projects, and these were listed under separate PMP Project Nos. 12, 13, 46, 103, and 104. As part of the Validation exercise, it was determined that the work involved was similar among various tunnels in different process areas, and that it would make sense to combine these disparate projects in one large phased project. Future Roadmap: As the triggers for this project are based on existing condition of the tunnels, piping and other items, the timing and sequence of work in each area should be based on the results of condition assessment. Alternate Delivery Methods: This project was considered an appropriate candidate for alternate delivery methods such as progressive design build (PDB), Job Order Contracting (JOC), or CM at risk (CMAR) by the Validation team, but as these are not an option available to the City, this is being set up using a traditional DBB delivery model. If other delivery method options becomes available in the future, the delivery method should be re-evaluated.				
Package Description:	This package involves structural, mechanical, coating, and piping improvements at all facility tunnels.				

Required Predecessor Effort:	Structural and Mechanical condition assessment of tunnels (including equipment and piping within tunnels) (Study S05).
Benefits of Project:	• Increases the ease of operations within the tunnels. • Reduces safety risk to O&M personnel and contractors.
Scope of Work:	Structural concrete repair and coatings, HVAC improvements, and piping modification work at the following tunnels (following identification of condition assessment) (Total approx. 130,000 sq. ft. footprint area): • Digesters Tunnel • East Primary Tunnel Branch A • East Primary Tunnel Branch B • East Primary Tunnel Branch C • East Primary Tunnel Main • Filtration Basement - Service Wing Crawlspace • Nitrification Battery A Tunnel • Nitrification Battery A Tunnel • P&E Building Tunnel • Remote Digesters Tunnel • Secondary Tunnel • Sludge Control - Blower Building Cross tunnel • West Primary East Side Crawl Space • West Primary Tunnel • West Primary West Side Crawl Space

Author:	AMB, JLD	**Reviewer:**	EDW
Date:	12/06/2013	**Date:**	12/09/2013

Attachments:

No Entries

Package ID:	PF-02	**Project ID(s):**	F-04, F-12, F-13, F-16, E-26, E-30, F-01, F-02	**Other Ref. ID:**	CPMS: 7086, 7249; OM: 16, 19, 21, 24, 25; PMP: 94, 95, 96, 98, 106, 107, 110
Package Name:	Support Building Improvements		**Process Area:**	Facilities	
Function:	Capacity Increase, R&R, Upgrade, New		**Priority:**	High	
Estimated Project Cost($):	48,180,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	4	
Current Schedule- Start Dates:					
Planning Date:	Mar 2015	**Design Date:**	Oct 2016	**Bid Date:**	May 2018
Construction Date:	Nov 2018 (Phase 1), Oct 2019 (Phase 2), Sep 2020 (Phase 3), Aug 2021 (Phase 4)	**Startup Date:**			
Packaging Criteria:	Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Bundling of small projects where possible, Comprehensive scope to include ancillary facilities/utility feeds				
Package Need:	The existing RWF facilities are generally old and in need of refurbishment. In addition, due to the history of systematic expansion and development of the treatment plant, the support facilities are widely dispersed across the plant. The RWF stands to gain potentially from systematically centralizing their support facilities, thereby increasing staff efficiency, and avoiding the duplication of certain facilities, such as workshops and storage facilities. It is also key to centralize monitoring of all fire alarm systems at the wastewater facility. The existing warehouse needs to be upgraded to better facilitate the receipt, processing, storage, and distribution of deliveries. There is currently no protection against inclement weather during off- and on-loading. There is no off-road parking and no provision of basic services to after-hour delivery truck arrivals. In addition, the RWF main operations area has very basic landscaping. This project enhances that landscaping around the perimeter, and around the Administration and Environmental Services Buildings. There is a need to upgrade and replace outdated cooling and HVAC systems facility wide to save energy, reduce emissions and improved plant reliability. An example of this is the need to eliminate the 'domino effect' of running the engine-driven blowers in order to provide steam to the chiller that in turn provides cooling for the air compressors. Furthermore, a public arts reserve allocation is required to comply with the revisions to the Public Art Master Plan adopted by the City Council on March 13, 2007.				

Background:	History: This project includes Plant Master Plan Project Nos. 94, 95, 96, 98, 106, and 107 and corresponds to Validation Project PF-02. During the validation exercise, the scope of this project was modified to include gap projects identified by O&M staff relating to fire alarms, elevators, women's locker rooms, and other improvements for code compliance. During the workshops, it was recommended that vertical access for tall construction equipment on site be a criterion for development of any site facility improvements and overhead piping. The construction of a new Admin building was determined to be beyond the scope of the first 10-year CIP. Future Roadmap: These Improvements are the first part of a two-part Facility-Wide Support Building Improvements, and focus on the Work to be performed in the first 10-year CIP. Some of these improvements (such as the Chillers, HVAC, and Cooling Tower) are driven by both an Improved Performance benefit, as well as the condition of the existing equipment. Other elements such as public art installations are based on policy decisions, and code compliance. Alternate Delivery Methods: As many of the project components are varied in scope and location throughout the RWF site, it was determined that progressive design build (PDB), Job Order Contracting (JOC), or CM at risk (CMAR) would be the potential appropriate delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.
Package Description:	This project entails: • Improvements to the existing administration, office, workshop, and storage facilities at the RWF main operations areas. • A new central warehouse and load-out area, where equipment and supplies will be stored temporarily before being moved to the various storage facilities for each treatment unit process. • Landscaping improvements, primarily along the perimeter of the RWF main operations area, include grass and trees/shrubs with associated irrigation, and perimeter fencing. • Public art installations. • Demolition and removal of old steam chiller • Purchase and installation of new electric chiller • Interconnection of required auxiliary systems • Install new facility air compressor and modify electrical and cooling water connection • Replacement of heating, ventilation, and air conditioning (HVAC) chiller in the Nitrification Building (part of BNR2 complex) • HVAC upgrades for P&E Office and Admin/Secondary Service Wing • Cooling Tower Replacement
Required Predecessor Effort:	• Site improvements guidelines (architectural, traffic, warehousing, landscaping, vertical clearance requirements assessment etc.) (Programmatic Study)

Benefits of Project:	• Replaces old equipment and facilities. • Improves reliability of existing HVAC systems. • Improves plant working environment for staff. • Eliminates reliance on steam systems. • Expands existing facilities for future staff. • Improve plant aesthetics and creates an attractive work environment.

Scope of Work:	The scope of work for this package is to be implemented over 30 years, and the cost estimate is assuming 1/3rd of the package scope gets implemented in the 10-year CIP.
	
	• New relocated warehouse (21,000 SF) with bridge crane and fenced laydown area (40,000 SF)
	• Ancillary equipment
	• Depending on the site improvements guidelines and decisions made, this would involve improvements to the existing administration, office, operations, engineering, training, workshop, and storage facilities at the RWF main operations areas. Improvements to the following existing support buildings:
	  ○ Admin building (31,600 SF area)
	  ○ Operations buildings (68,000 SF area)
	  ○ Engineering Services Building (32,500 SF area)
	  ○ Training (3,500 SF area)
	  ○ Maintenance area (46,000 SF area)
	  ○ Additional Storage/warehouse area (48,000 SF area)
	• Landscaping improvements, primarily along the perimeter of the RWF main operations area, include grass and trees/shrubs with associated irrigation, and perimeter fencing.
	• Public art installations.
	• Demolition and removal of old steam chiller
	• Purchase and installation of new electric chiller
	• Interconnection of required auxiliary systems
	• Install new facility air compressor and modify electrical and cooling water connection
	• Replacement of heating, ventilation, and air conditioning (HVAC) chiller in the Nitrification Building (part of BNR2 complex)
	• HVAC upgrades for P&E Office and Admin/Secondary Service Wing
	• Cooling Tower Replacement.
	• Elevator replacement
	• Code-compliant signage for RWF Buildings
	• Centralized Fire Alarm Monitoring for RWF Buildings
	• Environmental Wash Rack System in Grease Room
	• Replace (2) 10-ton bridge crane & rail systems in SBB
	• Replace (1) 20-ton bridge crane in Building 40

	• Sprinkler Drain Valves at both ESB and Building 40 • New Training Trailer • Female Locker/Shower Facility • Seismic Gas Shutoff Valves for RWF buildings • Fencing		
Author:	AMB, JLD	**Reviewer:**	EDW
Date:	12/06/2013	**Date:**	12/08/2013
Attachments: *No Entries*			

Package ID:	PF-03	**Project ID(s):**	F-03	**Other Ref. ID:**	CPMS: 6653, 6835, 7404; PMP: 97
Package Name:	Handrail Replacement		**Process Area:**	Facilities	
Function:	R&R		**Priority:**	High	
Estimated Project Cost($):	10,990,000.00		**Source of Estimate:**	City/MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	4	
Current Schedule- Start Dates:					
Planning Date:		**Design Date:**		**Bid Date:**	
Construction Date:	Nov 2013 (Phase 1), May 2016 (Phase 2), Nov 2018 (Phase 3), May 2021 (Phase 4)	**Startup Date:**			
Packaging Criteria:	Previously packaged by City, Project implementation already underway, Maintain plant compliance through phasing, Bundling of small projects where possible				
Package Need:	The safety of plant staff is a primary concern for the RWF. Since many of the facilities at the treatment plant are old, this program ensures handrails are replaced in a timely fashion, especially if a specific project in an area where handrails need to be replaced is scheduled far into the future.				
Background:	History: This project corresponds to PMP project 97. Future Roadmap: The trigger for this project is the existing condition of handrail, hence the phasing of this project should be based on condition assessment of existing handrail and corrosivity analysis of a various RWF process areas. This project should also be phased around other parallel improvements taking place at the Facility. Alternate Delivery Methods: This project would be a good candidate for Job Order Contracting (JOC). As that option is currently unavailable, a traditional DBB model has been selected for project delivery, but this should be re-evaluated if more delivery methods become available.				
Package Description:	This project entails the replacement of handrails at structures: 1. That do not have a modification or renovation project identified for that complex. 2. Where safety concerns require handrail replacement, even if a later modification or renovation project has been identified for that complex.				

Required Predecessor Effort:	• Condition Assessment of existing handrails • Corrosivity analysis for handrail locations to determine replacement cycle		
Benefits of Project:	• Reduces safety risk to O&M personnel. • Enhances contractor safety on site. • Reduces health risk to the public.		
Scope of Work:	Replacement of handrails at and around various structures.		
Author:	AMB, JLD	**Reviewer:**	EDW
Date:	12/06/2013	**Date:**	12/08/2013
Attachments: *No Entries*			

Package ID:	PF-04	**Project ID(s):**	F-04, F-06	**Other Ref. ID:**	CPMS: 6998, 7086; OM: 7, 12, 13, 28, 40; PMP: 98, 100
Package Name:	Yard Piping and Road Improvements		**Process Area:**	Facilities	
Function:	R&R, Upgrade, New		**Priority:**	High	
Estimated Project Cost($):	108,170,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	4	
Current Schedule- Start Dates:					
Planning Date:	Jun 2015	**Design Date:**	Dec 2016	**Bid Date:**	Dec 2017
Construction Date:	Jun 2018 (Phase 1), Sep 2019 (Phase 2), Dec 2020 (Phase 3), Apr 2022 (Phase 4)	**Startup Date:**			
Packaging Criteria:	Project implementation already underway, process and/or systems inter-dependency, avoid interferences by multiple contractors, maintain plant compliance through phasing, comprehensive scope to include ancillary facilities/utility feeds				
Package Need:	The RWF has approximately 300,000 linear feet of piping along with associated valves and related appurtenances. The pipes range in diameter from 8 inches to 144 inches and carry gas, liquids, sludge, air, steam and other process streams to and from the various treatment areas. The pipes vary in age, material, condition, reliability and redundancy. Over 70 percent of the piping was installed more than 25 years ago and is in need of rehabilitation or replacement due to age, failure, and/or excessive maintenance needs. Where feasible, the RWF will consider transitioning to grouping smaller diameter, non-gravity flow pipelines in covered, trench-type corridors, i.e. utili-dors, as part of this maintenance and upgrade program. The RWF also has an extensive roadway network, nearly 40,000 LF of paved surfaces that needs rehabilitation and/or replacement due to excessive wear, heavy vehicle traffic, and drainage issues. This project provides for continued R&R of these roads.				
Background:	<u>History:</u> This project corresponds to PMP projects 98 and 100. <u>Future Roadmap:</u> The trigger for this project is the existing condition of piping and roads, hence the phasing of this project should be based on condition assessment of existing piping and roads in various RWF areas. This project should also be phased around other parallel improvements taking place at the Facility.				

	Alternate Delivery Methods: This project would be a good candidate for Job Order Contracting (JOC), Progressive Design Build (PDB), or CM-At Risk (CMAR). As these options are currently unavailable, a traditional DBB model has been selected for project delivery, but this should be re-evaluated if more delivery methods become available.
Package Description:	This project entails the continued replacement of pipelines, or portions of pipelines, that: • Have a record of repeated breakages. • Due to their age and function need to be replaced as a preventative action. In addition, it includes improvement of roadways in the RWF main operations area, RSM main access road, and parking lot asphalt repairs and drainage improvements.
Required Predecessor Effort:	• Comprehensive piping condition assessment (Study S05).
Benefits of Project:	• Mitigates failure risk of process piping. • Improves plant reliability and flexibility. • Implements asset management program • Eliminates "weak links" in O&M. • Provides ease of operations. • Minimizes confined space entry on site.
Scope of Work:	• Repair/Replacement of pipelines, or portions of pipelines (to be identified in condition assessment). • Improvement of roadways in the RWF main operations area (approx. 31,500 LF). • Improvement of roadway to RSM main access (approx. 7,000 LF) • Various street and parking lot repairs. • Drainage improvements tying to RWF storm drain system.

