



South Orange County Wastewater Authority

TEN YEAR CAPITAL IMPROVEMENT PROGRAM 2019 - 2028



AUGUST 2019

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DEFINITION

The ongoing purpose of the Ten Year Capital Improvement Plan is to identify projects needed for the rehabilitation or replacement of the facilities owned or operated by the South Orange County Wastewater Authority (SOCWA). The identification of the improvement projects is to describe the need, the approximate scope and the required budget. The goal of the Ten Year Capital Improvement Plan is to allow SOCWA and its member agencies to more effectively plan and budget for capital projects.

The 2019 version of the Ten Year Capital Improvement Plan is the successor to the last Board approved plan in 2010.

Chapter 3 of this document provides more background regarding the development and use of the Plan.

EXTENDED PROJECTION

One unique feature of this Ten Year Plan is that it actually covers a fifteen year span. The planning life of the SOCWA Capital Improvement Plan has been an ongoing topic of discussion among SOCWA staff and members of the SOCWA Engineering Committee. A shorter planning period (< 5 years) provides a greater probability of an accurate cost projection. Beyond the five year planning period there is a greater uncertainty regarding the need, scope and cost of capital improvement projects. There is also a greater chance that unforeseen improvements will need to be addressed. However, several SOCWA member agencies believe the long planning projection is advantageous in

financial planning. The goal of doing a fifteen year plan is to improve the estimating accuracy within the nominal Ten Year period. The longer span allows spreading out projects that might otherwise be forced into Years 8, 9 and 10 of the Plan. This tended to create a spike in capital investment in the late years of the Ten Year Plan.

REPORT ORGANIZATION

This report describes the Ten Year Program through the following chapters:

- Background: Description of the institutional background of SOCWA, basic inventory of facilities and member agency ownership [Chapter 2].
- Ten Year Plan Development: Description of the development and utilization of the Ten Year Plan [Chapter 3].
- Assets: Description of basis for asset life projection at SOCWA facilities [Chapter 4].
- Cost Estimating: Description of cost estimate basis including anticipated accuracy, use of contingencies, and cost indexing [Chapter 5].
- Administrative Cost: Discussion regarding the development and allocation of administrative and legal costs associated with capital projects [Chapter 6].
- Small Capital Improvements: Basis for costs for small capital improvements

program managed by the SOCWA Operations Department [Chapter 7].

- Ten Year Program Summary and Capital Improvement Cost Allocation: Summary tables including the allocations of costs to member agencies [Chapter 8].
- Cost Loading: Projection of annual costs based on expected expenditures [Chapter 9].

More detailed information regarding the Ten Year Plan can be found in the following appendices:

- Cost Escalation Analysis: Analysis of cost escalation factors in order to forecast future capital improvements cost [Appendix A].
- J.B. Latham Treatment Plant: Summary of proposed improvements for the Latham facility [Appendix B].
- J.B. Latham Treatment Plant Project Descriptions: Summary of scope, need, key issues and timing for each capital improvement project for the Latham facility [Appendix C].
- J.B. Latham Treatment Plant Project Cost Tables: Basis for construction and supporting phase costs for each capital improvement project for the Latham facility [Appendix D].
- San Juan Creek Ocean Outfall: Description of proposed improvements for this outfall [Appendix E].
- Coastal Treatment Plant: Summary of proposed improvements for the

Coastal facility [Appendix F].

- Coastal Treatment Plant Project Descriptions: Summary of scope, need, key issues and timing for each capital improvement project for the Coastal facility [Appendix G].
- Coastal Treatment Plant Project Cost Tables: Basis for construction and supporting phase costs for each capital improvement project for the Coastal facility [Appendix H].
- Regional Treatment Plant: Summary of proposed improvements for the Regional facility [Appendix I].
- Regional Treatment Plant Project Descriptions: Summary of scope, need, key issues and timing for each capital improvement project for the Regional facility [Appendix J].
- Regional Treatment Plant Project Cost Tables: Basis for construction and supporting phase costs for each capital improvement project for the Regional facility [Appendix K].
- Effluent Transmission Main: Description of proposed improvements for the pipeline [Appendix L].
- Aliso Creek Ocean Outfall: Description of proposed improvements for this outfall [Appendix M].

SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

The South Orange County Wastewater Authority (SOCWA) is a joint powers authority responsible for the treatment of wastewater and the disposal of treated effluent. The service area is approximately 220 square miles in southern Orange County. SOCWA was formed in July, 2001, by the consolidation of three separate joint powers authorities: the Aliso Water Management Agency (AWMA), the South East Regional Reclamation Authority (SERRA) and the South Orange County Reclamation Authority (SOCRA). AWMA and SERRA were created in the early 1970's in an effort to regionalize wastewater treatment in South Orange County and take maximum advantage of the recently enacted Federal and State Clean Water Acts. The agencies that were originally members of AWMA and SERRA and continue to be part of SOCWA include the following:

- El Toro Water District
- Emerald Bay Service District
- Irvine Ranch Water District
- City of Laguna Beach
- Moulton Niguel Water District
- City of San Clemente
- City of San Juan Capistrano
- Santa Margarita Water District
- South Coast Water District

AWMA and SERRA were constructed around the Aliso Creek and San Juan Creek Watershed Basins respectively. This report will periodically address facilities or projects with respect to the appropriate watershed.

The third joint power authority that was merged into SOCWA was the South Orange County Reclamation Authority (SOCRA). SOCRA was formed in the early 1990's to manage water reuse permits within South Orange County. SOCRA did not directly manage any physical facilities. The Trabuco Canyon Water District, in addition to several of the agencies listed above, was also a member of SOCRA.

FACILITIES

SOCWA owns and/or operates wastewater treatment and disposal facilities in South Orange County. Some facilities that were constructed by AWMA/SERRA in the 1970's and 1980's are operated by the member agencies. The facilities are as follows:

- J. B. Latham Wastewater Treatment Plant [Project Committee 2].
- San Juan Creek Land and Ocean Outfall [Project Committee 5].
- San Clemente Land Outfall (operated by the City of San Clemente) [Project Committee 10].
- Coastal Treatment Plant [Project Committee 15].
- Coastal Treatment Plant Export Sludge Force Main [Project Committee 15].
- Coastal Treatment Plant Access Road [Project Committee 15].
- Regional Treatment Plant [Project Committee 17].

- Aliso Creek Effluent Transmission Main (Reaches B, C, D and E) [Project Committee 21].
- Regional Treatment Plant Effluent Line [Project Committee 2B*].
- Laguna Beach Pump Station (operated by the City of Laguna Beach) [Project Committee 23].
- Bluebird Pump Station (operated by the City of Laguna Beach) [Project Committee 23].
- North Coast Interceptor (operated by the City of Laguna Beach) [Project Committee 23].
- Aliso Creek Land and Ocean Outfall [Project Committee 24].

* Note that this is not the same as Project Committee 2 for the J. B Latham Treatment Plant.

The following facilities are not considered in this analysis:

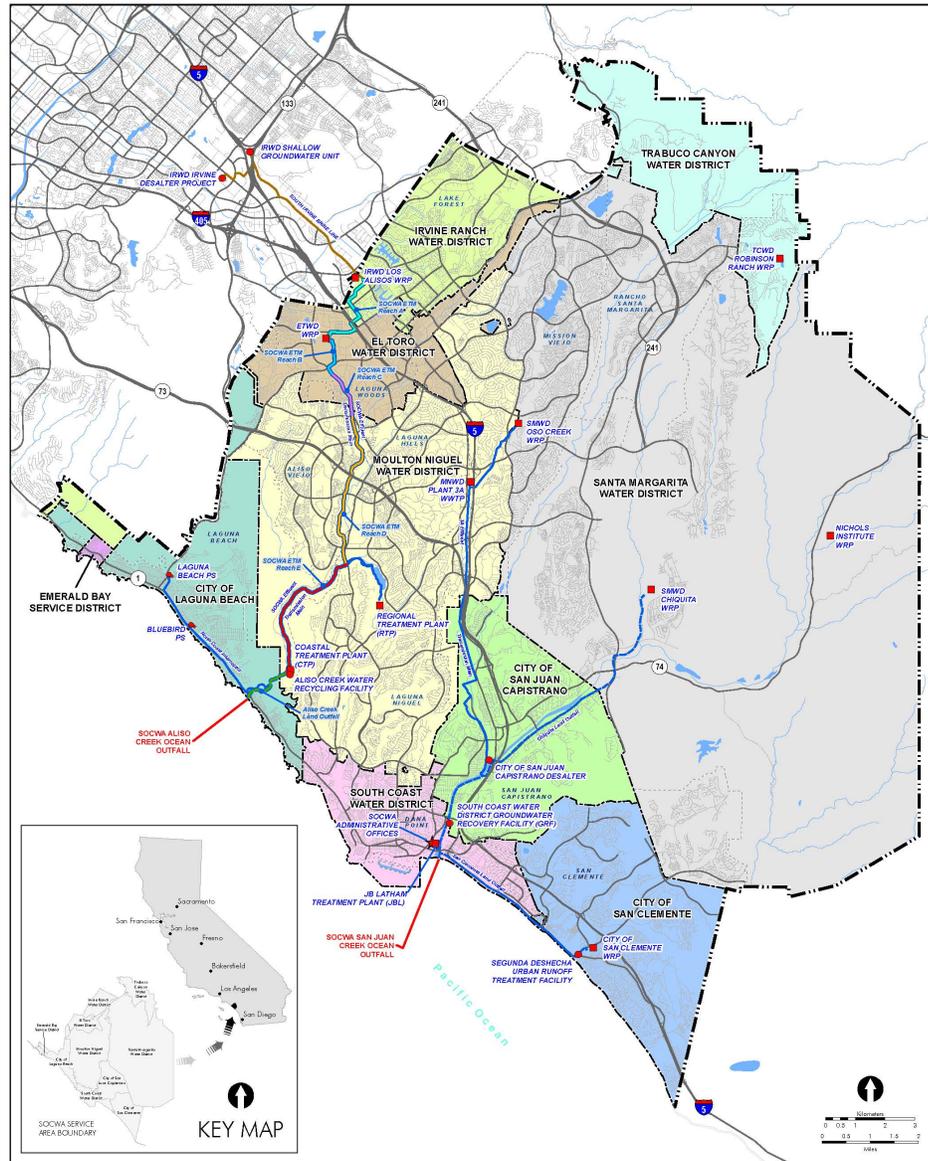
- The San Clemente Land Outfall is owned and operated by the City of San Clemente. That municipality develops and administers any capital projects related that facility
- The North Coast Interceptor, the Laguna Beach Pump Station and the Bluebird Pump Station are operated by the City of Laguna Beach. The City is also responsible for the Capital Programs for those facilities.

The physical facilities for Project Committees 2, 5 and 10 are located within the San Juan Creek Watershed Basin. The physical facilities for the Project Committees 15, 17, 21 (and 2B), 23 and 24 are located within the Aliso Creek Watershed Basin.

The locations of the SOCWA facilities along with boundaries of its member agencies are shown in Figure 2.1.

Figure 2.1
SOCWA Facilities Map

SOCWA SERVICE AREA MAP



- | | | | |
|--|--|---|---|
| <p>Member Agencies</p> <ul style="list-style-type: none"> ■ City of Laguna Beach ■ City of San Clemente ■ City of San Juan Capistrano ■ El Toro Water District ■ Emerald Bay Service District ■ Irvine Ranch Water District ■ Moulton Niguel Water District ■ Santa Margarita Water District ■ South Coast Water District ■ Trabuco Canyon Water District | <p>Facilities</p> <ul style="list-style-type: none"> ★ SOCWA Administrative Offices ● Desalter/Treatment Facility ● Pump Station ■ Treatment Facility — Transmission Line — South Irvine Brine Line — Land Outfall — Ocean Outfall | <p>SOCWA Effluent Transmission Line</p> <ul style="list-style-type: none"> — ETL - Reach A — ETL - Reach B — ETL - Reach C — ETL - Reach D — ETL - Reach E — Aliso Creek Land Outfall | <ul style="list-style-type: none"> SOCWA Boundary Line City Boundary Member Agency Boundary Waterbody Creek/Stream |
|--|--|---|---|



FACILITY OWNERSHIP

The ownership of capacity by the member agencies in each facility serves as the basis for the allocation of capital improvement programs costs. Tables 2.1 and 2.2 show the capacity ownership in the Aliso Creek and San

Juan Creek Basin Watersheds respectively. The capacity in the AWT at the Joint Regional Treatment Plant is completely owned by the Moulton Niguel Water District; the capacity in the AWT at the Coastal Treatment Plant is completely owned by the South Coast Water District.

Table 2.1
Aliso Creek Basin Project Committee Ownership Percentages

Ownership percentages by Project Committees								
District	PC 17 Liquid (%)	PC 17 Solid (%)	PC 17 Common (%)	PC 15 (%)	ETM Reach B/C PC 21 (%)	ETM Reach D PC 21 (%)	ETM Reach E PC 21 (%)	Outfall PC 24 (%)
ETWD	0.00	20.41	10.26	0.00	50.00	50.00	23.29	16.30
EBSD	0.00	0.59	0.33	2.99	0.00	0.00	0.00	0.78
IRWD	0.00	0.00	0.00	0.00	50.00	50.00	23.29	15.76
CLB	0.00	11.22	6.27	37.91	0.00	0.00	0.00	11.00
MNWD	100.00	58.82	78.13	29.25	0.00	0.00	53.42	43.85
SCWD	0.00	8.96	5.01	29.85	0.00	0.00	0.00	12.31
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 2.2
San Juan Creek Basin Project Committee Ownership Percentages

District	PC 2 Liquids (%)	PC 2 Solids (%)	PC 2 Common (%)	PC 5 (%)	PC 5 JBLTP Effluent PS (%)	PC 10 (%)
MNWD	23.08	21.62	22.35	15.51	20.27	0.00
CSC	0.00	0.00	0.00	16.62	0.00	100.00
CSJC	30.77	30.00	30.38	11.08	30.41	0.00
SMWD	17.31	28.38	22.85	44.32	20.27	0.00
SCWD	28.84	20.00	24.42	12.47	29.05	0.00
	100.00	100.00	100.00	100.00	100.00	100.00

USE OF THE TEN YEAR PLAN

The final Ten Year Capital Improvement Plan has been developed as a planning tool (as opposed to a strict budget). The adopted Ten Year Plan is then used as a guide to be used by SOCWA staff and the Engineering Committee in developing the annual capital improvement budgets. Changes in project priority, scope and cost estimation may occur between the Ten Year Plan and the development of the each annual budget. The proposed capital improvement budget must be developed by SOCWA staff, reviewed by the Engineering Committee and approved by the Board of Directors each fiscal year.

MODIFIED APPROACH

The 2019 version of the Ten Year Capital Improvement Plan (CIP) is the successor to the 2010 Plan which is the last Plan that was formally adopted by the SOCWA Board of Directors. Some of the projects proposed in the 2018 version are similar to projects identified in the 2010 version. However, the approach to defining and estimating the project is both more uniform and detailed in the current plan. This is reflected in the cost estimation tables presented in Appendices D, H, and K. Cost estimates for each proposed project are based on previous engineering studies, supplier quotes, past bid reviews, and additional input from SOCWA staff and consulting engineers. Appendices D, H, and K identify the sources for much of the cost estimate background. The approach to the 2019 CIP also places more emphasis on the useful life as described in Chapter 4 of this report. In addition, the list of assets has been expanded from the list

utilized for the 2010 plan. The more rigorous approach is appropriate as the facility is now nine years older; many of the assets are moving closer to the end of useful lives.

BASIS FOR PROJECTS

The primary basis for the Ten Year Capital Improvement Plan is the retrofit and replacement of equipment as they near the end of their useful lives. The process of defining the useful life is described in Chapter 5 of this report. Relatively few projects have been identified for regulatory compliance (gas flare replacement at Latham and Regional Plants; port duckbill check valves on San Juan Creek Ocean Outfall). Many of the projects addressed in this report address reliability issues; however, those reliability issues are generally related to equipment age.

Each Project Committee has a project that may be identified as speculative. For instance, the relocation of the Land Section of the Aliso Creek Ocean Outfall depends on additional information regarding risk evaluation and potential future actions by the private property owner in whose land the outfall is located. In general, these projects are set in Years 6 through 10 of the Ten Year Plan.

There are a series of large rehabilitation projects that are identified from Years 3 through 15 of the Ten Year Plan. These projects are typically preceded by at least two years by a condition assessment or another study to refine the need, scope, and cost for the rehabilitation work.

FACILITY USEFUL LIFE

A significant amount of capital improvement work has been done at the SOCWA treatment plants over the past 20 years to upgrade and replace aging assets. The Ten Year Plan considers the replacement of existing assets so that the treatment plant can continue to operate within regulatory and industry standards. The approach generally replaces an asset with a like component having the same useful life as the existing component. The intent of the asset replacement is to bring a component or system back to an industry standard. This approach is not based on trying to extend the life of the treatment plant to any specific value.

