City of Riverside Public Works Department

UPDATE OF THE INTEGRATED

MASTER PLAN FOR THE WASTEWATER COLLECTION AND TREATMENT FACILITIES

VOL. 6

Regional Water Quality Control Plant Condition Assessment Results

carollo

Engineers...Working Wonders With Water®

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Abbreviations

αF	alpha factor
µg/L	micrograms per liter
A/A Trunk Sewer	Acorn/Arlanza Trunk Sewer
AACE	Advancement of Cost Engineering
AADF	annual average daily flow
AAF	average annual flow
AB	Assembly Bill
ABS	Acrylonitrile-Butadiene-Styrene
ACI	American Concrete Institute
ACP	asbestos cement pipe
ACS	American Community Survey
ACT treatment train	Activated treatment train
ADC	alternative daily cover
ADEQ	Arizona Department of Environmental Quality
ADF	average daily flow
ADWF	average dry weather flow
AFY	acre-feet per year
APAD	acid-phase anaerobic digestion
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
ARVs	air release valves
ASCE	American Society of Civil Engineers
AWT	Advanced Water Treatment
BACT	best available control technology
BCM	Best Available Control Measures for Fugitive Dust Sources
BFP	belt filter press
BMP	best management practices
BNR	Biological nutrient removal
BOD	biochemical oxygen demand
BOD_5	5-day biochemical oxygen demand
BPTC	Best Practicable Treatment or Control
Btu/lb	British thermal unit per pound
BWF	base wastewater flow
C	Celsius
$CaCO_3$	calcium carbonate
Carollo	Carollo Engineers, Inc.

CASA	California Association of Sanitation Agencies
CCB	chlorine contact basin
CCF	hundred cubic feet
CCI	Construction Cost Index
CCTV	Closed Circuit Television
CDFW	California Division of Fish and Wildlife
CDM	Camp Dresser & McKee, Inc.
CECs	Contaminants of Emerging Concern
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
cfd	cubic feet per day
cfm	cubic feet per minute
cfs	cubic feet per second
CIP	Capital Improvement Program
City	City of Riverside
CIWQS	California's Integrated Water Quality System
CMB	Combustion Sources
CMMS	Computerized Maintenance Management System
CNG	compressed natural gas
CO_2	carbon dioxide
COD	chemical oxygen demand
COS	cost-of-service
cP	centipoise
CSCI	California Stream Condition Index
CSD	Community Services Districts
CTS	Coatings and Solvents
cu ft	cubic feet
CWA	Clean Water Act
CWC	California Water Code
CWEA	California Water Environment Association
DAF	dissolved air flotation
DAFT	dissolved air flotation thickeners
days/week	days per week
DCR	demand-capacity ratio
DDW	California Division of Drinking Water
DG	digester gas
DIR	Department of Industrial Relations
DMR	discharge monitoring report
DU	dwelling unit

DWF	dry weather flow
EBRT	empty bed residence time
EC	Emerging Constituents
EDR	electro-dialysis reversal
EDU	equivalent dwelling units
EGM	Emission Growth Management
EIR	Environmental Impact Report
EnerTech	EnerTech Environmental California, LLC
ENR	Engineering News Record
EPA	Environmental Protection Agency
EQ	equalization
ESA	Endangered Species Act
F	Fahrenheit
FDA	Food & Drug Administration
Flo-Dar	Marsh-McBirney Flo-Dar™
FLX	Compliance Flexibility Program
FOG	fats, oils, and grease
fps	feet per second
ft	feet
FTE	Full Time Employee
FUG	Fugitive Emissions
FY	fiscal years
g	grams
gal	gallons
GBT	gravity belt thickeners
GHG	Greenhouse Gas
GIS	Geographic Information System
GL	General Ledger
gpcd	gallons per capita day
gpd	gallons per day
gpd/ac	gallons per day per acre
gpm	gallons per minute
gpm/sq ft	gallons per minute per square feet
GWI	groundwater infiltration
H_2S	hydrogen sulfide
HGL	hydraulic grade line
HID	High-Intensity Discharge
hp	horsepower
hr	hour

hrs/day	hours per day
HS^-	hydrogen sulfide ion
HVAC	heating, ventilation, and air conditioning
I/I	Infiltration/inflow
IEBL	Inland Empire Brine Line
IEUA	Inland Empire Utilities Agency
in.	inch
iPACS	Internet-based POTW Administration and Compliance System
IRWD	Irvine Ranch Water District
IT	Information Technology
IWWMP	Integrated Wastewater Master Plan
klb/d	thousand pounds per day
klbN/d	thousand pounds of nitrogen per day
KPI	Key Performance Indicator
kWh	kilowatt hour
lbs	pounds
lbs/cfd	pounds per cubic feet per day
lbs/ft^3	pounds per cubic feet
LF	linear feet
LIMS	Laboratory Information Management System
LM	Longitudinal Motion
LOTO	Lock Out / Tag Out
LRO	legally responsible official
Master Plan	Integrated Master Plan for the Wastewater Collection and Treatment Facilities
MBR	Membrane Bioreactor
MBR treatment train	Membrane Bioreactor treatment train
MCC	motor control center
MCS	Multiple Component Sources
MDD	maximum day demand
MDL	Method Detection Limits
MF	microfiltration
MFR	multi-family residential
MG	million gallons
mg-min/L	milligrams per minute per liter
mg/L	milligrams per liter
mgd	million gallons per day
mgN/L	milligrams of nitrogen per liter
min	minute

min/hr	minutes per hour
ML&C	mortar lined and coated
MLSS	mixed liquor suspended solids
mm	millimeter
MMBtu	million British thermal units
MMBtu/hr	million British thermal units per hour
MMRP	Measurement, Monitoring and Reporting Procedures
MOB	Mobile Source Programs
MP	Master Plan
MPN	most probable number
MRP	Monitoring and Reporting Program
msl	mean sea level
mV	millivolt
N/L	nitrogen per liter
N_2O	nitrous oxide
NACWA	National Association of Clean Water Agencies
$NaHSO_3$	sodium bisulfite
NaOCl	sodium hypochlorite
NASSCO	National Association of Sewer Service Companies
NEC	National Electric Code
NELAC	National Environmental Laboratory Accreditation Conference
NELAP	National Environmental Laboratory Accreditation Program
NFPA	National Fire Protection Association
NGO	Non-Governmental Organizations
NH_3-N	ammonia nitrogen
NOAA	National Oceanic and Atmospheric Association
NOI	notice of intent
NO_X	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NTU	nephelometric turbidity unit
O&M	Operations and Maintenance
OCSD	Orange County Sanitation District
OERP	Overflow Emergency Response Plan
OES	Office of Emergency Services
OJT	On-the-Job Training
ORP	Oxidation-Reduction Potential
P/L	phosphorus per liter
PACP	Pipeline Assessment Certification Program
PAYGO	Pay-As-You-Go

PDR	Preliminary Design Report
PEIR	Programmatic Environmental Impact Report
PFRP	Process to Further Reduce Pathogens
PLC	programmable logic controller
POTW	Publicly Operated Treatment Work
ppbv	parts per billion by volume
ppcd	pounds per capita per day
ppd	pounds per day
ppd/cu ft	pounds per day per cubic feet
ppd/sq ft	pounds per day per square feet
pph	pounds per hour
ppm	parts per million
psf	pounds per square foot
psi	pounds per square inch
PTZ	Pan-Tilt-Zoom
PVC	Polyvinyl Chloride
PWS	potable water salinity
PWWF	peak wet weather flow
QICS	Qualitative Intelligence and Communication System
R&R	rehabilitation and repair
RAS	return activated sludge
RCNLD	Replacement Cost New Less Depreciation
RCP	reinforced concrete pipe
RDII	Rain Derived Infiltration and Inflow
RDT	rotary drum thickeners
RECLAIM	Regional Clean Air Incentives Market
Regional Board	California Regional Water Quality Control Board
RG	rain gauge
RNG	renewable natural gas
RO	reverse osmosis
RPU	Riverside Public Utilities
RST	rotary screw thickeners
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
RWQCP	Regional Water Quality Control Plant
S_2^-	sulfide ion
SARDA	Santa Ana River Dischargers Association
SART	Santa Ana River Trail
SB	Senate Bill

sBOD	Soluble biochemical oxygen demand
SBT	sludge blending tank
SCADA	supervisory control and data acquisition
SCAG	Southern California Association of Governments
SCAP	Site Cleanup Subaccount Program
SCAQMD	South Coast Air Quality Management District
scfm	standard cubic feet per minute
sCOD	soluble chemical oxygen demand
SECAP	System Evaluation and Capacity Assurance Plan
SFR	single-family residential
SFY	square feet per year
SIU	Significant Industrial Users
SLCP	Short Lived Climate Pollutant
SLR	solids loading rate
SOC	Strengths, Opportunities, and Concerns
SOP	Standard Operating Procedures
SOR	surface overflow rate
South Star	South Star Engineering & Consulting, Inc.
SO_X	Sulphur oxides
sq mi	square mile
SQR	Structural Quick Rating
SRF	State Revolving Fund
SRT	solids retention time
SS	stainless steel
SSC	Sustainable Communities Strategy
SSMP	Sewer System Management Plan
SSO	Sanitary Sewer Overflows
State Water Board	California State Water Resources Board
SWMM	Storm Water Management Model
SWRCB	State Water Resources Control Board
TDS	total dissolved solids
TIN	total inorganic nitrogen
TKN	total Kjeldahl nitrogen
TL	
TM	Technical Memorandum
TMDL	total maximum daily load
TN	total nitrogen
TOC	total organic carbon
TP	total phosphorus

TS	total solids
TSS	total suspended solids
TST	Test for Significant Toxicity
URS	URS Corporations
USACE	United States Army Corps of Engineers
USBR	U.S. Department of the Interior Bureau of Reclamation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UV/AOP	Ultraviolet/Advanced Oxidation Process
V&A	V&A Consulting Engineers
VCP	Vitrified Clay Pipe
VFA	volatile fatty acids
VFD	variable frequency drive
VSR	volatile solids reduction
VSS	volatile suspended solids
WaPUG	Wastewater Planning Users Group
WAS	waste activated sludge
WDR	Waste Discharge Requirements
WLAM	Waste Load Allocation Model
WMWD	Western Municipal Water District
WQMP	Water Quality Management Plan
WRCRWA	Western Riverside County Regional Wastewater Authority
wt	wet ton
WTPD	wet tons per day
WWTP	wastewater treatment plant
ZLD	Zero Liquid Discharge

City of Riverside Public Works Department

UPDATE OF THE INTEGRATED

MASTER PLAN FOR THE WASTEWATER COLLECTION AND TREATMENT FACILITIES

VOL. 6

CHAPTER 1

Regional Water Quality Control Plant Condition Assessment

Plant Condition Assessment Results

carollo

Engineers...Working Wonders With Water®

City of Riverside Public Works Department

Update of the Integrated Master Plan for the Wastewater Collection and Treatment Facilities

VOLUME 6: REGIONAL WATER QUALITY CONTROL PLANT CONDITION ASSESSMENT CHAPTER 1: PLANT CONDITION ASSESSMENT RESULTS

FINAL | June 2019

City of Riverside Public Works Department
Update of the Integrated Master Plan for the Wastewater Collection and Treatment Facilities

VOLUME 6: REGIONAL WATER QUALITY CONTROL PLANT CONDITION ASSESSMENT

CHAPTER 1: PLANT CONDITION ASSESSMENT RESULTS

Carollo Project No. 10495A00

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Chapter 1

PLANT CONDITION ASSESSMENT RESULTS

1.1 Purpose

This chapter summarizes the process and results of the condition assessment of the City's RWQCP. The findings and recommendations from the condition assessment are used as one source of information to develop the CIP and identify necessary projects for the next 20 years.

1.2 Background

The City's Wastewater Division operates and maintains the RWQCP, which consists of a headworks, two separate treatment plants, and a tertiary filtration plant. Together, these facilities provide preliminary, primary, secondary, and tertiary treatment for a design rated capacity of 46 mgd. The RWQCP construction will be completed in the summer of 2017 to convert one of the existing secondary treatment trains to a MBR treatment train (Plant 1). The portions of the plant related to the MBR treatment train (Plant 1) installation are new and were not included in the condition assessment.

1.3 Condition Assessment Methodology

The condition assessment was conducted via visual assessment with the purpose of capital project planning. For this assessment, a pre-assessment workshop was conducted in which the assessment process was explained and staff provided input. The information from these workshops was then reviewed, and an assessment inventory was compiled.

Afterward, field visits were conducted in specified areas, with City participation and input. The site visits were limited to visual assessment of equipment and structures; no confined space entries were conducted and processes were not taken offline to see below the operating water level. Using the information gathered, CIP projects were recommended for the next 20 years.

The condition assessment focused on identifying the actions required over the 20-year planning period to keep the process areas in good, working condition, as opposed to planning for future project expansions or modifications related to regulatory changes. Specifically, the goals of the assessment were to:

- Identify poor condition assets.
- Flag safety and code deficiencies.
- Forecast end-of-life replacements for existing assets within the planning period.

The goal of this chapter is to identify R&R CIP needs with respect to condition of the existing facilities. CIP needs with respect to regulations and capacity limitations are being addressed in Volume 4 of this update to the Master Plan. It is important to note that this effort includes rehabilitating and/or replacing assets before they fail as part of the City's ongoing asset management program. It is also important to note that the projects listed in this chapter would all be considered CIP projects and not maintenance projects, per our reading of the City guidelines. In some cases it may seem that the projects in the chapter could be classified as maintenance

projects. For example, painting of pipes and etcetera would normally be considered a maintenance project. However, in this chapter, if painting, or a similar type of improvement was recommended then it was done so such that it would be included as part of a larger project (e.g., replacing bar screens or pumps).

The condition assessment covered seven process areas over 1 day and was conducted by an engineering team of multiple disciplines. The workflow in Figure 1.1 summarizes the overall process for the assessment and development of the results.