Author:	AMB, JLD	**Reviewer:**	EDW
Date:	12/06/2013	**Date:**	12/08/2013

Attachments:

No Entries

Package ID:	PF-05	**Project ID(s):**	F-20	**Other Ref. ID:**	PMP: 114
Package Name:	Record Drawings		**Process Area:**	Facilities	
Function:	Record Drawings		**Priority:**	High	
Estimated Project Cost($):	11,900,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Jan 2015	**Design Date:**	Mar 2016	**Bid Date:**	
Construction Date:		**Startup Date:**	Dec 2022		
Packaging Criteria:	Project implementation already underway, Process and/or systems inter-dependency				
Package Need:	The RWF has a wealth of design and construction documents and drawings dating back to the late 1950s in physical and electronic formats. This project will collect and consolidate these valuable resources in a single system to be easily stored and retrieved by RWF staff for current operations and maintenance and future capital projects.				
Background:	History: This project corresponds to PMP project 114. Future Roadmap: The trigger for this project is a policy decision to map all existing RWF facilities (except yard piping, which has been mapped by GIS), to allow staff to better understand existing conditions, to better operate, and to plan improvements for existing facilities. The newer capital improvements would have creation of record drawings as part of their construction contracts.				
Package Description:	This project develops a document management system and standards for electronically capturing, indexing, storing, retrieving, distributing, and versioning master drawings, specifications, and other final design documents. It also involves inventorying, developing, updating, and integrating existing records and field drawings.				
Required Predecessor Effort:	Asset Management Strategy (Study 09).				
Benefits of Project:	• Increases standardization and communication between design and operations. • Increases ease of operations. • Replaces inefficient systems and practices. • Leverages technology to improve operations.				

Scope of Work:	• Field surveying (85% P&ID drawings and all facility drawings, except yard piping) • Marking-up or developing new drawings to reflect existing field conditions. • Field survey and as-building of facility building and tunnel drawings, except yard piping • Verifying that the CAD drawings reflect the existing field conditions. • Modification or development of new P&ID drawings by a third-party systems integrator to reflect existing field conditions. • Document scanning and archiving system • Input of metadata for existing drawings • Incorporating existing as-builts into an overall plant-wide P&ID and electrical record system. Among other parts of the Facility, this work will specifically cover the following areas: • 480V Switchgears: Develop one-line diagrams and schematic diagrams for the following switchgears: S1-1, S1-2, S-6, S2A S13-1 and S13-2. • 4160V Switchgears: Develop one-line diagrams and schematic diagrams for the following switchgears: S1, S2, S11, S14, S16 and S40. • Process Piping and Instrumentation Diagrams for the following RWF processes: Primary, secondary, nitrification, filtration, sludge processing, solid handling and recycle work. • Instrumentation Loop Diagrams for the following Plant processes: Primary, secondary, nitrification, filtration, sludge processing, solid handling and recycle work.

Author:	AMB, JLD	**Reviewer:**	EDW
Date:	01/07/2014	**Date:**	12/08/2013

Attachments:

No Entries

Package ID:	PF-06	**Project ID(s):**	F-11, F-22, F-23	**Other Ref. ID:**	CPMS: 7081; OM: 8, 23; PMP: 105
Package Name:	Facility Wide Water Systems		**Process Area:**	Facilities	
Function:	R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	12,600,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Jul 2014	**Design Date:**	Jan 2016	**Bid Date:**	Jul 2017
Construction Date:	Jan 2018	**Startup Date:**	Jan 2021		
Packaging Criteria:	Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Bundling of small projects where possible				
Package Need:	The RWF's four water systems include 1W potable water, 2W groundwater, 3W process water, and 4W fire protection water. These were constructed over time with the various expansions and are in need of rehabilitation and upgrade due to age and condition. In addition, changes to water uses and demands have not been addressed over time. An updated hydraulic model and assessment of current and future water demands will allow for the proper sizing of these systems to improve current and future performance and reduce damage to pumping equipment. In addition, t here is a need to upgrade the process water distribution in the plant for a variety of reasons including: • eliminating pump cavitation and other issues associated with 3W that could jeopardize worker safety and damage to facilities • to meet current and future needs in the P&E facility using 2W • need to upgrade current RWF fire protection to comply with California fire code for 4W				
Background:	<u>History:</u> This project includes Plant Master Plan Project No. 105 and corresponds to Validation Project PF-06. During the validation exercise, the scope of this project was modified to include gap projects identified by O&M staff relating to the 1W, 2W, and 4W systems (OM-8, OM-23) in addition to the 3W system upgrade scoped during the PMP. <u>Future Roadmap:</u> A condition assessment and network modeling should be done on each plant water system to identify aging assets and future expansion needs. Subsequent phases of the project will be focused on implementation of the study recommendations.				

	Alternate Delivery Methods: As many of the project components are varied in scope and location throughout the RWF site, it was determined that progressive design build (PDB), Job Order Contracting (JOC), or CM at risk (CMAR) would be the potential appropriate delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.
Package Description:	This project rehabilitates, replaces, and/or extends the RWF's four water systems (1W, 2W, 3W and 4W) including piping, valves, pumps, controls and other ancillary equipment. The scope of work will be based on hydraulic modeling and study of existing and future water demands at the RWF.
Required Predecessor Effort:	Facility-wide utility systems evaluation (Study S06).
Benefits of Project:	• Improves the reliability of plant water systems, which in turn improves the reliability of plant processes. • Increases ease of plant operations.

Scope of Work:	**3W system**
	• Hydraulic Modeling
	• Modifications to 3W pumps
	• Modifications to 3W piping
	• Additional Valves
	• New VFDs
	
	1W and 2W System
	• Evaluation study of existing demands, and projections of future demands for 1W (potable) and 2W (groundwater)
	• Modeling of 1W and 2W distribution systems to define the required system upgrades.
	• Construction of required upgrades to distribution system:
	  ○ Pipe repair/replacement or upgrade to match pressure zones
	  ○ Pump upgrades/replacement
	  ○ Valve/control replacement
	4W System
	• A study to build on the deficiencies identified in the Gap Analysis (2011).
	• Various corrections to Fire Pumps and valves.
	• Creation of a dedicated room for pumps

Author:	AMB, JLD	**Reviewer:**	EDW
Date:	01/07/2014	**Date:**	12/08/2013

Attachments:

No Entries

Package ID:	PF-07	**Project ID(s):**		**Other Ref. ID:**	
Package Name:	Facility Instrument Air System		**Process Area:**		
Function:	Upgrade, New		**Priority:**	High	
Estimated Project Cost($):	10,810,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Dec 2013	**Design Date:**	April 2014	**Bid Date:**	Sep 2014
Construction Date:	Mar 2015	**Startup Date:**	Jan 2018		
Packaging Criteria:	Previously packaged by City, Project implementation already underway, Comprehensive scope to include ancillary facilities/utility feeds				
Package Need:	The instrument air supply system plays a critical role by providing high pressure air for pneumatic operations and controls of valves and instruments located throughout the RWF process areas. The existing system is outdated and its location in the basement of the Secondary Blower Building makes it vulnerable to flooding. The existing system also lacks an independent power source and sufficient reservoirs for maintaining operations during an extended power failure. Replacement of the system will improve operational reliability and minimize interruptions to critical operations.				
Background:	History: The need to replace aging instrument air system replacement was identified by the RWF O&M staff prior to the CIP validation process, and implementation is already underway. Future Roadmap: At the time of the CIP validation process, this project is already underway. Alternate Delivery Methods: Since this project includes the replacement of multiple segments of the instrument air system, job order contracting (JOC) is a delivery vehicle that could be considered if available to the City. At the time of the CIP validation, the City is planning to proceed with a traditional design-bid-build (DBB) delivery method.				
Package Description:	The plant instrument air supply system is a high-pressure system used for controlling the facility's pneumatic controls. It is currently located in the secondary blower building and nitrification building. This project replaces the existing high-pressure Plant instrument air supply system with a new above grade distributed air supply system. This project also makes electrical upgrades to provide for power and redundancy improvements to the RWF air supply system.				
Required Predecessor Effort:					

Benefits of Project:	• Replaces aged equipment. • Provides process reliability. • Provides ease of O&M.
Scope of Work:	• New plant instrument air system shall be located above grade to protect it from flooding • System shall be designed with sufficient reservoir (s) to provide suitable redundancy and air supply to support operations in the event of an extended power loss. • System shall be configured such that each compressor, reservoir and pipe segment can be isolated for maintenance or repair without pressure loss or interruption • Provision of temporary system to maintain plant operation during construction • Demolition and decommissioning of old system

Author:	Mahama N., AMB	**Reviewer:**	
Date:	12/18/2013	**Date:**	

Attachments:

No Entries

Liquids Processing

Package ID:	PLD-01	**Project ID(s):**	LD-01	**Other Ref. ID:**	PMP: 37, 38, 39
Package Name:	New Disinfection Package		**Process Area:**	Disinfection	
Function:	Capacity Increase, Upgrade, New		**Priority:**	Medium	
Estimated Project Cost($):	42,790,000.00		**Source of Estimate:**	PMP/MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Apr 2019	**Design Date:**	Oct 2020	**Bid Date:**	Jul 2022
Construction Date:	Jan 2023	**Startup Date:**	Mar 2026		
Packaging Criteria:	Location proximity on plant site, Avoid interferences by multiple contractors, Maintain plant compliance through phasing, Comprehensive scope to include ancillary facilities/utility feeds				
Package Need:	The City has an objective of providing disinfection of all flows within chlorine contact basins. Currently, peak flows (PHWWF) and filter bypass flows do not go to the contact basins due to capacity limitations and are disinfected either at the filter influent pump station (FIPS) or in the artesian slough. It is difficult to maintain a consistent contact time for disinfection in the Artesian Slough. The existing chlorine contact basins have adequate capacity to treat maximum month flows, but not peak hour flows. Thus, the Facility needs to construct additional chlorine contact basins to disinfect peak hour flows. All hypochlorite used for final disinfection of the final effluent is purchased and stored onsite. However, there may be a financial benefit to generating the hypochlorite onsite as it is needed. As an alternate disinfection treatment train, it may be more cost effective on a life-cycle cost basis to provide disinfection using a new UV system than continued use of the existing hypochlorite system. In addition, transitioning to UV disinfection instead of continuing with the existing hypochlorite disinfection would have the following benefits: • Help the Facility meet its goal of reducing chemical use • Reduce the potential for disinfection byproduct formation • Could potentially aid the Facility in transitioning to advanced oxidation, if combined with peroxide, should the Facility be presented with new regulations governing CECs.				
Background:	<u>History:</u> This project includes Plant Master Plan Project Nos. 37, 38, and 39 and corresponds to Validation Project PLD-01. No additional comments were considered during the validation process.				

	Future Roadmap: At a minimum, this project would implement additional CCBs for hypochlorite disinfection of peak flows. New CEC regulations could be issued by the RWQCB within the next two to three permit cycles, which could be a driver for transitioning to UV disinfection, possibly coupled with an advanced oxidation process. To facilitate such a transition, additional flow analysis, regulatory monitoring, and feasibility studies will need to be performed. Should new regulations not be a driver to UV, onsite hypochlorite generation could be considered, since its life-cycle cost compares favorably to that of a new UV facility. Alternate Delivery Methods: As many of the project components are varied in scope and location throughout the RWF site, it was determined that progressive design build (PDB) or CM at risk (CMAR) would be the potential appropriate delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.
Package Description:	**Capacity.** This project would consist of the construction of additional 155 mgd CCBs to accommodate peak hour wet weather flows (PHWWFs). Hypochlorite would be kept in reserve for use during these peak flow conditions. **Chlorine Source.** If onsite hypochlorite generation is chosen, the onsite generation facility would consist of tube-type electrolytic cells, storage tanks for salt and brine solutions, and appurtenances. **Disinfection Method.** If the UV disinfection system is chosen, this project would replace the current hypochlorite disinfection system, and would consist of the construction of the following: • Two new UV channels and associated equipment to disinfect 35 mgd recycled water • Five new UV channels and associated equipment to disinfect 145 mgd discharge
Required Predecessor Effort:	• Alternative Analysis for Disinfection
Benefits of Project:	• Proactively addresses future regulations. • Meets all regulatory compliance requirements.
Scope of Work:	Construction of 155 mgd CCBs: • Two 130-feet by 115-feet CCBs Depending on the disinfection alternative chosen: • Continued use of purchased hypochlorite. • Construction of 180 mgd hypochlorite generation facility (equipment rated for 6,000 lbs of Chlorine equivalent), OR • Construction of 180 mgd UV disinfection facility (Two 65-feet by 25-feet channels; Five 42-feet by 65-feet channels)

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLD-02	**Project ID(s):**		**Other Ref. ID:**	OM: 52, 53
Package Name:	Outfall Bridge and Levee Improvements		**Process Area:**	Outfall	
Function:	R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	7,600,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Mar 2014	**Design Date:**	Apr 2016	**Bid Date:**	Oct 2016
Construction Date:	Apr 2017	**Startup Date:**	Apr 2018		
Packaging Criteria:	Location proximity on plant site, Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Bundling of small projects where possible, Incorporate O&M projects into larger packages				
Package Need:	The existing outfall bridge and instrumentation supports are in poor condition. This facility supports the monitoring equipment needed to demonstrate Facility compliance with its NPDES permit. Geotechnical and structural evaluations are needed to determine the extent of rehab/repair needed. Depending on these evaluations, environmental clearances could be needed as well. In addition, the existing electrical transformer is in need for refurbishment and repair. Furthermore, the current west side levee of Pond A-18 is experiencing significant erosion, the level-control gates are not structurally stable, and as a result large fish have moved into pond A-18 thru the crack on the bridge. This project will improve the aging facilities to ensure reliability at the outfall compliance point.				
Background:	This project was identified by the Validation team based on discussions with the City O&M staff.				
Package Description:	The project includes a condition assessment, outfall bridge repairs or replacement, levee and levee gate repairs, and electrical transformer refurbishment.				
Required Predecessor Effort:	• Environmental clearances for outfall work				
Benefits of Project:	• Mitigates process failure risk. • Replaces critical facilities.				
Scope of Work:	• Condition assessment and repair of outfall bridge structure and electrical transformer • Repair of west levee • Repair/replacement of gates at west levee • Obtaining the necessary environmental clearances.				