PROJECT COMMITTEE AGREEMENTS

The issue of the expiration of the Project Committee agreements was raised during the development of the review of the Ten Year Plan for the Coastal Treatment Plant. The development of the treatment plant capital improvement programs did not specifically address the Project Committee agreements as it was anticipated that these agreements would be the subject of future negotiations which would potentially result in studies that would address alternative approaches to capital improvements. The treatment plant Project Committee agreements expire during the following years:

- PC 2: 2023
- PC 15: 2030
- PC 17: 2029

There are two projects in the PC 2 Ten Year Plan that address the impact of changes to the project committee agreement due to the short-term expiration of that agreement in combination with wastewater master plan updates by PC 2 member agencies. Member agencies of PC 15 and PC 17 may elect to include projects in future versions of the SOCWA Ten Year Plan that address the impact of the expiring Project Committees agreements.

UPDATING THE TEN YEAR PLAN

The preparation of the Ten Year Plan included a very detailed Excel model describing the scope, timing, need and cost estimating for the projected capital project. Each year includes a series of studies and condition assessments that will provide information to help refine the Ten Year Plan. It is the intent of SOCWA staff that this information will be used to update the Ten Year Plan each year in conjunction with the preparation of the annual budget.

SOCWA ASSETS

The original listing of SOCWA assets was prepared by TetraTech in 2005 as part of an Asset Management Study. This listing provided a comprehensive list of mechanical items and systems. SOCWA has expanded the list with structural, structural appurtenances, electrical and instrumentation components, site facilities and buried piping. The list was also amended to include structures and equipment associated with new projects. The SOCWA asset listing is maintained in an Excel spreadsheet.

BASIS FOR EXPECTED LIFE

The current version of the Ten Year Plan is largely based on targeting assets for replacement that have exceeded their useful lives or are expected to exceed their useful lives during the 15 year span of the capital improvement program. The 'expected life' can be defined as that point in time when (1) the asset can no longer reliably serve its function, (2) the asset deteriorates to the point that it poses a safety risk, (3) the asset deteriorates to the point that continued maintenance is more expensive than replacement, or (4) the asset is no longer supported by vendors (e.g. can no longer obtain replacement parts). There is no single source defining the expected lives for all of the components in a wastewater treatment plant. The 2005 Asset Management Study prepared by Tetra Tech identified expected lives for many components. During the preparation of this report Carollo Engineers transmitted a list of expected lives typically used in their analyses. These values were comparable to the

numbers 2005 numbers utilized by TetraTech. The Carollo expected life values are presented in Table 4.1 in the column titled 'Life as Recommended by Consultant'. SOCWA staff expanded this listing and modified some of the values. Some of these values were provided at the recommendation of suppliers and installers. However, this list largely reflects the experience of SOCWA staff based on the local conditions found at SOCWA facilities. These values are presented in Table 4.1 in the column 'Life Utilized, Modified or Added by SOCWA Staff'. The values presented in this column are used in this analysis.

CONDITION ASSESSMENTS

Condition assessments are conducted either informally by the SOCWA Operations staff (through their observations of visual condition, performance, and maintenance history) or by external consultants. SOCWA began a program of contracting condition assessments in 2016. The Ten Year Plan includes over two dozen condition assessments over the planning span. The assessments will be used to update the scope and the timing of prospective projects.

UNLISTED ASSETS

Appendices B, F, and I provide lists of Assets included in this plan development for the J. B. Latham, Coastal and Regional Treatment Plants respectively. These tables do not include the list of all assets in the treatment plants. There are many HVAC components (such as fans, air conditioning, and ducting), plumbing items

Table 4.1
Listing of Expected Asset Lives

Discipline	Asset Type	Life as Recommended by Consultant	Life Utilized, Modified or Added By SOCWA Staff
Structural	Above-ground Concrete	50	50
Structural	Buried Concrete	50	50
<i>Structural</i>	<i>Lining in Concrete Channel</i>		30
Structural	Slab on grade	50	50
Structural	Clarifier	50	50
Structural	Digester.	50	50
Structural	Contact Basin	50	50
Structural	Aeration Basin	50	50
Structural	Tank, Chemical	25	25
Structural	Aluminum Covers		25
<i>Structural</i>	<i>Fiberglass Weirs, Baffles and Launderers</i>		30
<i>Structural</i>	<i>Stainless Steel Appurtenances</i>		40
<i>Structural</i>	<i>Coated Steel or Galvanized Structural Appurtenances</i>		30
<i>Structural</i>	<i>Wood Doors, Door Frames and Window Frames</i>		30
<i>Structural</i>	<i>Metallic Doors, Door Frames and Window Frames</i>		35
<i>Structural</i>	<i>Skylights</i>		35
<i>Structural</i>	<i>Roof - Built Up and Tiled</i>		25
<i>Structural</i>	<i>Roof - Built Up and Shingled</i>		25
<i>Structural</i>	<i>Roof - Membrane</i>		30
<i>Structural</i>	<i>Roll Up Doors</i>		35
<i>Structural</i>	<i>Prefabricated Metal Structures</i>		40
<i>Structural</i>	<i>Simple Wood Structures</i>		35
<i>Structural</i>	<i>Aluminum Handrail</i>		40
<i>Structural</i>	<i>Laboratory Benchwork</i>		30
<i>Structural</i>	<i>Maintenance Shop Bench Work</i>		30
Structural	Building	50	50
Mechanical	Pump	25	25
Mechanical	Pump, Grit	20	20
Mechanical	Pump, Sludge	20	20
Mechanical	Pump, End Suction	25	25
Mechanical	Pump, Mixing	25	25
Mechanical	Pump, Scum	25	25
Mechanical	Pump, Recirc	25	25
Mechanical	Pump, Vertical Turbine	30	30
Mechanical	Pump, Chemical	20	15

Table 4.1
Listing of Expected Asset Lives

Discipline	Asset Type	Life as Recommended by Consultant	Life Utilized, Modified or Added By SOCWA Staff
Mechanical	Pump, Submersible	25	25
Mechanical	Pump, Water	25	25
Mechanical	Pump, Sump	20	20
Mechanical	Motor	25	25
Mechanical	Gate	30	30
Mechanical	Valve	35	35
<i>Mechanical</i>	<i>Valves, Sludge and Grit</i>		20
<i>Mechanical</i>	<i>Valves, Compressed Air</i>		25
<i>Mechanical</i>	<i>Valve Actuators</i>		20
<i>Mechanical</i>	<i>Strainer</i>		30
Mechanical	Bar Screen	20	20
<i>Mechanical</i>	<i>Rotary Screen</i>		30
<i>Mechanical</i>	<i>Rotary Screen (Drum)</i>		15
Mechanical	Blower (Multistage or PD)	30	30
<i>Mechanical</i>	<i>Blower (Single Stage)</i>		30
<i>Mechanical</i>	<i>Blower (Single Stage) Rebuild</i>		15
Mechanical	Centrifuge	30	30
<i>Mechanical</i>	<i>Centrifuge Rebuild</i>		10
Mechanical	Cogeneration	25	25
<i>Mechanical</i>	<i>Engine Rebuild</i>		10
Mechanical	Compressor	20	20
Mechanical	Conveyor	20	20
Mechanical	Crane	40	40
Mechanical	Collector (Circular)	30	30
<i>Mechanical</i>	<i>Collector Recoating</i>		15
<i>Mechanical</i>	<i>Chain and Flight (Shafts; Sprockets)</i>		30
<i>Mechanical</i>	<i>Chain and Flight</i>		20
Mechanical	Drive	30	30
<i>Mechanical</i>	<i>Scum Collector/Beach (Stl)</i>		20
<i>Mechanical</i>	<i>Scum Collector/Beach (Stn Stl)</i>		30
Mechanical	Trough (Metallic)	20	20
Mechanical	Air Diffusers	20	20
Mechanical	Grinder	20	20
Mechanical	Grit Classifier	20	20
Mechanical	Grit Washer	20	20
<i>Mechanical</i>	<i>Sand and Anthracite Filter Media</i>		10
<i>Mechanical</i>	<i>Filter Underdrains/Troughs</i>		30
<i>Mechanical</i>	<i>Odor Control Scrubber (FRP Body)</i>		30
<i>Mechanical</i>	<i>Odor Control Scrubber (Pumps, Fans)</i>		15
<i>Mechanical</i>	<i>Odor Control Ducting and Gates</i>		25

Table 4.1
Listing of Expected Asset Lives

Discipline	Asset Type	Life as Recommended by Consultant	Life Utilized, Modified or Added By SOCWA Staff
<i>Mechanical</i>	<i>FRP Chemical Storage Tanks</i>		30
Mechanical	Mixer	20	20
<i>Mechanical</i>	<i>Mixer - Low Intensity</i>		30
Mechanical	Hydraulic Unit	30	30
Mechanical	Tank, Hydroneumatic Tank	30	30
Mechanical	Boiler/Heat Exchanger	25	25
Mechanical	Generator	40	40
<i>Mechanical</i>	<i>Diesel Storage Tank (Fiberglass)</i>		30
Mechanical	Fan	20	20
Mechanical	AC Unit	20	20
Mechanical	Heater	20	20
<i>Mechanical</i>	<i>Maintenance Shop Equipment</i>		25
<i>Mechanical</i>	<i>PVC Piping</i>		25
<i>Mechanical</i>	<i>Exposed Plumbing</i>		25
<i>Mechanical</i>	<i>Stainless Piping & Supports</i>		40
<i>Mechanical</i>	<i>Metal Piping & Supports</i>		30
Instrumentation	Analyzer	20	20
<i>Instrumentation</i>	<i>Laboratory Equipment</i>		25
Instrumentation	Controller	20	20
Instrumentation	Sampler	20	20
Instrumentation	Sensor	20	20
Instrumentation	Flow Meter	20	20
Electrical	Control Panel	30	30
Electrical	MCC	30	30
<i>Electrical</i>	<i>VFD</i>	20	15
<i>Electrical</i>	<i>PLC</i>	20	15
Electrical	Switch	20	20
Electrical	Switchgear	30	30
Electrical	Transformer	30	30
Electrical	Solar	20	20
<i>Electrical</i>	<i>Indoor Lighting, Receptacle</i>		35
<i>Electrical</i>	<i>Exterior Conduit, Junction Boxes</i>		30
<i>Electrical</i>	<i>Exterior Lighting</i>		30
Buried Piping	AC	60	
Buried Piping	CI	60-75	
Buried Piping	DIP	30-50	
Buried Piping	SS	50	

Table 4.1
 Listing of Expected Asset Lives

Discipline	Asset Type	Life as Recommended by Consultant	Life Utilized, Modified or Added By SOCWA Staff
Buried Piping	RCP	75	
Buried Piping	CONC	50-75	
Buried Piping	Manholes	75	
Buried Piping	HDPE	100	
Buried Piping	PVC	100	
Buried Piping	VCP	75-85	
Buried Piping	VCP-Rehab	100	
<i>Site</i>	<i>Fencing</i>		40
<i>Site</i>	<i>Storm Drains</i>		40
<i>Site</i>	<i>Concrete Storm Channels</i>		50
Site	Pavement	40	

(such as drains, drain piping, and hose fixtures), instruments (such as pressure gauges and fire alarms), and process components (including small valves and sample pumps) that are not included. Some of these items are included in the agency's Tabware maintenance programs; many of these assets are too limited in value to capitalize. These improvements are expected to be addressed by the Operations Department as part of Small Capital Improvements (or under the repair program if the items do not meet the threshold for capitalization).

The asset listings include a number of items that are earmarked for the Small Capital Improvement Program. These items include the following:

- Vehicles
- Office Furniture and Equipment
- Phone and Public Announcement System

DEVELOPING PROJECT COST ESTIMATES

The cost estimates included in the Ten Year Plan evaluation come from a wide variety of sources including prior bids, engineering studies, vendor quotes and staff estimates. Given this assortment of source the accuracy of the cost estimate can also be expected to vary. There are many characteristics that can be used to categorize cost estimates; the most significant are degree of project design definition (% complete), how the estimate will be used, estimate methodology, and the time and budget available to complete the estimate. In 1998, the Association for the Advancement of Cost Engineering (AACEI), published a "Recommended Practice 18R-97 Cost Estimate Classification System for the Process Industries." The proposed guideline for cost estimating accuracy is shown in Table 5.1.

The effort that has been placed into developing most of the projects in this estimate is termed a magnitude level analysis. The estimates that arise out of this analysis are magnitude estimates that can have a significant level of variation. The goal for the annual update of the Ten Year Capital Improvement Plan will be to continuously update the costs such that a study estimate level of accuracy can be developed for projects within a three year horizon.

The following factors were applied to the capital projects:

- General Conditions, Contractor Overhead and Profit, Bonds and Insurance: 27% (note that this was already integrated into some cost estimates and quotes) allocated as follows:
 - 15% General Conditions/Overhead
 - 10% Profit
 - 2% Bonds and Insurance
- Sales Tax: 8% (note that this was already integrated into some cost estimates and quotes).
- Design: 10% (this number might vary depending on project specific conditions) of estimated construction cost.
- Engineering Services During Construction (including response to RFI's, shop drawing review, preparation of as-built drawings and design intent manuals): 5% for projects >\$1 million; 7.5% for projects <\$1 million and >\$0.5M; 10% for projects <\$0.5M of estimated construction cost.
- Construction Management: 5% of estimated construction cost (or as high as 10 to 15% if either external resident engineering services are required or biological/cultural inspection services are needed. (Note the standard 5% to all projects is based on using external inspection services).

Table 5.1
Expected Cost Estimating Accuracy

ESTIMATE LEVEL	EXPECTED ESTIMATE ACCURACY
Order of Magnitude Estimate	+ 50% to – 30%
Study or Budget Estimate	+ 30% to – 15%
Detailed Estimate	+ 15% to – 5 %

CONTINGENCIES

Contingencies are built into each of the project budgets. Contingencies are used for the following purposes:

- **Project Scope Unknowns:** In master planning it is typical to plan a project around a major function (replacing the pumps in a pump station) without necessarily picking up minor issues in that same area (extending a service water line and providing a new hose connection; replacing lighting in the pump station). This can also include bringing the area up to current code and safety regulations. The contingency accounts for growth in the project scope to address minor issues in the vicinity of the main projects.
- **Technical Unknowns:** Master planning analyses also do not develop sufficient detail to know if a project is technically feasible. More expensive alternatives must sometimes be adopted as the understanding of the project grows.
- **Bid Unknowns:** The bid results are dependent on construction market conditions that are often uncertain.
- **Site Condition Unknowns:** The contingency must also address the potential for unknowns in the actual site condition.

This issue can deal with items such as the following:

- Existing underground utilities not recorded on as-built drawings.
- Embedded conduit encountered in saw cut of existing concrete slab.
- Inability to pull wire through conduit which has apparently been crushed.

Project scope and technical unknowns will typically be reduced as the project year draws nearer. Site unknowns may often be explored through potholing and condition assessments.

The range of contingencies used in this analysis typically ranged between 25% (for project costs more than \$500,000) and 30% (for project costs less than \$500,000). Lower and higher contingencies were utilized for project specific reasons.

Contingencies of up to 40% were applied to smaller projects (projects with a total capital price of less than \$200,000 due to the greater impact of uncertainty.

COST ESCALATION

SOCWA staff retained Carollo Engineers to analyze the cost escalation factors available for

SOCWA in order to forecast capital costs. This evaluation recommended the use of 3.2% inflation rate based on the compound annual growth rate of inflation since 1997. This value is incorporated into the Ten Year Plan to reflect the annual rate of inflation in project costs. The Carollo Technical Memorandum titled “Cost Escalation Analysis (May, 2017)” is presented in Appendix A.

Carollo revisited this analysis in June 2019 and incorporated the last two years of escalation data. Based upon this reassessment, Carollo did not make any changes to its previous recommended escalation factor of 3.2%

SOCWA staff have archived bid tabulations for projects over the past 18 years. This information has been used in the estimation of some project costs in this edition of the Ten Year Plan. The Engineering News Record (ENR) Los Angeles Construction Cost Index (CCI) to adjust past bid information to a 2018 value. A 2018 ENR Los Angeles CCI of 11940 was used in this analysis. Table 5.2 present average annual ENR construction cost indexes for the past 40 years.