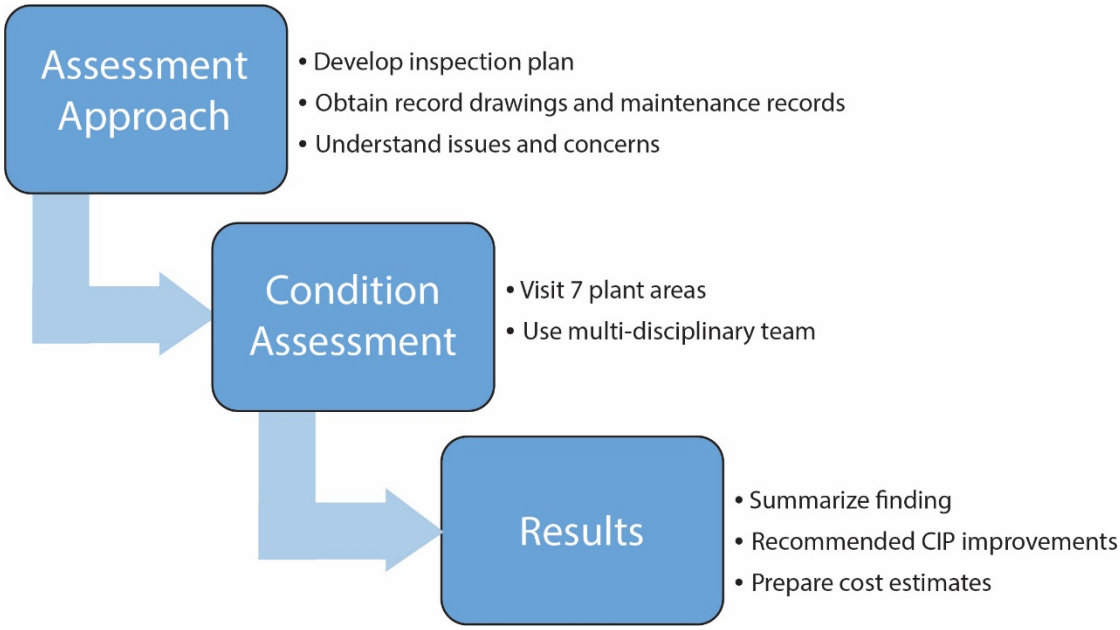


Figure 1.1 Condition Assessment Workflow

The following sections describe the major steps of the assessment process in more detail.

1.3.1 Assessed RWQCP Processes Areas

The condition assessment focused on the following seven areas of the plant:

1. Headworks.
2. Primary sludge pumping.
3. Aeration basins (ACT treatment train (Plant 2) only), specifically focusing on the MLR pumps, baffles, diffusers membranes, and mixers.
4. RAS and WAS pumping.
5. WAS thickening.
6. Tertiary filters.
7. Chlorine Contact Basins.

Figure 1.2 shows the location of these assessed process areas within the plant. In conjunction with RWQCP staff, the above areas were identified as the areas that will potentially require CIP needs in the next 20 years. All other process areas either have been recently rehabilitated or are currently being rehabilitated.

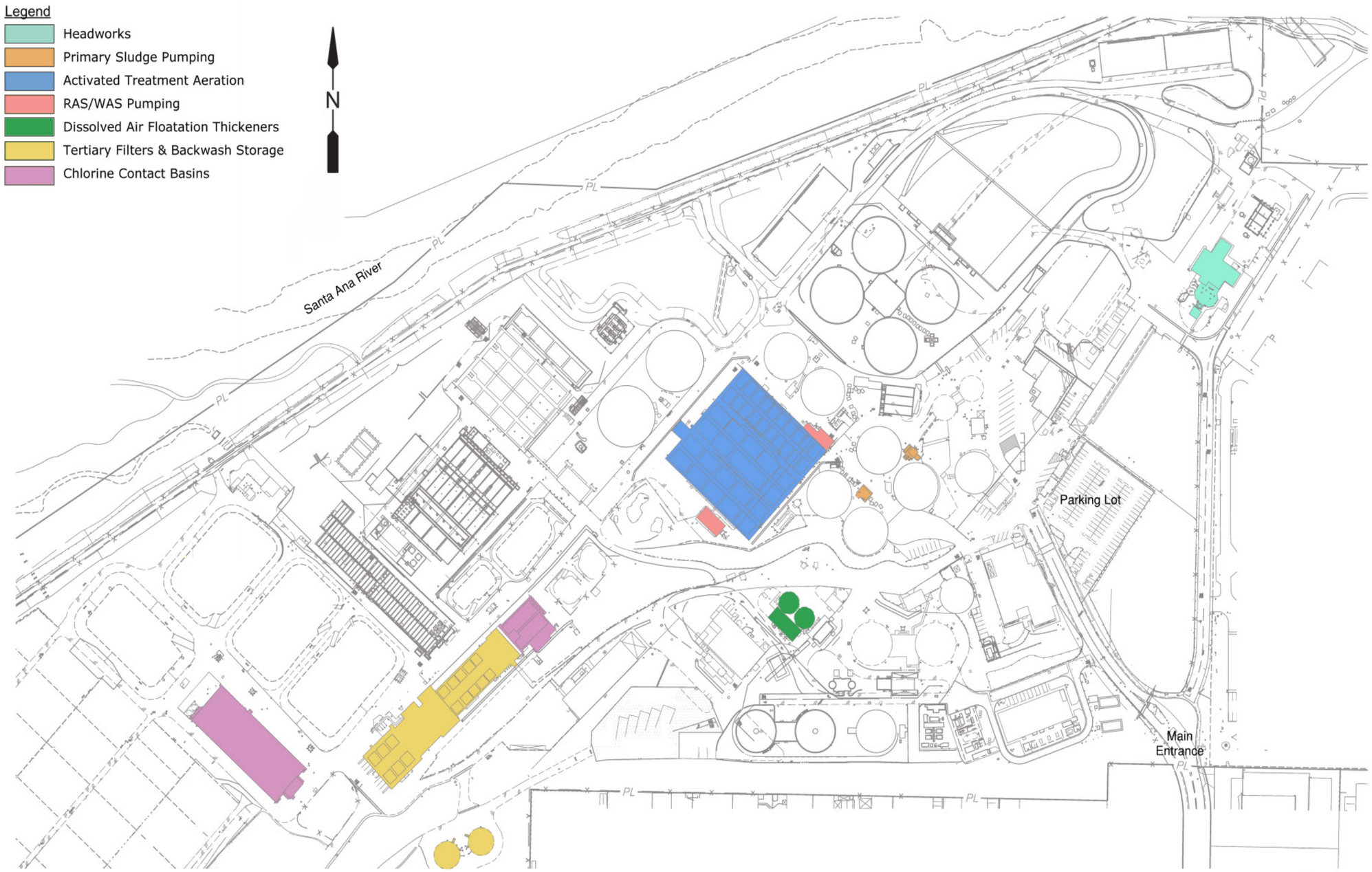


Figure 1.2 RWQCP Process Area Assessment Map

1.3.2 Information Gathering

An evaluation or assessment is only as good as the information collected for it. Ideally, a list of assets from the maintenance system would be available to help verify the assets in each area and their primary attributes. Furthermore, a review of record drawings can provide details about the area construction and operation.

In addition to input from staff, the following information was used to prepare for and supplement the visual observations made in the field:

- **Record Drawings** - Drawings from the original construction and major upgrades were provided and reviewed to understand the timing of construction, design, layout, equipment and structure locations, and buried assets in each process area.
- **Maintenance System Asset Data** - This included a list of major equipment as well as work order history. The information was used to understand the history of the assets.

1.3.3 Pre-Assessment Workshop

A pre-assessment workshop was held on February 16, 2017, at the RWQCP. The meeting's purpose was to review the gathered information, request additional information, present the assessment process for City feedback, and solicit input from the City on each area's issues and concerns.

Staff input focused on past and present issues, staff concerns, and any improvements needed or wanted for each area. The input gathered during the workshop was used to prepare for the field visits.

1.3.4 Asset Condition Scoring

The observations and evaluation of area assets were summarized into a single 1 to 5 score. Condition scores were assigned to only the major assets in each area. In general, major assets are defined as equipment and structures with a replacement value of more than $25,000. The list of assets was developed using the list provided from the City's maintenance system. Appendix A includes a list of the major assets in each process area along with the noted condition score.

The purpose of the condition score is to communicate the timing until a major upgrade, rehabilitation, or replacement is needed for that asset. The score is a generalized condition for the asset as a whole, including its components and associated equipment. The score is based on professional judgment and is subject to interpretation. Table 1.1 describes the condition scores and the timing they are meant to represent.

Table 1.1 Condition Score Explanation

Score(1)	Timing of Next Action(2)	General Description
1	More than 20 years	Newly installed, best possible condition
2	16 to 20 years	Good condition
3	11 to 15 years	Fair condition, normal maintenance required
4	6 to 10 years	Poor condition, in need of minor repairs
5	Within 5 years	Worst condition, broken or does not meet process requirements

Notes:
(1) Scores are meant to summarize the general condition of the asset as a whole.
(2) Timing based on professional judgment of assessors of next major upgrade, rehabilitation, or replacement.

1.3.5 Assessment and Development of Recommendations

The assessment of the RWQCP occurred on April 4, 2017. Recommendations for each process area were developed based on the observations from the assessment team. The assessors used the time in the field to visually inspect the major components, noting any repair and rehabilitation needs, identifying areas in need of more detailed inspection techniques (e.g., concrete coring or assessment), recording asset conditions, and identifying CIP-level projects for the update of the Master Plan.

The assessment team included five engineers from Carollo and a team of City staff members as indicated in the following:

- David Baranowski - Assessment Task Lead/Civil Engineer.
- John Briones - Electrical Engineer.
- James Doering - Structural Engineer.
- Brian Graham - Process Engineer.
- Khalil Kairouz - Mechanical Engineer.
- La Mond Mansell - Wastewater Plant Supervisor.
- Greg Otjen - Senior Wastewater Operator.
- Richard Pallante - Wastewater Maintenance Manager.
- Gilbert Perez - Wastewater Operations Manager.

The observations and recommendations were presented to the City for review and feedback during a workshop on May 3, 2017.

The observations and recommendations from each assessor were combined into a single set of recommendations for each process area. The recommended improvements were organized into two time frames: near-term and long-term. Near-term projects are recommended for the next 10 years and generally coincide with condition scores of 4 and 5. Long-term projects are recommended for completion between 10 and 20 years and coincide with a score of 2 and 3. In general, it is anticipated that assets with Level 1 score will not need a CIP project as part of this update of the Master Plan. These timeframes are based on professional judgment and consider the timing of related components and other affected items.

Additionally, the replacement of major assets was forecasted based on a combination of life and condition. Noting that the planning period extends 20 years into the future, some assets observed to be in fair condition, will need to be replaced in the next 10 to 20 years. The assets that fall into this situation are identified in the "End-of-Life Forecast" subsection of each process area.

The recommendations and CIP needs presented in this chapter are based solely on the condition of the assets. CIP needs pertaining to capacity, regulatory, and other factors will be included in Volume 7 (CIP and Overall Implementation) of the update to the Master Plan.

1.3.6 Cost Estimate Preparation

Cost estimates were completed for each recommended project. The costs were developed in accordance with Basis of Cost Estimates chapter of this update of the Master Plan (Volume 2, Chapter 4).

The presented costs are considered Class 4 estimates. The costs are based on the AACE International's definitions of the five "class estimates" in AACE International Recommended

Practice No. 18R-97. The expected accuracy of any estimates included herein is 30 percent over the estimate to 15 percent under the estimate.

1.4 Condition Assessment Findings

This section summarizes the findings from the condition assessment of the RWQCP, including information about the assessed areas, key observations, and near- and long-term recommended projects. End-of-life forecasts are also included for each area.

1.4.1 Headworks

The current headworks area was constructed in 1999 and consists of the screening room, blower room, electrical room, grit chambers, and grit pumping room. There is also a septage receiving station adjacent to the headworks that was evaluated as part of the condition assessment. Staff provided the following input for the headworks area:

- Bar screens are now 18 years old and have become a maintenance problem and staff are concerned about the ability to find replacement parts (manufacturer went out of business).
- Air ducts in the screening room are corroded.
- Grit pump room has access hatch safety concerns.
- A new biofilter system was installed in the area during the MBR project. However, because it is new, it was not evaluated as part of this project.
- Grit chambers have been inspected and no concrete issues were noted.
- The T-Lock lining on the influent channels has failed in some areas.

1.4.1.1 Key Observations

The condition assessment found several issues at the headworks area. Exposed aggregate was observed in some of the structure and water had pooled on the screening room floor. The access hatch to the grit room was lacking fall or vehicle protection, and some electrical equipment did not meet current NEC standards. The classification of the screening room could be Class I, Division 1 or Division 2 depending on the number of air changes per hour provided by the ventilation system. According to NFPA 820, if the room has at least 12 air changes per hour then it would be classified Class I, Division 2, otherwise it would be Class 1, Division 1.

Several areas were observed with various stages of corrosion. The metal air ducts in the screening room had significant corrosion, and the FRP had coating issues over the entire area. The screening conveyer is also corroded and in poor condition. Staff noted that a clog in the previous biofilter resulted in poor ventilation in the screening room, which is most likely the cause of accelerated corrosion in this area. Noteworthy corrosion was observed on the barscreen gates and the screening conveyor.

The hatches to the influent channels are not rated for traffic and not protected by bollards. These hatches were previously blocked by the biofilter, which was removed and relocated. This area is now available for vehicle traffic and is accessible by the trucks using the septage receiving station. This area is considered to be hazardous for vehicle traffic and should be conned off until hatches can be replaced or bollards installed.

The grinders, washers, and compactors will be in need of replacement in the next few years. Staff noted that this can be completed with internal resources.

Temporary, rolling ladders were placed to allow access to the grit snails and elevated equipment. The mobility of these ladders and lack of landing area for maintenance is a safety concern.

Ferric chloride can be dosed upstream of headworks. The current configuration does not allow for separate dosing to the two treatment trains. This is an operational issue if the City plans to operate both treatment trains long-term (if the Active train is shut down and only the MBR treatment train (Plant 1) is active, then this is not an issue). The location of the dosing point should be moved to allow greater operational control of the chemical in each treatment train. In addition, dosing directly upstream of the headworks is not recommended because of the potential for corrosion to the headworks equipment (bar screens, gates, etc.).

The barscreens are in fair condition; however, considering the age of the units, the maintenance history, the corrosion on the gates, and the concern over the availability to find replacement parts, there is a strong case to be made to replace them over the next 10 years.

Overall, the septage receiving station is in fair condition. Some minor components were corroded. However, staff noted the concern over the location of the station and the access given to non-City trucks to dump into the station.

All electrical equipment in the area should meet Class 1, Division 1 or Division 2 standards, depending on the classification of the area. As portions of the area are rehabilitated or upgraded, the electrical components should be replaced with compliant equipment.

1.4.1.2 Near-Term Projects (0 to 10 Years)

To mitigate the more immediate issues listed above, the following projects are recommended for completion in the near-term:

1. Replace all metal ducting in the screening room and repair the coating on the FRP ducting. Improve the grit room pump's ventilation to ensure 12 air changes per hour and add H_2S sensors.
2. Replace all electrical components that do not meet appropriate classification with hazardous rated equipment and seal all conduits.
3. Replace the bar screens and slide gates.
4. Replace the screening conveyers.
5. Install permanent stairs and landings for the grit classifiers and elevated equipment.
6. Implement hatch and safety improvements. Replace the damaged hatch to the grit room and install fall protection for the opening. Replace the plate covers with traffic-rated hatches and install vehicle bollards.
7. Perform a structural condition assessment of the influent box concrete.
8. Perform a study to relocate ferric dosing to downstream of the grit splitter box.
9. Replace the corroded septage receiving components.
10. The City should also consider conducting a feasibility study to look into alternative locations for the septage receiving station that would restrict access to the plant.
11. Investigate and fix the cause of foul air in the electrical/MCC room.
12. Paint the interior of the headworks building and all interior piping.