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/05/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLD-03	**Project ID(s):**		**Other Ref. ID:**	
Package Name:	Final Effluent Pump Station and Stormwater Channel Improvements		**Process Area:**	Outfall	
Function:	New		**Priority:**	Medium	
Estimated Project Cost($):	37,530,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Low-bid DB				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Jul 2019	**Design Date:**	Oct 2020	**Bid Date:**	
Construction Date:	Oct 2021	**Startup Date:**	Apr 2023		
Packaging Criteria:	Location proximity on plant site, Avoid interferences by multiple contractors, Maintain plant compliance through phasing, Opportune timing – schedule alignment, Outside RWF perimeter				
Package Need:	Future sea level rise will dictate the need for a levee for shoreline protection (to be built by Army Corps of Engineers). A new final effluent pump station would be needed to hydraulically push the final treated effluent to the Coyote Creek. Other improvements to the existing storm water channel (rehabilitation of flapper gates and embankments) would also be tied together with this work to better improve hydraulics.				
Background:	History: In order to mitigate the effects of sea-level rise, the US Army Corps of Engineers (USACE) is planning to build a levee near the outfall of the RWF. The sea level rise is anticipated to disrupt the final effluent hydraulics, and thus a new low lift pump station was identified by the City staff during the validation process. Future Roadmap: The schedule of this project will need to match the implementation of the levee, to allow the pump station to be operational prior to the levee being built. This will require close coordination with the USACE to better understand the timing of this exercise. Alternate Delivery Methods: Since this project is tied closely with the levee, it is a good candidate for design-build-operate (DBO). However based on the current delivery methods available to the City, it is slated to be delivered via design build (DB). This delivery method should be re-evaluated as the project advances through the stage gates.				
Package Description:	350 MGD pump station • Improvement to 2-3 flapper gates at storm water channel (assumed 72" dia.). • Improvements to approx. 100 LF of storm water channel embankment				
Required Predecessor Effort:	• Flows and Loads Analysis				

Benefits of Project:	• Allows continued operations of RWF in anticipation of future sea level rise.		
Scope of Work:	• 350 MGD pump station (5+1 pumps, 200 HP each) • Rehabilitation of approx. 100 LF of open channel embankments • Replacement of 2-3 flapper gates.		
Author:	AMB, JLD	**Reviewer:**	
Date:	01/07/2014	**Date:**	
Attachments: *No Entries*			

Package ID:	PLF-01	**Project ID(s):**	LF-02, LF-03	**Other Ref. ID:**	CPMS: 6833; OM: 11, 44; PMP: 31, 32
Package Name:	Filter Repair and Rehabilitation Package		**Process Area:**	Filtration	
Function:	R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	24,700,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Sep 2014	**Design Date:**	Mar 2016	**Bid Date:**	Mar 2017
Construction Date:	Sep 2017	**Startup Date:**	Sep 2019		
Packaging Criteria:	Project implementation already underway, Location proximity on plant site, Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Maintain plant compliance through phasing, Bundling of small projects where possible, Incorporate O&M projects into larger packages				
Package Need:	The existing filter complex, constructed in the 1970s, is in need of significant refurbishment. The filtration media, consisting of anthracite and sand, needs to be replaced and some of the mechanical and electrical components need to be upgraded. Depending on how new filtration technology develops over the next years, it is possible that a replacement filter complex will be constructed. The filtration repairs under this project are aimed at either: 1. Keeping the facility operational through transition to a new filter complex. 2. Keeping the facility as the sole filtration facility.				
Background:	<u>History:</u> This project includes Plant Master Plan Project Nos. 31 and 32 and corresponds to Validation Project PF-02. During the validation exercise, the scope was further refined based on specific valve replacement and concrete repair needs (OM-11, OM-44) identified by O&M staff. <u>Future Roadmap:</u> Depending on the outcome of the detailed condition assessment, the estimated cost to rehabilitate the existing filter complex will have to be compared to building a new filter complex. Any new filtration technology will first be pilot tested to assess performance under RWF-specific conditions. In addition, any final technology selection must consider likely future, more stringent TN regulations, and the nutrient removal strategy chosen by the RWF. Special attention will need to be given to the sequencing and constructability for the valve replacements in the filter gallery.				

	Alternate Delivery Methods: As the filter rehab will be largely dependent upon the condition and shutdown constraints at each filter/valve, progressive design-build (PDB) and construction management at risk (CMAR) were identified. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.
Package Description:	This project entails the replacement of filter media and underdrain systems for all filters, as well as repairs and upgrades required to the existing filters to suit the intended future role of the facility. This includes valve replacement, electrical control replacement, addition of air scouring equipment and piping, and concrete repair to varying degrees, depending on the intended future role of the facility.
Required Predecessor Effort:	• Filter media surveillance (completed). • Detailed condition assessment of filters.
Benefits of Project:	• Leverages technology to improve operations. • Enhances cost effectiveness of operations. • Mitigates failure risk. • Increases ease of operations. • Improves plant reliability/flexibility.
Scope of Work:	• Replacement of the media and underdrain systems for all 16 filters (approx. 212 T of sand; 400 T of anthracite). • Addition of air scour piping (16-inch dia. WSP, 1,500 LF) and associated instrumentation, blowers (two 150 HP units) and valves. • Valve replacement (16 no. each of 24-inch isolation, 36-inch influent, 30-inch drain, 32 no. of 30-inch backwash BFVs) • Electrical control replacement • Concrete repair at filters (quantity to be determined based on field investigation). • Concrete repair at west primary clarifiers (quantity to be determined based on field investigation). • New VFDs for backwash pumps (3x 24" vertical turbine pumps, 400 HP, 18,000 GPM each).

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLF-02	**Project ID(s):**	LF-04	**Other Ref. ID:**	CPMS: 7448; PMP: 33
Package Name:	Alternative Filter Technology Field Verification Package		**Process Area:**	Filtration	
Function:	New, Piloting		**Priority:**	Medium	
Estimated Project Cost($):	2,600,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Jul 2019	**Design Date:**	Oct 2020	**Bid Date:**	Apr 2021
Construction Date:	Oct 2021	**Startup Date:**	Oct 2022		
Packaging Criteria:	Process and/or systems inter-dependency, Opportune timing – schedule alignment				
Package Need:	Secondary effluent filtration will continue to be needed to meet reuse water requirements, and at least partially to ensure Bay discharge is well within the current requirements set by the Facility NPDES permit. Partial filtration will likely transition to full filtration in the future to accommodate growth in reuse water production, and to meet anticipated future total nitrogen (TN) limits expected within the next three permit cycles. The wastewater facility has several filtration options available to achieve permit compliance. One approach is the rehabilitation of the existing filters. The existing filter complex, constructed in the 1970s, is in significant need of refurbishment. A second approach is to replace existing filters with alternative technology. Other technologies such as disk filters etc. represent potential alternatives to the existing dual-media filtration system. Field testing and verification of alternative technologies would be utilized to determine the technology that is most suitable for the needs of the Facility's secondary effluent for both Bay discharge and recycled water supply.				
Background:	<u>History:</u> This project includes Plant Master Plan Project No. 33 and corresponds to Validation Project PF-02. <u>Future Roadmap:</u> The Filtration Technologies Evaluation project (nearing completion) will provide the basis for selecting three filtration technologies to consider for additional testing. <u>Alternate Delivery Methods:</u> As many of the project components will be sole sourced, it was determined that progressive design build (PDB) or CM at risk (CMAR) would be the potential appropriate delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.				
Package Description:	This project entails the field verification of up to three filtration technologies based upon a screening of available systems.				

Required Predecessor Effort:	• Filtration Alternatives Evaluation (in process). • Detailed condition assessment of the existing filter complex.
Benefits of Project:	• Improves plant reliability/flexibility. • Proactively approaches changing regulations (i.e. CECs). • Replaces obsolete technology with proven new/proven technology. • Leverages technology to improve operations. • Seeks best value solutions, not just low bid. • Enhances cost effectiveness of operations.

Scope of Work:	• Site investigation
	• Preparation of equipment sizing, layout, wiring schematics, P&IDs
	• Project management
	• Field verification of up to three filtration technologies:
	  ○ 1 disk in a 3-disk unit; 53 sf; 350 gpm capacity.
	  ○ 1 disk in a 3-disk unit; 18 sf; 162 gpm capacity.
	  ○ 1 disk in a 2-disk unit; 19 sf; 122 gpm capacity.
	• 3 slabs on grade
	• 6-inch dia. 500 LF header pipeline.
	• 12-inch dia. 600 LF filter effluent and backwash water pipeline.
	• Utility water and power connections to pilot filters.
	• Temporary pumps and piping rental/purchase
	• For 1 filter - structural modifications, access platforms and handrail

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLH-01	**Project ID(s):**	LH-01, LH-02, LH-10, LH-07	**Other Ref. ID:**	CPMS: 6013, 7477; OM: 10, 17, 47; PMP: 1, 2, 7
Package Name:	Near-Term Headworks Improvements Package		**Process Area:**	Headworks	
Function:	R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	26,220,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Jul 2014	**Design Date:**	Sep 2015	**Bid Date:**	Mar 2016
Construction Date:	Sep 2016	**Startup Date:**	Sep 2018		
Packaging Criteria:	Location proximity on plant site, Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Bundling of small projects where possible, Opportune timing – schedule alignment				
Package Need:	The RWF has two headworks (HW) facilities, Headworks No. 1 (HW1) and Headworks No. 2 (HW2). HW1 was built in the mid-1950s and early 1960s and is the Plant's duty headworks , and HW2 was built in 2008 to operate in parallel with HW1 to handle peak hour wet weather flow. Under a different project PLH-02, a new Headworks is slated to replace the older HW1 facility in the future. HW1 would eventually be decommissioned. This project will improve the functional reliability of HW2 so HW1 can be taken out of service for repair. This will allow HW1 to remain in operation as the new duty headworks headworks is being constructed.				
Background:	<u>History:</u> This project includes Plant Master Plan Project Nos. 1, 2, and 7 and corresponds to Validation Project PLH-01. <u>Future Roadmap:</u> This project is meant to a) ensure sufficient process reliability during construction of the new Headworks under project PLH-02, and b) implement some of the changes necessary to the headworks complex to allow the future decommissioning of HW1. The sooner the new headworks can be constructed and brought online, the shorter the required reliable operating period is required of HW1, which may provide opportunities to eliminate scope and cost from this project. <u>Alternate Delivery Methods:</u> Because of equipment with long lead times, it was determined that progressive design build (PDB) or CM at risk (CMAR) would be the potential appropriate delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.				

Package Description:	This project will complete a condition assessment of Headworks No. 1 (HW1) to identify equipment that may require rehabilitation. In addition, t his project will modify HW2 to accommodate all dry weather flow when HW1 is completely offline for rehabilitation. Specific improvements include: • Enhancements (rerouting return streams) to allow short-term improvements and ultimately decommissioning of HW1. • R&R of HW1 to keep it fully functional until new headworks is online. Improvements may include refurbishment of bar screens, grit classifiers, discharge valves, channel gate valves, and/or concrete. • Improvements to HW2, appropriate for a wet-weather headworks.
Required Predecessor Effort:	
Benefits of Project:	• Improves plant reliability/flexibility. • Improves automation and process control. • Mitigates failure risk.
Scope of Work:	**Enhancement Project - Phase 1:** • New 96-inch pipeline, 150-feet length. • New junction box for 96-inch pipe. • New Recycle Pump Station No. 1 with two 3.5 mgd submersible pumps, one 6.4 mgd submersible pump, and associated valves and piping. • New Recycle Pump Station No. 2 with two 2.2 mgd submersible pumps, and associated valves and piping. • Installation of one motorized gate operator at the California Structure. • Install a new 30-inch dia. Filter Backwash EQ Basin Overflow pipeline. • Installation of two new 300 gpm centrifugal drain pumps at West Primary Clarifiers 7 and 8. • Modifications to P&E cooling water pipeline (approx. new pipe is 20 ft. of 18-inch DIP) • Addition of four 10-feet wide stop gates at Raw Sewage Mixer Structure. **HW1 R&R:** • Rehabilitation and repair of four existing bar screens, 8-feet wide and 8-feet high. • Replacement of aerated grit classifiers 3 and 4 with total two new grit cyclones. • Replacement of total discharge valves (2x 54-inch gate valves) for raw sewage pumps 5 and 6. • Installation of 2 new channel gate valves. • VFD Upgrade to Small Raw Sewage Pumps (4x 200 HP, 34 MGD each).