Table 5.2
Construction Cost Indexes

YEAR	LOS ANGELES CCI	20 CITIES CCI
1980	3681	3193
1981	5265	4201
1982	5452	4290
1983	5454	4387
1984	5042	4161
1985	5265	4201
1986	5452	4290

YEAR	LOS ANGELES CCI	20 CITIES CCI
1987	5454	4387
1988	5666	4525
1989	5676	4588
1990	5988	4723
1991	6085	4818
1992	6302	4973
1993	6427	5260
1994	6550	5408
1995	6529	5432
1996	6522	5597
1997	6622	5860
1998	6691	5895
1999	6823	6039
2000	7066	6238
2001	7247	6318
2002	7420	6532
2003	7542	6709
2004	7844	7108
2005	8299	7415
2006	8547	7700
2007	8855	7939
2008	9266	8185
2009	9777	8578
2010	9962	8805
2011	10051	9053
2012	10300	9291
2013	10305	9542
2014	10739	9800
2015	10981	10039
2016	11148	10342
2017	11636	10703
2018	11940	11069
2019	12113	11268

¹ Values are based on the published index in June of each year.

ADMINISTRATION

There are two types of administration cost that may be included in the individual project and annual costs:

- Engineering Labor Costs
- Legal Costs.

The engineering labor and legal costs have been estimated as presented in Table 6.1. The estimated administration cost for a given year is then applied to the projects for that year based on the percentage of the individual capital project cost to the overall capital project cost for that year. It is acknowledged that some projects will have an inherently higher (or lower) administration cost than be determined by a straight percentage allocation. However, this level of estimate is more detailed than developed for the Ten Year Plan. The actual allocation of the administration cost will be based on a year to year basis through the annual budgeting process.

There can be additional costs for a project that can be classified as administration. These can include trailer rentals, software, 3rd party inspectors and 3rd party program managers. Where appropriate these costs are included in the specific project cost estimate.

ENGINEERING LABOR COSTS

The engineering labor costs are based on a SOCWA Engineering Department of three individuals: Director of Engineering, Senior Engineer, and Associate Engineer. The salaries and

fringe benefit costs associated with those positions were established by the SOCWA Finance Department.

The escalation of engineering labor costs from Years 2 through 5 is based on a cost of living adjustment (COLA) rate of 1.032 and an average merit increase of 3%. The escalation rate for Years 6 through 15 is based only on the COLA rate of 1.032. The rationale for this lower overall escalation rate is that as staff retires or departs over time they are typically replaced with individuals at a lower pay rate. Therefore, the total cost of engineering labor is not expected to accelerate at a constant pace.

Only a portion of engineering labor is associated with capital projects. The costs for the remaining portion of work is allocated to overall administration. The latter group of activities would include Operations support, Board meetings and Engineering Committee meetings. The expected allocation of engineering labor to capital projects for Year 1 (Fiscal Year 2019/20) is 52.1%. The value is projected increase to as much as 60%. The capital allocation percentages are presented in Table 6.1.

LEGAL COSTS

The legal costs associated with the Capital Improvement Program can vary significantly in any given year. The standard legal costs associated with capital projects include the following:

- Review of contracts, bonds and insurance forms.
- Review of titles and easements.

Table 6.1
Capital Improvement Program Administration Costs

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Fiscal Year	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34
Inflation		1.063	1.063	1.063	1.063	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032
% To CIP	52.1%	53.5%	55.0%	56.5%	58.0%	59.5%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Engineering Labor Cost To CIP	\$402,799	\$439,665	\$480,449	\$524,627	\$572,462	\$606,060	\$630,710	\$650,892	\$671,721	\$693,216	\$715,399	\$738,292	\$761,917	\$786,298	\$811,460
Legal	\$10,000	\$10,320	\$10,650	\$10,991	\$11,343	\$11,706	\$12,080	\$12,467	\$12,866	\$13,278	\$13,702	\$14,141	\$14,593	\$15,060	\$15,542
Legal Inflation		1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032	1.032
Total Administration Cost To CIP	\$412,799	\$449,985	\$491,100	\$535,618	\$583,805	\$617,766	\$642,790	\$663,359	\$684,587	\$706,494	\$729,101	\$752,433	\$776,510	\$801,359	\$827,002

- Review of CEQA documentation.

SOCWA has not been involved in any construction claims in over 20 years. However, it can be assumed that disputes will arise requiring legal assistance. The Ten Year Plan is based on the assumption that the initial annual cost for legal support is \$10,000. This value is escalated at the COLA rate of 1.032.

SMALL CAPITAL IMPROVEMENTS COSTS

Each year of the Ten Year Plan includes small capital improvements projects that are managed by SOCWA's Operations Department.

The list of requested projects for the Ten Year Plan is developed each year by the SOCWA Operations Department. Small capital improvement projects are projects that are generally executed by the Operations Department. These projects are usually simple equipment replacement projects that do not require an engineered design. The projects can also include the retrofit of larger equipment such as engines or blowers. The small capital improvements can also address assets not included in Appendices B, F, and I.

The Ten Year Capital Improvement Program does not include a projection of the specific annual small capital improvement projects. Table 7.1 presents the budgetary numbers for small capital improvements for Fiscal Year 2019/20. These numbers have been used as the basis for small capital improvements in Year 2 through 15 using an annual inflation rate of 3.2% as discussed in Chapter 5. The amount and the allocation of the small capital improvements can deviate significantly each year. Therefore, it is noted that these values simply represent budgetary place holders.

The Fiscal Year 2019/20 budget also included limited small capital improvements for Project Committees 5 (San Juan Creek Ocean Outfall) and 24 (Aliso Creek Ocean Outfall). These improvements are not included in the Ten Year Plan as small capital work for these

facilities is rare. Similarly no small capital improvement work has been identified for Project Committee 21 (Effluent Transmission Main).

RELATIONSHIP OF SMALL AND LARGE CAPITAL IMPROVEMENTS

Table 7.1 identified a small capital improvements budget of slightly over \$2,000,000. This reflects a small capital expenditure that is almost three times higher than the small capital improvements cost used in the 2010 version of the Ten Year Plan. There is likely to be overlap between small capital improvements and large capital projects at the planning level. For instance, one raw sewage pump out of four units may be replaced as a small capital improvement while the reconstruction of the rehabilitation of the raw sewage pump station is included in a later year in the Ten Year Plan. The level of forecasting in the Ten Year Plan does not reflect that a prior small capital improvement may result in a lower cost for the larger rehabilitation project or that the small capital improvement may result in a postponement of the larger project.

Table 7.1
 Small Capital Improvements Budget for Fiscal Year 2019-20

Facility	Cost Center	Small Capital Improvements Budget
J. B. Latham Treatment Plant	PC 2	
	PC 2 Liquids	\$252,000
	PC 2 Common	\$212,500
	PC 2 Solids	\$220,500
	Subtotal	\$685,000
Coastal Treatment Plant	PC 15	
	PC 15 Liquids	\$581,000
	PC 15 AWT	\$40,000
	Subtotal	\$621,000
Regional Treatment Plant	PC 17	
	PC 17 Liquids	\$316,000
	PC 17 Common	\$165,000
	PC 17 Solids	\$220,000
	PC 17 AWT	\$35,000
	Subtotal	\$736,000
	Total	\$2,042,000

GENERAL

This report presents the Ten Year Capital Improvement Program for SOCWA facilities (2019 – 2028). The Capital Improvement Program is to be updated every year to improve the accuracy of the planning/budgeting process. Appendices B, E, F, I, L, and M presented tables identifying the capital improvements according to facility (or project committee) with the costs allocated to the member agencies owning these facilities.

COST SUMMARY TABLES

Table 8.1 shows the total capital cost by project committee by year for the proposed program. Tables 8.2 through 8.10 show the distribution of costs for over the fifteen year planning span for each member agency (with the exception of the Trabuco Canyon Water District which does not own capacity in any SOCWA facility). These costs are adjusted according to anticipated inflation as discussed in Chapter 5. The tables include the administration costs and the small capital improvement costs presented in Chapters 6 and 7 respectively.

Table 8.1 - Annual Capital Improvement Budget

Year	Fiscal Year	PC 02			PC 02 Total	PC 05	PC 05 Total	PC 15		PC 15 Total	PC 17				PC 17 Total	PC 21		PC 21 Total	PC 24	PC 24 Total	Grand Total
		Liquids	Common	Solids				Liquids	AWT		Liquids	Common	Solids	AWT		B/C/D	E				
1	2020	\$ 4,222,203	\$ 1,188,671	\$ 5,080,720	\$ 10,491,594	\$ 75,730	\$ 75,730	\$12,321,354	\$ 40,000	\$12,361,354	\$ 6,793,536	\$ 472,696	\$ 1,974,150	\$ 35,000	\$ 9,275,382	\$ 226,011	\$ 103,673	\$ 329,684	\$ 106,253	\$ 106,253	\$ 32,639,997
2	2021	\$ 4,944,789	\$ 1,267,467	\$ 5,419,441	\$ 11,631,697	\$ 542,178	\$ 542,178	\$ 8,009,136		\$ 8,009,136	\$ 3,945,308	\$ 1,307,355	\$ 430,040	\$ 36,120	\$ 5,718,823	\$ 172,288	\$ 105,640	\$ 277,927	\$ 50,703	\$ 50,703	\$ 26,230,465
3	2022	\$ 4,724,339	\$ 588,149	\$ 4,816,392	\$ 10,128,879			\$ 4,529,953	\$ 67,080	\$ 4,597,033	\$ 6,048,663	\$ 2,407,707	\$ 3,290,367	\$ 37,276	\$ 11,784,013	\$ 966,608		\$ 966,608			\$ 27,476,534
4	2023	\$ 7,083,766	\$ 292,576	\$ 233,560	\$ 7,609,902	\$ 178,570	\$ 178,570	\$ 1,421,397	\$ 69,227	\$ 1,490,624	\$ 2,057,640	\$ 2,069,733	\$ 437,114	\$ 38,469	\$ 4,602,956				\$ 66,964	\$ 66,964	\$ 13,949,016
5	2024	\$ 1,366,148	\$ 324,455	\$ 4,356,252	\$ 6,046,855	\$ 38,935	\$ 38,935	\$ 3,815,124	\$ 71,442	\$ 3,886,566	\$ 591,219	\$ 5,722,692	\$ 577,859	\$ 39,700	\$ 6,931,469	\$ 343,142		\$ 343,142			\$ 17,246,967
6	2025	\$ 4,704,987	\$ 6,923,709	\$ 819,986	\$ 12,448,682	\$ 581,817	\$ 581,817	\$ 3,474,072	\$ 325,719	\$ 3,799,791	\$ 3,532,789	\$ 193,145	\$16,341,074	\$ 40,970	\$ 20,107,977	\$1,771,090		\$ 1,771,090	\$ 173,071	\$ 173,071	\$ 38,882,428
7	2026	\$ 3,830,223	\$ 2,356,608	\$ 5,336,797	\$ 11,523,628	\$ 89,987	\$ 89,987	\$ 3,200,572	\$ 76,087	\$ 3,276,659	\$ 7,741,809	\$ 4,112,880	\$ 1,210,933	\$ 42,281	\$ 13,107,903	\$ 419,939	\$ 401,942	\$ 821,881	\$ 2,431	\$ 2,431	\$ 28,822,490
8	2027	\$ 1,080,349	\$ 850,038	\$14,505,508	\$ 16,435,895			\$ 3,107,973	\$1,632,435	\$ 4,740,407	\$ 8,845,146	\$ 4,172,379	\$ 274,271	\$ 43,634	\$ 13,335,431	\$2,915,201	\$1,590,445	\$ 4,505,645	\$ 590,420	\$ 590,420	\$ 39,607,798
9	2028	\$ 324,219	\$ 3,530,173	\$ 273,399	\$ 4,127,791	\$ 980,647	\$ 980,647	\$ 3,252,251	\$ 81,035	\$ 3,333,286	\$ 4,979,468	\$ 929,274	\$ 2,649,158	\$ 45,030	\$ 8,602,930	\$ 286,349		\$ 286,349			\$ 17,331,003
10	2029	\$ 6,279,489	\$ 292,770	\$ 1,303,936	\$ 7,876,194			\$ 6,095,769	\$ 83,628	\$ 6,179,397	\$ 5,152,556	\$ 4,103,969	\$ 292,106	\$ 46,471	\$ 9,595,102	\$2,697,922		\$ 2,697,922	\$7,896,357	\$7,896,357	\$ 34,244,973
11	2030	\$ 1,917,044	\$ 2,253,063	\$ 291,176	\$ 4,461,282			\$ 4,375,676	\$3,296,310	\$ 7,671,987	\$ 6,100,802	\$ 226,090	\$ 742,204	\$ 47,958	\$ 7,117,054						\$ 19,250,323
12	2031	\$ 356,350	\$ 311,807	\$ 5,503,266	\$ 6,171,423			\$ 3,065,020	\$ 89,066	\$ 3,154,085	\$ 1,552,143	\$ 233,325	\$21,779,768	\$ 49,493	\$ 23,614,729						\$ 32,940,236
13	2032	\$ 4,122,824	\$ 321,784	\$ 310,110	\$ 4,754,718			\$ 5,202,491	\$ 91,916	\$ 5,294,406	\$ 1,512,516	\$ 240,791	\$ 1,519,902	\$ 51,077	\$ 3,324,286						\$ 13,373,410
14	2033	\$ 1,286,627	\$ 332,081	\$ 320,033	\$ 1,938,741			\$ 3,345,682	\$ 94,857	\$ 3,440,539	\$ 7,446,574	\$ 248,496	\$ 331,328	\$ 52,711	\$ 8,079,110						\$ 13,458,391
15	2034	\$ 1,267,162	\$ 1,998,948	\$ 330,274	\$ 3,596,384			\$ 8,166,623	\$ 513,132	\$ 8,679,755	\$ 1,509,775	\$ 4,014,328	\$ 341,931	\$ 54,398	\$ 5,920,432				\$ 151,315	\$ 151,315	\$ 18,347,886
Grand Total		\$47,510,517	\$22,832,298	\$48,900,848	\$119,243,663	\$2,487,865	\$2,487,865	\$73,383,093	\$6,531,933	\$79,915,026	\$67,809,943	\$30,454,860	\$52,192,205	\$660,589	\$151,117,598	\$9,798,549	\$2,201,700	\$12,000,249	\$9,037,514	\$9,037,514	\$373,801,915
Ten Year Total		\$38,560,511	\$17,614,615	\$42,145,989	\$ 98,321,115	\$2,487,865	\$2,487,865	\$49,227,602	\$2,446,652	\$51,674,254	\$49,688,133	\$25,491,830	\$27,477,072	\$404,951	\$103,061,987	\$9,798,549	\$2,201,700	\$12,000,249	\$8,886,199	\$8,886,199	\$276,431,669

Table 8.2 - Annual Capital Improvement Budget - ETWD

Year	Fiscal Year	PC 17				PC 17 Total	PC 21		PC 21 Total	PC 24		PC 24 Total	Grand Total
		Liquids	Common	Solids	AWT		B/C/D	E					
1	2020	\$ -	\$ 48,499	\$ 402,924	\$-	\$ 451,423	\$ 113,006	\$ 24,145	\$ 137,151	\$ 17,319	\$ 17,319	\$ 605,893	
2	2021	\$ -	\$ 134,135	\$ 87,771	\$-	\$ 221,906	\$ 86,144	\$ 24,604	\$ 110,747	\$ 8,265	\$ 8,265	\$ 340,918	
3	2022	\$ -	\$ 247,031	\$ 671,564	\$-	\$ 918,595	\$ 483,304		\$ 483,304			\$ 1,401,899	
4	2023	\$ -	\$ 212,355	\$ 89,215	\$-	\$ 301,570				\$ 10,915	\$ 10,915	\$ 312,485	
5	2024	\$ -	\$ 587,148	\$ 117,941	\$-	\$ 705,089	\$ 171,571		\$ 171,571			\$ 876,660	
6	2025	\$ -	\$ 19,817	\$ 3,335,213	\$-	\$ 3,355,030	\$ 885,545		\$ 885,545	\$ 28,211	\$ 28,211	\$ 4,268,785	
7	2026	\$ -	\$ 421,982	\$ 247,151	\$-	\$ 669,133	\$ 209,970	\$ 93,612	\$ 303,582	\$ 396	\$ 396	\$ 973,111	
8	2027	\$ -	\$ 428,086	\$ 55,979	\$-	\$ 484,065	\$1,457,600	\$370,415	\$1,828,015	\$ 96,239	\$ 96,239	\$ 2,408,318	
9	2028	\$ -	\$ 95,343	\$ 540,693	\$-	\$ 636,037	\$ 143,174		\$ 143,174			\$ 779,211	
10	2029	\$ -	\$ 421,067	\$ 59,619	\$-	\$ 480,686	\$1,348,961		\$1,348,961	\$1,287,106	\$1,287,106	\$ 3,116,753	
11	2030	\$ -	\$ 23,197	\$ 151,484	\$-	\$ 174,681						\$ 174,681	
12	2031	\$ -	\$ 23,939	\$ 4,445,251	\$-	\$ 4,469,190						\$ 4,469,190	
13	2032	\$ -	\$ 24,705	\$ 310,212	\$-	\$ 334,917						\$ 334,917	
14	2033	\$ -	\$ 25,496	\$ 67,624	\$-	\$ 93,120						\$ 93,120	
15	2034	\$ -	\$ 411,870	\$ 69,788	\$-	\$ 481,658				\$ 24,664	\$ 24,664	\$ 506,322	
Grand Total		\$ -	\$3,124,669	\$10,652,429	\$-	\$13,777,098	\$4,899,275	\$512,776	\$5,412,050	\$1,473,115	\$1,473,115	\$20,662,263	
Ten Year Total		\$ -	\$2,615,462	\$ 5,608,070	\$-	\$ 8,223,532	\$4,899,275	\$512,776	\$5,412,050	\$1,448,450	\$1,448,450	\$15,084,033	