1.4.1.3 Long-Term Projects (10 to 20 Years)

In addition to the near-term projects listed above, the following long-term projects are recommended to mitigate less immediate issues:

1. Resurface the screening room floor and eliminate ponding areas.
2. Determine whether it is feasible to upgrade other indoor and outdoor areas of the headworks with more energy-efficient, "reduced maintenance" LED lamps.

1.4.1.4 End-of-Life Forecast

Based on the headworks assets' age and condition, the following assets are recommended for replacement over the next 20 years:

- Grit snails, grit classifiers (slurry cups), and grit conveyors.
- Grit pumps.
- MCC.

1.4.1.5 Project Cost Estimates

The recommendations were totaled for the near-term projects, long-term projects, and asset end of life replacements. The total cost for these projects is shown below. Detailed cost estimates are included in Appendix B.

- Near-term projects: $8,679,300.
- Long-term projects: $103,300.
- Asset end of life replacements: $1,855,700.

1.4.2 Primary Sludge Pumping

Primary sludge pumping consists of two belowground pump rooms located near the primary clarifiers: Primary Sludge Pumping Structure No. 1 was installed in 1967, and Primary Sludge Pumping Structure No. 2 was installed in 1986. Both rooms were rehabilitated in the past with new pumping units. No. 1 includes an aboveground brick building, while No. 2 is completely underground.

Staff provided the following input for this area:

- The pump rooms are congested and have poor ventilation.
- The access hatches lack fall protection.
- Staff would like to consider relocating the electrical cabinets outside of Primary Sludge Pumping Station No. 1 inside the abandoned building.
- The valve conditions are a maintenance issue and some valves are frozen.

1.4.2.1 Key Observations

The condition assessment revealed several issues with primary sludge pumping. Both pump rooms are extremely congested, with No. 2 more congested than No. 1. Furthermore, the scum pits are uncovered, and the walls have exposed aggregate. Paint on the pump room walls is peeling, and the rooms have poor ventilation. As a result, corrosion in the rooms is an issue. Many valves are corroded and some are frozen (according to staff input). The doors to the pump rooms are also corroded.

Finally, the access hatches lack fall protection and the electrical equipment does not meet Class 1, Division 2 standards. Two of the outlets in the room are also uncovered.

The staff desires to relocate the electrical equipment that is in both of the pump rooms and outside of Primary Sludge Pumping Structure No. 1. The desired location is inside the abandoned upper level of Structure No. 1. From a visual perspective, it does not appear that the building could immediately accommodate the electrical cabinets due to their height. The building may require modifications in order to house the equipment. However, at a minimum, all electrical equipment located in the pump rooms is recommended for relocation.

1.4.2.2 Near-Term Projects (0 to 10 Years)

To mitigate the more immediate issues identified above, the following projects are recommended for completion in the near term:

1. Make the following improvements:
   a. Install fall protection around all access hatches.
   b. Cover the scum pits and improve the grating for traffic loads.
   c. Inspect the condition of the scum pit concrete for both stations.
   d. Remove the abandoned steam generator.
   e. Improve site lighting in the stairways.
   f. Replace the MCC.
2. Overhaul Primary Sludge Pumping Structure at No. 1 by completing the following:
   a. Bring the electrical components up to code and relocate them out of the pump room.
   b. Replace pumps with smaller or fewer units (this will be evaluated in Volume 4, Chapter 5).
   c. Replace piping and valves (some portions can be reused).
   d. Paint the room, recoat all piping that isn't replaced, and replace the door.
   e. Replace the fan with a larger unit to meet NFPA 820 ventilation requirements.
   f. Add a lifting crane.
3. Primary Sludge Pumping Structure No. 2 Repairs:
   a. Paint the room, recoat all piping, and replace the door.
   b. Replace the frozen valves and paint the piping.
   c. Replace and upsize the fan and replace the air release valve on the roof to meet NFPA 820 ventilation requirements.
   d. Install an additional access hatch.
   e. Repair stair treads.
   f. Cover exposed electrical outlets and replace the irrigation controller junction box.

1.4.2.3 Long-Term Projects (10 to 20 Years)

In addition to the near-term projects listed above, several long-term projects were identified for the primary pumping areas to mitigate less immediate issues. These projects are as follows:

1. Rehabilitate Pump Room No. 2 and reconfigure it with fewer or smaller pumps (this will be evaluated in Volume 4, Chapter 5). Install an additional access hatch.
2. Resurface the scum pit concrete and install a protective liner.
3. Perform a study to further investigate corrosion on the primary effluent pipe's crown.
4. Study the extent of building modifications needed in order to relocate the electrical equipment. As part of this effort, identify requirements for the ceiling height, door width, and ventilation.

1.4.2.4 End-of-Life Forecast

Based on the primary sludge pumping ages and condition, no assets are recommended for replacement over the next 20 years.

1.4.2.5 Project Cost Estimates

The recommendations were totaled for the near-term projects, long-term projects, and asset end of life replacements. The total cost for these projects is shown below. Detailed cost estimates are included in Appendix B.

- Near-term projects: $1,876,200.
- Long-term projects: $749,500.
- Asset end of life replacements: $0.

1.4.3 ACT Treatment Train (Plant 2) Aeration Basins

Aeration for the ACT treatment train (Plant 2) consists of six aeration basins in the ACT treatment train (Plant 2). Basins 1 and 2 were installed in 1967, Basins 3 and 4 were installed in 1979, and Basins 5 and 6 were installed in 1986. Each basin contains baffles, diffusers, inlet and outlet gates, and MLR pumps.

For the aeration basins, staff provided the following input:

- The isolation gates on the inlet to basins 5 and 6 have operational issues.
- Membrane diffusers are in need of replacement.
- The baffles were damaged and were recently repaired.
- The anoxic mixers are in working condition.
- The MLR pumps are in the process of being replaced.
- The dissolved oxygen probes were recently upgraded.
- Blower No. 2 is currently out of service.

1.4.3.1 Key Observations

At the time of the condition assessment, all basins were online and their interiors could not be observed. The condition of the baffles, diffusers, and MLR pumps were discussed with staff.

Overall, the basins were in good condition. According to staff, the mixers work well and require only minimal maintenance. Furthermore, the recent baffle repair could extend the life for an additional 10 years. However, when considering the level of effort to drain the tanks to make repairs, it makes sense to coordinate the replacement of the baffles with the replacement of the diffusers. Several diffusers appeared to have failed and all have surpassed their useful life expectation.

Nonetheless, the assessment also revealed several non-process related issues with the aeration basins. Paint on the air piping is peeling, and the pipe between Basins 2 and 3 has settling issues. Additionally, the side-mounted railings showed corrosion, and several basins lacked kick plates.

Furthermore, the inlet isolation gates at the junction structure between Basins 5 and 6 do not seal; however, discussions with staff revealed that these gates may no longer be necessary. Additionally, basin gates and some of the air control valves are manually operated and additional automation could ease plant operation. The concrete walkways had cracks and spalling, vegetation was growing in one basin, and the electrical conduit had corrosion.

1.4.3.2 Near-Term Projects (0 to 10 Years)

To mitigate immediate issues in the aeration basins noted above, the following projects are recommended in the near-term:

1. Replace the membrane diffusers and replace the redwood baffles with FRP baffles.
2. Replace corroded influent gates between basins 5 and 6 or seal the gates if they are not needed.
3. Make the following repairs to the basins:
   a. Paint the air piping.
   b. Replace corroded conduits, boxes, and conduit clamps with SS parts.
   c. Install kick plates on Basins 3 through 6 and replace side-mounted railings with top-mounted railings.
   d. Remove vegetation and seal openings in the adjacent gate.
   e. Repair cracks and spalls in the concrete walkways.
4. City staff should perform a detailed condition assessment of the aeration basin concrete structure when the basins are taken out of service for maintenance.
5. Install motorized operators on gates and control valves for additional automatic control.

1.4.3.3 Long-Term Projects (10 to 20 Years)

In addition to the short-term projects listed above, the following long-term projects were identified to mitigate less immediate issues:

1. Replace HID lamps with LEDs.
2. Realign the settled air pipe or reinstall supports.

1.4.3.4 End-of-Life Forecast

Based on the aeration basins assets' ages and condition, the following assets are recommended for replacement over the next 20 years:

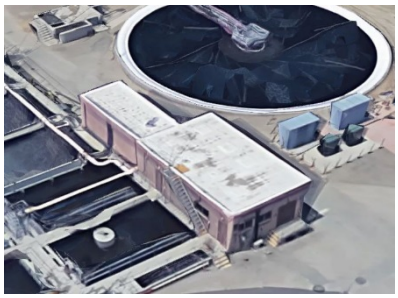
- Floating mixers.

1.4.3.5 Project Cost Estimates

The recommendations were totaled for the near-term projects, long-term projects, and asset end of life replacements. The total cost for these projects is shown below. Detailed cost estimates are included in Appendix B.

- Near-term projects: $3,323,600.
- Long-term projects: $60,400.
- Asset end of life replacements: $532,000.

1.4.4 RAS/WAS Pumping



RAS and WAS pumping for the ACT treatment train (Plant 2) is located in two belowground pump stations located on either side of the aeration basins. The RAS/WAS Pump Room (PS 16) was installed in 1986 and is located below the old aeration blower room. The RAS pump room (PS 10) was installed in 1967 and is adjacent to the Aeration Basin 6, near the primary clarifiers.

For this facility, staff provided the following input:

- The electrical components have been modified several times, and the VFDs are old.
- The WAS pumps are candidates for replacement.
- Flow isolation is difficult with the current valve configuration in the PS 16 RAS header.
- The facility's structural elements are original and should be reviewed.
- Three of the four RAS pumps in PS 10 were recently replaced.

1.4.4.1 Key Observations

The condition assessment revealed several issues with PS 16. Its roof showed signs of leakage and corrosion, and the building upper level is possibly a classified area (Division 2) because of an opening in the floor. Furthermore, the air duct was routed through the access hatch in the pump room ceiling/switchgear room floor to avoid drilling through the building floor. No fall protection was installed around this opening. The overhead clearance of the stairs leading down into the pump room does not appear to meet code. This should be verified and remedied, if possible.

New switchgear was recently installed in the room above PS 16. Due to the opening in the floor, this is deemed a classified area. According to staff, no consideration was given to classification requirements when installing the new switchgear. It is unclear if the new equipment is rated for this type of environment; however, if the ventilation system provides six air changes per hour, then this area is not considered classified.

PS 10 also had several problems. The valves are 50 years old, and Pump 4 is corroded. Paint was also peeling off the pump room walls and ceiling, and no crane was available to remove equipment. The building is 50 years old and appeared to be of the pan deck style without steels beams, which is vulnerable to seismic activity; implying that the ceiling of the pump room could collapse during a seismic event.

Additionally, the condition of the drain pumps in both pump situations is unknown by staff. They have no recollection of them operating.

1.4.4.2 Near-Term Projects (0 to 10 Years)

To mitigate more immediate concerns in the RAS/WAS pump stations, several near-term projects are recommended:

For PS 16, these projects are as follows:

1. Replace the VFDs and MCCs and reconfigure the MCCs along the room's walls.
2. Repair or replace the corroded roof members near the roof leak.
3. Install fall protection around the opening.
4. Remove the abandoned WAS pumps.
5. Replace the drain pump.

In addition to these projects, evaluating the WAS pump capacity is recommended based on future operating parameters once the MBR treatment train (Plant 1) treatment train is fully operational.

For PS 10, the following near-term projects are recommended:

1. A seismic analysis of the PS 10 building should be performed because the pan deck system without steel beams is vulnerable. Depending on the outcome of this analysis, the PS 10 building may need to be replaced and repurposed. A new location for a replacement RAS/WAS pump station should be identified.
2. Install an equipment crane.
3. Paint the room.
4. Replace the corroded pipe supports and anchor them to the floor.
5. Replace Pump No. 4.
6. Replace the 50-year-old valves and paint the piping.
7. Replace the drain pump.

1.4.4.3 Long-Term Projects (10 to 20 Years)

In addition to the near-term projects listed above, the following long-term projects are recommended to mitigate less immediate concerns:

1. Replace the MCCs in PS 10.
2. Install LED for both pump stations.

1.4.4.4 End-of-Life Forecast

Based on the RAS/WAS pump station assets' age and condition, the following assets are recommended for replacement over the next 20 years:

- PS 16 RAS pumps and valves.
- PS 16 WAS pumps.

1.4.4.5 Project Cost Estimates

The recommendations were totaled for the near-term projects, long-term projects, and asset end of life replacements. The total cost for these projects is shown below. Detailed cost estimates are included in Appendix B.

- Near-term projects: $2,073,200.
- Long-term projects: $198,600.
- Asset end of life replacements: $943,400.

1.4.5 WAS Thickening

The WAS thickening area consists of two DAFT and a building for sludge and chemical pumps. Also located in the building is the ferric chloride pumping station for the sludge line that feeds the solids blending process. This area was constructed in 1986.

Staff provided the following information for this area:

- Additional DAFT capacity is needed.
- The polymer feed system is outdated technology.
- A chemical tank at the building's rear is unused.
- The building contains abandoned equipment. This should be removed so that the abandoned areas can be repurposed.
- The collector mechanisms should be evaluated for replacement.
- The interior of the DAFTs could use coating.
- The gearbox of DAFT No. 1 was replaced 10 years ago.
- The air compressors were recently replaced.
- The ferric chloride pumping station in the building is planned for relocation in early 2018.

1.4.5.1 Key Observations

The condition assessment revealed several issues with this area. One DAFT was offline due to gear failure, which has a long lead time for replacement. The internal components of the out-of-service DAFT were therefore available for visual inspection. They were observed to be corroded and in need of rehabilitation. Furthermore, the decking, piping, and electrical components for both DAFTs need to be repaired and painted.

The connection between the DAFT rotating mechanism and the gear box needs to be evaluated to ensure it is seismically secure. The electrical room does not appear to be sealed off from the pump room, which would mean the room may be a classified area depending on the ventilation system in place. The hanging pipes lack seismic bracing.

The DAFT capacity will be evaluated in Volume 5, Chapter 4 of the update to the Master Plan. The evaluation should consider alternative technologies for additional capacity by completing a life-cycle cost comparison and identifying footprint requirements.

1.4.5.2 Near-Term Projects (0 to 10 Years)

To mitigate the more immediate concerns identified above, the following near-term projects are recommended:

1. Rehabilitate both DAFT units. Repair corrosion on the internal mechanisms and then recoat the structures, as well as paint the piping, pressure tank, decking, and outdoor equipment.
2. Perform a seismic evaluation of the DAFT mechanism connection.

3. Complete the following building upgrades:
   a. Remove abandoned equipment in the building and demolish unused pump pads.
   b. Remove the unused chemical tank.
   c. Upgrade the ventilation to declassify the electrical room.
   d. Install seismic bracing on the hanging pipes.
   e. Paint interior of building.