- Structural Rehabilitation (approximate total area 10,000 ft^2) and new coating of concrete (approximate total area 53,200 ft^2) at:
    - Inlet Control Structure (Milpitas)
    - Inter-tie Junction Box
    - Santa Clara Structure
    - Influent Overflow Junction Structure
    - Headworks Influent Well
    - Bar Screen 1-4 Channels
    - South Grit Building
    - Aerated Grit Basin Channel
    - Aerated Grit Tank (South and North)
    - North Grit Building
    - Detritor South and North
    - Detritor Channel
    - RSPS No. 1 Distribution Box
    - RSPS No. 1 Large Wet Well
    - RSPS No. 1 Small Wet Well
    - Pump & Engine Building

Rehabilitation of the following piping:

- Influent Overflow Junction Structure (IOJS) to Influent Channel (segment constructed in 1961, 78-inch RCP, approx. length 100 LF)
    - Junction Box 1 to Junction Box 2 (84-inch RCP, approx. length 100 LF)
    - Junction Box 2 to Distribution Structure (78-inch RCP, approx. length 250 LF)

HW2 R&R:

- Remove influent flow meter and replace with straight pipe section.
- Replace one 8-ft wide and 8-ft high climber screen.
- Replace barscreen gate gearbox
- Gate and valve actuator replacement (approx. 20)
- Replace 150 LF sluiceway with conveyor to new screw press; remove existing washer compactor units.
- OM-47: Source water conversion at sluiceway from TPS to 3W is no longer required.

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/02/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLH-02	**Project ID(s):**	LH-03, LH-05, LH-04, LH-08, LH-09	**Other Ref. ID:**	PMP: 1, 3, 4, 5, 8
Package Name:	New Headworks Package		**Process Area:**	Headworks	
Function:	Upgrade, New		**Priority:**	Medium	
Estimated Project Cost($):	79,900,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Jul 2014	**Design Date:**	Jan 2016	**Bid Date:**	Jan 2018
Construction Date:	Jul 2018	**Startup Date:**	Jul 2021		
Packaging Criteria:	Location proximity on plant site, Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Bundling of small projects where possible, Opportune timing – schedule alignment				
Package Need:	The original HW1 was built in the mid 1950s and early 1960s to handle 167 mgd average dry weather flow (ADWF) and 271 mgd PHWWF. HW2 was built in 2008 and was designed to operate in parallel with HW1 to handle a combined Peak Hour Wet Weather Flow (PHWWF) of 400 mgd. The capacities of the facilities are such that either facility can accommodate average dry weather flows, but both facilities need to be online (operating in parallel) to accommodate peak wet weather flows. (RSPS1 would be the sole operating pump station for flows from both headworks, since the partition wall in the California Structure is no longer a part of HW Enhancements - Phase 1 Project.) A recent analysis of the headworks facilities completed in 2009 (Headworks Condition Assessment) identified HW1 as having structures and equipment that are aging and deteriorating and require more extensive repairs and replacement. It is anticipated that building a new duty headworks facility would be more cost effective and would provide greater operational reliability and enhanced treatment, addressing some of the operational issues currently experienced at the Facility, such as the deposition of grit in downstream processes.				
Background:	<u>History:</u> This project includes Plant Master Plan Project Nos. 1, 3, 4, 5, and 8 and corresponds to Validation Project PLH-02. HW3 is intended to replace Headworks 1 as the new duty headworks. <u>Future Roadmap:</u> Since the feasibility/development phases of both this project (PLH-02) and Headworks R&R Project (PLH-01) overlap, there is potential to combine these two projects. If PLH-02 is expedited, many of the scope items for HW1 improvements can be eliminated from PLH-01.				

	<u>Alternate Delivery Methods:</u> Because there is opportunity to pre-purchase equipment, it was determined that progressive design build (PDB) or CM at risk (CMAR) would be the potential appropriate delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.
Package Description:	This project will involve construction of a new headworks (Headworks No. 3 or HW3) to serve as the duty headworks. HW3 will be operated in conjunction with HW2, which in turn will serve as the wet weather peak flows headworks. This project also expands the volume of the equalization (EQ) basin by 25% to 10 MG. It provides the basin with a concrete liner and spraydown systems to facilitate cleaning after equalized flows are drained and returned to the treatment plant. Also included is installation of odor control covers over select junction boxes, influent screens, and screenings and grit collection areas of the headworks complex, along with the necessary concrete and steel corrosion protection. In addition, conduits for the collected foul air, and combination biological-chemical treatment scrubbers are to be constructed. Further re-routing and modifications to a number of influent pipelines to the plant, improvements to Emergency Basin Overflow Structure (EBOS), and connection of the Lamplighter force main to the Santa Clara No. 2 structure are other components to this project.
Required Predecessor Effort:	Updated Flows and Loads (S01).
Benefits of Project:	• Improves plant reliability/flexibility. • Enhances cost effectiveness of operations. • Replaces inefficient systems and practices.
Scope of Work:	**HW3:** • Two 84-inch pipelines (or a single 120-inch pipeline) between the emergency basin overflow structure (EBOS) and the headworks influent well (Approx. 1,100 LF). • Screenings facility (3x 5/8 mm coarse screens, 3x 1/4 mm fine screens; 3x gates, 3 weirs) • 70-ft x 70-ft x 40-ft flow split structure • Screenings handling systems (2 conveyors and compactors) • Grit removal facilities (3 hydrocell units) • Grit handling systems (3 grit classifiers) • Expansion of Raw Sewage Pump Station (RSPS) No. 2, or new raw sewage pump station upstream of HW3 (3x 500 HP, 80 MGD pumps) • 96-inch dia. effluent pipeline, approx. 400 LF. • Additional electrical equipment to be installed in the existing electrical building • New Electrical Building (approx. footprint 30-feet x 65-feet) • New Flow Split Structure.

- New concrete flow split structure 45'x45' footprint, 20' deep, 2x 6' long overflow weirs.

Raw EQ Basin:

- Modifications to basin overflow weir and bottom to increase basin capacity (Excavation of approx. 660 CF)
- Concrete liner and spraydown systems (approx. 250,000 SF, 9-inch thick, automated sprays).

Odor Control:

- Covers over select junction boxes, the screens, and screenings and grit collection areas of the headworks complex (6 locations, 4,900 SF each)
- Concrete and steel corrosion protection
- Conduits for the collected foul air
- Combination biological-chemical treatment scrubbers (2x 9-feet dia. packed tower scrubber, 2x 12-feet dia. carbon adsorption vessel)

Consolidation of Influent Piping:

- Flows from the Alviso/Los Esteros Forcemains will be collected in a common pipeline and diverted from the Influent Overflow Junction Structure (IOJS) into the headworks well at Headworks No. 2. This flow will be metered and added to the raw sewage flow.
- Similarly, Stormwater Pump Station flows will be re-routed to the same location, but will not be metered.
- Filter Building Drainage Pump Station flows into IOJS will be diverted as part of the recycle flow project.
- Pipes: 2,300 LF of 96-inch dia, 600 LF of 36-inch dia, 3x 310 LF of 12-inch dia.

Headworks Enhancements - Phase 2:

- Installation of a baffle wall and sluice gate at EBOS.
- Connection of the Lamplighter force main to the Santa Clara No. 2 structure (600 LF of 24-inch dia).

Author:	JLD	**Reviewer:**	DJB
Date:	01/07/2014	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLP-01	**Project ID(s):**	LP-05	**Other Ref. ID:**	CPMS: 6717; PMP: 14
Package Name:	Iron Salt Facilities		**Process Area:**	Primary Treatment	
Function:	New		**Priority:**	High	
Estimated Project Cost($):	5,150,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Nov 2013	**Design Date:**	Apr 2014	**Bid Date:**	Sep 2014
Construction Date:	Mar 2015	**Startup Date:**	Jul 2016		
Packaging Criteria:	Project implementation already underway				
Package Need:	The addition of iron salts and polymer to influent wastewater is commonly used in the industry to chemically enhance the precipitation of solids. This increased removal in the primary treatment phase has a number of benefits, the first being a decreased organic load on the secondary treatment process. Since aeration requires a very large energy input, reducing the organic load through chemically enhanced precipitation in the upstream process will result in an O&M savings for the plant. In addition, an increase in primary settled sludge would increase the feedstock to the digesters resulting in increased gas production. Iron salts are also very effective in binding and precipitating phosphorus, which prevents the phosphorus from contributing to the formation of struvite depositions, which are a costly O&M issue in digesters. Additionally, iron salts will reduce the future costs for the plant to draw off and treat foul air as well as to minimize the corrosive impacts of H2S generation. Limiting the formation and presence of H2S at the plant also positively affects the health and safety of plant personnel.				
Background:	<u>History:</u> This project includes Plant Master Plan Project No. 14 and corresponds to Validation Project PLP-01. During the validation exercise, the scope of this project was modified to include facilities that would allow for chemically enhanced primary treatment (CEPT), which would allow for increased organic removal in primary treatment. <u>Future Roadmap:</u> This project has been slated as one of the four "pilot" projects for the CIP project delivery model (PDM), and is already underway. <u>Alternate Delivery Methods:</u> Traditional DBB has been chosen as the delivery option for this project as alternative delivery methods were ruled out during the stage gate process.				

Package Description:	This project entails the implementation of iron salt and polymer feed stations. Each station consists of a chemical storage tank, a concrete containment structure, a metal roof structure with open sides, and a receiving station to offload chemicals from delivery trucks. It also includes the pumps, piping, and instrumentation to dose and deliver the chemical solution to the incoming wastewater, as well as safety systems associated with chemical handling facilities, such as eyewash/shower stations.
Required Predecessor Effort:	None
Benefits of Project:	• Increases ease of operations. • Enhances cost effectiveness of operations. • Reduces energy consumption in secondary process. • Reduces hydrogen sulfide emissions. • Reduces corrosion and odor.
Scope of Work:	• Iron salt feed station - chemical storage tank (approx. 6,500 gal), a concrete containment structure (approx. 650 sq. ft), a metal roof structure with open sides (approx. 650 sq. ft), and a receiving station to offload chemicals from delivery trucks. • Chemical feed pumps, piping, and instrumentation to dose and deliver the chemical solution to the incoming wastewater, as well as safety systems associated with chemical handling facilities, such as eyewash/shower stations. • Polymer Storage and Dosing Facility - Open structure to house one polymer dosing system, including storage tank or tanks of adequate capacity and day tanks, and associated blending, dosing and mixing equipment. Structure may include a shade roof for tanks and mechanical equipment complete with all piping, metering, containment, emergency equipment, alarms and instrumentation and controls as required and all connections necessary for providing chemical filling, potable and recycled water for operation, and required for operation in compliance with all codes and regulations. Structure shall also include connections for tanker truck delivery of polymer.

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLP-02	**Project ID(s):**	LP-01, LP-02	**Other Ref. ID:**	CPMS: 6012; OM: 45; PMP: 9, 10, 11
Package Name:	East Primaries Rehabilitation and Repair		**Process Area:**	Primary Treatment	
Function:	R&R, Upgrade		**Priority:**	Medium	
Estimated Project Cost($):	92,470,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	4	
Current Schedule- Start Dates:					
Planning Date:	Jan 2016	**Design Date:**	Apr 2017	**Bid Date:**	Apr 2018
Construction Date:	Oct 2018 (Phase 1), Jan 2020 (Phase 2), Apr 2021 (Phase 3), Jul 2022 (Phase 4)	**Startup Date:**	Sep 2023		
Packaging Criteria:	Project implementation already underway, Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Opportune timing – schedule alignment, Incorporate O&M projects into larger packages				
Package Need:	The RWF has two banks of primary treatment clarifiers: West and East Primary Clarifiers. Due to their age, condition, and treatment limitations, the West Primaries are to be decommissioned. The East Primaries will therefore be the only primary treatment units remaining, and will need to be upgraded to remain in full use. The Infrastructure Condition Assessment Report (May 2007) by CH2MHILL, and the Condition Assessment of Four Primary Settling Tanks (Oct 2009) by V&A assessed the condition of the East Primaries and observed that there were a number of areas that needed to be addressed including civil, architectural, mechanical, instrumentation and controls, electrical, structural components, and corrosion control. In addition, provisions will be made for the incorporation of odor control capabilities (i.e. covers, ducting, etc.). Other improvements to replace old piping and pumps are also included in this package. Part of the RWF vision is to be a good neighbor with respect to odor, noise, and aesthetics. Additionally, the RWF development master plan includes bringing the public closer to the plant's treatment processes. The Primary Treatment area treats screened raw influent, and is one of the critical processes that requires odor control				
Background:	<u>History:</u> This project includes Plant Master Plan Project Nos. 9, 10, and 11 and corresponds to Validation Project PLP-02. During the validation exercise, the scope of this project was modified to include other items (primary sludge pumps, light pole replacement) identified by the plant O&M staff.				