Table 8.3 - Annual Capital Improvement Budget - EBSD

Year	Fiscal Year	PC 15		PC 15 Total	PC 17				PC 17 Total	PC 24	PC 24 Total	Grand Total
		Liquids	AWT		Liquids	Common	Solids	AWT				
1	2020	\$ 367,802	\$-	\$ 367,802	\$ -	\$ 1,560	\$ 11,647	\$-	\$ 13,207	\$ 829	\$ 829	\$ 381,838
2	2021	\$ 239,079		\$ 239,079	\$ -	\$ 4,314	\$ 2,537	\$-	\$ 6,852	\$ 395	\$ 395	\$ 246,326
3	2022	\$ 135,222	\$-	\$ 135,222	\$ -	\$ 7,945	\$ 19,413	\$-	\$ 27,359			\$ 162,581
4	2023	\$ 42,430	\$-	\$ 42,430	\$ -	\$ 6,830	\$ 2,579	\$-	\$ 9,409	\$ 522	\$ 522	\$ 52,361
5	2024	\$ 113,884	\$-	\$ 113,884	\$ -	\$ 18,885	\$ 3,409	\$-	\$ 22,294			\$ 136,179
6	2025	\$ 103,704	\$-	\$ 103,704	\$ -	\$ 637	\$ 96,412	\$-	\$ 97,050	\$ 1,350	\$ 1,350	\$ 202,103
7	2026	\$ 95,539	\$-	\$ 95,539	\$ -	\$ 13,573	\$ 7,145	\$-	\$ 20,717	\$ 19	\$ 19	\$ 116,275
8	2027	\$ 92,775	\$-	\$ 92,775	\$ -	\$ 13,769	\$ 1,618	\$-	\$ 15,387	\$ 4,605	\$ 4,605	\$ 112,768
9	2028	\$ 97,082	\$-	\$ 97,082	\$ -	\$ 3,067	\$ 15,630	\$-	\$ 18,697			\$ 115,779
10	2029	\$ 181,963	\$-	\$ 181,963	\$ -	\$ 13,543	\$ 1,723	\$-	\$ 15,267	\$61,592	\$ 61,592	\$ 258,821
11	2030	\$ 130,617	\$-	\$ 130,617	\$ -	\$ 746	\$ 4,379	\$-	\$ 5,125			\$ 135,742
12	2031	\$ 91,493	\$-	\$ 91,493	\$ -	\$ 770	\$128,501	\$-	\$129,271			\$ 220,764
13	2032	\$ 155,298	\$-	\$ 155,298	\$ -	\$ 795	\$ 8,967	\$-	\$ 9,762			\$ 165,060
14	2033	\$ 99,871	\$-	\$ 99,871	\$ -	\$ 820	\$ 1,955	\$-	\$ 2,775			\$ 102,646
15	2034	\$ 243,780	\$-	\$ 243,780	\$ -	\$ 13,247	\$ 2,017	\$-	\$ 15,265	\$ 1,180	\$ 1,180	\$ 260,225
Grand Total		\$ 2,190,540	\$-	\$2,190,540	\$ -	\$100,501	\$307,934	\$-	\$408,435	\$70,493	\$ 70,493	\$2,669,468
Ten Year Total		\$ 1,469,481	\$-	\$1,469,481	\$ -	\$ 84,123	\$162,115	\$-	\$246,238	\$69,312	\$ 69,312	\$1,785,031

Table 8.4 - Annual Capital Improvement Budget - IRWD

Year	Fiscal Year	PC 21		PC 21 Total	PC 24	PC 24 Total	Grand Total
		B/C/D	E				
1	2020	\$ 113,006	\$ 24,145	\$ 137,151	\$ 16,745	\$ 16,745	\$ 153,896
2	2021	\$ 86,144	\$ 24,604	\$ 110,747	\$ 7,991	\$ 7,991	\$ 118,738
3	2022	\$ 483,304		\$ 483,304			\$ 483,304
4	2023				\$ 10,554	\$ 10,554	\$ 10,554
5	2024	\$ 171,571		\$ 171,571			\$ 171,571
6	2025	\$ 885,545		\$ 885,545	\$ 27,276	\$ 27,276	\$ 912,821
7	2026	\$ 209,970	\$ 93,612	\$ 303,582	\$ 383	\$ 383	\$ 303,965
8	2027	\$ 1,457,600	\$ 370,415	\$ 1,828,015	\$ 93,050	\$ 93,050	\$ 1,921,065
9	2028	\$ 143,174		\$ 143,174			\$ 143,174
10	2029	\$ 1,348,961		\$ 1,348,961	\$ 1,244,466	\$ 1,244,466	\$ 2,593,427
15	2034				\$ 23,847	\$ 23,847	\$ 23,847
Grand Total		\$ 4,899,275	\$ 512,776	\$ 5,412,050	\$ 1,424,312	\$ 1,424,312	\$ 6,836,363
Ten Year Total		\$ 4,899,275	\$ 512,776	\$ 5,412,050	\$ 1,400,465	\$ 1,400,465	\$ 6,812,515

Table 8.5 - Annual Capital Improvement Budget - CLB

Year	Fiscal Year	PC 15		PC 15 Total	PC 17				PC 17 Total	PC 24	PC 24 Total	Grand Total
		Liquids	AWT		Liquids	Common	Solids	AWT				
1	2020	\$ 4,671,080	\$ -	\$ 4,671,080	\$ -	\$ 29,638	\$ 221,500	\$ -	\$ 251,138	\$ 11,688	\$ 11,688	\$ 4,933,906
2	2021	\$ 3,036,299		\$ 3,036,299	\$ -	\$ 81,971	\$ 48,250	\$ -	\$ 130,222	\$ 5,577	\$ 5,577	\$ 3,172,098
3	2022	\$ 1,717,325	\$ -	\$ 1,717,325	\$ -	\$ 150,963	\$ 369,179	\$ -	\$ 520,142			\$ 2,237,468
4	2023	\$ 538,858	\$ -	\$ 538,858	\$ -	\$ 129,772	\$ 49,044	\$ -	\$ 178,817	\$ 7,366	\$ 7,366	\$ 725,041
5	2024	\$ 1,446,331	\$ -	\$ 1,446,331	\$ -	\$ 358,813	\$ 64,836	\$ -	\$ 423,649			\$ 1,869,979
6	2025	\$ 1,317,036	\$ -	\$ 1,317,036	\$ -	\$ 12,110	\$1,833,468	\$ -	\$1,845,579	\$ 19,038	\$ 19,038	\$ 3,181,653
7	2026	\$ 1,213,351	\$ -	\$ 1,213,351	\$ -	\$ 257,878	\$ 135,867	\$ -	\$ 393,744	\$ 267	\$ 267	\$ 1,607,363
8	2027	\$ 1,178,246	\$ -	\$ 1,178,246	\$ -	\$ 261,608	\$ 30,773	\$ -	\$ 292,381	\$ 64,946	\$ 64,946	\$ 1,535,574
9	2028	\$ 1,232,943	\$ -	\$ 1,232,943	\$ -	\$ 58,265	\$ 297,236	\$ -	\$ 355,501			\$ 1,588,444
10	2029	\$ 2,310,933	\$ -	\$ 2,310,933	\$ -	\$ 257,319	\$ 32,774	\$ -	\$ 290,093	\$868,599	\$ 868,599	\$ 3,469,626
11	2030	\$ 1,658,838	\$ -	\$ 1,658,838	\$ -	\$ 14,176	\$ 83,275	\$ -	\$ 97,451			\$ 1,756,290
12	2031	\$ 1,161,963	\$ -	\$ 1,161,963	\$ -	\$ 14,629	\$2,443,690	\$ -	\$2,458,319			\$ 3,620,282
13	2032	\$ 1,972,287	\$ -	\$ 1,972,287	\$ -	\$ 15,098	\$ 170,533	\$ -	\$ 185,631			\$ 2,157,918
14	2033	\$ 1,268,363	\$ -	\$ 1,268,363	\$ -	\$ 15,581	\$ 37,175	\$ -	\$ 52,756			\$ 1,321,119
15	2034	\$ 3,096,003	\$ -	\$ 3,096,003	\$ -	\$ 251,698	\$ 38,365	\$ -	\$ 290,063	\$ 16,645	\$ 16,645	\$ 3,402,711
Grand Total		\$ 27,819,859	\$ -	\$27,819,859	\$ -	\$1,909,520	\$5,855,965	\$ -	\$7,765,485	\$994,127	\$ 994,127	\$36,579,471
Ten Year Total		\$ 18,662,404	##	\$18,662,404	\$ -	\$1,598,338	\$3,082,928	##	\$4,681,265	\$977,482	\$ 977,482	\$24,321,152

Table 8.6 - Annual Capital Improvement Budget - MNWD

Year	Fiscal Year	PC 02			PC 02 Total	PC 05	PC 05 Total	PC 15		PC 15 Total	PC 17				PC 17 Total	PC 21		PC 21 Total	PC 24	PC 24 Total	Grand Total
		Liquids	Common	Solids				Liquids	AWT		Liquids	Common	Solids	AWT		B/C/D	E				
1	2020	\$ 974,355	\$ 265,659	\$ 1,098,534	\$ 2,338,548	\$ 11,746	\$ 11,746	\$ 3,604,456	\$ -	\$ 3,604,456	\$ 6,793,536	\$ 369,313	\$ 1,161,195	\$ 35,000	\$ 8,359,044	\$ -	\$ 55,382	\$ 55,382	\$ 46,592	\$ 46,592	\$ 14,415,767
2	2021	\$ 1,141,105	\$ 283,270	\$ 1,171,771	\$ 2,596,146	\$ 84,092	\$ 84,092	\$ 2,342,971	\$ -	\$ 2,342,971	\$ 3,945,308	\$ 1,021,425	\$ 252,950	\$ 36,120	\$ 5,255,803	\$ -	\$ 56,433	\$ 56,433	\$ 22,233	\$ 22,233	\$ 10,357,677
3	2022	\$ 1,090,232	\$ 131,447	\$ 1,041,382	\$ 2,263,061			\$ 1,325,180	\$ -	\$ 1,325,180	\$ 6,048,663	\$ 1,881,121	\$ 1,935,394	\$ 37,276	\$ 9,902,454	\$ -	\$ -				\$ 13,490,695
4	2023	\$ 1,634,715	\$ 65,388	\$ 50,499	\$ 1,750,603	\$ 27,696	\$ 27,696	\$ 415,812	\$ -	\$ 415,812	\$ 2,057,640	\$ 1,617,065	\$ 257,111	\$ 38,469	\$ 3,970,284			\$ 29,364	\$ 29,364		\$ 6,193,759
5	2024	\$ 315,265	\$ 72,513	\$ 941,892	\$ 1,329,671	\$ 6,039	\$ 6,039	\$ 1,116,066	\$ -	\$ 1,116,066	\$ 591,219	\$ 4,471,090	\$ 339,897	\$ 39,700	\$ 5,441,905	\$ -	\$ -				\$ 7,893,680
6	2025	\$ 1,085,766	\$ 1,547,399	\$ 177,294	\$ 2,810,459	\$ 90,240	\$ 90,240	\$ 1,016,296	\$ -	\$ 1,016,296	\$ 3,532,789	\$ 150,902	\$ 9,611,819	\$ 40,970	\$ 13,336,481	\$ -	\$ -	\$ 75,891	\$ 75,891		\$ 17,329,367
7	2026	\$ 883,898	\$ 526,685	\$ 1,153,902	\$ 2,564,484	\$ 13,957	\$ 13,957	\$ 936,287	\$ -	\$ 936,287	\$ 7,741,809	\$ 3,213,358	\$ 712,271	\$ 42,281	\$ 11,709,718	\$ -	\$ 214,717	\$ 214,717	\$ 1,066	\$ 1,066	\$ 15,440,230
8	2027	\$ 249,311	\$ 189,977	\$ 3,136,326	\$ 3,575,615			\$ 909,198	\$ -	\$ 909,198	\$ 8,845,146	\$ 3,259,843	\$ 161,326	\$ 43,634	\$ 12,309,950	\$ -	\$ 849,616	\$ 849,616	\$ 258,899	\$ 258,899	\$ 17,903,278
9	2028	\$ 74,820	\$ 788,968	\$ 59,113	\$ 922,901	\$152,098	\$152,098	\$ 951,405	\$ -	\$ 951,405	\$ 4,979,468	\$ 726,033	\$ 1,558,235	\$ 45,030	\$ 7,308,767	\$ -	\$ -				\$ 9,335,171
10	2029	\$ 1,449,113	\$ 65,432	\$ 281,932	\$ 1,796,477			\$ 1,783,240	\$ -	\$ 1,783,240	\$ 5,152,556	\$ 3,206,395	\$ 171,817	\$ 46,471	\$ 8,577,239	\$ -	\$ -	\$3,462,553	\$3,462,553		\$ 15,619,509
11	2030	\$ 442,395	\$ 503,543	\$ 62,957	\$ 1,008,895			\$ 1,280,049	\$ -	\$ 1,280,049	\$ 6,100,802	\$ 176,642	\$ 436,565	\$ 47,958	\$ 6,761,967						\$ 9,050,910
12	2031	\$ 82,235	\$ 69,686	\$ 1,189,895	\$ 1,341,816			\$ 896,633	\$ -	\$ 896,633	\$ 1,552,143	\$ 182,295	\$12,810,860	\$ 49,493	\$ 14,594,790						\$ 16,833,239
13	2032	\$ 951,421	\$ 71,916	\$ 67,051	\$ 1,090,388			\$ 1,521,923	\$ -	\$ 1,521,923	\$ 1,512,516	\$ 188,128	\$ 894,006	\$ 51,077	\$ 2,645,727						\$ 5,258,038
14	2033	\$ 296,914	\$ 74,218	\$ 69,196	\$ 440,328			\$ 978,737	\$ -	\$ 978,737	\$ 7,446,574	\$ 194,148	\$ 194,887	\$ 52,711	\$ 7,888,321						\$ 9,307,386
15	2034	\$ 292,422	\$ 446,750	\$ 71,411	\$ 810,583			\$ 2,389,042	\$ -	\$ 2,389,042	\$ 1,509,775	\$ 3,136,359	\$ 201,124	\$ 54,398	\$ 4,901,657			\$ 66,352	\$ 66,352		\$ 8,167,633
Grand Total		\$ 10,963,965	\$5,102,853	\$10,573,156	\$26,639,974	\$385,868	\$ 385,868	\$21,467,293	\$ -	\$21,467,293	\$67,809,943	\$23,794,118	\$30,699,455	\$660,589	\$122,964,106	\$ -	\$1,176,148	\$1,176,148	\$3,962,950	\$3,962,950	\$176,596,339
Ten Year Total		\$ 8,898,579	\$3,936,738	\$ 9,112,646	\$21,947,964	\$385,868	\$ 385,868	\$14,400,911	##	\$14,400,911	\$49,688,133	\$19,916,546	\$16,162,014	\$404,951	\$ 86,171,644	\$ -	\$1,176,148	\$1,176,148	\$3,896,598	\$3,896,598	\$127,979,133

Table 8.7 - Annual Capital Improvement Budget - CSC

Year	Fiscal Year	PC 05	PC 05 Total	Grand Total
1	2020	\$ 12,586	\$ 12,586	\$ 12,586
2	2021	\$ 90,110	\$ 90,110	\$ 90,110
4	2023	\$ 29,678	\$ 29,678	\$ 29,678
5	2024	\$ 6,471	\$ 6,471	\$ 6,471
6	2025	\$ 96,698	\$ 96,698	\$ 96,698
7	2026	\$ 14,956	\$ 14,956	\$ 14,956
9	2028	\$ 162,984	\$ 162,984	\$ 162,984
Grand Total		\$ 413,483	\$ 413,483	\$ 413,483
Ten Year Total		\$ 413,483	\$ 413,483	\$ 413,483