1.4.5.3 Long-Term Projects (10 to 20 Years)

In addition to the near-term projects listed above, the following long-term projects are recommended to address less immediate concerns:

1. Cover the DAFT tanks.
2. Replace the DAFT No. 1 drive.
3. Replace the polymer pump systems.
4. Add LED lights and replace the windows and doors of the building.

1.4.5.4 End-of-Life Forecast

Based on the WAS thickening assets' age and condition, the following assets are recommended for replacement over the next 20 years:

- MCCs.
- Sludge pumps.
- Recycle pumps.
- Pressure tank.
- Rotating mechanisms.

1.4.5.5 Project Cost Estimates

The recommendations were totaled for the near-term projects, long-term projects, and asset end of life replacements. The total cost for these projects is shown below. Detailed cost estimates are included in Appendix B.

- Near-term projects: $656,600.
- Long-term projects: $285,800.
- Asset end of life replacements: $1,636,800.

1.4.6 Tertiary Filters

The RQWCP contains 16 tertiary filters. Filters 1 through 8 were installed in 1981; Filters 9 and 10 were installed in 1982; and Filters 11 through 16 were added in 1990. The filter building contains the filter pumping and piping along with a control room.

Staff provided the following input on the tertiary filters:

- The filters are difficult to operate.
- Staff is considering alternative treatment technologies to replace or retrofit these filters.
- The valves located on the overhead piping in the piping gallery are difficult to access.
- Two steel storage tanks are used for backwash and may be repurposed if the filters are replaced.
- The east filters (Filters 1 through 10) need to operate continuously in order to supply the backwash tanks. This limits operational flexibility.
- The fiberglass troughs on Filters 1 through 10 are in need of replacement.

1.4.6.1 Key Observations

A 2014 filter study was conducted by another consultant. The study performed a more in-depth evaluation of the filters than the visual assessment included here. According to staff, none of the recommendations from the 2014 study were implemented due to the ongoing MBR treatment train (Plant 1) construction. The assessment team reviewed the recommendations from the 2014 study and they believe the recommendations are all still valid. These recommendations have been included below.

The condition assessment revealed several issues with the tertiary filters in addition to the items listed in the 2014 study. Although the backwash storage tank's coating was in good condition, the tanks have a rigid pipe connection to the ground. Only one filter was offline during the assessment and available for partial internal inspection, Filter 13. The steel trough support beam has surface corrosion throughout.

In general, the concrete walls of the filters have extensive cracking and evidence of past leakage throughout. No active leaking was observed during the inspection. Furthermore, the influent sluice gates and operators appear to have moderate corrosion and wear. The floor inside of the pipe gallery area does not drain properly. Large cracks and spalling were observed on the staircase leading out of the filter building on the north side of Filter 11 through 16. It was not clear what caused this cracking/spalling.

Several pipe gallery valves are difficult to access. The City recently replaced the valves and installed platforms to ease valve operation.

Lastly, the backwash system can be modified to pull from the plant reclaimed water system or the effluent of the chlorine contact tanks instead of being fed by the east filters.

1.4.6.2 Near-Term Projects (0 to 10 Years)

Note that the recommendations for near- and long-term projects will depend on the outcome of the life cycle cost analysis to replace or retrofit the existing filter with an alternative technology. This is discussed in Volume 4, Chapter 7 of this update to the Master Plan.

The 2014 study recommended several improvements to the filters. These projects are as follows:

1. Replace the filter media.
2. Inspect the underdrain systems. It is assumed that most, if not all, will need to be replaced and will be included in the budget for replacement.
3. Add an actuator to the air scour blower cross-over interconnection.
4. Add an actuator to the backwash supply piping valve that isolates the east and west sides.

5. Configure the drains for the air blow-off valves in the galleries to eliminate standing water.
6. Rehabilitate the subsurface wash system of Filters 11 through 16 and replace the failed plastic hubs with brass components.
7. Replace instrumentation that is older than 10 years.
8. Provide "concrete equipment pads/curbs" for the east filter pipe penetrations through floors.
9. Rehabilitate the backwash system valves.
10. Repair the PVC lining at the West filter rapid mix.
11. Replace the east filter feed meters.
12. Replace the waste backwash valves in Filters 9 and 10.

In addition to the projects listed in the 2014 study, the following near-term projects are also recommended:

1. Replace the fiberglass troughs on filters 1-10.
2. Modify the backwash system to reduce the need to run the east filters continuously.
3. Complete a backwash tank seismic evaluation and an interior condition assessment.
4. Investigate the cause of the stair crack described previously.

1.4.6.3 Long-Term Projects (10 to 20 Years)

In addition to the near-term projects listed above, the following long-term projects are recommended to mitigate less immediate concerns:

1. Install LED lights on the filter deck.
2. Demolish the tertiary control room, which was abandoned when Filters 11 through 16 were added, as well as the breezeway for Filters 1 through 10.
3. Resurface the pipe gallery's floor to eliminate pooling water.
4. Relocate or install operators on valves that are difficult to reach.

1.4.6.4 End-of-Life Forecast

Based on the tertiary filtration assets' age and condition, the following assets are recommended for replacement over the next 20 years:

- Backwash pumps.
- Filter feed pumps.
- Gates and valves.
- MCCs and VFDs.
- HVAC fans.

1.4.6.5 Project Cost Estimates

The recommendations were totaled for the near-term projects, long-term projects, and asset end of life replacements. The total cost for these projects is shown below. Detailed cost estimates are included in Appendix B.

- Near-term projects: $20,919,600 (includes replacement of filter underdrains).
- Long-term projects: $2,568,100.
- Asset end of life replacements: $7,389,700.

1.4.7 Chlorine Contact Basins

CCB 1 and CCB 2 were installed in 1981, and CCB 3 was installed in 1990. CCB 1 is located on the northeast end of the tertiary filter building and is covered with a plastic membrane. CCB 2 has been altered or added onto several times, most recently as part of the MBR project in 2017. CCB 2 is adjacent to the MBR and is now part of the MBR treatment train (Plant 1). CCB 2 was not visually assessed because it is not part of the activated train, but input from staff was included in the findings and recommendations. CCB 3 is located west of the tertiary filters and is covered with a concrete slab.

For these basins, staff provided the following input:

- The chemical feed systems require significant monitoring and adjusting.
- New chemical injection systems are being installed.
- The chemical mixing system had issues that are being corrected as part of the current project.
- Gas Masters were installed in 2002.
- The cover of CCB 2 is in need of replacement.

1.4.7.1 Key Observations

The condition assessment revealed a few issues with both basins. Rusting was observed on various conduit fittings, weatherproof switches/receptacle faceplates, control panel enclosures, light poles/bases, and conduit claps of both basins.

For CCB 1, water had ponded on the membrane cover; however, the cover appeared to be in acceptable condition otherwise. Continued ponding can stretch the cover and is not easily remedied.

For CCB 3, the concrete cover had extensive transverse cracking, and expansion join sealants exuded. The aboveground mechanical equipment was rusted and needed paint.

Staff indicated that the cover for CCB 2 is in need of replacement. This basin was not part of the scope, but its cost is included to coincide with the replacement of the cover of CCB 1.

1.4.7.2 Near-Term Projects (0 to 10 Years)

To mitigate the more immediate concerns listed above, near-term projects are recommended. These projects are listed below:

For CCB 1:

1. Repair ponding areas on the membrane cover.
2. Repair the corroded gate actuators and equipment.

For CCB 3:

1. Replace the cover's expansion joint sealant.
2. Replace the corroded electrical outlets and junction boxes.
3. Repair the corroded gate actuators and equipment.

1.4.7.3 Long-Term Projects (10 to 20 Years)

The following long-term projects are recommended to mitigate less immediate concerns in the chlorine contact basins:

1. Replace the membrane covers for CCB 1 and CCB 2.
2. Replace the gates and all mechanical equipment for CCB 1 and CCB 3.

3. Replace the HVAC units for both basins.
4. Convert all lighting to LED lighting.

1.4.7.4 End-of-Life Forecast

Based on the Chlorine Contact Basin assets' ages and condition, the following assets are recommended for replacement over the next 20 years:

- MCCs.
- Flash mixers.
- Sample pumps.

1.4.7.5 Project Cost Estimates

The recommendations were totaled for the near-term projects, long-term projects, and asset end of life replacements. The total cost for these projects is shown below. Detailed cost estimates are included in Appendix B.

- Near-term projects: $223,200.
- Long-term projects: $1,278,200.
- Asset end of life replacements: $1,005,300.

1.5 Recommended CIP

The recommended CIP for the seven assessed process areas for the update of the Master Plan is shown in Table 1.2. The table shows the total for each process area in the near-term (0 to 10 years), long-term (10 to 20 years), and for the assets that are expected to reach the end of their useful life by the end of the planning period. As mentioned previously, it should be noted that the projects and the associated CIP identified in this chapter are not related to capacity expansion and/or addressing regulatory requirements. This section only deals with projects aimed at keeping the current facilities in operation to meet the current permit requirements. Once all updates to the Master Plan projects are identified, more precise timing and detailed plans for each area's recommended projects will be established.

Table 1.2 RWQCP CIP Summary

Process Area	Near-Term Projects	Long-Term Projects	End of Life Assessment	Total
Headworks	$8,679,300	$103,300	$1,855,700	**$10,638,300**
Primary Sludge Pumping	$1,876,200	$749,500	$0	**$2,625,700**
Aeration Basins	$3,323,600	$60,400	$532,000	**$3,916,000**
RAW/WAS Pumping	$2,073,200	$198,600	$943,400	**$3,215,200**
WAS Thickening	$656,600	$285,800	$1,636,800	**$2,579,200**
Tertiary Filters	$20,919,600	$2,568,100	$7,389,700	**$30,877,400**
Chlorine Contact Basins	$223,200	$1,278,200	$1,005,300	**$2,506,700**
Total	**$37,751,700**	**$5,243,900**	**$13,362,900**	**$56,358,500**

Notes:
(1) Detailed cost estimates included in Appendix B.
(2) Recommended timing based on engineering judgment of assessors.
(3) In total, the preliminary CIP for the next 20 years is $56.4 million. Roughly two-thirds of that is recommended in the first 10 years. One third of the total is based on the end of life asset assessments.

Figure 1.3 shows the total CIP costs for the RWQCP divided into near-term and long-term projects.

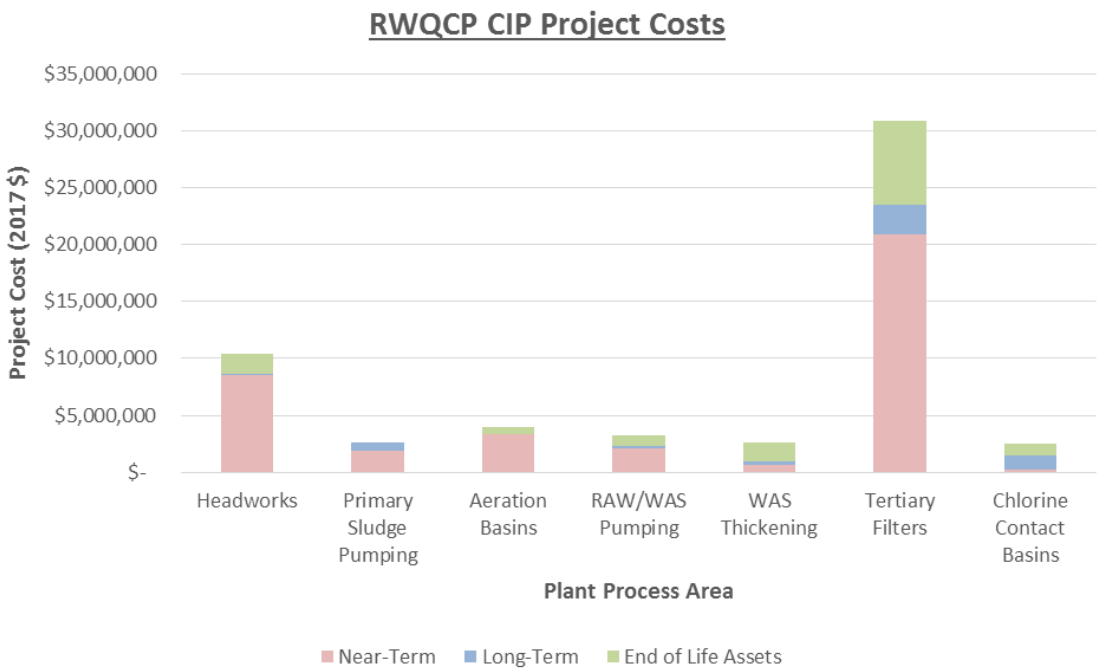


Figure 1.3 RWQCP CIP Summary

Appendix 1A

ASSET INVENTORY

ASSET INVENTORY AND CONDITION SCORING TABLE
REGIONAL WATER QUALITY CONTROL PLANT CONDITION ASSESSMENT
UPDATE OF THE INTEGRATED MASTER PLAN FOR THE WASTEWATER DIVISION
CITY OF RIVERSIDE PUBLIC WORKS DEPARTMENT