	Future Roadmap: The project is using a phased approach to allow for refurbishment of a quadrant of the East Primary Clarifiers, while the other three are operational. Alternately, the West Primary Clarifiers are available to provide treatment capacity while the refurbishment of the East Primaries is underway. Once this refurbishment is complete, the West Primaries can either be demolished or re-purposed. The results of the odor control study will guide the odor control measures used on the primary clarifiers. Alternate Delivery Methods: Because of the phasing and complexity of the project, it was determined that progressive design build (PDB) or CM at risk (CMAR) would be the potential delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.
Package Description:	The project entails rehabilitation of the East Primary Clarifiers, including: • Complete replacement of all mechanical, electrical, and controls equipment • Refurbishment and coating of concrete • Structural modifications to accommodate odor control covers • Installation of covers over the East Primary Clarifiers, including select inlet and outlet junction boxes, along with the necessary concrete and steel corrosion protection. • Replacement of light poles at East Primary clarifiers. • Installation of conduits for the collected foul air, and combination biological-chemical treatment scrubbers.
Required Predecessor Effort:	• Odor, noise, and emission control (including corrosion control) study (Study S03).
Benefits of Project:	• Reduces odors. • Fulfills all commitments to neighbors/public. • Mitigates failure risk. • Improves plant reliability/flexibility. • Meets all regulatory compliance requirements- no permit violations.
Scope of Work:	• Complete replacement of all mechanical, electrical, and controls equipment for 18 clarifiers (10 clarifiers 200-feetx40-feet; 8 clarifiers 150-feetx40-feet) including new SST clarifier mechanisms, plastic chains, cross collectors, weirs, scum troughs etc. • Refurbishment and coating (approx. 172,000 sq. ft.) of concrete • Concrete repair (approx. 26,000 sq. ft.). Structural modifications to accommodate odor control covers - approx. 200 48-inch diameter, 35-feet deep concrete shafts; 40-feet total length of reinforced internal wall. • Installation of covers over the East Primary Clarifiers, and select inlet and outlet junction boxes. • Concrete and steel corrosion protection.

	• Installation of conduits for the collected foul air. • Combination biological-chemical treatment scrubbers (2x 7-feet dia. packed tower scrubber, 2x 10-feet dia. carbon adsorption vessel). • Replacement of 11 light poles at East Primary clarifiers. • Replacement of Primary Sludge pumps, and controls (18x 15HP progressing cavity pumps). • Drives for clarifier mechanisms (18x 1 HP top drives; 18x 1.5 HP bottom drive). • Associated pumps and instrumentation (2x 20 HP centrifugal pumps).

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013
Attachments: *No Entries*			

Package ID:	PLS-01	**Project ID(s):**	LS-04, LS-08, LS-09, LS-10, E-14	**Other Ref. ID:**	CPMS: 6714; OM: 31, 33, 35, 39; PMP: 20, 24, 85
Package Name:	Aeration Tanks and Blowers Rehabilitation and Repair		**Process Area:**	Secondary Treatment	
Function:	R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	97,170,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	4	
Current Schedule- Start Dates:					
Planning Date:	Jan 2015	**Design Date:**	Jul 2016	**Bid Date:**	Jan 2018
Construction Date:	Jul 2018 (Phase 1), Jan 2020 (Phase 2), Jul 2021 (Phase 3), Jan 2023 (Phase 4)	**Startup Date:**	Jul 2024		
Packaging Criteria:	Location proximity on plant site, Process and/or systems inter-dependency, Avoid interferences by multiple contractors, Similar priority rating, Bundling of small projects where possible, Opportune timing – schedule alignment, Incorporate O&M projects into larger packages.				
Package Need:	The BNR1 and BNR2 aeration basins were constructed in phases between the 1960s and 1980s. These basins are the mainstay of the RWF treatment process, and need to be in operation for decades to come. Due to their age, and the aggressive and corrosive environment they operate in, extensive rehabilitation is required. In addition, the process air fed into the BNR1 comes from 2 sources, namely the electric blowers in Building 40 and the engine-driven blowers in the Secondary Blower Building. There is a need to minimize the impact of starting current from the blowers when the plant is run on emergency power. Furthermore, the engine-driven blowers are more than 30 years old and will not be able to meet stringent emission requirements in the future. Lastly, there is a need to install VFDs to minimize the impact on starting current on the nitrification (BNR2) blowers when the plant is run on emergency power. The S11 switchgear is outdated and needs to be upgraded to become compatible with the new VFDs to be installed on the nitrification blowers. This will also result in cost savings by operating the electric motors and process air compressors more efficiently.				

Background:	History: This project includes Plant Master Plan Project Nos. 20, 24, and 85 and corresponds to Validation Project PLS-01. During the validation exercise, the scope of this project was modified to reflect specific needs identified by the O&M staff. Additionally, blower electrical modifications were packaged in this project. Originally the PMP recommended a project that would connect the air piping. Future Roadmap: There is an intricate connection between the Emergency Diesel Generator project (PE-01), Cogeneration Project (PE-02), Support Building Improvements Project (PF-02) and this project. When the emergency diesel generator project (PE-01) comes online, in case of a power outage, the new generators can handle the inrush current from only one of the electric blowers. For BNR1 blowers, this can be mitigated by either replacing motors on the Building 40 BNR1 blowers and installing VFDs, installing new electrical blowers with VFDs, or potentially through the use of a jockey blower. Similarly, BNR2 blowers would need VFDs to mitigate inrush current and allow their operation of the emergency diesel generators. BNR1 can be aerated using existing engine-driven blowers in the Secondary Blower Building until modifications described above are completed, but these blowers depend on digester gas. Once the Cogeneration engines (PE-02) are online, all digester gas is diverted to those, and the engine-driven blowers would have to be supplied with natural gas. This could lead to potential cap and trade issues, so has to be carefully considered. Furthermore, the cogeneration project (PE-02) is driven by the need to have it online by 2017 to meet air quality emission regulations. In addition, the engine-driven blowers are slated for decommissioning as part of this project. The waste heat from the engine-driven blowers supplies the steam for the current chillers. Before the blowers are decommissioned, the chillers (and all other equipment depending) on the heat from these blowers should be replaced with new electric chillers. This work is under the scope of project PF-02. The aeration system study would guide the design of this project PLS-01 to further specify what the operational points for the blowers should be. Alternate Delivery Methods: Progressive design build (PDB) or CM at risk (CMAR) would be the potential delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.

Package Description:	This package combines projects at the aeration basins and blowers that involve:
	• Aeration Basins:
	  ○ completing the conversion of approximately 24 aeration basins from coarse bubble diffusion to fine bubble diffusion.
	  ○ ongoing maintenance work in the aeration basins to rehabilitate the concrete, replace corroded piping to suit the new aeration diffuser system, and various other components, such as valves, fittings and meters.
	  ○ installation of partition walls in the aeration basins to optimize process treatment capabilities.
	• BNR1 Blowers:
	  ○ installation of either new electrical blowers with VFDs in the Secondary Blower Building, or VFDs on the electric blowers in Building 40.
	• BNR2 Blowers:
	  ○ replacement of S11 switchgear and installation of VFDs on 5 nitrification (BNR2) blowers.

Required Predecessor Effort:	• Updated BioWin model, part of Design Criteria and Sizing Basis (Study S01). • Aeration demands and biosolids production assessment (process modeling) (Study S02).
Benefits of Project:	• Improves plant reliability/flexibility. • Enhances cost effectiveness of operations. • Leverages technology to improve operations. • Reduces energy consumption.
Scope of Work:	**Aeration Basins** • Completion of the conversion of approximately 24 aeration basins from coarse bubble diffusion to fine bubble diffusion (Diffusers provide 25% coverage of 325,000 SF). • Possible substitution of existing fine bubble diffusers to a different, more efficient and durable type of diffuser. • Installation of partition walls (33,000 sf FRP baffles). • Realignment of the existing diffuser grids, and aeration header piping. • 48x 24-inch RAS plug valve actuator replacement. • Sludge pumping modifications/improvements - replacement of 6x 100 HP pumps at BNR1, 2x 200 HP pumps at BNR2). • Ongoing maintenance work to rehabilitate the concrete, replace corroded piping to suit the new aeration diffuser system, replace/rehabilitate other components, such as nitrification valves. • Replacement of 70 light poles in BNR2 basins.

BNR1 Blowers

- Decommission engine generators in P&E building.
- Mechanical modifications to the blowers (impeller replacement) for three 4,000 HP single-stage BNR1 blowers.
- Replacement of aeration instrumentation.
- New PLC-based control system and fiber optic communication.
- Decommissioning of existing engine-driven blowers, and other obsolete equipment and piping in the Secondary Blower Building.
- Furthermore, there are two options for installation of VFD control at Building 40 BNR1 blowers:
    - Option 1: Replace 3 existing synchronous electric motors (4,000 V, 4,000 HP each) and 1-stage compressors with induction electric motors and two stage compressors. Also 3 VFDs will be installed (4160V)
    - Option 2: Replace 6 engine driven blowers with 6 electric driven blowers and install 6 VFDs (4160V)

Nitrification (BNR2) Blowers

- Installation and interconnection of VFDs on five Nitrification Process Aeration Blowers
- Mechanical modifications to the blowers (impeller replacement) for five 2,250 HP multistage centrifugal BNR2 blowers.
- Upgrade of existing control panels in the nitrification operator room and the plant DCS system.
- Upgrades to the fans and bearings of the existing blower electric motors (5 @ 2250 HP)
- Install and interconnect new outdoor S11 switchgear; the existing S11 switchgear will continue to be operational as the existing electrical loads are moved to the new S11 Switchgear
- Evaluate the efficiency of using a VFD vs. Inlet Guide Van adjustment for the expected variation in the Aeration Air Demand
- New S11 Switchgear. It is recommended to be installed in an outdoor walk-in enclosure at south-east end of Nitrification Building

Author:	AMB, JLD, MN, DC	**Reviewer:**	DJB
Date:	01/30/2014	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLS-02	**Project ID(s):**	LS-06, LS-07	**Other Ref. ID:**	CPMS: 6011, 6625; OM: 54; PMP:15, 16
Package Name:	Secondary Clarifier Rehabilitation and Repair		**Process Area:**	Secondary Treatment	
Function:	R&R, Upgrade		**Priority:**	Medium	
Estimated Project Cost($):	49,090,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	2	
Current Schedule- Start Dates:					
Planning Date:	Jul 2014	**Design Date:**	Jan 2016 (Phase 1), Dec 2020 (Phase 2)	**Bid Date:**	Jan 2017
Construction Date:	Dec 2017 (Phase 1), Dec 2021 (Phase 2)	**Startup Date:**	Dec 2020 (Phase 1), Dec 2025 (Phase 2)		
Packaging Criteria:	Project implementation already underway, Process and/or systems inter-dependency, Similar priority rating, Maintain plant compliance through phasing				
Package Need:	The RWF has 26 clarifiers associated with the secondary aeration basins (or BNR1) and 16 clarifiers associated with the nitrification aeration basins (or BNR2). These clarifiers, together with the aeration basins, are at the core of the treatment process, and need to be operational for decades to come. Performance of the nitrification and secondary clarifiers directly impacts the performance of the filters, and ultimately the quality of final effluent. This clarifier performance can likely be improved through hydraulic modeling and the selective placement of baffles in the clarifiers to reduce short-circuiting. Replacement of central effluent launders with a new peripheral launder in the older clarifiers (A1-A6, B1-B6, A1-A-8, and B1-B8) will improve clarifier performance and efficiency. The pilot project PLS-04 is needed to confirm modeling results before converting the remaining 25 clarifiers to new peripheral launders.				
Background:	<u>History:</u> This project includes Plant Master Plan Project Nos. 15 and 16 and corresponds to Validation Project PLS-02. During the PMP, this project was scoped based on a condition assessment completed for the BNR2 clarifiers (AECOM 2011). The validation exercise incorporated additional findings from a separate BNR1 condition assessment completed after the PMP (CH2M Hill 2012). <u>Future Roadmap:</u> The project was envisioned to be a phased construction, with work in BNR2 commencing prior to work in BNR1. The BNR1 condition assessment report recommended a modified baffle and launder recommendation, which is slated to be a pilot project under PLS-04. This pilot study should be conducted prior to the modifications in BNR1. In the mean time, work in BNR2 can commence.				