Table 8.8 - Annual Capital Improvement Budget - CSJC

Year	Fiscal Year	PC 02			PC 02 Total	PC 05	PC 05 Total	Grand Total
		Liquids	Common	Solids				
1	2020	\$ 1,299,139	\$ 361,173	\$ 1,524,216	\$ 3,184,528	\$ 8,391	\$ 8,391	\$ 3,192,919
2	2021	\$ 1,521,474	\$ 385,115	\$ 1,625,832	\$ 3,532,421	\$ 60,073	\$ 60,073	\$ 3,592,494
3	2022	\$ 1,453,643	\$ 178,707	\$ 1,444,917	\$ 3,077,267			\$ 3,077,267
4	2023	\$ 2,179,620	\$ 88,898	\$ 70,068	\$ 2,338,586	\$ 19,786	\$ 19,786	\$ 2,358,372
5	2024	\$ 420,353	\$ 98,584	\$ 1,306,876	\$ 1,825,813	\$ 4,314	\$ 4,314	\$ 1,830,127
6	2025	\$ 1,447,688	\$ 2,103,742	\$ 245,996	\$ 3,797,426	\$ 64,465	\$ 64,465	\$ 3,861,892
7	2026	\$ 1,178,530	\$ 716,046	\$ 1,601,039	\$ 3,495,615	\$ 9,971	\$ 9,971	\$ 3,505,586
8	2027	\$ 332,415	\$ 258,281	\$ 4,351,652	\$ 4,942,348			\$ 4,942,348
9	2028	\$ 99,760	\$ 1,072,630	\$ 82,020	\$ 1,254,409	\$ 108,656	\$ 108,656	\$ 1,363,064
10	2029	\$ 1,932,150	\$ 88,957	\$ 391,181	\$ 2,412,288			\$ 2,412,288
11	2030	\$ 589,860	\$ 684,584	\$ 87,353	\$ 1,361,797			\$ 1,361,797
12	2031	\$ 109,646	\$ 94,741	\$ 1,650,980	\$ 1,855,367			\$ 1,855,367
13	2032	\$ 1,268,561	\$ 97,773	\$ 93,033	\$ 1,459,367			\$ 1,459,367
14	2033	\$ 395,885	\$ 100,902	\$ 96,010	\$ 592,797			\$ 592,797
15	2034	\$ 389,896	\$ 607,373	\$ 99,082	\$ 1,096,351			\$ 1,096,351
Grand Total		\$ 14,618,620	\$ 6,937,506	\$ 14,670,254	\$ 36,226,381	\$ 275,655	\$ 275,655	\$ 36,502,036
Ten Year Total		\$ 11,864,772	\$ 5,352,133	\$ 12,643,797	\$ 29,860,702	\$ 275,655	\$ 275,655	\$ 30,136,358

Table 8.9 - Annual Capital Improvement Budget - SMWD

Year	Fiscal Year	PC 02			PC 02 Total	PC 05	PC 05 Total	Grand Total
		Liquids	Common	Solids				
1	2020	\$ 730,766	\$ 271,529	\$ 1,441,826	\$ 2,444,120	\$ 33,564	\$ 33,564	\$ 2,477,684
2	2021	\$ 855,829	\$ 289,528	\$ 1,537,949	\$ 2,683,306	\$ 240,293	\$ 240,293	\$ 2,923,600
3	2022	\$ 817,674	\$ 134,351	\$ 1,366,814	\$ 2,318,839			\$ 2,318,839
4	2023	\$ 1,226,036	\$ 66,833	\$ 66,280	\$ 1,359,150	\$ 79,142	\$ 79,142	\$ 1,438,292
5	2024	\$ 236,449	\$ 74,115	\$ 1,236,234	\$ 1,546,798	\$ 17,256	\$ 17,256	\$ 1,564,054
6	2025	\$ 814,325	\$1,581,585	\$ 232,699	\$ 2,628,609	\$ 257,861	\$ 257,861	\$ 2,886,470
7	2026	\$ 662,923	\$ 538,321	\$ 1,514,496	\$ 2,715,740	\$ 39,882	\$ 39,882	\$ 2,755,623
8	2027	\$ 186,984	\$ 194,174	\$ 4,116,428	\$ 4,497,586			\$ 4,497,586
9	2028	\$ 56,115	\$ 806,399	\$ 77,586	\$ 940,100	\$ 434,623	\$ 434,623	\$ 1,374,722
10	2029	\$ 1,086,835	\$ 66,877	\$ 370,036	\$ 1,523,748			\$ 1,523,748
11	2030	\$ 331,796	\$ 514,668	\$ 82,631	\$ 929,095			\$ 929,095
12	2031	\$ 61,676	\$ 71,226	\$ 1,561,738	\$ 1,694,640			\$ 1,694,640
13	2032	\$ 713,566	\$ 73,505	\$ 88,004	\$ 875,075			\$ 875,075
14	2033	\$ 222,685	\$ 75,857	\$ 90,820	\$ 389,363			\$ 389,363
15	2034	\$ 219,316	\$ 456,620	\$ 93,726	\$ 769,663			\$ 769,663
Grand Total		\$ 8,222,974	\$5,215,590	\$13,877,268	\$27,315,832	\$1,102,622	\$1,102,622	\$28,418,454
Ten Year Total		\$ 6,673,935	\$4,023,713	\$11,960,348	\$22,657,996	\$1,102,622	\$1,102,622	\$23,760,618

Table 8.10 - Annual Capital Improvement Budget - SCWD

Year	Fiscal Year	PC 02			PC 02 Total	PC 05	PC 05 Total	PC 15		PC 15 Total	PC 17				PC 17 Total	PC 24	PC 24 Total	Grand Total
		Liquids	Common	Solids				Liquids	AWT		Liquids	Common	Solids	AWT				
1	2020	\$ 1,217,943	\$ 290,310	\$1,016,144	\$ 2,524,397	\$ 9,444	\$ 9,444	\$ 3,678,016	\$ 40,000	\$ 3,718,016	\$ -	\$ 23,686	\$ 176,884	\$-	\$ 200,570	\$ 13,080	\$ 13,080	\$ 6,465,507
2	2021	\$ 1,426,381	\$ 309,554	\$1,083,888	\$ 2,819,824	\$ 67,610	\$ 67,610	\$ 2,390,787		\$ 2,390,787	\$ -	\$ 65,510	\$ 38,532	\$-	\$ 104,041	\$ 6,242	\$ 6,242	\$ 5,388,504
3	2022	\$ 1,362,790	\$ 143,644	\$ 963,278	\$ 2,469,712			\$ 1,352,225	\$ 67,080	\$ 1,419,305	\$ -	\$ 120,647	\$ 294,817	\$-	\$ 415,464			\$ 4,304,481
4	2023	\$ 2,043,394	\$ 71,456	\$ 46,712	\$ 2,161,562	\$ 22,268	\$ 22,268	\$ 424,298	\$ 69,227	\$ 493,524	\$ -	\$ 103,712	\$ 39,165	\$-	\$ 142,877	\$ 8,243	\$ 8,243	\$ 2,828,474
5	2024	\$ 394,081	\$ 79,242	\$ 871,250	\$ 1,344,573	\$ 4,855	\$ 4,855	\$ 1,138,843	\$ 71,442	\$ 1,210,285	\$ -	\$ 286,756	\$ 51,776	\$-	\$ 338,533			\$ 2,898,246
6	2025	\$ 1,357,208	\$1,690,983	\$ 163,997	\$ 3,212,188	\$ 72,553	\$ 72,553	\$ 1,037,036	\$ 325,719	\$ 1,362,755	\$ -	\$ 9,678	\$1,464,160	\$-	\$1,473,838	\$ 21,305	\$ 21,305	\$ 6,142,639
7	2026	\$ 1,104,872	\$ 575,556	\$1,067,359	\$ 2,747,788	\$ 11,221	\$ 11,221	\$ 955,395	\$ 76,087	\$ 1,031,482	\$ -	\$ 206,091	\$ 108,500	\$-	\$ 314,591	\$ 299	\$ 299	\$ 4,105,381
8	2027	\$ 311,639	\$ 207,605	\$2,901,102	\$ 3,420,346			\$ 927,753	\$1,632,435	\$ 2,560,188	\$ -	\$ 209,072	\$ 24,575	\$-	\$ 233,647	\$ 72,681	\$ 72,681	\$ 6,286,862
9	2028	\$ 93,525	\$ 862,177	\$ 54,680	\$ 1,010,381	\$122,287	\$122,287	\$ 970,821	\$ 81,035	\$ 1,051,856	\$ -	\$ 46,565	\$ 237,365	\$-	\$ 283,929			\$ 2,468,453
10	2029	\$ 1,811,391	\$ 71,503	\$ 260,787	\$ 2,143,681			\$ 1,819,633	\$ 83,628	\$ 1,903,260	\$ -	\$ 205,644	\$ 26,173	\$-	\$ 231,817	\$ 972,042	\$ 972,042	\$ 5,250,801
11	2030	\$ 552,993	\$ 550,267	\$ 58,235	\$ 1,161,496			\$ 1,306,172	\$3,296,310	\$ 4,602,482	\$ -	\$ 11,329	\$ 66,501	\$-	\$ 77,831			\$ 5,841,809
12	2031	\$ 102,793	\$ 76,153	\$1,100,653	\$ 1,279,599			\$ 914,931	\$ 89,066	\$ 1,003,997	\$ -	\$ 11,692	\$1,951,467	\$-	\$1,963,159			\$ 4,246,755
13	2032	\$ 1,189,276	\$ 78,590	\$ 62,022	\$ 1,329,888			\$ 1,552,982	\$ 91,916	\$ 1,644,898	\$ -	\$ 12,066	\$ 136,183	\$-	\$ 148,249			\$ 3,123,035
14	2033	\$ 371,142	\$ 81,105	\$ 64,007	\$ 516,253			\$ 998,711	\$ 94,857	\$ 1,093,568	\$ -	\$ 12,452	\$ 29,687	\$-	\$ 42,139			\$ 1,651,960
15	2034	\$ 365,527	\$ 488,205	\$ 66,055	\$ 919,787			\$ 2,437,798	\$ 513,132	\$ 2,950,930	\$ -	\$ 201,153	\$ 30,637	\$-	\$ 231,790	\$ 18,627	\$ 18,627	\$ 4,121,133
Grand Total		\$ 13,704,957	\$5,576,350	\$9,780,170	\$29,061,476	\$310,237	\$ 310,237	\$21,905,401	\$6,531,933	\$28,437,334	\$ -	\$1,526,053	\$4,676,422	\$-	\$6,202,474	\$1,112,518	\$1,112,518	\$65,124,039
Ten Year Total		\$ 11,123,224	\$4,302,031	\$8,429,198	\$23,854,453	\$310,237	\$ 310,237	\$14,694,807	\$2,446,652	\$17,141,458	\$ -	\$1,277,362	\$2,461,946	\$-	\$3,739,307	\$1,093,891	\$1,093,891	\$46,139,347

GENERAL

The capital improvement budget for any given fiscal year is rarely expended within that fiscal year. Larger projects require multiple years for design and construction. Years 1 (2019/20) and 2 (2020/21) are already based on cost loading as set forth in the Fiscal Year 2029/20 Budget. Several of the larger projects in the Ten Year Plan have already been divided between multiple years to reflect the multiple years of expenditures. The remaining projects in Years 3 through 15 are based in the cost loading assumptions presented in Table 9.1.

Table 9.2 presents the anticipated expenditures for each year of the fifteen span for each project committee cost center. The table also includes a bar chart showing the shift of budget numbers that can be expected with the cost loading.

Tables 9.3 through 9.11 show the anticipated annual expenditures for each of the participating member agencies.

Table 9.1 - Cost Loading Basis

Project Type	First Fiscal Year	Second Fiscal Year	Third Fiscal Year
Condition Assessment	100%	0%	0%
Construction	25%	50%	25%
Construction with Permitting	10%	10%	80%
Design	50%	50%	0%
Study	100%	0%	0%

Table 9.2 - Annual Capital Improvement Budget with Cost Loading

Year	Values	PC 02			PC 02 Total	PC 05	PC 05 Total	PC 15		PC 15 Total	PC 17				PC 17 Total	PC 21		PC 21 Total	PC 24	PC 24 Total	Grand Total
		Liquids	Common	Solids				Liquids	AWT		Liquids	Common	Solids	AWT		B/C/D	E				
1	2020	\$ 4,222,203	\$ 1,188,671	\$ 5,080,720	\$ 10,491,594	\$ 75,730	\$ 75,730	\$ 12,321,354	\$ 40,000	\$ 12,361,354	\$ 6,793,536	\$ 472,696	\$ 1,974,150	\$ 35,000	\$ 9,275,382	\$ 226,011	\$ 103,673	\$ 329,684	\$ 106,253	\$ 106,253	\$ 32,639,997
2	2021	\$ 4,944,789	\$ 1,267,467	\$ 5,419,441	\$ 11,631,697	\$ 542,178	\$ 542,178	\$ 8,009,136	\$ -	\$ 8,009,136	\$ 3,945,308	\$ 1,307,355	\$ 430,040	\$ 36,120	\$ 5,718,823	\$ 172,288	\$ 105,640	\$ 277,927	\$ 50,703	\$ 50,703	\$ 26,230,465
3	2022	\$ 1,496,825	\$ 323,166	\$ 1,373,836	\$ 3,193,827	\$ -	\$ -	\$ 1,707,080	\$ 67,080	\$ 1,774,160	\$ 2,064,517	\$ 844,228	\$ 998,321	\$ 37,276	\$ 3,944,341	\$ 241,652	\$ -	\$ 241,652	\$ -	\$ -	\$ 9,153,979
4	2023	\$ 4,130,348	\$ 469,231	\$ 2,528,597	\$ 7,128,176	\$ 149,274	\$ 149,274	\$ 2,754,544	\$ 69,227	\$ 2,823,771	\$ 3,472,848	\$ 1,771,102	\$ 1,965,145	\$ 38,469	\$ 7,247,563	\$ 483,304	\$ -	\$ 483,304	\$ 66,964	\$ 66,964	\$ 17,899,052
5	2024	\$ 5,343,977	\$ 412,783	\$ 2,417,357	\$ 8,174,116	\$ 38,999	\$ 38,999	\$ 2,785,390	\$ 71,442	\$ 2,856,832	\$ 2,623,408	\$ 3,024,771	\$ 1,095,636	\$ 39,700	\$ 6,783,514	\$ 413,223	\$ -	\$ 413,223	\$ -	\$ -	\$ 18,266,684
6	2025	\$ 3,433,453	\$ 1,924,511	\$ 2,449,166	\$ 7,807,129	\$ 87,415	\$ 87,415	\$ 2,997,306	\$ 136,726	\$ 3,134,032	\$ 1,656,333	\$ 3,382,161	\$ 4,442,572	\$ 40,970	\$ 9,522,036	\$ 904,237	\$ -	\$ 904,237	\$ 86,535	\$ 86,535	\$ 21,541,383
7	2026	\$ 3,558,010	\$ 4,121,729	\$ 4,111,176	\$ 11,790,915	\$ 80,678	\$ 80,678	\$ 3,088,335	\$ 202,083	\$ 3,290,418	\$ 3,889,233	\$ 2,629,719	\$ 8,625,912	\$ 42,281	\$ 15,187,144	\$ 902,252	\$ 401,942	\$ 1,304,194	\$ 87,143	\$ 87,143	\$ 31,740,492
8	2027	\$ 3,371,111	\$ 3,130,199	\$ 6,507,923	\$ 13,009,233	\$ 510,447	\$ 510,447	\$ 3,748,931	\$ 529,998	\$ 4,278,929	\$ 7,002,865	\$ 3,100,158	\$ 4,767,741	\$ 43,634	\$ 14,914,399	\$ 1,284,911	\$ 397,611	\$ 1,682,522	\$ 296,426	\$ 296,426	\$ 34,691,956
9	2028	\$ 1,588,760	\$ 1,905,443	\$ 7,393,692	\$ 10,887,895	\$ 1,003,144	\$ 1,003,144	\$ 2,796,008	\$ 857,991	\$ 3,653,999	\$ 7,563,502	\$ 3,326,263	\$ 1,110,867	\$ 45,030	\$ 12,045,663	\$ 1,600,775	\$ 795,222	\$ 2,395,997	\$ 295,818	\$ 295,818	\$ 30,282,515
10	2029	\$ 2,012,363	\$ 2,059,796	\$ 4,097,741	\$ 8,169,901	\$ -	\$ -	\$ 4,425,180	\$ 472,106	\$ 4,897,286	\$ 5,983,618	\$ 2,540,464	\$ 1,475,161	\$ 46,471	\$ 10,045,714	\$ 1,546,455	\$ 397,611	\$ 1,944,066	\$ 789,636	\$ 789,636	\$ 25,846,603
11	2030	\$ 3,710,684	\$ 1,601,490	\$ 802,071	\$ 6,114,244	\$ -	\$ -	\$ 5,291,205	\$ 888,806	\$ 6,180,010	\$ 5,359,667	\$ 2,347,782	\$ 1,003,168	\$ 47,958	\$ 8,758,576	\$ 1,348,961	\$ -	\$ 1,348,961	\$ 789,636	\$ 789,636	\$ 23,191,427
12	2031	\$ 2,628,445	\$ 1,287,269	\$ 1,856,634	\$ 5,772,348	\$ -	\$ -	\$ 4,480,638	\$ 1,694,069	\$ 6,174,707	\$ 4,740,324	\$ 1,204,547	\$ 5,898,642	\$ 49,493	\$ 11,893,006	\$ 674,481	\$ -	\$ 674,481	\$ 6,317,086	\$ 6,317,086	\$ 30,831,628
13	2032	\$ 1,699,457	\$ 809,515	\$ 2,911,496	\$ 5,420,468	\$ -	\$ -	\$ 3,595,942	\$ 894,417	\$ 4,490,359	\$ 2,693,589	\$ 240,791	\$ 11,465,288	\$ 51,077	\$ 14,450,746	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 24,361,573
14	2033	\$ 2,483,833	\$ 332,081	\$ 1,620,726	\$ 4,436,641	\$ -	\$ -	\$ 4,229,469	\$ 94,857	\$ 4,324,326	\$ 3,020,580	\$ 248,496	\$ 6,297,919	\$ 52,711	\$ 9,619,706	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 18,380,673
15	2034	\$ 2,002,860	\$ 756,768	\$ 330,274	\$ 3,089,902	\$ -	\$ -	\$ 5,041,485	\$ 201,702	\$ 5,243,187	\$ 4,493,971	\$ 1,195,918	\$ 641,643	\$ 54,398	\$ 6,385,930	\$ -	\$ -	\$ -	\$ 37,829	\$ 37,829	\$ 14,756,849
16	2035	\$ 664,524	\$ 828,120	\$ -	\$ 1,492,644	\$ -	\$ -	\$ 4,283,671	\$ 207,620	\$ 4,491,290	\$ 2,251,986	\$ 1,878,940	\$ -	\$ -	\$ 4,130,925	\$ -	\$ -	\$ -	\$ 75,657	\$ 75,657	\$ 10,190,517
17	2036	\$ 218,874	\$ 414,060	\$ -	\$ 632,934	\$ -	\$ -	\$ 1,827,421	\$ 103,810	\$ 1,931,231	\$ 254,660	\$ 939,470	\$ -	\$ -	\$ 1,194,129	\$ -	\$ -	\$ -	\$ 37,829	\$ 37,829	\$ 3,796,123
Grand Total		\$ 47,510,517	\$ 22,832,298	\$ 48,900,848	\$ 119,243,663	\$ 2,487,865	\$ 2,487,865	\$ 73,383,093	\$ 6,531,933	\$ 79,915,026	\$ 67,809,943	\$ 30,454,860	\$ 52,192,205	\$ 660,589	\$ 151,117,598	\$ 9,798,549	\$ 2,201,700	\$ 12,000,249	\$ 9,037,514	\$ 9,037,514	\$ 373,801,915
Ten Year Total		\$ 34,101,839	\$ 16,802,995	\$ 41,379,648	\$ 92,284,482	\$ 2,487,865	\$ 2,487,865	\$ 44,633,264	\$ 2,446,652	\$ 47,079,915	\$ 44,995,167	\$ 22,398,916	\$ 26,885,545	\$ 404,951	\$ 94,684,579	\$ 7,775,108	\$ 2,201,700	\$ 9,976,807	\$ 1,779,477	\$ 1,779,477	\$ 248,293,126