5 = Failed
4 = Poor
3 = Fair
2 = Good
1 = New
n/a = Not Observed

Area	System	Asset ID	Asset Description	Asset Type	Condition Score	Comment
Headworks	Screening	STR-HDW	STRUCTURE, HEADWORKS	STRUCTURE	4	Influent channel T-LOCK lining issues
Headworks	Screening	HDW-BSR-001	BARSCREEN, COG RAKE, FMC-LINK BELT, #1	BARSCREEN	3	
Headworks	Screening	HDW-BSR-002	BARSCREEN, COG RAKE, FMC-LINK BELT, #2	BARSCREEN	3	
Headworks	Screening	HDW-BSR-003	BARSCREEN, COG RAKE, FMC-LINK BELT, #3	BARSCREEN	3	
Headworks	Screening	HDW-BSR-004	BARSCREEN, COG RAKE, FMC-LINK BELT, #4	BARSCREEN	3	
Headworks	Screening	HDW-SGS-001	CLASSIFIER, SOLIDS, 42", TEACUP, EUTEK	CLASSIFIER	3	
Headworks	Screening	HDW-SGS-002	CLASSIFIER, SOLIDS, 42", TEACUP, EUTEK	CLASSIFIER	3	
Headworks	Screening	HDW-CGS-001	CONVEYOR, SHAFTLESS SCREW, 460 MM, GRIT/ SCREENINGS, AMERICAN	CONVEYOR	4	
Headworks	Screening	HDW-CGS-002	CONVEYOR, SHAFTLESS SCREW, 460 MM, GRIT/ SCREENINGS, AMERICAN	CONVEYOR	4	
Headworks	Screening	HDW-CRS-001	CONVEYOR, SHAFTLESS SCREW, 320 MM, RAW SCREENINGS, AMERICAN	CONVEYOR	4	
Headworks	Screening	HDW-CRS-002	CONVEYOR, SHAFTLESS SCREW, 320 MM, RAW SCREENINGS, AMERICAN	CONVEYOR	4	
Headworks	Screening	HDW-GCS-001	GRINDER COMPACTOR, SCREENING WASHER MONSTER, JWC	GRINDER COMPACTOR	3	
Headworks	Screening	HDW-GCS-002	GRINDER COMPACTOR, SCREENING WASHER MONSTER, JWC	GRINDER COMPACTOR	3	
Headworks	Screening	HDW-DGS-001	DEWATERING, GRIT SNAIL UNIT, 3 CUBIC YARDS, EUTEK, #1	DEWATERING	3	
Headworks	Screening	HDW-DGS-002	DEWATERING, GRIT SNAIL UNIT, 3 CUBIC YARDS, EUTEK, #2	DEWATERING	3	
Headworks	GRIT	HDW-CAS-001	COMPRESSOR, AIR, GRIT SYSTEM / PLANT AIR, CHAMPION	COMPRESSOR	3	
Headworks	GRIT	HDW-CAS-002	COMPRESSOR, AIR, GRIT SYSTEM / PLANT AIR, CHAMPION	COMPRESSOR	3	
Headworks	GRIT	HDW-CGR-001	CHAMBER, GRIT REMOVAL, JETA, JONES & ATWOOD, #1	GRIT CHAMBER	n/a	
Headworks	GRIT	HDW-CGR-002	CHAMBER, GRIT REMOVAL, JETA, JONES & ATWOOD, #2	GRIT CHAMBER	n/a	
Headworks	GRIT	HDW-PGA-001	PUMP, CENTRIFUGAL, RECESSED IMPELLER, MODEL 3X3-16, SERIES 6100, MORRIS,	PUMP	3	
Headworks	GRIT	HDW-PGA-002	PUMP, CENTRIFUGAL, RECESSED IMPELLER, MODEL 3X3-16, SERIES 6100, MORRIS,	PUMP	3	
Headworks	HVAC	HDW-BFA-001	BLOWER, CENTRIFUGAL, FOUL AIR, VERANTIS ENVIRONMENTAL,	BLOWER	3	
Headworks	HVAC	HDW-BFA-002	BLOWER, CENTRIFUGAL, FOUL AIR, VERANTIS ENVIRONMENTAL,	BLOWER	3	
Headworks	HVAC	HDW-EAH-001	AIR HANDLER, EXHAUST AIR, TRI STACK, HEADWORKS ROOF	AIR HANDLER	n/a	
Headworks	Electrical	HDW-MCC-001	MAIN MOTOR CONTROL CENTER, SQUARE D,	MOTOR CONTROL CENTER	3	
Headworks	Electrical	HDW-MCC-002	MAIN MOTOR CONTROL CENTER, SQUARE D,	MOTOR CONTROL CENTER	3	
Primary Sludge Pumping	Pump Room 1	ACT-PRI-PS-001	STRUCTURE, PUMPING, PRIMARY SLUDGE AND SCUM, # 1, (PRIMARIES # 1 AND # 2)	STRUCTURE	4	Peeling paint, corroded door, scum pit corrosion
Primary Sludge Pumping	Pump Room 1	ACT-PRI-GIL-001	GRINDER, IN LINE, (MUFFIN MONSTER), JWC, FOR PRIMARY SLUDGE PUMP # 1,	GRINDER	4	
Primary Sludge Pumping	Pump Room 1	ACT-PRI-GIL-002	GRINDER, IN LINE, (MUFFIN MONSTER), JWC, FOR PRIMARY SLUDGE PUMP # 2,	GRINDER	4	
Primary Sludge Pumping	Pump Room 1	ACT-PRI-GIL-003	GRINDER, IN LINE, (MUFFIN MONSTER), JWC, FOR PRIMARY SCUM PUMP # 1,	GRINDER	4	
Primary Sludge Pumping	Pump Room 1	ACT-PRI-PSC-001	PUMP, PRIMARY SCUM, NETZSCH, 2NE90, PRIMARY PUMPING STRUCTURE # 1	PUMP	4	
Primary Sludge Pumping	Pump Room 1	ACT-PRI-PSL-001	PUMP, PRIMARY SLUDGE, NETZSCH, 2NE90, PRIMARY PUMPING STRUCTURE # 1	PUMP	4	
Primary Sludge Pumping	Pump Room 1	ACT-PRI-MCC-001	MOTOR CONTROL CENTER, ALLEN BRADLEY, PUMPING STRUCTURE, # 1	MOTOR CONTROL CENTER	3	
Primary Sludge Pumping	Pump Room 2	ACT-PRI-PS-002	STRUCTURE, PUMPING, PRIMARY SLUDGE AND SCUM, # 2, (PRIMARIES # 3 AND # 4)	STRUCTURE	3	
Primary Sludge Pumping	Pump Room 2	ACT-PRI-GIL-004	GRINDER, IN LINE, (MUFFIN MONSTER), JWC, FOR PRIMARY SLUDGE PUMP # 3,	GRINDER	3	
Primary Sludge Pumping	Pump Room 2	ACT-PRI-GIL-005	GRINDER, IN LINE, (MUFFIN MONSTER), JWC, FOR PRIMARY SLUDGE PUMP # 4,	GRINDER	3	
Primary Sludge Pumping	Pump Room 2	ACT-PRI-GIL-006	GRINDER, IN LINE, (MUFFIN MONSTER), JWC, FOR PRIMARY SCUM PUMP # 2,	GRINDER	3	
Primary Sludge Pumping	Pump Room 2	ACT-PRI-PSC-002	PUMP, PRIMARY SCUM, MOYNO, PRIMARY PUMPING STRUCTURE # 2	PUMP	3	
Primary Sludge Pumping	Pump Room 2	ACT-PRI-PSL-003	PUMP, PRIMARY SLUDGE, MOYNO, PRIMARY PUMPING STRUCTURE # 2	PUMP	3	
Primary Sludge Pumping	Pump Room 2	ACT-PRI-MCC-002	MOTOR CONTROL CENTER, ALLEN BRADLEY, PUMPING STRUCTURE, # 2	MOTOR CONTROL CENTER	2	

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Area	System	Asset ID	Asset Description	Asset Type	Condition Score	Comment
Aeration Basins		ACT-AER-BSN-001	BASIN, AERATION, ACTIVATED, # 1	STRUCTURE	3	
Aeration Basins			DIFFUSER, ZONE 1, EDI FLEXAIR MINI-PANEL, 102 EA.	DIFFUSERS	5	Condition based on useful life and staff input
Aeration Basins		ACT-AER-MXF-001	MIXER, FLOATING, EPI OF ILLINOIS, #1	MIXER	3	Condition based on useful life and staff input
Aeration Basins		ACT-AER-PML-001	PUMP, MIXED LIQUOR RECYCLE, ITT FLYGT, # 1, ACT	PUMP, MLR	1	Condition based on useful life and staff input
Aeration Basins		ACT-AER-BSN-002	BASIN, AERATION, ACTIVATED, # 2	STRUCTURE	3	
Aeration Basins			DIFFUSER, ZONE 1, EDI FLEXAIR MINI-PANEL, 102 EA.	DIFFUSERS	5	Condition based on useful life and staff input
Aeration Basins		ACT-AER-MXF-002	MIXER, FLOATING, EPI OF ILLINOIS, #2	MIXER	3	Condition based on useful life and staff input
Aeration Basins		ACT-AER-PML-002	PUMP, MIXED LIQUOR RECYCLE, ITT FLYGT, # 2, ACT	PUMP, MLR	1	Condition based on useful life and staff input
Aeration Basins		ACT-AER-BSN-003	BASIN, AERATION, ACTIVATED, # 3	STRUCTURE	3	
Aeration Basins			DIFFUSER, ZONE 1, EDI FLEXAIR MINI-PANEL, 102 EA.	DIFFUSERS	5	Condition based on useful life and staff input
Aeration Basins		ACT-AER-MXF-003	MIXER, FLOATING, EPI OF ILLINOIS, #3	MIXER	3	Condition based on useful life and staff input
Aeration Basins		ACT-AER-PML-003	PUMP, MIXED LIQUOR RECYCLE, ITT FLYGT, # 3, ACT	PUMP, MLR	1	Condition based on useful life and staff input
Aeration Basins		ACT-AER-BSN-004	BASIN, AERATION, ACTIVATED, # 4	STRUCTURE	3	
Aeration Basins			DIFFUSER, ZONE 1, EDI FLEXAIR MINI-PANEL, 102 EA.	DIFFUSERS	5	Condition based on useful life and staff input
Aeration Basins		ACT-AER-MXF-004	MIXER, FLOATING, EPI OF ILLINOIS, #4	MIXER	3	Condition based on useful life and staff input
Aeration Basins		ACT-AER-PML-004	PUMP, MIXED LIQUOR RECYCLE, ITT FLYGT, # 4, ACT	PUMP, MLR	1	Condition based on useful life and staff input
Aeration Basins		ACT-AER-BSN-005	BASIN, AERATION, ACTIVATED, # 5	STRUCTURE	3	
Aeration Basins			DIFFUSER, ZONE 1, EDI FLEXAIR MINI-PANEL, 102 EA.	DIFFUSERS	5	Condition based on useful life and staff input
Aeration Basins		ACT-AER-PML-005	PUMP, MIXED LIQUOR RECYCLE, ITT FLYGT, # 5, ACT	PUMP, MLR	3	Condition based on useful life and staff input
Aeration Basins		ACT-AER-MXF-005	MIXER, FLOATING, EPI OF ILLINOIS, #5	MIXER	1	Condition based on useful life and staff input
Aeration Basins		ACT-AER-BSN-006	BASIN, AERATION, ACTIVATED, # 6	STRUCTURE	3	
Aeration Basins			DIFFUSER, ZONE 1, EDI FLEXAIR MINI-PANEL, 102 EA.	DIFFUSERS	5	Condition based on useful life and staff input
Aeration Basins		ACT-AER-MXF-006	MIXER, FLOATING, EPI OF ILLINOIS, #6	MIXER	3	Condition based on useful life and staff input
Aeration Basins		ACT-AER-PML-006	PUMP, MIXED LIQUOR RECYCLE, ITT FLYGT, # 6, ACT	PUMP, MLR	1	Condition based on useful life and staff input
RAS/WAS	PS10 (RAS)	ACT-SEC-PS-003	STRUCTURE, PUMPING, ACTIVATED SECONDARY RAS, # 3	STRUCTURE	4	Seismic vulnerability
RAS/WAS	PS10 (RAS)	ACT-AER-PTD-001	PUMP, AERATION TANK DRAIN, PEABODY BARNES, #1	PUMP	5	Never seen in operation
RAS/WAS	PS10 (RAS)	ACT-SEC-PRA-001	PUMP, RETURN ACTIVATED SLUDGE, FAIRBANKS MORSE, # 1, ACT SECONDARY RAS	PUMP	1	New
RAS/WAS	PS10 (RAS)	ACT-SEC-PRA-002	PUMP, RETURN ACTIVATED SLUDGE, FAIRBANKS MORSE, # 2, ACT SECONDARY RAS	PUMP	1	New
RAS/WAS	PS10 (RAS)	ACT-SEC-PRA-003	PUMP, RETURN ACTIVATED SLUDGE, FAIRBANKS MORSE, # 3, ACT SECONDARY RAS	PUMP	1	New
RAS/WAS	PS10 (RAS)		PUMP, RETURN ACTIVATED SLUDGE, FAIRBANKS MORSE	PUMP	5	
RAS/WAS	PS10 (RAS)	ACT-AER-MCC-001	MOTOR CONTROL CENTER, SQUARE D MODEL 6, FROM DPW 423 (DIST. PANEL W)	MOTOR CONTROL CENTER	3	
RAS/WAS	PS10 (RAS)	ACT-AER-MCC-002	MOTOR CONTROL CENTER, GENERAL ELECTRIC, 7700	MOTOR CONTROL CENTER	3	
RAS/WAS	PS16 (RAS/WAS)	ACT-SEC-PS-004	STRUCTURE, PUMPING, ACTIVATED SECONDARY RAS AND WAS, # 4	STRUCTURE	4	Leaks in roof
RAS/WAS	PS16 (RAS/WAS)	ACT-AER-PTD-002	PUMP, AERATION TANK DRAIN, PEABODY BARNES, #2	PUMP	5	Never seen in operation
RAS/WAS	PS16 (RAS/WAS)	ACT-SEC-PRA-004	PUMP, RETURN ACTIVATED SLUDGE, CHICAGO, # 4, ACT SECONDARY PUMPING	PUMP	3	
RAS/WAS	PS16 (RAS/WAS)	ACT-SEC-PRA-005	PUMP, RETURN ACTIVATED SLUDGE, CHICAGO, # 5, ACT SECONDARY PUMPING	PUMP	3	
RAS/WAS	PS16 (RAS/WAS)	ACT-SEC-PRA-006	PUMP, RETURN ACTIVATED SLUDGE, CHICAGO, # 6, ACT SECONDARY PUMPING	PUMP	3	
RAS/WAS	PS16 (RAS/WAS)	ACT-SEC-PWA-001	PUMP, WASTE ACTIVATED SLUDGE, FAIRBANKS MORSE, # 1, ACT SECONDARY	PUMP	3	
RAS/WAS	PS16 (RAS/WAS)	ACT-SEC-PWA-002	PUMP, WASTE ACTIVATED SLUDGE, FAIRBANKS MORSE, # 2, ACT SECONDARY	PUMP	3	
RAS/WAS	PS16 (RAS/WAS)	SEC-MCC-001	MOTOR CONTROL CENTER, ALLEN BRADLEY, 2100 CENTERLINE	MOTOR CONTROL CENTER	3	
RAS/WAS	PS16 (RAS/WAS)	SEC-VFD-001	VARIABLE FREQUENCY DRIVE, ALLEN BRADLEY, RAS PUMP #22A, RWPS-428	VARIABLE FREQUENCY DRIVE	4	
RAS/WAS	PS16 (RAS/WAS)	SEC-VFD-002	VARIABLE FREQUENCY DRIVE, ALLEN BRADLEY, RAS PUMP #22B, RWPS-429	VARIABLE FREQUENCY DRIVE	4	
RAS/WAS	PS16 (RAS/WAS)	SEC-VFD-003	VARIABLE FREQUENCY DRIVE, ALLEN BRADLEY, RAS PUMP #22C, RWPS-430	VARIABLE FREQUENCY DRIVE	4	
RAS/WAS	PS16 (RAS/WAS)	SEC-VFD-004	VARIABLE FREQUENCY DRIVE, ALLEN BRADLEY, RAS PUMP #22D, RWPS-431	VARIABLE FREQUENCY DRIVE	4	
RAS/WAS	PS16 (RAS/WAS)	SEC-VFD-005	VARIABLE FREQUENCY DRIVE, ALLEN BRADLEY, RAS STANDBY PUMP #22E,	VARIABLE FREQUENCY DRIVE	4	
RAS/WAS	PS16 (RAS/WAS)	SEC-VFD-006	VARIABLE FREQUENCY DRIVE, ALLEN BRADLEY, WAS PUMP #22F, RWPS-433	VARIABLE FREQUENCY DRIVE	4	
RAS/WAS	PS16 (RAS/WAS)	SEC-VFD-007	VARIABLE FREQUENCY DRIVE, ALLEN BRADLEY, WASTE BACKWASH PUMP #22H,	VARIABLE FREQUENCY DRIVE	4	
RAS/WAS	PS16 (RAS/WAS)	SEC-VFD-008	VARIABLE FREQUENCY DRIVE, ALLEN BRADLEY, STANDBY / WAS / WASTE BACKWASH	VARIABLE FREQUENCY DRIVE	4	