	Alternate Delivery Methods: Because of the phasing and complexity of the project, it was determined that progressive design build (PDB) or CM at risk (CMAR) would be the potential delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.
Package Description:	This package entails the implementation of the modifications necessary to improve performance of the 25 BNR1 and 16 BNR2 clarifiers. In addition, it entails mechanical and structural rehabilitation, including the replacement of sludge collector mechanisms, access bridges, launders, gates and operators, and other equipment as needed.
Required Predecessor Effort:	• Secondary Clarifier Modeling, HDR (December 2011). • Secondary Clarifier Condition Assessment (BNR1), CH2M Hill (May 2012). • Nitrification Clarifier Condition Assessment, AECOM (October 2011).
Benefits of Project:	• Improves plant reliability/flexibility. • Enhances cost effectiveness of operations.
Scope of Work:	**BNR1 clarifiers:** • Replace 2-inch concrete topping in six clarifiers (98’ diameter, 12’ deep) • Replace mechanism in 16x 98’ diameter clarifiers, including scum trough, and anti rotation baffle. • Replace 10 clarifier drives. • Recoat 20x 98” clarifiers with glass flaked epoxy coatings. • Replace 10x 2 HP clarifier motors. • Install scum beach for all 26 clarifiers - 22x 98’ diameter, 4x 140’ diameter. • Install new PVC scum spray system for all 26 clarifiers. • Replace 5’x5’ butterfly valves (16 total). Replace 8x 54” butterfly valves. • Replace groundwater pressure relief valves with duckbill check valves - 30x 6” diameter and 16x 4” diameter. • Replace central effluent launder with peripheral launder for 16x 98’ diameter clarifiers. • Install perforated influent baffles in all 26 clarifiers. • Replace 26 flow measurement instruments. • Replace struts, fasteners, and linings for 26 Parshall flumes. • Rehab RAS piping using CIPP method (approx. 8” diameter x 1000’). • Replace 26 telescoping valves and actuators.

	BNR2 Clarifiers: • Remove and replace mechanical components on 15x BNR2 clarifiers. • Replace galvanized railing on 10 clarifiers • Repair grout and base slab coating in 10 clarifiers • Repair cracks in 12-feet deep walls for 16 clarifiers • Repair interior launder walls for 1 clarifier • Replace exterior stair and landing at scum box for 14 clarifiers • Replace meter vault railing on top slab for 20 clarifiers • Replace pipe supports in meter vaults for 16 clarifiers • Repair cracks in meter vaults in 14 clarifiers. • Replace groundwater relief valves and rehab. sleeves and drain rock in 16 clarifiers • Remove and replace turnbuckles and telescoping valve actuators (2 HP each) in 16 clarifiers • Replace 2 MCCs serving the BNR2 clarifiers • Provide centralized low-pressure air system for secondary treatment

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013
Attachments: *No Entries*			

Package ID:	PLS-03	**Project ID(s):**	LS-14	**Other Ref. ID:**	PMP: 28, 29, 30
Package Name:	Aeration Basin Future Modifications		**Process Area:**	Secondary Treatment	
Function:	Capacity Increase, Upgrade, New		**Priority:**	Medium	
Estimated Project Cost($):	36,990,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	4	
Current Schedule- Start Dates:					
Planning Date:	Jul 2019	**Design Date:**	Jan 2021	**Bid Date:**	Aug 2022
Construction Date:	Feb 2023 (Phase 1), May 2024 (Phase 2), Aug 2025 (Phase 3), Nov 2026 (Phase 4)	**Startup Date:**	Feb 2028		
Packaging Criteria:	Location proximity on plant site, Similar priority rating				
Package Need:	Based on the PMP flow and loading projections, the existing activated sludge secondary system (step-feed) would only be sufficient until approximately year 2026. After that time, the existing tankage would be converted to a higher-capacity process, such as nitrification with anaerobic selector (NAS) to provide sufficient capacity for 2040 flows. However, subsequent to the PMP, flow projections have reduced dramatically, which will likely delay this required process modification. Meeting a future plant final effluent regulation of TN< 8mg/L would still be required, however, and can be accomplished in two possible ways: 1. Nitrification with anaerobic selector (NAS) followed by a combination of denitrification and tertiary filters, or 2. Modified Ludzack-Ettinger (MLE) process followed by tertiary filtration. The MLE process is assumed for this package.				
Background:	<u>History:</u> This project includes Plant Master Plan Project Nos. 28, 29, and 30 and corresponds to Validation Project PLS-03. This project was originally envisioned to accommodate future nutrient regulations and increased flow. During the validation process, the liquids process group cited additional flow studies that indicate that the PMP flow projects may potentially be conservative. Because of this uncertainty , the additional aeration basins have been removed from the project scope for the time being.				

	Future Roadmap: The direction of this project will be influenced by the revised projections of the influent plant flows (Study S01) and future TN discharge regulations. The TN regulation can be met by either the MLE process or the filtration process selected in a new filter complex (anticipated beyond the 2014 10-year CIP), so an overall nutrient removal strategy should be formulated before deciding on the scope of this project. Alternate Delivery Methods: Because of the phasing and complexity of the project, it was determined that progressive design build (PDB) or CM at risk (CMAR) would be the potential delivery methods for this project. Traditional DBB was chosen as these delivery options are not available at present, but this delivery method should be re-evaluated as the project advances through the stage gates.
Package Description:	For the MLE process, the project would consist of creating an anoxic zone occupying 20% of the aeration tank volume, and the addition of a carbon source. This would also involve structural modifications to existing tankage to create the anoxic zones with anoxic zone mixers. Because of the anticipated lower flow rates since the PMP, the additional aeration basins, additional RAS pumps, additional blowers and fine bubble diffusers, new IMLR pumps, and pipelines are not required.
Required Predecessor Effort:	• Updated flow and load projections, part of Design Criteria and Sizing Basis (Study S01). • Updated plant process model (BioWin) , part of Design Criteria and Sizing Basis (Study S01). • Tracking of timing for the imposition of new regulatory requirements. • Study to determine most appropriate alternative.
Benefits of Project:	• Proactively approaches changing regulations. • Allows for higher levels of treatment. • Leverages technology to improve operations.
Scope of Work:	Modification of existing step-feed aeration basins to MLE process would involve: • Structural modifications to existing tankage to create the anoxic zones • 48 new anoxic zone mixers (25 HP each) • 24 Internal Mixed Liquor Return (IMLR) pumps • A new methanol feed system (2 separate locations) • New fine bubble diffusers to convert current anoxic zones to aerobic zones (180,000 SF)

	The aeration basins and associated infrastructure, not included in the scope of work (pending outcome of BioWin analysis, regulatory requirements, flow and load projections etc.) are the following: • Addition of 11 new 2.75 MG aeration basins (approx. 65-ftx 440-ft x 17-ft) • 22 new anoxic zone mixers (25 HP each) • Additional RAS pumps (6 pumps, 20 MGD, 150 HP) • Additional blowers (4x 2,250 HP, 50,000 cfm) • New blower building (approx. footprint 100-ft x 100-ft) • Additional fine bubble diffusers (225,000 SF) • 11 new IMLR pumps, • New WAS pumps (4x 20 HP, 3 MGD each) • A new methanol feed system (1 location) • Piping: 2x 1,500 LF of 84-inch dia. ML piping, 500 LF of 84-inch dia. raw sewage piping, 2,800 LF of 48-inch dia. RAS piping. • New yard piping structure

Author:	AMB, JLD	**Reviewer:**	DJB
Date:	12/03/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PLS-04	**Project ID(s):**	LS-05	**Other Ref. ID:**	PMP: 22
Package Name:	BNR1 Clarifier Rehab Demonstration		**Process Area:**	Secondary Treatment	
Function:	R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	1,880,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**		
Current Schedule- Start Dates:					
Planning Date:	Jan 2017	**Design Date:**	Apr 2017	**Bid Date:**	Oct 2017
Construction Date:	Apr 2018	**Startup Date:**	Apr 2019		
Packaging Criteria:	Avoid interferences by multiple contractors, Opportune timing – schedule alignment				
Package Need:	To pilot test the baffle and launder configuration at BNR1 recommended by a previously completed computational modeling exercise. This effort should be completed prior to the full scale replacement of the BNR1 clarifier equipment under project PLS-02.				
Background:	History: This project was added during validation based on recommendations from baffle and launder modeling during the BNR1 condition assessment report. Note that the condition assessment described modifications to only the launders and baffles, and not the replacement of the mechanism itself. Future Roadmap: One year of sampling is slated to be conducted after the modifications of the baffles and launders is complete. The results of this sampling will dictate the scope of project PLS-02.				
Package Description:	For one BNR1 clarifier: • Demolition of existing clarifier launders, baffles, and sludge collector. • Installation of new clarifier baffles, launders, and sludge collector.				
Required Predecessor Effort:	• CFD Modeling for clarifier (2011 HDR, completed).				
Benefits of Project:	• Replaces obsolete technology with proven new/proven technology. • Enhances cost effectiveness of operations.				
Scope of Work:	For one BNR1 clarifier: • Demolition of existing clarifier launders, baffles and sludge collector. • Installation of new clarifier baffles, effluent launders and sludge collector. • Sampling and testing (dye testing etc.). • Monitoring and analysis of performance data over a year.				

Author:	AMB	**Reviewer:**	
Date:	01/14/2014	**Date:**	

Attachments:

No Entries

Solids Processing

Package ID:	PS-01	**Project ID(s):**	S-01, S-26	**Other Ref. ID:**	CPMS: 7091; PMP: 45, 47, 52, 53
Package Name:	Digester and Thickener Facilities Upgrade Project		**Process Area:**	Solids - DAFT and Digestion	
Function:	R&R, Upgrade		**Priority:**	High	
Estimated Project Cost($):	75,420,000.00		**Source of Estimate:**	B&C/City/MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	No		**No. of Phases:**	1	
Current Schedule- Start Dates:					
Planning Date:	Nov 2013	**Design Date:**	Feb 2014	**Bid Date:**	Apr 2015
Construction Date:	Oct 2015	**Startup Date:**	Oct 2017		
Packaging Criteria:	Previously packaged by City, Project implementation already underway, Bundling of small projects where possible, Opportune timing – schedule alignment				
Package Need:	Digesters. The facility has 16 anaerobic digesters constructed between 1956 and 1983, and many of these digesters are out of service. All digesters need extensive upgrades, as all are more than 30 years old. DAFT. The existing dissolved air floatation thickeners are aging and replacement of key components are necessary to continue reliable service. Biogas Flares. The existing biogas waste gas flare system requires repair and replacement of key components.				
Background:	The facility has 16 anaerobic digesters constructed between 1956 and 1983, and many of these digesters are out of service due to age and cleaning requirements. All digesters need extensive upgrades, as all are more than 30 years old. The existing dissolved air floatation thickeners are aging and replacement of key components are necessary to continue reliable service. The existing biogas waste gas flare system requires repair and replacement of key components. This project ensures reliability in the overall digestion process. This project will rehabilitate ultimately up to ten anaerobic digesters at the PLANT, however funding included with this CIP is for the rehabilitation of four (4) digesters and six (6) dissolved air flotation units. This Project: • Replaced the Scum Digestion project identified in CIP 2009-2010. This project corresponds to Plant Master Plan Project Nos. 45 -53. Reference to Project Validation number PS-01. • In the 2013-2017 CIP this project was entitled “Digester Rehabilitation". The project name changed in order to better reflect the project scope.				

	After conversations with the PLANT O&M staff, this project will also include the addition of a new above ground gas manifold to connect all digester gas laterals, a new sludge pipeline, and a new waste biogas flare system to replace the existing worn units. Tunnel improvements will be provided in the vicinity of the digesters to improve ventilation and drainage.
Package Description:	The Project will include modifications to four (4) of the existing anaerobic digesters, replacement of the digester gas pipeline and upgrades to six (6) dissolved air flotation thickeners ("DAFTs") at the Wastewater Facility. The digester modifications include upgrades to digester nos. 5, 6, 7, and 8 to like-new condition, and DAFT systems will be upgraded to improve digester and DAFT capacity, safety, and performance. A new waste biogas flare system will be provided to replace the existing worn units.
Required Predecessor Effort:	None
Benefits of Project:	• Increase ease of operations • Mitigate failure risk • Improve plant reliability/flexibility • Ensure equipment redundancy • Improve automation and control • Reduce safety risk to O&M personnel
Scope of Work:	The following specific elements are included in the Project: • Digester Cover and Mixing Upgrades – Work includes design of new digester covers and mixers, replacement of the existing lateral piping, and addition of associated equipment. • Mixing System Evaluation – evaluate alternative types of digester mixing systems taking into account future operating conditions and issues such as struvite. • Digester Gas Manifold Pipeline Relocation – This element includes upgrades and/or relocation of existing digester gas piping in tunnels and tunnel ventilation improvements. • DAFT Upgrades – Six of the existing DAFT units will be upgraded including odor containment and treatment. The thickening modifications will include new DAFT collectors, new sludge feed pumps, new float pumps, new polymer system, saturation system upgrades/replacement, and piping modifications associated with all upgrades. • Sludge Storage Evaluation - Evaluation of primary sludge storage/equalization and primary and secondary sludge blending. • Sludge Distribution Piping. The existing piping system will be modified to convey co-thickened sludge to the rehabilitated and other existing digesters. • Digester Heating Upgrades – this element includes piping, equipment and control modifications to the individual upgraded and operationally parallel and digester heat supply systems. Digester Tunnel Ventilation Improvements – This element includes modifications to supply and exhaust ventilation equipment and insertion of separation walls as necessary to conform to National Fire Protection Association ("NFPA") guidelines.