Table 9.3 - Annual Capital Improvement Budget with Cost Loading - ETWD

Year	Fiscal Year	PC 17				PC 17 Total	PC 21		PC 21 Total	PC 24	PC 24 Total	Grand Total
		Liquids	Common	Solids	AWT		B/C/D	E				
1	2020	\$ -	\$ 48,499	\$ 402,924	\$ -	\$ 451,423	\$ 113,006	\$ 24,145	\$ 137,151	\$ 17,319	\$ 17,319	\$ 605,893
2	2021	\$ -	\$ 134,135	\$ 87,771	\$ -	\$ 221,906	\$ 86,144	\$ 24,604	\$ 110,747	\$ 8,265	\$ 8,265	\$ 340,918
3	2022	\$ -	\$ 86,618	\$ 203,757	\$ -	\$ 290,375	\$ 120,826	\$ -	\$ 120,826	\$ -	\$ -	\$ 411,201
4	2023	\$ -	\$ 181,715	\$ 401,086	\$ -	\$ 582,801	\$ 241,652	\$ -	\$ 241,652	\$ 10,915	\$ 10,915	\$ 835,368
5	2024	\$ -	\$ 310,341	\$ 223,619	\$ -	\$ 533,961	\$ 206,611	\$ -	\$ 206,611	\$ -	\$ -	\$ 740,572
6	2025	\$ -	\$ 347,010	\$ 906,729	\$ -	\$ 1,253,739	\$ 452,118	\$ -	\$ 452,118	\$ 14,105	\$ 14,105	\$ 1,719,962
7	2026	\$ -	\$ 269,809	\$ 1,760,549	\$ -	\$ 2,030,358	\$ 451,126	\$ 93,612	\$ 544,738	\$ 14,204	\$ 14,204	\$ 2,589,300
8	2027	\$ -	\$ 318,076	\$ 973,096	\$ -	\$ 1,291,172	\$ 642,456	\$ 92,604	\$ 735,059	\$ 48,317	\$ 48,317	\$ 2,074,549
9	2028	\$ -	\$ 341,275	\$ 226,728	\$ -	\$ 568,003	\$ 800,387	\$ 185,207	\$ 985,595	\$ 48,218	\$ 48,218	\$ 1,601,816
10	2029	\$ -	\$ 260,652	\$ 301,080	\$ -	\$ 561,732	\$ 773,228	\$ 92,604	\$ 865,831	\$ 128,711	\$ 128,711	\$ 1,556,274
11	2030	\$ -	\$ 240,882	\$ 204,747	\$ -	\$ 445,629	\$ 674,481	\$ -	\$ 674,481	\$ 128,711	\$ 128,711	\$ 1,248,820
12	2031	\$ -	\$ 123,587	\$ 1,203,913	\$ -	\$ 1,327,499	\$ 337,240	\$ -	\$ 337,240	\$ 1,029,685	\$ 1,029,685	\$ 2,694,425
13	2032	\$ -	\$ 24,705	\$ 2,340,065	\$ -	\$ 2,364,771	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 2,364,771
14	2033	\$ -	\$ 25,496	\$ 1,285,405	\$ -	\$ 1,310,901	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,310,901
15	2034	\$ -	\$ 122,701	\$ 130,959	\$ -	\$ 253,660	\$ -	\$ -	\$ -	\$ 6,166	\$ 6,166	\$ 259,827
Grand Total		\$ -	\$ 2,835,500	\$ 10,652,429	\$ -	\$ 13,487,929	\$ 4,899,275	\$ 512,776	\$ 5,412,050	\$ 1,454,617	\$ 1,473,390	\$ 20,354,596
Ten Year Total		\$ -	\$ 2,298,129	\$ 5,487,340	\$ -	\$ 7,785,468	\$ 3,887,554	\$ 512,776	\$ 4,400,330	\$ 290,055	\$ 290,055	\$ 12,475,853

Table 9.4 - Annual Capital Improvement Budget with Cost Loading - EBSD

Year	Fiscal Year	PC 15			PC 17				PC 24		Grand Total	
		Liquids	AWT	PC 15 Total	Liquids	Common	Solids	AWT	PC 17 Total	PC 24 Total		
1	2020	\$ 367,802	\$ -	\$ 367,802	\$ -	\$ 1,560	\$ 11,647	\$ -	\$ 13,207	\$ 829	\$ 829	\$ 381,838
2	2021	\$ 239,079	\$ -	\$ 239,079	\$ -	\$ 4,314	\$ 2,537	\$ -	\$ 6,852	\$ 395	\$ 395	\$ 246,326
3	2022	\$ 50,958	\$ -	\$ 50,958	\$ -	\$ 2,786	\$ 5,890	\$ -	\$ 8,676	\$ -	\$ -	\$ 59,634
4	2023	\$ 82,225	\$ -	\$ 82,225	\$ -	\$ 5,845	\$ 11,594	\$ -	\$ 17,439	\$ 522	\$ 522	\$ 100,187
5	2024	\$ 83,146	\$ -	\$ 83,146	\$ -	\$ 9,982	\$ 6,464	\$ -	\$ 16,446	\$ -	\$ -	\$ 99,592
6	2025	\$ 89,472	\$ -	\$ 89,472	\$ -	\$ 11,161	\$ 26,211	\$ -	\$ 37,372	\$ 675	\$ 675	\$ 127,519
7	2026	\$ 92,189	\$ -	\$ 92,189	\$ -	\$ 8,678	\$ 50,893	\$ -	\$ 59,571	\$ 680	\$ 680	\$ 152,440
8	2027	\$ 111,908	\$ -	\$ 111,908	\$ -	\$ 10,231	\$ 28,130	\$ -	\$ 38,360	\$ 2,312	\$ 2,312	\$ 152,581
9	2028	\$ 83,463	\$ -	\$ 83,463	\$ -	\$ 10,977	\$ 6,554	\$ -	\$ 17,531	\$ 2,307	\$ 2,307	\$ 103,301
10	2029	\$ 132,095	\$ -	\$ 132,095	\$ -	\$ 8,384	\$ 8,703	\$ -	\$ 17,087	\$ 6,159	\$ 6,159	\$ 155,341
11	2030	\$ 157,946	\$ -	\$ 157,946	\$ -	\$ 7,748	\$ 5,919	\$ -	\$ 13,666	\$ 6,159	\$ 6,159	\$ 177,772
12	2031	\$ 133,750	\$ -	\$ 133,750	\$ -	\$ 3,975	\$ 34,802	\$ -	\$ 38,777	\$ 49,273	\$ 49,273	\$ 221,801
13	2032	\$ 107,342	\$ -	\$ 107,342	\$ -	\$ 795	\$ 67,645	\$ -	\$ 68,440	\$ -	\$ -	\$ 175,781
14	2033	\$ 126,253	\$ -	\$ 126,253	\$ -	\$ 820	\$ 37,158	\$ -	\$ 37,978	\$ -	\$ -	\$ 164,231
15	2034	\$ 150,492	\$ -	\$ 150,492	\$ -	\$ 3,947	\$ 3,786	\$ -	\$ 7,732	\$ 295	\$ 295	\$ 158,519
Grand Total		\$ 2,008,119	\$ -	\$ 2,008,119	\$ -	\$ 91,200	\$ 307,934	\$ -	\$ 399,134	\$ 69,607	\$ 69,607	\$ 2,476,861
Ten Year Total		\$ 1,332,336	\$ -	\$ 1,332,336	\$ -	\$ 73,916	\$ 158,625	\$ -	\$ 232,541	\$ 13,880	\$ 13,880	\$ 1,578,757

Table 9.5 - Annual Capital Improvement Budget with Cost Loading - IRWD

Year	Fiscal Year	PC 21		PC 21 Total	PC 24		Grand Total
		B/C/D	E		PC 24 Total		
1	2020	\$ 113,006	\$ 24,145	\$ 137,151	\$ 16,745	\$ 16,745	\$ 153,896
2	2021	\$ 86,144	\$ 24,604	\$ 110,747	\$ 7,991	\$ 7,991	\$ 118,738
3	2022	\$ 120,826	\$ -	\$ 120,826	\$ -	\$ -	\$ 120,826
4	2023	\$ 241,652	\$ -	\$ 241,652	\$ 10,554	\$ 10,554	\$ 252,206
5	2024	\$ 206,611	\$ -	\$ 206,611	\$ -	\$ -	\$ 206,611
6	2025	\$ 452,118	\$ -	\$ 452,118	\$ 13,638	\$ 13,638	\$ 465,756
7	2026	\$ 451,126	\$ 93,612	\$ 544,738	\$ 13,734	\$ 13,734	\$ 558,472
8	2027	\$ 642,456	\$ 92,604	\$ 735,059	\$ 46,717	\$ 46,717	\$ 781,776
9	2028	\$ 800,387	\$ 185,207	\$ 985,595	\$ 46,621	\$ 46,621	\$ 1,032,216
10	2029	\$ 773,228	\$ 92,604	\$ 865,831	\$ 124,447	\$ 124,447	\$ 990,278
11	2030	\$ 674,481	\$ -	\$ 674,481	\$ 124,447	\$ 124,447	\$ 798,927
12	2031	\$ 337,240	\$ -	\$ 337,240	\$ 995,573	\$ 995,573	\$ 1,332,813
13	2032	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
14	2033	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
15	2034	\$ -	\$ -	\$ -	\$ 5,962	\$ 5,962	\$ 5,962
Grand Total		\$ 4,899,275	\$ 512,776	\$ 5,412,050	\$ 1,406,427	\$ 1,406,427	\$ 6,818,477
Ten Year Total		\$ 3,887,554	\$ 512,776	\$ 4,400,330	\$ 280,446	\$ 280,446	\$ 4,680,775

Table 9.6 - Annual Capital Improvement Budget with Cost Loading - CLB

Year	Fiscal Year	PC 15			PC 17				PC 17 Total	PC 24	PC 24 Total	Grand Total
		Liquids	AWT	PC 15 Total	Liquids	Common	Solids	AWT				
1	2020	\$ 4,671,080	\$ -	\$ 4,671,080	\$ -	\$ 29,638	\$ 221,500	\$ -	\$ 251,138	\$ 11,688	\$ 11,688	\$ 4,933,906
2	2021	\$ 3,036,299	\$ -	\$ 3,036,299	\$ -	\$ 81,971	\$ 48,250	\$ -	\$ 130,222	\$ 5,577	\$ 5,577	\$ 3,153,651
3	2022	\$ 647,162	\$ -	\$ 647,162	\$ -	\$ 52,933	\$ 112,012	\$ -	\$ 164,945	\$ -	\$ -	\$ 2,237,472
4	2023	\$ 1,044,260	\$ -	\$ 1,044,260	\$ -	\$ 111,048	\$ 220,489	\$ -	\$ 331,537	\$ 7,366	\$ 7,366	\$ 724,914
5	2024	\$ 1,055,954	\$ -	\$ 1,055,954	\$ -	\$ 189,653	\$ 122,930	\$ -	\$ 312,583	\$ -	\$ -	\$ 1,866,999
6	2025	\$ 1,136,292	\$ -	\$ 1,136,292	\$ -	\$ 212,061	\$ 498,457	\$ -	\$ 710,518	\$ 9,519	\$ 9,519	\$ 3,181,653
7	2026	\$ 1,170,802	\$ -	\$ 1,170,802	\$ -	\$ 164,883	\$ 967,827	\$ -	\$ 1,132,711	\$ 9,586	\$ 9,586	\$ 1,607,363
8	2027	\$ 1,421,237	\$ -	\$ 1,421,237	\$ -	\$ 194,380	\$ 534,941	\$ -	\$ 729,320	\$ 32,607	\$ 32,607	\$ 1,536,562
9	2028	\$ 1,059,979	\$ -	\$ 1,059,979	\$ -	\$ 208,557	\$ 124,639	\$ -	\$ 333,196	\$ 32,540	\$ 32,540	\$ 1,588,444
10	2029	\$ 1,677,605	\$ -	\$ 1,677,605	\$ -	\$ 159,287	\$ 165,513	\$ -	\$ 324,800	\$ 86,860	\$ 86,860	\$ 3,469,506
11	2030	\$ 2,005,919	\$ -	\$ 2,005,919	\$ -	\$ 147,206	\$ 112,555	\$ -	\$ 259,761	\$ 86,860	\$ 86,860	\$ 1,756,290
12	2031	\$ 1,698,630	\$ -	\$ 1,698,630	\$ -	\$ 75,525	\$ 661,828	\$ -	\$ 737,353	\$ 694,879	\$ 694,879	\$ 3,620,282
13	2032	\$ 1,363,238	\$ -	\$ 1,363,238	\$ -	\$ 15,098	\$ 1,286,405	\$ -	\$ 1,301,503	\$ -	\$ -	\$ 2,156,038
14	2033	\$ 1,603,411	\$ -	\$ 1,603,411	\$ -	\$ 15,581	\$ 706,627	\$ -	\$ 722,207	\$ -	\$ -	\$ 1,321,119
15	2034	\$ 1,911,250	\$ -	\$ 1,911,250	\$ -	\$ 74,984	\$ 71,992	\$ -	\$ 146,976	\$ 4,161	\$ 4,161	\$ 2,518,948
Grand Total		\$ 25,503,117	\$ -	\$ 25,503,117	\$ -	\$ 1,732,805	\$ 5,855,965	\$ -	\$ 7,588,771	\$ 981,643	\$ 981,643	\$ 35,673,145
Ten Year Total		\$ 16,920,670	\$ -	\$ 16,920,670	\$ -	\$ 1,404,412	\$ 3,016,558	\$ -	\$ 4,420,970	\$ 195,743	\$ 195,743	\$ 24,300,468