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Area	System	Asset ID	Asset Description	Asset Type	Condition Score	Comment
WAS Thickening	DAF No. 1	STH-DAF-001	CLARIFIER, DISSOLVED AIR FLOTATION, EIMCO, DAF #1	CLARIFIER	4	Internals and appurtenances
WAS Thickening	DAF No. 1	STH-TPR-001	TANK, PRESSURIZATION, DAF RECYCLE, 1000 GPM, MARK STEEL	TANK	4	Coating
WAS Thickening	DAF No. 2	STH-DAF-002	CLARIFIER, DISSOLVED AIR FLOTATION, EIMCO, DAF #2	CLARIFIER	4	Internals and appurtenances
WAS Thickening	DAF No. 2	STH-TPR-002	TANK, PRESSURIZATION, DAF RECYCLE, 1000 GPM, MARK STEEL	TANK	4	Coating
WAS Thickening	Buildling	STR-DAF	STRUCTURE, DISSOLVED AIR FLOTATION (DAF)	STRUCTURE	3	
WAS Thickening	Buildling	STH-CFA-001	COMPRESSOR, ROTARY SCREW, 150 PSI, INGERSOL RAND	COMPRESSOR	1	New
WAS Thickening	Buildling	STH-CFA-002	COMPRESSOR, ROTARY SCREW, 150 PSI, INGERSOL RAND	COMPRESSOR	1	New
WAS Thickening	Buildling	STH-CFU-001	CHEMICAL MIXING & FEED UNIT, US FILTER, POLYBLEND	CHEMICAL MIXING & FEED UNIT	4	Old units
WAS Thickening	Buildling	STH-CFU-002	CHEMICAL MIXING & FEED UNIT, US FILTER, POLYBLEND	CHEMICAL MIXING & FEED UNIT	4	Old units
WAS Thickening	Buildling	STH-PCF-001	PUMP, METERING, FERRIC CHLORIDE, PULSAFEEDER, DAF # 1	PUMP	1	New
WAS Thickening	Buildling	STH-PCF-002	PUMP, METERING, FERRIC CHLORIDE, PULSAFEEDER, DAF # 2	PUMP	1	New
WAS Thickening	Buildling	STH-PRC-001	PUMP SET, DAF RECYCLE, CORNELL	PUMP	3	
WAS Thickening	Buildling	STH-PRC-002	PUMP SET, DAF RECYCLE, CORNELL	PUMP	3	
WAS Thickening	Buildling	STH-PTS-001	PUMP, PROGRESSIVE CAVITY, NETZSCH, 2NE100A, PUMP #1, THICKENED SLUDGE, DAF	PUMP	3	
WAS Thickening	Buildling	STH-PTS-002	PUMP, PROGRESSIVE CAVITY, NETZSCH, 2NE100A, PUMP #2, THICKENED SLUDGE, DAF	PUMP	3	
WAS Thickening	Buildling	STH-MCC-001	MOTOR CONTROL CENTER, ALLEN BRADLY	MOTOR CONTROL CENTER	3	
Chlorine Contact Basins	CCB 1	DFE-CCB-001	BASIN, CHLORINE CONTACT, #1	STRUCTURE	3	Membrane repairs needed
Chlorine Contact Basins	CCB 1	DFE-CGM-001	CONTROL, GASMASTRRR, SYM COM, CCB #1	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 1	DFE-MCF-001	MIXER, FLASH, CHEMICAL, GASMASTRRR SERIES 32, 10HP, SUBMERSIBLE, BLEACH,	MIXER	n/a	
Chlorine Contact Basins	CCB 1	DFE-MCF-002	MIXER, FLASH, CHEMICAL, GASMASTRRR SERIES 32, 10HP, SUBMERSIBLE, BLEACH,	MIXER	n/a	
Chlorine Contact Basins	CCB 1	DFE-MXC-001	MIXER, CHLORINE, LIGHTNIN, CCB #1	MIXER	n/a	
Chlorine Contact Basins	CCB 1	DFE-CFS-002	FEEDER, CHEMICAL, LVN 2000, CCB #1.	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 1	DFE-CFS-003	FEEDER, CHEMICAL, LVN 2000, CCB #1.	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 1	DFE-PSA-001	PUMP, SAMPLE, DOSING CHAMBER, CCB #1, SUPPLIES Q DFE-AIT-002	PUMP	3	
Chlorine Contact Basins	CCB 1	DFE-PSA-002	PUMP, SAMPLE, DOSING CHAMBER, CCB #1, SUPPLIES Q DFE-AIT-001	PUMP	3	
Chlorine Contact Basins	CCB 3	DFE-CCB-003	BASIN, CHLORINE CONTACT, #3	STRUCTURE	3	Cover repairs needed
Chlorine Contact Basins	CCB 3	DFE-CGM-002	CONTROL, GASMASTRRR, SYM COM, SODIUM HYPOCHLORITE, CCB #3	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 3	DFE-CGM-003	CONTROL, GASMASTRRR, SYM COM, SBS, CCB #3	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 3	DFE-MCF-003	MIXER, FLASH, CHEMICAL, GASMASTRRR SERIES 32, 10HP, SUBMERSIBLE, BLEACH,	MIXER	n/a	
Chlorine Contact Basins	CCB 3	DFE-CFS-005	FEEDER, CHEMICAL, LVN 2000, CL2, CCB #3.	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 3	DFE-CFS-006	FEEDER, CHEMICAL, LVN 2000, SBS, CCB #3.	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 3	DFE-CFS-007	FEEDER, CHEMICAL, LVN 2000, SBS, CCB #3.	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 3	DFE-CFS-008	FEEDER, CHEMICAL, LVN 2000, SBS, CCB #3.	CHEMICAL SYSTEM	n/a	
Chlorine Contact Basins	CCB 3	DFE-MCC-001	MOTOR CONTROL CENTER, SQUARE D MODEL 5, CCB #3	MOTOR CONTROL CENTER	3	
Chlorine Contact Basins	CCB 3	DFE-MCF-004	MIXER, FLASH, CHEMICAL, GASMASTRRR SERIES 32, 10HP, SUBMERSIBLE, SBS,	MIXER	n/a	
Chlorine Contact Basins	CCB 3	DFE-MCF-005	MIXER, FLASH, CHEMICAL, GASMASTRRR SERIES 32, 10HP, SUBMERSIBLE, SBS,	MIXER	n/a	
Chlorine Contact Basins	CCB 3	DFE-MCF-006	MIXER, FLASH, CHEMICAL, GASMASTRRR SERIES 32, 10HP, SUBMERSIBLE, SBS,	MIXER	n/a	
Chlorine Contact Basins	CCB 3	DFE-MXC-002	MIXER, FLASH, CL2, HANSEN, CCB #3	MIXER	n/a	
Chlorine Contact Basins	CCB 3	DFE-PSA-003	PUMP, SAMPLE, DOSING CHAMBER, BLEACH, CCB #3	PUMP	3	
Chlorine Contact Basins	CCB 3	DFE-PSA-004	PUMP, SAMPLE, DOSING CHAMBER, BLEACH, CCB # 3	PUMP	3	
Chlorine Contact Basins	CCB 3	DFE-PSA-005	PUMP, SAMPLE, DOSING CHAMBER, SBS, CCB # 3	PUMP	3	
Chlorine Contact Basins	CCB 3	DFE-SAH-001	AIR HANDLER, SUPPLY, PURAFIL, IN-LINE CARBON UNIT, FAN ENGINEERING	AIR HANDLER	3	

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Tertiary Filters		TER-TTF-001	TANK, TERTIARY FILTER, #1	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-002	TANK, TERTIARY FILTER, #2	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-003	TANK, TERTIARY FILTER, #3	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-004	TANK, TERTIARY FILTER, #4	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-005	TANK, TERTIARY FILTER, #5	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-006	TANK, TERTIARY FILTER, #6	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-007	TANK, TERTIARY FILTER, #7	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-008	TANK, TERTIARY FILTER, #8	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-009	TANK, TERTIARY FILTER, #9	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-010	TANK, TERTIARY FILTER, #10	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-011	TANK, TERTIARY FILTER, #11	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-012	TANK, TERTIARY FILTER, #12	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-013	TANK, TERTIARY FILTER, #13	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-014	TANK, TERTIARY FILTER, #14	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-015	TANK, TERTIARY FILTER, #15	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-TTF-016	TANK, TERTIARY FILTER, #16	FILTER	4	2014 Study Recommendations
Tertiary Filters		TER-PWB-002	PUMP, WASTE BACKWASH, TERTIARY, ALLIS-CHALMERS, #2, TERTIARY PUMP ROOM	PUMP	3	
Tertiary Filters		TER-PWW-001	PUMPSET, WASTEWATER, TERTIARY WASTEWATER LIFT STATION	PUMP	3	
Tertiary Filters		TER-PWW-002	PUMPSET, WASTEWATER, TERTIARY WASTEWATER LIFT STATION	PUMP	3	
Tertiary Filters		TER-SDP-001	SUMP, DRAIN PUMP, TERTIARY PUMP ROOM STRUCTURE	PUMP	3	
Tertiary Filters		TER-SDP-002	SUMP, DRAIN PUMP, MIDDLE PIPE GALLERY, TERTIARY	PUMP	3	
Tertiary Filters		TER-SDP-003	SUMP, DUPLEX PUMP, LOWER PIPE GALLERY, TERTIARY	PUMP	3	
Tertiary Filters		TER-TBS-001	TANK, BACKWASH SUPPLY, #1	TANK	4	Rigid connection
Tertiary Filters		TER-TBS-002	TANK, BACKWASH SUPPLY, #2	TANK	4	Rigid connection
Tertiary Filters		UTL-FRV-001	FAN, VENTILATOR, ROOF, TERTIARY, FRF-1	FAN	3	
Tertiary Filters		UTL-FRV-002	FAN, VENTILATOR, ROOF, TERTIARY, FRF-2	FAN	3	
Tertiary Filters		UTL-FRV-003	FAN, VENTILATOR, ROOF, TERTIARY, FRF-3	FAN	3	
Tertiary Filters		UTL-FRV-004	FAN, VENTILATOR, ROOF, TERTIARY, FRF-4	FAN	3	
Tertiary Filters		TER-VFD-001	VARIABLE FREQUENCY DRIVE, TOSHIBA AS1, 300 HP, FILTER INFLUENT PUMP #1	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-002	VARIABLE FREQUENCY DRIVE, FILTER INFLUENT PUMP #2, ABB ACS 600	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-003	VARIABLE FREQUENCY DRIVE, FILTER INFLUENT PUMP #3, ABB ACS 600	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-004	VARIABLE FREQUENCY DRIVE, TOSHIBA AS1, 150 HP, WASTE BACKWASH PUMP #1	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-006	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #9, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-007	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #10, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-008	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #7, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-009	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #8, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-010	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #5, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-011	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #6, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-012	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #3, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-013	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #4, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-014	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #1, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-015	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #2, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-016	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, ALUM FLASH MIXER, VFD M7001,	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-017	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #11, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-018	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #12, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-019	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #13, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-020	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #14, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-021	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #15, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-022	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #16, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-023	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #17, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-024	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #18, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-025	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #19, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-026	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, FLOCCULATOR #20, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-027	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, POLYMER FLASH MIXER, VFD	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-028	VARIABLE FREQUENCY DRIVE, TOSHIBA AS1, 150 HP, RAW WATER PUMP #5	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-029	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, RAW WATER PUMP #6, VFD P7115,	VARIABLE FREQUENCY DRIVE	n/a	
Tertiary Filters		TER-VFD-030	VARIABLE FREQUENCY DRIVE, SQUARE D OMEGAPAK, RAW WATER PUMP #7, VFD P7114,	VARIABLE FREQUENCY DRIVE	n/a	

Appendix 1B

DETAILED COST ESTIMATES

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Headworks Near-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Metals and Site Rehabilitation**					
	Aluminum Stairs to Grit Classifiers	10	RSR	$650	$6,500	
	Aluminum Grating for Grit Classifiers	200	SF	$64	$12,800	
	Replace Hatch to Grit Room	1	EA	$8,600	$8,600	
	Replace Plate Covers with Traffic-Rated Hatches	3	EA	$9,200	$27,600	
	Install Bollards around Traffic-Rated Hatches	15	EA	$400	$6,000	
	Total					$61,500
2	**Mechanical Upgrades and Rehabilitation**					
	New Bar Screens	4	EA	$400,000	$1,600,000	
	Slide Gates	12	EA	$20,000	$240,000	
	Corrosion Repair and Coating (Full Facility)	1	LS	$65,000	$65,000	
	Replace Metal Ducting	380	LF	$73	$27,740	
	Relocate Ferric Dosing Discharge Location	1	LS	$35,000	$35,000	
	Grit Pump Room H2S Analyzer	1	EA	$20,000	$20,000	
	Replace Electrical to Comply with Area Classification	1	LS	$250,000	$250,000	
	Total					$2,237,740
3	**Studies**					
	Structural condition assessment of the influent box	1	LS	$50,000	$50,000	
	Study to relocate ferric dosing to downstream of the grit splitter box	1	LS	$50,000	$50,000	
	Feasibility study to look into alternative locations for septage receiving station	1	LS	$75,000	$75,000	
	Total					$175,000
	ITEM NO. 1 , 2, & 3 SUBTOTAL					**$2,474,240**
4	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$247,424	
	Electrical and Instrumentation Allowance	20	%		$494,848	
	Construction Difficulty	20	%		$494,848	
	Total					$1,237,100
	SUBTOTAL					**$3,711,340**
	Estimating Contingency	30	%			$1,114,000
	SUBTOTAL					**$4,825,340**
	General Conditions	10	%			$482,534
	SUBTOTAL					**$5,307,874**
	General Contractor Overhead & Profit	15	%			$554,914
	SUBTOTAL					**$5,380,254**
	Escalation to June 2018	3	%			$161,408
	SUBTOTAL					**$5,541,662**
	Sales Tax on 50% of Subtotal Above	7.75	%			$417,000
	CONSTRUCTION COST SUBTOTAL					**$5,797,254**
	Engineering, Management, and Legal	30	%			$1,740,000
	PROJECT COST (June 2018 Dollars)					**$7,537,300**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Headworks Long-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Long-Term Projects**					
	Resurface Floor of Screening Room	1800	SF	$18	$32,400	
	Feasible study to upgrade indoor and outdoor lighting with LED lamps	1	LS	$15,000	$15,000	
	Total					$47,400
	ITEM NO. 1 SUBTOTAL					**$47,400**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	0	%		$0	
	Electrical and Instrumentation Allowance	0	%		$0	
	Construction Difficulty	5	%		$2,370	
	Total					$2,400
	SUBTOTAL					**$49,800**
	Estimating Contingency	30	%			$15,000
	SUBTOTAL					**$64,800**
	General Conditions	10	%			$6,480
	SUBTOTAL					**$71,280**
	General Contractor Overhead & Profit	15	%			$7,452
	SUBTOTAL					**$72,252**
	Escalation to June 2018	3	%			$2,168
	SUBTOTAL					**$74,420**
	Sales Tax on 50% of Subtotal Above	7.75	%			$6,000
	CONSTRUCTION COST SUBTOTAL					**$78,252**
	Engineering, Management, and Legal	30	%			$24,000
	PROJECT COST (June 2018 Dollars)					**$102,300**

CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Headworks End-of-Life Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Mechanical Equipment**					
	Grit Classifier	2	EA	$200,000	$400,000	
	Grit Pumps	2	EA	$73,000	$146,000	
	Motor Control Center	1	EA	$100,000	$100,000	
	Total					$646,000
	ITEM NO. 1 SUBTOTAL					**$646,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$64,600	
	Electrical and Instrumentation Allowance	20	%		$129,200	
	Construction Difficulty	10	%		$64,600	
	Total					$258,400
	SUBTOTAL					**$904,400**
	Estimating Contingency	30	%			$272,000
	SUBTOTAL					**$1,176,400**
	General Conditions	10	%			$117,640
	SUBTOTAL					**$1,294,040**
	General Contractor Overhead & Profit	15	%			$135,286
	SUBTOTAL					**$1,311,686**
	Escalation to June 2018	3	%			$39,351
	SUBTOTAL					**$1,351,037**
	Sales Tax on 50% of Subtotal Above	7.75	%			$102,000
	CONSTRUCTION COST SUBTOTAL					**$1,413,686**
	Engineering, Management, and Legal	30	%			$425,000
	PROJECT COST (June 2018 Dollars)					**$1,838,700**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Primary Sludge Pumping Near-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Site Improvements**					
	Install Fall Protection at Access Hatches	2	EA	$3,000	$6,000	
	Scum Pit Covers	55	SF	$55	$3,100	
	Inspect Scum Pits	1	LS	$20,000	$20,000	
	Site Lighting	2	EA	$2,500	$5,000	
	Demolish Steam Generator at Pump Room 1	1	LS	$2,000	$2,000	
	Total					$36,100
2	**Primary Pumping Station 1 Overhaul**					
	Full Mechanical Demolition	1	LS	$15,000	$15,000	
	Primary Sludge Pumps	3	EA	$40,000	$120,000	
	6"-8" DI Piping, Supports, & Pipe Fittings	90	LF	$138	$12,420	
	Plug Valves	14	EA	$2,000	$28,000	
	Check Valves	3	EA	$2,500	$7,500	
	Paint Room	1	LS	$20,000	$20,000	
	Replace Door	1	EA	$1,200	$1,200	
	New Fan	1	EA	$6,000	$6,000	
	Lifting Crane and Station Modifications	1	LS	$35,000	$35,000	
	Total					$245,120
3	**Primary Pumping Station 2**					
	Paint Room	1	LS	$20,000	$20,000	
	Replace Door	1	EA	$1,200	$1,200	
	Replace Plug Valves	12	EA	$2,000	$24,000	
	Replace Check Valves	4	EA	$2,500	$10,000	
	Coating	1	LS	$20,000	$20,000	
	New Fan	1	EA	$6,000	$6,000	
	Stair tred repair	10	EA	$250	$2,500	
	Total					$83,700
	ITEM NO. 1, 2, & 3 SUBTOTAL					**$364,920**
4	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$36,492	
	Electrical and Instrumentation Allowance	20	%		$72,984	
	Construction Difficulty	25	%		$91,230	
	Total					$200,700
	SUBTOTAL					**$565,620**
	Estimating Contingency	30	%			$170,000
	SUBTOTAL					**$735,620**
	General Conditions	10	%			$73,562
	SUBTOTAL					**$809,182**
	General Contractor Overhead & Profit	15	%			$84,596
	SUBTOTAL					**$820,216**
	Escalation to June 2018	3	%			$24,606
	SUBTOTAL					**$844,823**
	Sales Tax on 50% of Subtotal Above	7.75	%			$64,000
	CONSTRUCTION COST SUBTOTAL					**$884,216**
	Engineering, Management, and Legal	30	%			$266,000
	PROJECT COST (June 2018 Dollars)					**$1,150,200**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Primary Sludge Pumping Long-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Primary Pumping Station 2**					
	Full Mechanical Demolition	1	LS	$15,000	$15,000	
	Primary Sludge Pumps	3	EA	$40,000	$120,000	
	New Access Hatch	1	EA	$7,500	$7,500	
	6"-8" DI Piping, Supports, & Pipe Fittings	90	LF	$138	$12,420	
	Total					$154,920
2	**Scum Pit**					
	Resurface Pit Concrete	210	SF	$18	$3,780	
	Install T-Lock Liner	160	SF	$30	$4,800	
	Total					$8,580
3	**Studies**					
	Study to further investigate corrosion on the primary effluent pipe's crown	1	LS	$15,000	$15,000	
	Study the extent of building modifications needed and the electrical equipment to relocate.	1	LS	$30,000	$30,000	
	Total					$45,000
	ITEM NO. 1, 2, & 3 SUBTOTAL					**$208,500**
4	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$20,850	
	Electrical and Instrumentation Allowance	40	%		$83,400	
	Construction Difficulty	25	%		$52,125	
	Total					$156,400
	SUBTOTAL					**$364,900**
	Estimating Contingency	30	%			$110,000
	SUBTOTAL					**$474,900**
	General Conditions	10	%			$47,490
	SUBTOTAL					**$522,390**
	General Contractor Overhead & Profit	15	%			$54,614
	SUBTOTAL					**$529,514**
	Escalation to June 2018	3	%			$15,885
	SUBTOTAL					**$545,399**
	Sales Tax on 50% of Subtotal Above	7.75	%			$42,000
	CONSTRUCTION COST SUBTOTAL					**$571,514**
	Engineering, Management, and Legal	30	%			$172,000
	PROJECT COST (June 2018 Dollars)					**$743,500**

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UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Primary Sludge Pumping End-of-Life Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Motor Control Centers**					
	Electrical Demolition	1	LS	$25,000	$25,000	
	Replace MCCs	1	LS	$180,000	$180,000	
	Total					$205,000
	ITEM NO. 1 SUBTOTAL					**$205,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	0	%		$0	
	Electrical and Instrumentation Allowance	20	%		$41,000	
	Construction Difficulty	5	%		$10,250	
	Total					$51,300
	SUBTOTAL					**$256,300**
	Estimating Contingency	30	%			$77,000
	SUBTOTAL					**$333,300**
	General Conditions	10	%			$33,330
	SUBTOTAL					**$366,630**
	General Contractor Overhead & Profit	15	%			$38,330
	SUBTOTAL					**$371,630**
	Escalation to June 2018	3	%			$11,149
	SUBTOTAL					**$382,778**
	Sales Tax on 50% of Subtotal Above	7.75	%			$29,000
	CONSTRUCTION COST SUBTOTAL					**$400,630**
	Engineering, Management, and Legal	30	%			$121,000
	PROJECT COST (June 2018 Dollars)					**$521,600**

CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Aeration Basin Near-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Process Equipment Rehabilitation**					
	Demolition	1	LS	$25,000	$25,000	
	Influent Gates	3	EA	$20,000	$60,000	
	Replace Diffuser Membranes at Each Basin	6	EA	$75,000	$450,000	
	FRP Baffles	6	EA	$26,000	$156,000	
	Total					$691,000
2	**Aeration Basin**					
	Paint Air Piping	1	LS	$15,000	$15,000	
	New Top Mounted Handrail at Basins 3-6	1000	LF	$45	$45,000	
	Remove Vegetation	1	LS	$5,000	$5,000	
	Repair Concrete Cracks and Spalls	1	LS	$60,000	$60,000	
	Total					$125,000
	ITEM NO. 1 & 2 SUBTOTAL					**$816,000**
3	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$81,600	
	Electrical and Instrumentation Allowance	20	%		$163,200	
	Construction Difficulty	10	%		$81,600	
	Total					$326,400
	SUBTOTAL					**$1,142,400**
	Estimating Contingency	30	%			$343,000
	SUBTOTAL					**$1,485,400**
	General Conditions	10	%			$148,540
	SUBTOTAL					**$1,633,940**
	General Contractor Overhead & Profit	15	%			$170,821
	SUBTOTAL					**$1,656,221**
	Escalation to June 2018	3	%			$49,687
	SUBTOTAL					**$1,705,908**
	Sales Tax on 50% of Subtotal Above	7.75	%			$129,000
	CONSTRUCTION COST SUBTOTAL					**$1,785,221**
	Engineering, Management, and Legal	30	%			$536,000
	PROJECT COST (June 2018 Dollars)					**$2,321,200**

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UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Aeration Basin Long-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Modifications**					
	Realign Settled Air Pipes	1	LS	$20,000	$20,000	
	Install Motorized Operators on Gates and Control Valves	45	EA	$7,600	$342,000	
	Replace HID Lamps with LEDs	20	EA	$1,300	$26,000	
	Total					$362,000
	ITEM NO. 1 SUBTOTAL					**$362,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$36,200	
	Electrical and Instrumentation Allowance	20	%		$72,400	
	Construction Difficulty	15	%		$54,300	
	Total					$162,900
	SUBTOTAL					**$524,900**
	Estimating Contingency	30	%			$158,000
	SUBTOTAL					**$682,900**
	General Conditions	10	%			$68,290
	SUBTOTAL					**$751,190**
	General Contractor Overhead & Profit	15	%			$78,534
	SUBTOTAL					**$761,434**
	Escalation to June 2018	3	%			$22,843
	SUBTOTAL					**$784,277**
	Sales Tax on 50% of Subtotal Above	7.75	%			$60,000
	CONSTRUCTION COST SUBTOTAL					**$821,434**
	Engineering, Management, and Legal	30	%			$247,000
	PROJECT COST (June 2018 Dollars)					**$1,068,400**

CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Aeration Basin End-of-Life Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Mechanical Equipment**					
	Surface Mixers	6	EA	$32,000	$192,000	
	Total					$192,000
	ITEM NO. 1 SUBTOTAL					**$192,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$19,200	
	Electrical and Instrumentation Allowance	20	%		$38,400	
	Construction Difficulty	5	%		$9,600	
	Total					$67,200
	SUBTOTAL					**$259,200**
	Estimating Contingency	30	%			$78,000
	SUBTOTAL					**$337,200**
	General Conditions	10	%			$33,720
	SUBTOTAL					**$370,920**
	General Contractor Overhead & Profit	15	%			$38,778
	SUBTOTAL					**$375,978**
	Escalation to June 2018	3	%			$11,279
	SUBTOTAL					**$387,257**
	Sales Tax on 50% of Subtotal Above	7.75	%			$30,000
	CONSTRUCTION COST SUBTOTAL					**$405,978**
	Engineering, Management, and Legal	30	%			$122,000
	PROJECT COST (June 2018 Dollars)					**$528,000**

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UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : RAS/WAS Pumping Near-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Pump Station 10**					
	Equipment Crane	1	LS	$35,000	$35,000	
	Paint Room	1	EA	$15,000	$15,000	
	Replace Pipe Supports	1	LS	$10,000	$10,000	
	New Pump No. 4	1	EA	$35,000	$35,000	
	Check Valves	4	EA	$2,500	$10,000	
	Plug Valves	4	EA	$2,000	$8,000	
	Paint Piping	1	LS	$15,000	$15,000	
	Replace Drain Pump	1	EA	$8,000	$8,000	
	Total					$136,000
2	**Pump Station 16**					
	Replace MCC	2	EA	$60,000	$120,000	
	Replace Pump VFDs	7	EA	$40,000	$280,000	
	Replace Corroded Roof Members	1	LS	$40,000	$40,000	
	Demolish Abandoned Equipment	1	LS	$7,500	$7,500	
	Replace Drain Pump	1	EA	$8,000	$8,000	
	Install Fall Protection	1	LS	$5,000	$5,000	
	Total					$460,500
3	**Studies**					
	WAS Pumping Study	1	LA	$50,000	$50,000	
	PS 10 Seismic Study	1	LA	$75,000	$75,000	
	Total					$125,000
	ITEM NO. 1, 2, & 3 SUBTOTAL					**$721,500**
4	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$72,150	
	Electrical and Instrumentation Allowance	20	%		$144,300	
	Construction Difficulty	10	%		$72,150	
	Total					$288,600
	SUBTOTAL					**$1,010,100**
	Estimating Contingency	30	%			$304,000
	SUBTOTAL					**$1,314,100**
	General Conditions	10	%			$131,410
	SUBTOTAL					**$1,445,510**
	General Contractor Overhead & Profit	15	%			$151,122
	SUBTOTAL					**$1,465,222**
	Escalation to June 2018	3	%			$43,957
	SUBTOTAL					**$1,509,178**
	Sales Tax on 50% of Subtotal Above	7.75	%			$114,000
	CONSTRUCTION COST SUBTOTAL					**$1,579,222**
	Engineering, Management, and Legal	30	%			$474,000
	PROJECT COST (June 2018 Dollars)					**$2,053,200**

CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : RAS/WAS Pumping Long-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Pump Station 10**					
	Demolish and Replace MCCs	1	LS	$60,000	$60,000	
	Total					$60,000
2	**LED Lighting**					
	Install LED lighting in Buildings	2	EA	$7,000	$14,000	
	Total					$14,000
	ITEM NO. 1 & 2 SUBTOTAL					**$74,000**
3	**Allowances**					
	Yard Piping & Site Civil Allowance	0	%		$0	
	Electrical and Instrumentation Allowance	20	%		$14,800	
	Construction Difficulty	10	%		$7,400	
	Total					$22,200
	SUBTOTAL					**$96,200**
	Estimating Contingency	30	%			$29,000
	SUBTOTAL					**$125,200**
	General Conditions	10	%			$12,520
	SUBTOTAL					**$137,720**
	General Contractor Overhead & Profit	15	%			$14,398
	SUBTOTAL					**$139,598**
	Escalation to June 2018	3	%			$4,188
	SUBTOTAL					**$143,786**
	Sales Tax on 50% of Subtotal Above	7.75	%			$11,000
	CONSTRUCTION COST SUBTOTAL					**$150,598**
	Engineering, Management, and Legal	30	%			$46,000
	PROJECT COST (June 2018 Dollars)					**$196,600**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : RAS/WAS Pumping End-of-Life Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Asset End of Life Forecast**					
	PS 16 RAS Pumps	3	EA	$48,000	$144,000	
	PS 16 RAS Pump Plug Valves	5	EA	$5,000	$25,000	
	PS 16 RAS Pump Check Valves	3	EA	$16,000	$48,000	
	PS 16 WAS Pumps	4	EA	$25,000	$100,000	
	Total					$317,000
	ITEM NO. 1 SUBTOTAL					**$317,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$31,700	
	Electrical and Instrumentation Allowance	20	%		$63,400	
	Construction Difficulty	15	%		$47,550	
	Total					$142,700
	SUBTOTAL					**$459,700**
	Estimating Contingency	30	%			$138,000
	SUBTOTAL					**$597,700**
	General Conditions	10	%			$59,770
	SUBTOTAL					**$657,470**
	General Contractor Overhead & Profit	15	%			$68,736
	SUBTOTAL					**$666,436**
	Escalation to June 2018	3	%			$19,993
	SUBTOTAL					**$686,429**
	Sales Tax on 50% of Subtotal Above	7.75	%			$52,000
	CONSTRUCTION COST SUBTOTAL					**$718,436**
	Engineering, Management, and Legal	30	%			$216,000
	PROJECT COST (June 2018 Dollars)					**$934,400**