	• A new waste biogas flare system - including: new waste gas flares assemblies, with pilot units, associated piping, metering, safety valving, electrical and controls, and misc. site work and structures

Author:	Petrik	**Reviewer:**	DJB
Date:	12/03/2013	**Date:**	12/06/2013
Attachments: *No Entries*			

Package ID:	PS-02	**Project ID(s):**	S-02, S-03	**Other Ref. ID:**	PMP: 44, 50, 51, 53 (part), 60
Package Name:	Additional Digester Facility Upgrades		**Process Area:**	Solids (Digester)	
Function:	R&R, Upgrade, New		**Priority:**	Medium	
Estimated Project Cost($):	50,230,000.00		**Source of Estimate:**	PMP/MWHC (2014$)	
Delivery Method:	Design/Bid/Build (DBB)				
Phasing of project:	Yes		**No. of Phases:**	2	
Current Schedule- Start Dates:					
Planning Date:	Jul 2019	**Design Date:**	Oct 2020	**Bid Date:**	Oct 2021
Construction Date:	Apr 2022	**Startup Date:**	Apr 2024		
Packaging Criteria:	Process and/or systems inter-dependency, Similar priority rating, Bundling of small projects where possible				
Package Need:	The facility has 16 anaerobic digesters constructed between 1956 and 1983, and the digesters need extensive upgrades. Four digesters are in the process of being upgraded under another PMP project. It is believed that the steel floating covers of these digesters are nearing the end of their useful life. Given the condition of the existing digesters, reliability and redundancy in the digestion process is a major concern. In addition, the gas mixing system for the existing digesters does not provide sufficient mixing energy when compared to current design standards.				
Background:	The facility has 16 anaerobic digesters constructed between 1956 and 1983. Six of these digesters are out of service. All digesters need extensive upgrades, as all are more than 30 years old. Plant staff reported that the steel floating covers of these digesters are nearing the end of their useful life. Given the condition of the existing digesters, reliability and redundancy in the digestion process is a major concern. In addition, the gas mixing system for the existing digesters does not provide sufficient mixing energy when compared to current design standards. At least 10 digesters will be required to meet future sludge loading conditions. Four digesters have already been upgraded under other CIP projects. This project will rehabilitate 6 additional digesters, including new covers and mixers.				
Package Description:	This project includes installing new covers and mixers on six (6) existing digesters and the installation of a new sludge piping. The anaerobic digestion process must be kept in operation with at least 7/8 of the 12 active digesters on-line. The upgrade of these digesters will be phased in order to meet the minimum digesters on-line.				
Required Predecessor Effort:	• Class A vs. Class B evaluations under Master Agreement Service Order #4 ("Digester Process Evaluation"). • DAFT and Digester Upgrade Project (for 4 digesters)				

Benefits of Project:	• Increase ease of operations • Mitigate failure risk • Improve plant reliability/flexibility • Ensure equipment redundancy • Improve automation and control
Scope of Work:	The upgrades will consist of modifying six of the existing anaerobic digesters including: • **Digester Cover and Mixing Upgrades** – Work includes design of new digester covers and mixers, replacement of the existing lateral piping, and addition of associated equipment. • **Sludge Distribution Piping.** The existing piping system will be modified to convey co-thickened sludge to the rehabilitated digesters, and include replacing the existing 10-inch hose lateral piping with 16-inch lateral piping, • **Digester Heating Upgrades.** This element includes piping, equipment and control modifications to the individual upgraded and operationally parallel and digester heat supply systems.

Author:	Petrik	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PS-03	**Project ID(s):**	S-04, S-10, S-12, S-05	**Other Ref. ID:**	PMP: 44, 54, 57, 58, 59, 60, 64
Package Name:	Digested Sludge Dewatering Facility		**Process Area:**	Solids (dewatering)	
Function:	New		**Priority:**	High	
Estimated Project Cost($):	64,320,000.00		**Source of Estimate:**	PMP/MWHC (2014$)	
Delivery Method:	Low-bid DB				
Phasing of project:	No		**No. of Phases:**	1	
Current Schedule- Start Dates:					
Planning Date:	Jul 2014	**Design Date:**	Oct 2015	**Bid Date:**	
Construction Date:	May 2016	**Startup Date:**	May 2018		
Packaging Criteria:	Process and/or systems inter-dependency, Similar priority rating, Maintain plant compliance through phasing, Meet City Initiatives				
Package Need:	The existing process train does not include mechanical dewatering, as digested sludge is currently pumped and stored in lagoons. Stored sludge is then subsequently dried in open air drying beds prior to landfill disposal. This current mode of operation is not consistent with future proposed adjacent land uses. Some form of mechanical dewatering and sludge cake storage will be required to replace the current lagoon and drying bed operation by Year 2018. The new sludge storage facility will be required to hold dewatered cake prior to off-site transfer and on-site drying. The digestion process creates ideal conditions for the formation of struvite, which increases maintenance by formation of scales that clog digester pipelines, accumulate in tankage, and increasing wear and tear of equipment components. Struvite has been identified as a significant issue at the Wastewater Facility. In addition, the removal of debris typical in wastewater is important relative to biosolids quality and its acceptability for reuse. Removing debris from the solids streams will provide a higher quality biosolids end product, thereby increasing final biosolids disposition options available to the WPCP. Also, the sludge screening will remove debris and hair which will reduce overall pump and equipment maintenance.				
Background:	City Council has directed the Administration to transition to a new biosolids dewatering process by 2018 due to the projected decommissioning of the lagoons and sludge drying beds, changes in future biosolids regulations, and reduction of odor impacts to the surrounding community. The transition will involve significant capital investment and major changes to PLANT operations with the addition of new sludge dewatering facility. Removing moisture and debris from the solids streams will reduce overall O&M requirements, and will provide a higher quality biosolids end product, thereby increasing final biosolids disposition options available to the PLANT. In discussions with the O&M staff at the PLANT, the new PS and WAS sludge screening project and the chemical storage and pumping facility (for struvite control) were added to the scope of this project.				

	This project: • Corresponds to Plant Master Plan Project Nos. 44, 54, and 57-60, 64. Reference to Project Validation numbers PS-03. • In the 2013-2017 CIP this project was part of the project entitled "New Biosolids Facility". The project name changed in order to better reflect only a portion of the referenced scope. • The Expenditure Schedule is based on the design/build estimate
Package Description:	This project entails the installation of mechanical dewatering units, such as centrifuges or belt filter presses, a feed storage tank for biosolids prior to dewatering, and polymer storage and dosage facilities, dewatered cake storage, and solids conveyance systems, all housed in an odor-controlled building. The selection of appropriate equipment will be based on the findings of a technology evaluation concept design report, and would be implemented in two phases over the 30-year planning period. This project constitutes the first phase, capable of processing at least 2/3 of the projected planning period solids loading. Sludge cake storage will be implemented in conjunction with the mechanical dewatering project, with sufficient capacity for conveying and temporarily storing dewatered sludge cake at 20 to 28% solids concentration. Multiple silos or hoppers will be provided for 4 to 7 days storage. A new chemical storage and pumping facility will be constructed to allow the addition of chemicals and other liquids for struvite control. The existing digested sludge transfer pipeline (from digesters to the transfer wet well) will be replaced with a new pipe, with takedown couplings and cleanouts for struvite control. A new Primary Sludge and WAS sludge screening facility will be provided to remove debris from the primary sludge and WAS streams. This facility will be equipped with mechanical fine sludge screens housed in an odor contained facility. This facility will be provided with screening conveyance and storage bins.
Required Predecessor Effort:	• Influent Characterization Study (revised biosolids flows and loads, BioWin modeling) • Odor, noise, and controls Programmatic Study
Benefits of Project:	• Improve Performance • Mitigate failure risk • Odor reduction (in biogas) • Improve reuse opportunities for biosolids product • Leverage technology to improve operations • Define design requirements to reduce capital costs • Improve Plant reliability/flexibility Reduced truck traffic
Scope of Work:	A new Dewatering Facility will be implemented, including the follow work items: • **Prepare Concept Design Report.** The design requirements of the dewatering equipment, sludge feed storage tank and pumping, and odor control facilities will be

defined and summarized in a report, based on the pilot testing results and evaluations performed. Part of the report will include an evaluation of alternative sludge cake storage methods. Conveying systems will be defined. A sludge screen technology evaluation will be performed which will define screen type and sizing.

- **New Dewatering Facility** This project includes the installation of mechanical dewatering units, such as centrifuges or belt filter presses, a feed storage tank for biosolids prior to dewatering, and polymer storage and dosage facilities and solids conveyance systems, all housed in an odor-controlled building. An overhead crane will be provided to remove heavy equipment. A new sludge cake storage facility will be provided as part of this facility and includes necessary conveying, pumping, and tankage. The storage will consist of multiple storage silos or hoppers, with odor control, feeding conveyors, and controls. The building will be architecturally enhanced structure, and will include:
    - Process control room
    - MCC room
    - HVAC systems
    - Showers, lockers, and bathrooms
    - Parts storage area
- **New Odor Control and Treatment Facilities.** New odor control and treatment facilities will be provided to capture fugitive odors from sources such as wet cake bins, dewatering equipment, conveyors, and storage vessels.
- **New Truck Load-out Facility** . A dewatered cake truck load-out facility, with weight scales, will be provided to efficiently transport dewatered sludge cake to on-site or off-site locations. This facility will have at least two truck bays, and will be completely odor contained to capture fugitive odors during cake loadout procedures. Spreader conveyors will be provided to ease truck loadout.
- **Conduct Evaluation and Pilot testing of Struvite Control Measures**. A study will be undertaken to evaluate alternative struvite control/mitigation alternatives. A pilot scale testing program will validate and define design criteria for the selected control measure(s). A technical memorandum will be prepared summarizing results.
    - **New chemical storage handling tanks and containment areas,** including pumping, piping, and associated controls, and health and safety equipment.
        - **Replacement of the existing digested sludge transfer pipeline** (from digesters to the transfer wet well) - with takedown couplings and cleanouts for struvite control.
        - **New PS and WAS Fine Screening Facility.** A new PS and WAS fine sludge screening facility will be provided, which includes the addition of new mechanical fine screening units, material conveyance and storage containers, and associated piping, appurtenances, electrical and controls. This facility will be provided with odor containment and treatment facilities for the containment areas and conveyors.

	○ **New electrical distribution and switchgear.** New electrical switchgear building will be provided to house new electrical transfer equipment and switchgear for all sludge processing facilities. Air conditioning systems will be provided. Underground duct banks will be provided.

Author:	Petrik	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PS-04	**Project ID(s):**	S-07	**Other Ref. ID:**	PMP: 56
Package Name:	FOG Receiving		**Process Area:**	Solids	
Function:	New		**Priority:**	Medium	
Estimated Project Cost($):	9,700,000.00		**Source of Estimate:**	B&C/MWHC (2014$)	
Delivery Method:	Low-bid DB				
Phasing of project:	No		**No. of Phases:**	1	
Current Schedule- Start Dates:					
Planning Date:	Jul 2019	**Design Date:**	Nov 2020	**Bid Date:**	
Construction Date:	May 2021	**Startup Date:**	Dec 2022		
Packaging Criteria:	Bundling of small projects where possible, Comprehensive scope to include ancillary facilities/utility feeds				
Package Need:	Fat, Oil and Grease (FOG) management is an ever-growing concern for wastewater treatment plant operators, as FOG is known to cause problems in a number of ways: flow inefficiencies, sewer-cleaning costs, build up/accumulations at pumping stations and treatment works. All of these aspects directly affect the performance of the plant and lead to increased operations and maintenance issues and associated costs. The controlled collection and then introduction of FOGs into the treatment process (e.g. Anaerobic Digesters) is increasingly being seen as a viable, cost effective and sustainable option which if planned and managed well, can provide an efficient renewable energy source while offering healthy economic and environmental benefits. Accepting FOG at the Wastewater Facility will enhance gas production and increase energy and heat production.				
Background:	Fat, Oil and Grease (FOG) management is becoming popular in California in order to reduce O&M costs in the collection system and also provide for additional biogas production that can be used to generate substantial electrical power at the PLANT. The City is very interested in these benefits. The controlled introduction of FOGs into the treatment process (e.g. Anaerobic Digesters) is increasingly being seen as a viable, cost effective and sustainable option which if investigated, planned and managed well, can provide an efficient renewable energy source while offering healthy economic and environmental benefits. Accepting FOG at the PLANT will enhance gas production and increase energy and heat production. A FOG receiving station will be provided, including a new dedicated receiving and screening facility for haulers bringing FOG and other liquid wastes to the PLANT. It would provide some storage capacity, and the capability to distribute and monitor the flow of FOG to the digesters. The facility location has not been determined at this time, so a new access road and gateways are provided to allow multiple options to be considered.				