Table 9.7 - Annual Capital Improvement Budget with Cost Loading - MNWD

Year	Fiscal Year	PC 02			PC 02 Total	PC 05	PC 05 Total	PC 15			PC 15 Total	PC 17				PC 17 Total	PC 21		PC 21 Total	PC 24		PC 24 Total	Grand Total
		Liquids	Common	Solids				Liquids	AWT	Liquids		Common	Solids	AWT	B/C/D		E	PC 24 Total					
1	2020	\$ 974,355	\$ 265,659	\$ 1,098,534	\$ 2,338,548	\$ 11,746	\$ 11,746	\$ 3,604,456	\$ -	\$ 3,604,456	\$ 6,793,536	\$ 369,313	\$ 1,161,195	\$ 35,000	\$ 8,359,044	\$ -	\$ 55,382	\$ 55,382	\$ 46,592	\$ 46,592	\$ 14,415,767		
2	2021	\$ 1,141,105	\$ 283,270	\$ 1,171,771	\$ 2,596,146	\$ 84,092	\$ 84,092	\$ 2,342,971	\$ -	\$ 2,342,971	\$ 3,945,308	\$ 1,021,425	\$ 252,950	\$ 36,120	\$ 5,255,803	\$ -	\$ 56,433	\$ 56,433	\$ 22,233	\$ 22,233	\$ 10,357,677		
3	2022	\$ 345,421	\$ 72,225	\$ 297,046	\$ 714,692	\$ -	\$ -	\$ 499,384	\$ -	\$ 499,384	\$ 2,064,517	\$ 659,588	\$ 587,212	\$ 37,276	\$ 3,348,593	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 4,562,669		
4	2023	\$ 953,157	\$ 104,870	\$ 546,724	\$ 1,604,751	\$ 23,152	\$ 23,152	\$ 805,807	\$ -	\$ 805,807	\$ 3,472,848	\$ 1,383,746	\$ 1,155,898	\$ 38,469	\$ 6,050,961	\$ -	\$ -	\$ -	\$ 29,364	\$ 29,364	\$ 8,514,035		
5	2024	\$ 1,233,225	\$ 92,254	\$ 522,672	\$ 1,848,151	\$ 6,049	\$ 6,049	\$ 814,830	\$ -	\$ 814,830	\$ 2,623,408	\$ 2,363,227	\$ 644,453	\$ 39,700	\$ 5,670,788	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 8,339,818		
6	2025	\$ 792,335	\$ 430,114	\$ 529,549	\$ 1,751,999	\$ 13,558	\$ 13,558	\$ 876,824	\$ -	\$ 876,824	\$ 1,656,333	\$ 2,642,453	\$ 2,613,121	\$ 40,970	\$ 6,952,877	\$ -	\$ -	\$ -	\$ 37,946	\$ 37,946	\$ 9,633,203		
7	2026	\$ 821,079	\$ 921,176	\$ 888,903	\$ 2,631,159	\$ 12,513	\$ 12,513	\$ 903,453	\$ -	\$ 903,453	\$ 3,889,233	\$ 2,054,576	\$ 5,073,761	\$ 42,281	\$ 11,059,852	\$ -	\$ 214,717	\$ 214,717	\$ 38,212	\$ 38,212	\$ 14,859,906		
8	2027	\$ 777,949	\$ 699,577	\$ 1,407,118	\$ 2,884,644	\$ 79,170	\$ 79,170	\$ 1,096,702	\$ -	\$ 1,096,702	\$ 7,002,865	\$ 2,422,126	\$ 2,804,385	\$ 43,634	\$ 12,273,011	\$ -	\$ 212,404	\$ 212,404	\$ 129,983	\$ 129,983	\$ 16,675,914		
9	2028	\$ 366,637	\$ 425,853	\$ 1,598,636	\$ 2,391,126	\$ 155,588	\$ 155,588	\$ 817,937	\$ -	\$ 817,937	\$ 7,563,502	\$ 2,598,781	\$ 653,412	\$ 45,030	\$ 10,860,725	\$ -	\$ 424,808	\$ 424,808	\$ 129,716	\$ 129,716	\$ 14,779,899		
10	2029	\$ 464,392	\$ 460,349	\$ 885,998	\$ 1,810,739	\$ -	\$ -	\$ 1,294,530	\$ -	\$ 1,294,530	\$ 5,983,618	\$ 1,984,843	\$ 867,690	\$ 46,471	\$ 8,882,622	\$ -	\$ 212,404	\$ 212,404	\$ 346,255	\$ 346,255	\$ 12,546,550		
11	2030	\$ 856,312	\$ 357,921	\$ 173,421	\$ 1,387,654	\$ -	\$ -	\$ 1,547,875	\$ -	\$ 1,547,875	\$ 5,359,667	\$ 1,834,301	\$ 590,064	\$ 47,958	\$ 7,831,991	\$ -	\$ -	\$ -	\$ 346,255	\$ 346,255	\$ 11,113,775		
12	2031	\$ 606,564	\$ 287,695	\$ 401,434	\$ 1,295,694	\$ -	\$ -	\$ 1,310,754	\$ -	\$ 1,310,754	\$ 4,740,324	\$ 941,102	\$ 3,469,581	\$ 49,493	\$ 9,200,501	\$ -	\$ -	\$ -	\$ 2,770,042	\$ 2,770,042	\$ 14,576,990		
13	2032	\$ 392,182	\$ 180,921	\$ 629,513	\$ 1,202,616	\$ -	\$ -	\$ 1,051,947	\$ -	\$ 1,051,947	\$ 2,693,589	\$ 188,128	\$ 6,743,883	\$ 51,077	\$ 9,676,677	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 11,931,240		
14	2033	\$ 573,192	\$ 74,218	\$ 350,427	\$ 997,837	\$ -	\$ -	\$ 1,237,277	\$ -	\$ 1,237,277	\$ 3,020,580	\$ 194,148	\$ 3,704,436	\$ 52,711	\$ 6,971,875	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 9,206,990		
15	2034	\$ 462,199	\$ 169,132	\$ 71,411	\$ 702,741	\$ -	\$ -	\$ 1,474,822	\$ -	\$ 1,474,822	\$ 4,493,971	\$ 934,360	\$ 377,414	\$ 54,398	\$ 5,860,144	\$ -	\$ -	\$ -	\$ 16,588	\$ 16,588	\$ 8,054,295		
Grand Total		\$ 10,760,104	\$ 4,825,234	\$ 10,573,156	\$ 26,158,495	\$ 385,868	\$ 385,868	\$ 19,679,571	\$ -	\$ 19,679,571	\$ 65,303,298	\$ 21,592,119	\$ 30,699,455	\$ 660,589	\$ 118,255,462	\$ -	\$ 1,176,148	\$ 1,176,148	\$ 3,913,186	\$ 3,913,186	\$ 169,568,729		
Ten Year Total		\$ 7,869,655	\$ 3,755,347	\$ 8,946,951	\$ 20,571,953	\$ 385,868	\$ 385,868	\$ 13,056,895	\$ -	\$ 13,056,895	\$ 44,995,167	\$ 17,500,079	\$ 15,814,077	\$ 404,951	\$ 78,714,274	\$ -	\$ 1,176,148	\$ 1,176,148	\$ 780,301	\$ 780,301	\$ 114,685,439		

Table 9.8 - Annual Capital Improvement Budget with Cost Loading - CSC

Year	Fiscal Year	PC 05	PC 05 Total	Grand Total
1	2020	\$ 12,586	\$ 12,586	\$ 12,586
2	2021	\$ 90,110	\$ 90,110	\$ 90,110
3	2022	\$ -	\$ -	\$ -
4	2023	\$ 24,809	\$ 24,809	\$ 24,809
5	2024	\$ 6,482	\$ 6,482	\$ 6,482
6	2025	\$ 14,528	\$ 14,528	\$ 14,528
7	2026	\$ 13,409	\$ 13,409	\$ 13,409
8	2027	\$ 84,836	\$ 84,836	\$ 84,836
9	2028	\$ 166,723	\$ 166,723	\$ 166,723
10	2029	\$ -	\$ -	\$ -
Grand Total		\$ 413,508	\$ 413,508	\$ 413,508
Ten Year Total		\$ 413,483	\$ 413,483	\$ 413,483

Table 9.9 - Annual Capital Improvement Budget with Cost Loading - CSJC

Year	Fiscal Year	PC 02			PC 02 Total	PC 05	PC 05 Total	Grand Total
		Liquids	Common	Solids				
1	2020	\$ 1,299,139	\$ 361,173	\$ 1,524,216	\$ 3,184,528	\$ 8,391	\$ 8,391	\$ 3,192,919
2	2021	\$ 1,521,474	\$ 385,115	\$ 1,625,832	\$ 3,532,421	\$ 60,073	\$ 60,073	\$ 3,592,494
3	2022	\$ 460,562	\$ 98,193	\$ 412,151	\$ 970,905	\$ -	\$ -	\$ 970,905
4	2023	\$ 1,270,876	\$ 142,574	\$ 758,579	\$ 2,172,029	\$ 16,540	\$ 16,540	\$ 2,188,569
5	2024	\$ 1,644,300	\$ 125,423	\$ 725,207	\$ 2,494,930	\$ 4,321	\$ 4,321	\$ 2,499,251
6	2025	\$ 1,056,447	\$ 584,755	\$ 734,750	\$ 2,375,952	\$ 9,686	\$ 9,686	\$ 2,385,637
7	2026	\$ 1,094,772	\$ 1,252,372	\$ 1,233,353	\$ 3,580,496	\$ 8,939	\$ 8,939	\$ 3,589,436
8	2027	\$ 1,037,265	\$ 951,099	\$ 1,952,377	\$ 3,940,741	\$ 56,558	\$ 56,558	\$ 3,997,298
9	2028	\$ 488,849	\$ 578,961	\$ 2,218,108	\$ 3,285,918	\$ 111,148	\$ 111,148	\$ 3,397,067
10	2029	\$ 619,189	\$ 625,861	\$ 1,229,322	\$ 2,474,372	\$ -	\$ -	\$ 2,474,372
11	2030	\$ 1,141,749	\$ 486,606	\$ 240,621	\$ 1,868,977	\$ -	\$ -	\$ 1,868,977
12	2031	\$ 808,752	\$ 391,132	\$ 556,990	\$ 1,756,874	\$ -	\$ -	\$ 1,756,874
13	2032	\$ 522,910	\$ 245,968	\$ 873,449	\$ 1,642,327	\$ -	\$ -	\$ 1,642,327
14	2033	\$ 764,256	\$ 100,902	\$ 486,218	\$ 1,351,376	\$ -	\$ -	\$ 1,351,376
15	2034	\$ 616,265	\$ 229,941	\$ 99,082	\$ 945,288	\$ -	\$ -	\$ 945,288
Grand Total		\$ 14,346,806	\$ 6,560,074	\$ 14,670,254	\$ 35,577,135	\$ 275,655	\$ 275,655	\$ 35,852,790
Ten Year Total		\$ 10,492,874	\$ 5,105,525	\$ 12,413,894	\$ 28,012,293	\$ 275,655	\$ 275,655	\$ 28,287,949

Table 9.10 - Annual Capital Improvement Budget with Cost Loading - SMWD

Year	Fiscal Year	PC 02			PC 02 Total	PC 05	PC 05 Total	Grand Total
		Liquids	Common	Solids				
1	2020	\$ 730,766	\$ 271,529	\$ 1,441,826	\$ 2,444,120	\$ 33,564	\$ 33,564	\$ 2,477,684
2	2021	\$ 855,829	\$ 289,528	\$ 1,537,949	\$ 2,683,306	\$ 240,293	\$ 240,293	\$ 2,923,600
3	2022	\$ 259,066	\$ 73,821	\$ 389,872	\$ 722,759	\$ -	\$ -	\$ 722,759
4	2023	\$ 714,868	\$ 107,187	\$ 717,575	\$ 1,539,629	\$ 66,158	\$ 66,158	\$ 1,605,787
5	2024	\$ 924,919	\$ 94,292	\$ 686,007	\$ 1,705,218	\$ 17,284	\$ 17,284	\$ 1,722,502
6	2025	\$ 594,251	\$ 439,617	\$ 695,033	\$ 1,728,902	\$ 38,742	\$ 38,742	\$ 1,767,644
7	2026	\$ 615,809	\$ 941,528	\$ 1,166,685	\$ 2,724,022	\$ 35,757	\$ 35,757	\$ 2,759,779
8	2027	\$ 583,462	\$ 715,032	\$ 1,846,843	\$ 3,145,337	\$ 226,230	\$ 226,230	\$ 3,371,567
9	2028	\$ 274,978	\$ 435,261	\$ 2,098,210	\$ 2,808,449	\$ 444,593	\$ 444,593	\$ 3,253,042
10	2029	\$ 348,294	\$ 470,520	\$ 1,162,873	\$ 1,981,686	\$ -	\$ -	\$ 1,981,686
11	2030	\$ 642,234	\$ 365,829	\$ 227,615	\$ 1,235,677	\$ -	\$ -	\$ 1,235,677
12	2031	\$ 454,923	\$ 294,051	\$ 526,883	\$ 1,275,857	\$ -	\$ -	\$ 1,275,857
13	2032	\$ 294,137	\$ 184,918	\$ 826,235	\$ 1,305,290	\$ -	\$ -	\$ 1,305,290
14	2033	\$ 429,894	\$ 75,857	\$ 459,936	\$ 965,687	\$ -	\$ -	\$ 965,687
15	2034	\$ 346,649	\$ 172,869	\$ 93,726	\$ 613,244	\$ -	\$ -	\$ 613,244
Grand Total		\$ 8,070,078	\$ 4,931,838	\$ 13,877,268	\$ 26,879,184	\$ 1,102,622	\$ 1,102,622	\$ 27,981,806
Ten Year Total		\$ 5,902,241	\$ 3,838,314	\$ 11,742,873	\$ 21,483,429	\$ 1,102,622	\$ 1,102,622	\$ 22,586,050