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UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : WAS Thickening Near-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**DAF Tank**					
	Repair Corrosion and Recoat Mechanism	1	LS	$40,000	$40,000	
	Paint Mechanical Equipment	1	LS	$20,000	$20,000	
	Total					$60,000
2	**Building**					
	Demolish Abandoned Equipment	1	LS	$7,500	$7,500	
	New Ventilation Fans	2	EA	$6,000	$12,000	
	Ventilation Ducting	80	LF	$60	$4,800	
	Seismic Brace Hanging Pipes	1	LS	$20,000	$20,000	
	Total					$44,300
3	**Studies**					
	DAF Seismic Connection Study	1	LS	$50,000	$50,000	
	Total					$50,000
	ITEM NO. 1, 2, & 3 SUBTOTAL					**$154,300**
4	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$15,430	
	Electrical and Instrumentation Allowance	20	%		$30,860	
	Construction Difficulty	10	%		$15,430	
	Total					$61,700
	SUBTOTAL					**$216,000**
	Estimating Contingency	30	%			$65,000
	SUBTOTAL					**$281,000**
	General Conditions	10	%			$28,100
	SUBTOTAL					**$309,100**
	General Contractor Overhead & Profit	15	%			$32,315
	SUBTOTAL					**$313,315**
	Escalation to June 2018	3	%			$9,399
	SUBTOTAL					**$322,714**
	Sales Tax on 50% of Subtotal Above	7.75	%			$25,000
	CONSTRUCTION COST SUBTOTAL					**$338,315**
	Engineering, Management, and Legal	30	%			$102,000
	PROJECT COST (June 2018 Dollars)					**$440,300**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : WAS Thickening Long-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**DAF Tank and Polymer Pumps**					
	Tank Covers	2150	SF	$25	$53,800	
	Replace Mechanism Drive Motors	1	EA	$7,000	$7,000	
	Replace Polymer Pump Systems	2	EA	$12,000	$24,000	
	Total					$84,800
2	**Building**					
	Replace Windows and Doors	1	LS	$7,000	$7,000	
	Install LED Lighting	1	LS	$7,500	$7,500	
	Total					$14,500
	ITEM NO. 1 & 2 SUBTOTAL					**$99,300**
3	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$9,930	
	Electrical and Instrumentation Allowance	20	%		$19,860	
	Construction Difficulty	10	%		$9,930	
	Total					$39,700
	SUBTOTAL					**$139,000**
	Estimating Contingency	30	%			$42,000
	SUBTOTAL					**$181,000**
	General Conditions	10	%			$18,100
	SUBTOTAL					**$199,100**
	General Contractor Overhead & Profit	15	%			$20,815
	SUBTOTAL					**$201,815**
	Escalation to June 2018	3	%			$6,054
	SUBTOTAL					**$207,869**
	Sales Tax on 50% of Subtotal Above	7.75	%			$16,000
	CONSTRUCTION COST SUBTOTAL					**$217,815**
	Engineering, Management, and Legal	30	%			$66,000
	PROJECT COST (June 2018 Dollars)					**$283,800**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : WAS Thickening End-of-Life Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Mechanical/Electrical Replacement**					
	Demolish and Replace MCCs	2	LS	$60,000	$120,000	
	New Sludge Pumps	2	EA	$35,000	$70,000	
	New Recycle Pumps	2	EA	$55,000	$110,000	
	New Pressure Tank	1	EA	$10,000	$10,000	
	New Rotating Mechanisms	2	EA	$120,000	$240,000	
	Total					$550,000
	ITEM NO. 1 SUBTOTAL					**$550,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$55,000	
	Electrical and Instrumentation Allowance	20	%		$110,000	
	Construction Difficulty	15	%		$82,500	
	Total					$247,500
	SUBTOTAL					**$797,500**
	Estimating Contingency	30	%			$240,000
	SUBTOTAL					**$1,037,500**
	General Conditions	10	%			$103,750
	SUBTOTAL					**$1,141,250**
	General Contractor Overhead & Profit	15	%			$119,313
	SUBTOTAL					**$1,156,813**
	Escalation to June 2018	3	%			$34,704
	SUBTOTAL					**$1,191,517**
	Sales Tax on 50% of Subtotal Above	7.75	%			$90,000
	CONSTRUCTION COST SUBTOTAL					**$1,246,813**
	Engineering, Management, and Legal	30	%			$375,000
	PROJECT COST (June 2018 Dollars)					**$1,621,800**

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UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Filters Near-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**2014 Study Improvement Recommendations**					
	Actuator for Air Scour Blower Cross-Over Interconnection	1	EA	$35,000	$35,000	
	Actuator for BW Supply Piping Valve	1	EA	$35,000	$35,000	
	Configure Drains for Air Blow-Off Valves in Galleries	600	LS	$60	$36,000	
	Rehab Subsurface Wash System Filters 11-16, Price per Hub	32	EA	$1,000	$32,000	
	Concrete Pad at East Pipe Penetrations	1	LS	$8,000	$8,000	
	Replace Backwash Valves	1	LS	$30,000	$30,000	
	Repair PVC Liner at West Filter Rapid Mix Tank	500	SF	$100	$50,000	
	Replace East Filter Flow Meters	1	LS	$260,000	$260,000	
	Replace Waste Backwash Valves in Filters 9 and 10	1	LS	$78,000	$78,000	
	Rehab Filter Media and Underdrain Piping	16	EA	$405,000	$6,480,000	
	Total					$7,044,000
2	**Backwash System Modifications**					
	Tap Into Existing Piping	1	LS	$2,500	$2,500	
	6"-8" DI Piping, Supports, & Pipe Fittings	200	LF	$138	$27,600	
	Isolation Valves	6	EA	$2,000	$12,000	
	Total					$42,100
3	**Studies**					
	Backwash tank seismic study and internal condition assessment	1	LS	$100,000	$100,000	
	Investigate the cause of the stair crack.	1	LS	$5,000	$5,000	
	Total					$105,000
	ITEM NO. 1, 2, & 3 SUBTOTAL					**$7,191,100**
4	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$719,110	
	Electrical and Instrumentation Allowance	20	%		$1,438,220	
	Construction Difficulty	10	%		$719,110	
	Total					$2,876,400
	SUBTOTAL					**$10,067,500**
	Estimating Contingency	30	%			$3,021,000
	SUBTOTAL					**$13,088,500**
	General Conditions	10	%			$1,308,850
	SUBTOTAL					**$14,397,350**
	General Contractor Overhead & Profit	15	%			$1,505,178
	SUBTOTAL					**$14,593,678**
	Escalation to June 2018	3	%			$437,810
	SUBTOTAL					**$15,031,488**
	Sales Tax on 50% of Subtotal Above	7.75	%			$1,132,000
	CONSTRUCTION COST SUBTOTAL					**$15,725,678**
	Engineering, Management, and Legal	30	%			$4,718,000
	PROJECT COST (June 2018 Dollars)					**$20,443,700**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Filters Long-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Facility Improvements**					
	Install LED Lights	10	EA	$1,300	$13,000	
	Demolish Abandoned Tertiary Control Room	1	LS	$500,000	$500,000	
	Demolish Filters 1-10 Breeze Way	1	LS	$250,000	$250,000	
	Resurface Pipe Gallery Floor	3330	SF	$18	$60,000	
	Install Operators on Valves	30	EA	$3,500	$105,000	
	Total					$928,000
	ITEM NO. 1 SUBTOTAL					**$928,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$92,800	
	Electrical and Instrumentation Allowance	20	%		$185,600	
	Construction Difficulty	5	%		$46,400	
	Total					$324,800
	SUBTOTAL					**$1,252,800**
	Estimating Contingency	30	%			$376,000
	SUBTOTAL					**$1,628,800**
	General Conditions	10	%			$162,880
	SUBTOTAL					**$1,791,680**
	General Contractor Overhead & Profit	15	%			$187,312
	SUBTOTAL					**$1,816,112**
	Escalation to June 2018	3	%			$54,483
	SUBTOTAL					**$1,870,595**
	Sales Tax on 50% of Subtotal Above	7.75	%			$141,000
	CONSTRUCTION COST SUBTOTAL					**$1,957,112**
	Engineering, Management, and Legal	30	%			$588,000
	PROJECT COST (June 2018 Dollars)					**$2,545,100**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : Filters End-of-Life Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Mechanical Equipment**					
	New Pumps	1	LS	$450,000	$450,000	
	MCCs and VFDs	1	LS	$300,000	$300,000	
	New Ventilation Fans	7	EA	$6,000	$42,000	
	Replace Gates and Valves	242	EA	$7,000	$1,694,000	
	Total					$2,486,000
	ITEM NO. 1 SUBTOTAL					**$2,486,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$248,600	
	Electrical and Instrumentation Allowance	20	%		$497,200	
	Construction Difficulty	15	%		$372,900	
	Total					$1,118,700
	SUBTOTAL					**$3,604,700**
	Estimating Contingency	30	%			$1,082,000
	SUBTOTAL					**$4,686,700**
	General Conditions	10	%			$468,670
	SUBTOTAL					**$5,155,370**
	General Contractor Overhead & Profit	15	%			$538,971
	SUBTOTAL					**$5,225,671**
	Escalation to June 2018	3	%			$156,770
	SUBTOTAL					**$5,382,441**
	Sales Tax on 50% of Subtotal Above	7.75	%			$405,000
	CONSTRUCTION COST SUBTOTAL					**$5,630,671**
	Engineering, Management, and Legal	30	%			$1,690,000
	PROJECT COST (June 2018 Dollars)					**$7,320,700**

CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : CCB Near-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**CCB 1**					
	Repair Ponding Areas on Cover	1	LS	$10,000	$10,000	
	Repair Corroded Equipment	1	LS	$25,000	$25,000	
	Total					$35,000
2	**CCB 3**					
	Replace Expansion Joint Sealant on Cover	1	LS	$15,000	$15,000	
	Repair Corroded Electrical Outlets	1	LS	$5,000	$5,000	
	Repair Corroded Equipment	1	LS	$25,000	$25,000	
	Total					$45,000
	ITEM NO. 1 & 2 SUBTOTAL					**$80,000**
3	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$8,000	
	Electrical and Instrumentation Allowance	20	%		$16,000	
	Construction Difficulty	5	%		$4,000	
	Total					$28,000
	SUBTOTAL					**$108,000**
	Estimating Contingency	30	%			$33,000
	SUBTOTAL					**$141,000**
	General Conditions	10	%			$14,100
	SUBTOTAL					**$155,100**
	General Contractor Overhead & Profit	15	%			$16,215
	SUBTOTAL					**$157,215**
	Escalation to June 2018	3	%			$4,716
	SUBTOTAL					**$161,931**
	Sales Tax on 50% of Subtotal Above	7.75	%			$13,000
	CONSTRUCTION COST SUBTOTAL					**$170,215**
	Engineering, Management, and Legal	30	%			$52,000
	PROJECT COST (June 2018 Dollars)					**$222,200**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : CCB Long-Term Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**Facility Improvements**					
	Replace CCB 1 and Old Portion of CCB 2 Covers	17800	SF	$25	$445,000	
	Replace Mechanical Equipment and Gates	1	LS	$200,000	$200,000	
	Replace Ventilation Fans	3	EA	$6,000	$18,000	
	Install LED Lighting	2	EA	$7,500	$15,000	
	Total					$445,000
	ITEM NO. 1 SUBTOTAL					**$445,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$44,500	
	Electrical and Instrumentation Allowance	20	%		$89,000	
	Construction Difficulty	10	%		$44,500	
	Total					$178,000
	SUBTOTAL					**$623,000**
	Estimating Contingency	30	%			$187,000
	SUBTOTAL					**$810,000**
	General Conditions	10	%			$81,000
	SUBTOTAL					**$891,000**
	General Contractor Overhead & Profit	15	%			$93,150
	SUBTOTAL					**$903,150**
	Escalation to June 2018	3	%			$27,095
	SUBTOTAL					**$930,245**
	Sales Tax on 50% of Subtotal Above	7.75	%			$70,000
	CONSTRUCTION COST SUBTOTAL					**$973,150**
	Engineering, Management, and Legal	30	%			$292,000
	PROJECT COST (June 2018 Dollars)					**$1,265,200**

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CITY OF RIVERSIDE PUBLIC WORKS

UPDATED INTEGRATED MASTER PLAN FOR WASTEWATER COLLECTION AND TREATMENT FACILITIES PROJECT

TASK : 7 - CIP and Financial Plan and User Rates and Fees
JOB # : 10495A.00
LOCATION : Riverside, CA
TITLE : CCB End-of-Life Rehabilitation

ESTIMATE PREPARATION DATE : 6/1/2017
PREPARED BY : WJ
REVIEWED BY : DB

ITEM NO.	DESCRIPTION	QTY	UNIT	UNIT COST	SUBTOTAL	TOTAL
1	**End of Life Assessment**					
	New Flash Mixers	9	EA	$20,000	$180,000	
	New Sample Pumps	5	EA	$10,000	$50,000	
	New MCCs	2	EA	$60,000	$120,000	
	Total					$350,000
	ITEM NO. 1 SUBTOTAL					**$350,000**
2	**Allowances**					
	Yard Piping & Site Civil Allowance	10	%		$35,000	
	Electrical and Instrumentation Allowance	20	%		$70,000	
	Construction Difficulty	10	%		$35,000	
	Total					$140,000
	SUBTOTAL					**$490,000**
	Estimating Contingency	30	%			$147,000
	SUBTOTAL					**$637,000**
	General Conditions	10	%			$63,700
	SUBTOTAL					**$700,700**
	General Contractor Overhead & Profit	15	%			$73,255
	SUBTOTAL					**$710,255**
	Escalation to June 2018	3	%			$21,308
	SUBTOTAL					**$731,563**
	Sales Tax on 50% of Subtotal Above	7.75	%			$56,000
	CONSTRUCTION COST SUBTOTAL					**$766,255**
	Engineering, Management, and Legal	30	%			$230,000
	PROJECT COST (June 2018 Dollars)					**$996,300**