Package Description:	This project entails the construction of a FOG (Fats, Oils, Grease) receiving station; including storage tankage, access control, feed piping from the receiving station to the digesters accepting FOG, and a ½-mile of access road improvements. A FOG receiving station will provide a dedicated receiving point for haulers bringing FOG to the Plant. It would provide some storage capacity, and the capability to distribute and monitor the flow of FOG to the digesters.
Required Predecessor Effort:	none
Benefits of Project:	• Positive return on Investment • Improve plant reliability/flexibility • Aligns with City's 'Green Vision' goal
Scope of Work:	The project includes: • **Preparation of a Concept Design Report.** A review of the current and future FOG and other liquid waste loadings which may be expected to be processed at the Facility will be performed. FOG and other liquid wastes can vary widely, in terms of strength, chemical composition, pH, toxicity, and volume. The expected quantities and quality will be summarized in a technical memorandum which will define pre-treatment, storage, conveyance, and other specialty handling requirements. This report will review health & safety requirements during construction, operation and maintenance; • **New FOG Handling and Processing Facility**. Work includes addition of FOG handling facility, with access control, storage, pumping, odor control, and automation components. • **New Access Roadway.** Provide a new ½-mile access road and access gates at the Facility site.

Author:	Petrik	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PS-05	**Project ID(s):**	S-16, S-17, S-18, S-27	**Other Ref. ID:**	PMP: 66, 67, 68
Package Name:	Thermal Dryer Facility		**Process Area:**	Solids (Thermal Drying)	
Function:	New		**Priority:**	Medium	
Estimated Project Cost($):	108,170,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Low-bid DB				
Phasing of project:	No		**No. of Phases:**	1	
Current Schedule- Start Dates:					
Planning Date:	Jan 2019	**Design Date:**	May 2020	**Bid Date:**	
Construction Date:	May 2021	**Startup Date:**	Nov 2022		
Packaging Criteria:	Process and/or systems inter-dependency, Similar priority rating, Comprehensive scope to include ancillary facilities/utility feeds				
Package Need:	The existing sludge dewatering process utilizes lagoon storage followed by open air solar drying in earthen beds (sludge drying beds). The Facility has committed to moving out of this mode of operation, and is transitioning partially to mechanical dewatering followed by heat drying. The current plan is to thermally dry the dewatered cake in order to utilize available waste heat from the cogeneration facility. The actual drying requirements and product dryness will be based on: 1) Newby Landfill minimum cake solids contractual requirements; and 2) the actual disposal/reuse market specifications related to water content. The new biosolids dewatering facility that will come on-line in 2018 timeframe will generate a high strength waste stream that must be recycled through the current liquid stream treatment process. The impacts and processing requirements from this recycle stream must be defined to eliminate liquid treatment concerns.				
Background:	The existing sludge dewatering process utilizes lagoon storage followed by open air solar drying in earthen beds (sludge drying beds). The PLANT has committed to moving out of this mode of operation, and is transitioning partially to mechanical dewatering followed by heat (thermal) drying. Previously under the PMP, the plan was to thermally dry at least 20% of the dewatered cake in order to utilize waste heat from the Cogeneration Facility. In order to meet Newby Island disposal requirements and to reduce overall disposal/reuse costs, this project now requires the thermal drying facility to process 100% of the generated sludge's. This project: • Corresponds to Plant Master Plan Project Nos. 66 - 68. Reference to Project Validation numbers PS-05. • The Expenditure Schedule is based on the design/build estimate • In the 2013-2017 CIP this project was a part of the project entitled "New Biosolids Facility". The project name changed in order to better reflect only a portion of the referenced scope.				

	This project constitutes will be capable of processing the projected dewatered cake produced to a dryness of over 90%. This project would be implemented prior to closure of the Newby Island landfill (currently scheduled for 2025).
Package Description:	This project entails the installation of mechanical thermal drying units, such as rotary drum, fluidized bed, or belt dryers, along with supporting facilities such as storage tankage, conveyors, pelletizers, and solids conveyance systems, all housed in an odor-controlled building. The selection of appropriate equipment will be based on the findings of a conceptual design study, and would be implemented in at least two phases over the 30-year planning period. This project constitutes the first phase, capable of processing a majority of the projected dewatered cake produced. The Conceptual Design Study project consists of an engineering study and field verification to determine the process and technology most appropriate for treatment of the side stream by the dewatering process. A temporary pilot facility will be constructed to receive a portion of the recycle streams from the new mechanical dewatering facility. The study will also include the field testing of at least one side stream treatment technology, and developing design criteria of key components including items such as: • pretreatment requirements • tankage and design criteria • heat and energy requirements • O&M requirements
Required Predecessor Effort:	• Review landfill cake solids minimum requirements • Implementation of the mechanical dewatering facility
Benefits of Project:	• Leverage technology to improve operations • Reduced disposal costs • Improved reliability • Lower cost of treatment
Scope of Work:	A new sludge thermal drying facility will be implemented, including the follow work items: • **Prepare Concept Design Report.** The design requirements of the 1) sludge drying equipment, 2) sludge feed storage tank and pumping, 3) side stream (liquid) treatment units, and 4) odor control facilities will be defined and summarized in a report. This study will evaluate current side stream liquid processing technologies and costs, defining design criteria, and developing system operating and maintenance requirements. At least one side stream treatment technology will be identified for further evaluation and testing. This report will also identify plant interface requirements and conveyance needs. • **Conduct Side-Stream Treatment Technology Verification Testing**. At least one pretreatment technology will be pilot tested at the Facility site. User agreements with at least 1 pretreatment technology will be prepared and executed Tests will be conducted at various flow rates, temperatures, and equipment throughputs. A test report will be provided by the manufacturer.

	• **New Sludge Drying Facility.** This project includes the installation of mechanical sludge drying and processing units, such as rotary drum or belt dryers, a recycle tanks, and product storage, and dried material conveyance and load-out systems, all housed in an odor-controlled building. • **New Odor and Emissions Control Facilities.** New odor control and air emission treatment facilities will be provided to capture fugitive odors from sources such as wet cake bins, drying equipment, and conveyors, and treat exhaust stacks from the thermal drying equipment. • **Product Storage and Load-out Facility** . A dried product storage and truck load-out facility, with weight scales, will be provided to efficiently transport dried product to on-site or off-site locations.

Author:	Petrik	**Reviewer:**	DJB
Date:	12/04/2013	**Date:**	12/06/2013
Attachments: *No Entries*			

Package ID:	PS-06	**Project ID(s):**	S-18	**Other Ref. ID:**	PMP: 69
Package Name:	Greenhouse Demonstration (solids drying)		**Process Area:**	Solids	
Function:	New, Demonstration Project		**Priority:**	Medium	
Estimated Project Cost($):	9,050,000.00		**Source of Estimate:**	PMP/MWHC (2014$)	
Delivery Method:	Low-bid DB				
Phasing of project:	Yes		**No. of Phases:**	1	
Current Schedule- Start Dates:					
Planning Date:	Jan 2020	**Design Date:**	Apr 2021	**Bid Date:**	Oct 2021
Construction Date:	Apr 2022	**Startup Date:**	Jul 2023		
Packaging Criteria:	Avoid interferences by multiple contractors				
Package Need:	The RWF has committed to decommissioning of the existing open air solar drying beds operation by transitioning to mechanical dewatering of digested sludges, followed by drying operations for a portion of the dewatered solids stream. Covered greenhouses would allow continued solar drying for a portion of the dewatered sludge stream, even during the wet months of the year, and would be equipped with odor control equipment.				
Background:	The City has committed to decommissioning of the existing open lagoons and solar drying beds operation by transitioning to mechanical dewatering of digested sludge, followed by drying operations for a portion of the dewatered solids stream. Covered greenhouses would allow continued solar drying for a portion of the dewatered sludge stream, even during the wet months of the year, and would be equipped with odor control equipment. Prior to implementation of a full scale facility, A Biosolids Greenhouse Drying Pilot Testing/Field Verification Program will be undertaken to provide detailed performance, costs, and technology evaluations. PLANT staff indicated their preference in implementing the construction of two full-scale field demonstration greenhouse facilities, including recommended enclosures in order to determine whether this technology is scalable to a larger operation.				
Package Description:	This project entails the construction of two full-scale field demonstration greenhouse facilities, including recommended enclosures. The purpose of this field demonstration project would be to determine whether this technology is scalable to a larger operation.				
Required Predecessor Effort:	Implementation of the mechanical dewatering facility				
Benefits of Project:	• Leverage technology to improve operations • Reduced disposal costs • Improved reliability • Lower cost of treatment				

Scope of Work:	A Biosolids Greenhouse Drying Pilot Testing/Field Verification Program will be undertaken, including the follow work items: • **Define Study Goals and Objectives.** A summary document will be prepared listing the field verification goals and objectives. At least two solar drying technologies will be screened and identified for further evaluation and testing. This report will also identify plant interface requirements and sludge conveyance needs. • **User Agreements.** User agreements with two drying technologies will be prepared and executed. • **Greenhouse Drying Technology Verification Testing**. Two solar drying technologies will be pilot tested at the Plant site. Tests will be conducted at various sludge flow rates, concentrations, and temperatures. Odor emissions will be monitored. A test report will be provided by each manufacturer. • **Basis of Design Report.** The design requirements of the biosolids drying equipment, associated spreaders and pumping, storage, and odor control facilities will be defined and summarized in a report, based on the field testing results and evaluations performed.

Author:	Petrik	**Reviewer:**	DJB
Date:	12/06/2013	**Date:**	12/06/2013

Attachments:

No Entries

Package ID:	PS-07	**Project ID(s):**	S-23, A-01	**Other Ref. ID:**	PMP: 62, 90
Package Name:	Lagoons and Drying Bed Retirement		**Process Area:**	Solids	
Function:	Decommissioning		**Priority:**	Medium	
Estimated Project Cost($):	26,860,000.00		**Source of Estimate:**	MWHC (2014$)	
Delivery Method:	Progressive DB				
Phasing of project:	Yes		**No. of Phases:**	4	
Current Schedule- Start Dates:					
Planning Date:	Jan 2016	**Design Date:**	Apr 2017	**Bid Date:**	Oct 2017
Construction Date:	Apr 2018 (Phase 1), Oct 2019 (Phase 2), May 2021 (Phase 3), Dec 2022 (Phase 4)	**Startup Date:**	Jun 2024		
Packaging Criteria:	Location proximity on plant site, Avoid interferences by multiple contractors				
Package Need:	The existing process train entails digested sludge stored in lagoons and subsequently dried in open air drying beds. Future biosolids processing would include mechanical dewatering, and mechanical drying for at least a portion of the Facility's biosolids. This transition process will not only include changes in the treatment processes used to stabilize and dry the biosolids generated, but will also include a more diversified portfolio of disposition options than the current Newby landfill alternative. This is important for several reasons: (1) Newby landfill is expected to close in the 2025 timeframe; (2) the City has a sustainability goal to increase the recycling of by-products from the RWF operation; (3) there is a need to provide more flexibility to provide diversion of the dried biosolids on short notice; and (4) eliminate the odors from the operation of the lagoons and sludge drying beds Once the mechanical dewatering facilities are in place, the lagoons and drying beds can be decommisioned and rehabilitated. The solids left in place after City staff removes a majority of sludge in the lagoons, would be removed and disposed of in an approved disposal/reuse site. At that time, the lagoons and sludge drying beds would no longer be necessary for the Plant's operations and would be available for further rehabilitation (not included under this project)				
Background:	The City has committed to decommissioning of the existing open lagoons and solar drying beds operation by transitioning to mechanical dewatering of digested sludge. This is important for several reasons: (1) Newby landfill is expected to close in the 2025 timeframe; (2) the City has a sustainability goal to increase the recycling of by-products from the RWF operation; (3) there is a need to provide more flexibility to provide diversion of the dried biosolids on short notice; and (4) eliminate the odors from the operation of the lagoons and sludge drying beds. This project: • Corresponds to Plant Master Plan Project No. 62. Reference to Project Validation numbers PS-07.				

	• In the 2013-2017 CIP this project was a part of the improvements entitled "New Biosolids Facility". The project name changed in order to better reflect only a portion of the referenced scope. • All future earthwork and rehabilitation needs that will be required for the retired lagoons and drying beds will be conducted by future developers. Once the lagoons and drying beds are decommissioned by the City, the solids left in place would be removed and disposed of, and these facilities would no longer be necessary for the PLANT's operations.
Package Description:	This project entails emptying the existing lagoons of their biosolids content, partially to the drying beds for solar drying, and partially through mechanical dewatering facility. As the lagoons are emptied, and the wet sludge would be dried in the drying beds, and then the air-dried solids from the drying beds would be hauled offsite, and the drying beds will no longer be in service. The solids and liquid water cap remaining in the lagoons after retirement, will be removed by a contactor to an offsite disposal/reuse location or to a local landfill. All future earthwork and rehabilitation needs that will be required for the retired lagoons and drying beds will be conducted by future developers. These developer costs are not included in this project.
Required Predecessor Effort:	Mechanical Dewatering Facility
Benefits of Project:	• Reduced odor and noise • Reduce public impacts • Aligns with City policy and direction
Scope of Work:	A decommissioning plan will be developed to define the lagoon retirement options and recommendations. Sampling and additional manpower will be required to supplement existing operations. After the Plant staff retires the lagoons from normal operations, the remaining sludges (approximately 2-feet of solids and 1- to 1 1/2-ft water cap) will be stabilized and removed by a contractor. The water remaining will be pumped to the Plant Headworks for treatment. Lime or other stabilizing material will be used to assist in odor control and drying of the wet sludge materials.

Author:	Petrik	**Reviewer:**	DJB
Date:	12/06/2013	**Date:**	12/06/2013

Attachments:

No Entries