Table 9.11 - Annual Capital Improvement Budget with Cost Loading - SCWD

Year	Fiscal Year	PC 02			PC 02 Total	PC 05		PC 05 Total	PC 15		PC 15 Total	PC 17				PC 17 Total	PC 24		Grand Total
		Liquids	Common	Solids		Liquids	AWT		Liquids	Common		Solids	AWT	PC 24	PC 24 Total				
1	2020	\$ 1,217,943	\$ 290,310	\$ 1,016,144	\$ 2,524,397	\$ 9,444	\$ 9,444	\$ 3,678,016	\$ 40,000	\$ 3,718,016	\$ -	\$ 23,686	\$ 176,884	\$ -	\$ 200,570	\$ 13,080	\$ 13,080	\$ 6,465,506.55	
2	2021	\$ 1,426,381	\$ 309,554	\$ 1,083,888	\$ 2,819,824	\$ 67,610	\$ 67,610	\$ 2,390,787	\$ -	\$ 2,390,787	\$ -	\$ 65,510	\$ 38,532	\$ -	\$ 104,041	\$ 6,242	\$ 6,242	\$ 5,388,503.58	
3	2022	\$ 431,776	\$ 78,927	\$ 274,767	\$ 785,471	\$ -	\$ -	\$ 509,576	\$ 67,080	\$ 576,656	\$ -	\$ 42,303	\$ 89,450	\$ -	\$ 131,753	\$ -	\$ -	\$ 1,493,879.30	
4	2023	\$ 1,191,447	\$ 114,601	\$ 505,719	\$ 1,811,767	\$ 18,614	\$ 18,614	\$ 822,252	\$ 69,227	\$ 891,479	\$ -	\$ 88,748	\$ 176,077	\$ -	\$ 264,825	\$ 8,243	\$ 8,243	\$ 2,994,927.39	
5	2024	\$ 1,541,532	\$ 100,814	\$ 483,471	\$ 2,125,817	\$ 4,863	\$ 4,863	\$ 831,460	\$ 71,442	\$ 902,902	\$ -	\$ 151,567	\$ 98,169	\$ -	\$ 249,736	\$ -	\$ -	\$ 3,283,318.18	
6	2025	\$ 990,419	\$ 470,025	\$ 489,833	\$ 1,950,277	\$ 10,901	\$ 10,901	\$ 894,718	\$ 136,726	\$ 1,031,444	\$ -	\$ 169,476	\$ 398,054	\$ -	\$ 567,530	\$ 10,652	\$ 10,652	\$ 3,570,804.00	
7	2026	\$ 1,026,349	\$ 1,006,653	\$ 822,235	\$ 2,855,237	\$ 10,061	\$ 10,061	\$ 921,891	\$ 202,083	\$ 1,123,974	\$ -	\$ 131,772	\$ 772,882	\$ -	\$ 904,653	\$ 10,727	\$ 10,727	\$ 4,904,652.25	
8	2027	\$ 972,436	\$ 764,491	\$ 1,301,585	\$ 3,038,511	\$ 63,653	\$ 63,653	\$ 1,119,084	\$ 529,998	\$ 1,649,082	\$ -	\$ 155,345	\$ 427,190	\$ -	\$ 582,534	\$ 36,490	\$ 36,490	\$ 5,370,270.46	
9	2028	\$ 458,296	\$ 465,368	\$ 1,478,738	\$ 2,402,402	\$ 125,092	\$ 125,092	\$ 834,629	\$ 857,991	\$ 1,692,620	\$ -	\$ 166,675	\$ 99,534	\$ -	\$ 266,208	\$ 36,415	\$ 36,415	\$ 4,522,738.06	
10	2029	\$ 580,489	\$ 503,066	\$ 819,548	\$ 1,903,103	\$ -	\$ -	\$ 1,320,949	\$ 472,106	\$ 1,793,055	\$ -	\$ 127,299	\$ 132,174	\$ -	\$ 259,474	\$ 97,204	\$ 97,204	\$ 4,052,836.32	
11	2030	\$ 1,070,390	\$ 391,133	\$ 160,414	\$ 1,621,937	\$ -	\$ -	\$ 1,579,464	\$ 888,806	\$ 2,468,270	\$ -	\$ 117,644	\$ 89,884	\$ -	\$ 207,528	\$ 97,204	\$ 97,204	\$ 4,394,938.71	
12	2031	\$ 758,205	\$ 314,391	\$ 371,327	\$ 1,443,923	\$ -	\$ -	\$ 1,337,504	\$ 1,694,069	\$ 3,031,573	\$ -	\$ 60,358	\$ 528,518	\$ -	\$ 588,877	\$ 777,633	\$ 777,633	\$ 5,842,005.46	
13	2032	\$ 490,228	\$ 197,709	\$ 582,299	\$ 1,270,236	\$ -	\$ -	\$ 1,073,415	\$ 894,417	\$ 1,967,833	\$ -	\$ 12,066	\$ 1,027,290	\$ -	\$ 1,039,356	\$ -	\$ -	\$ 4,277,424.04	
14	2033	\$ 716,490	\$ 81,105	\$ 324,145	\$ 1,121,740	\$ -	\$ -	\$ 1,262,528	\$ 94,857	\$ 1,357,385	\$ -	\$ 12,452	\$ 564,294	\$ -	\$ 576,745	\$ -	\$ -	\$ 3,055,870.49	
15	2034	\$ 577,748	\$ 184,826	\$ 66,055	\$ 828,629	\$ -	\$ -	\$ 1,504,921	\$ 201,702	\$ 1,706,623	\$ -	\$ 59,926	\$ 57,491	\$ -	\$ 117,417	\$ 4,657	\$ 4,657	\$ 2,657,326.12	
Grand Total		\$ 13,450,130	\$ 5,272,971	\$ 9,780,170	\$ 28,503,271	\$ 310,237	\$ 310,237	\$ 20,081,195	\$ 6,220,503	\$ 26,301,698	\$ -	\$ 1,384,826	\$ 4,676,422	\$ -	\$ 6,061,247	\$ 1,098,548	\$ 1,098,548	\$ 62,275,001	
Ten Year Total		\$ 9,837,069	\$ 4,103,808	\$ 8,275,930	\$ 22,216,807	\$ 310,237	\$ 310,237	\$ 13,323,362	\$ 2,446,652	\$ 15,770,014	\$ -	\$ 1,122,380	\$ 2,408,945	\$ -	\$ 3,531,325	\$ 219,054	\$ 219,054	\$ 42,047,436	

Appendix A
Cost Escalation Analysis



COST ESCALATION ANALYSIS
2019 UPDATE

Technical Memorandum
July 2019

Summary and Results

Background

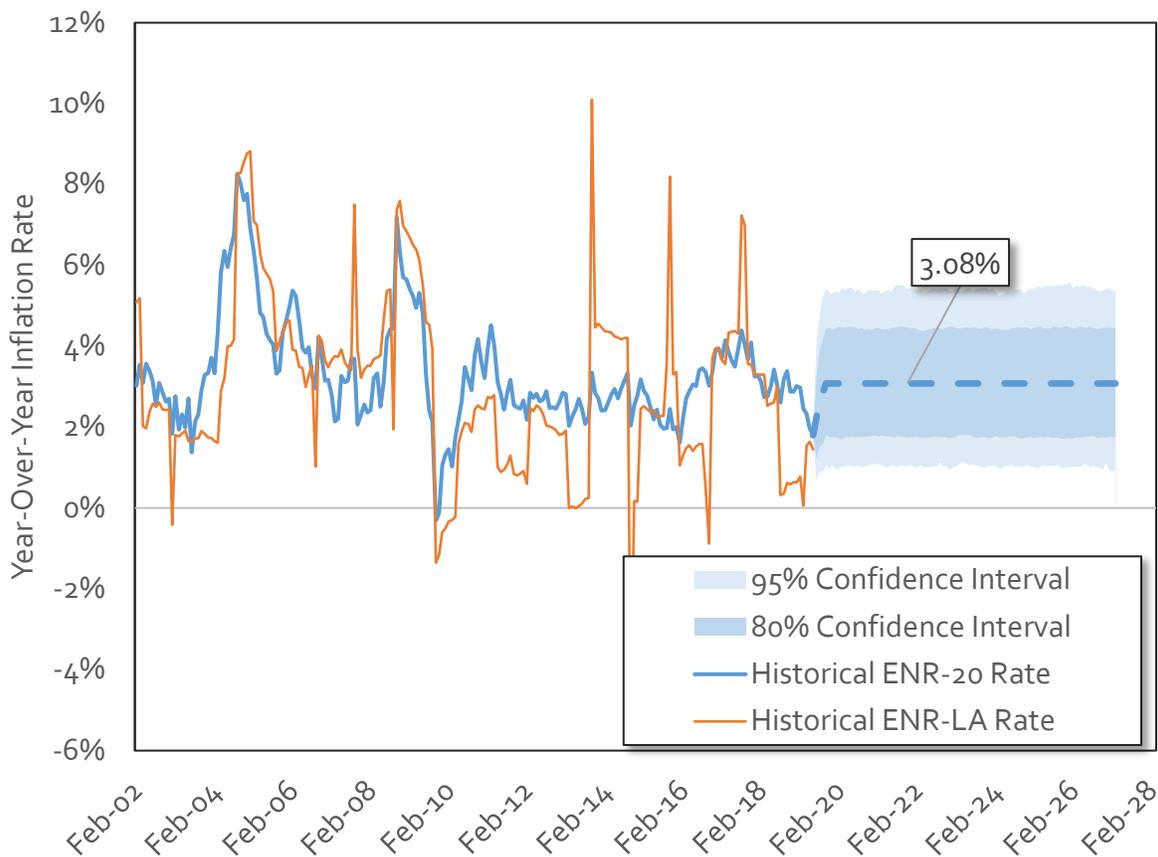
In 2017, South Orange County Wastewater Authority (SOCWA) retained Carollo Engineers, Inc. (Carollo) to analyze the cost escalation factors available for SOCWA to forecast operational and capital costs. This technical memorandum updates that analysis based on the latest data available as of June 2019 and provides revised recommendations of inflation factors for SOCWA to use going forward.

Results and Recommendations

Over the past two decades, the nationwide average of construction cost indices has shown a median of 2.8 percent year-over-year growth, and a mean of 3.1 percent. From 1997 to 2017, the compound annual growth rate (CAGR) for this index was 3.2 percent. This was unchanged when including data through June 2019.

Year-over-year escalation has consistently returned to approximately 3 percent, with the inflation rate falling between 2 and 4 percent during nearly 70 percent of all months in the past twenty years. Forecasting models of both this benchmark cost value and the escalation rate of this value, resulted in 3.1 percent annual escalation, as shown in Figure 1. This forecast is unchanged when including data through June 2019.

Figure 1 Historical and Forecasted Inflation Rates



Cost forecasting also requires the application of conservative assumptions to safeguard against improper budgeting. For example, should actual cost escalation outpace assumed escalation, the utility could fail to achieve positive cash flows and would thus be unable to implement its capital program. **Therefore, it is recommended that annual cost forecasts continue to utilize a minimum of 3.2 percent based on the CAGR of inflation observed since 1997.** This measure is the highest of the average measures calculated here, both historical and forecasted. Given that this figure exceeded historical year-over-year growth rates 64 percent of the time, it would have covered the majority of actual escalation scenarios over the past two decades.

Historical Inflation Analysis

Escalation Indices

Carollo's analysis commenced with a review of the last several decades of cost escalation data, utilizing a number of benchmarks available. Carollo collected available cost inflation data from two sources.

ENR

Engineering News-Record publishes a **Construction Cost Index (ENR-CCI)** each month for a list of twenty major U.S. cities. For many cost analyses, the ENR-CCI for the metropolitan area is appropriate. However, if none of the twenty cities apply to a specific utility, the 20-city average is best to use (ENR-20). Los Angeles (ENR-LA) is the nearest city to SOCWA in the 20-city index, approximately 50 miles north. This index will likely track closely with SOCWA's cost drivers, but given the single data point of LA cost data, this analysis looks at both the LA index and the 20-city average.

Local costs are driven by a handful of factors, 80% of which is a labor estimate, followed by lumber, Portland cement, and structural steel. ENR gets quotes from various suppliers in each market and calculates their index. A labor increase as a result of a new union deal or some other localized cause that results in a significant step change to one of these four components will cause more volatility to a local index than a the 20-cities average. For those reasons, the 20-city average can help smooth out fluctuations based on localized factors.

CPI

The U.S. Bureau of Labor Statistics publishes a monthly **Consumer Price Index (CPI)** specific to water, sewer, and trash collection for urban areas. The CPI tracks "changes in prices paid by urban consumers for a representative basket of goods and services."¹ Water, sewer, and trash collection services is one of the services that figures into the calculation of the CPI.

The Water, Sewer, and Trash CPI tracks consumer prices—the actual rates and fees assessed by service providers. This often can correlate with utility cost changes, but it does not have to. Deferred maintenance and bond funded capital are two factors that can inflate the CPI above a typical cost escalation for capital projects. The capital costs increase, but utilities may not immediately pass these increases on to consumers. This comes at the cost of greater increases later. While this measure does not track construction or capital costs and measures the change in retail water and sewer service, it may still serve as a useful comparison to show the overall trend in costs over time. It is also helpful when considering rate increases and customer bill

¹ "Consumer Price Index", US Department of Labor, Bureau of Labor Statistics. <https://www.bls.gov/cpi/>

impact. The CPI is available at both national and regional scales; the national water and sewer CPI was utilized for this analysis

Historical Analysis and Discussion

Cumulative Escalation

Carollo compiled twenty years of data for each of these three indices. Looking at the growth of each of these indices (Figure 2), the water and sewer national CPI has substantially outpaced the two ENR indices, particularly over the past decade (likely as most agencies have increased their rates to fund capital replacement). The CPI has increased by 120 percent since January 1999, while the LA and 20-city average ENR indices have increased by approximately 69 and 71 percent, respectively.

These indices are outlined in Table 1. The compound annual growth rate for each of these indices in the original 2017 analysis was 2.9, 3.2, and 4.4 percent for the ENR-LA, ENR-20, and CPI, respectively. These figures have decreased slightly once including data through June 2019, falling to 2.8, 3.1, and 4.2 percent, respectively.

Figure 2 Historical Escalation Benchmark Values

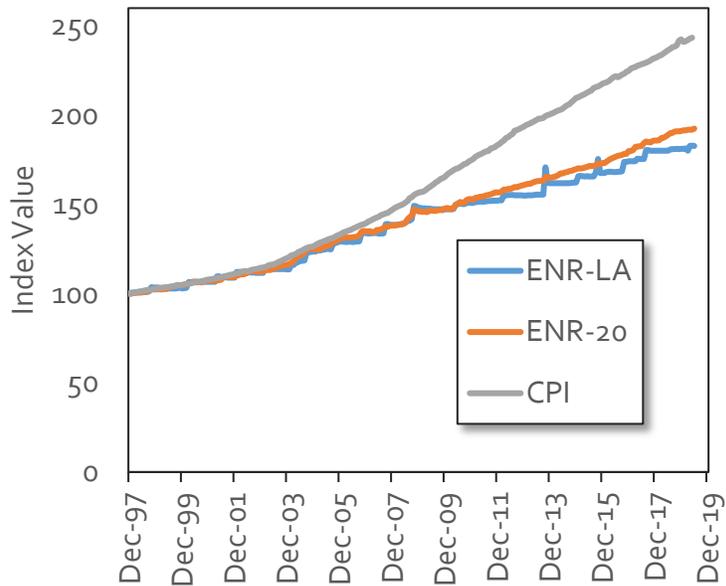


Table 1 Summary of Historical Escalation Rates for Three Major Indices

	ENR-LA	ENR-20	CPI
Min	-5.1%	-0.3%	1.9%
First Quartile	1.6%	2.3%	3.2%
Median	2.5%	2.8%	4.5%
Third Quartile	3.9%	3.5%	5.3%
Max	10.1%	8.3%	6.8%
Standard Deviation	2.1%	1.3%	1.2%
Notes:			
(1)	Calculated from monthly year-over-year escalation rates for each index, from December 1997 to March 2017.		
(2)	Year-over-year escalation is measured as the percent change between a given month, and that same month in the prior year (i.e. April 2017 compared with April 2016).		

Year-over-Year Escalation

These indices are useful for observing the year-over-year trend in cost—comparing a given month’s costs with cost’s in the same month in the prior year. Carollo reviewed the year-over-year escalation for each month of the available data, and found that the median value for ENR-LA, ENR-20, and CPI to be 2.5, 2.8, and 4.5 percent, respectively. CPI fell slightly once including 2019 data, from 4.7 percent in 2017. The ENR-LA and ENR-20 were unchanged in this update.

Discussion

Comparing the three indices, CPI is consistently higher by most measures reviewed. The median year-over-year inflation rate during the period of review is nearly twice as high as both ENR measures. Based on a review of the historical growth under each indices, the CPI factor appears to have a higher growth rate over the past decade compared with the first decade of the analysis. Looking at the histograms shown in Figure 5, this index appears to have a distribution that is almost bimodal, suggesting that there may be two distinct historical trends.

While it is the lowest of the three indices, the ENR-LA index is the most volatile, with a standard deviation of 2.1 percent. Additionally, ENR-LA has the largest range of the three measures, with the greatest maximum rate (10.1 percent) and the lowest minimum rate (-5.1 percent).

Given the volatility of the ENR-LA and the higher escalation of the CPI, the ENR-20 may be the best rate for benchmarking escalation rates, regardless of location. Looking again at the histograms for each index, this index is rather closely clustered between 2 and 4 percent, in contrast with the ENR-LA, which has longer tails and therefore greater variance, and CPI, which has a less well-defined measure of central tendency, aside from tracking consumer prices rather than producer/utility costs.

Another consideration that supports the use of the ENR-20 is the comparison of historical growth between this index and the ENR-LA. Figure 2 above shows the growth of a baseline value of 100 under each index, and Figure 1 also shows the year-over-year rate for ENR-LA. Notably, both ENR-LA and ENR-20 approach the same ending value, but the trend line of the ENR-LA displays a number of spikes. Therefore, the ENR-20 is a valuable benchmark because it tends to smooth out local and regional cost drivers that impact city-specific ENR figures. These local-level cost impacts could be short-lived, and driven by forces such as weather or labor disputes, things that cannot be reasonably predicted.

Additionally, SOCWA is approximately 50 miles to the south of Los Angeles. While the region will largely be driven by costs in LA, it could be far enough from the city to have its own independent cost drivers. Furthermore, SOCWA is approximately 75 miles from the City of San Diego, and 20 miles from San Diego County. Cost drivers from this major metropolitan area could also impact SOCWA’s costs (ENR does not produce an index for San Diego). As a result, the national ENR figure is recommended to adjust for these geographic factors and the apparent volatility shown by ENR-LA.

Figure 3 Distribution of Year-Over-Year Escalation Rates for Three Major Indices

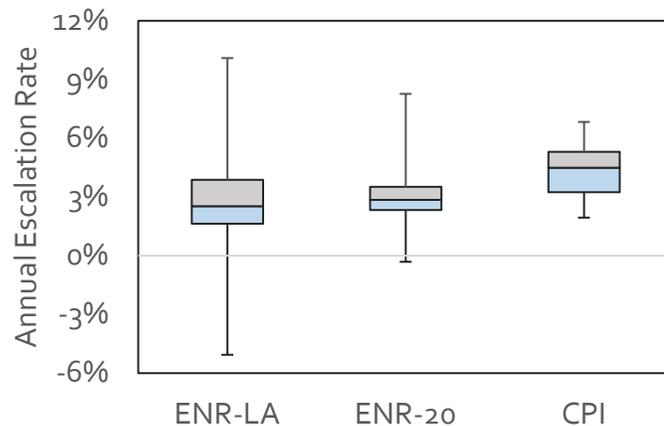
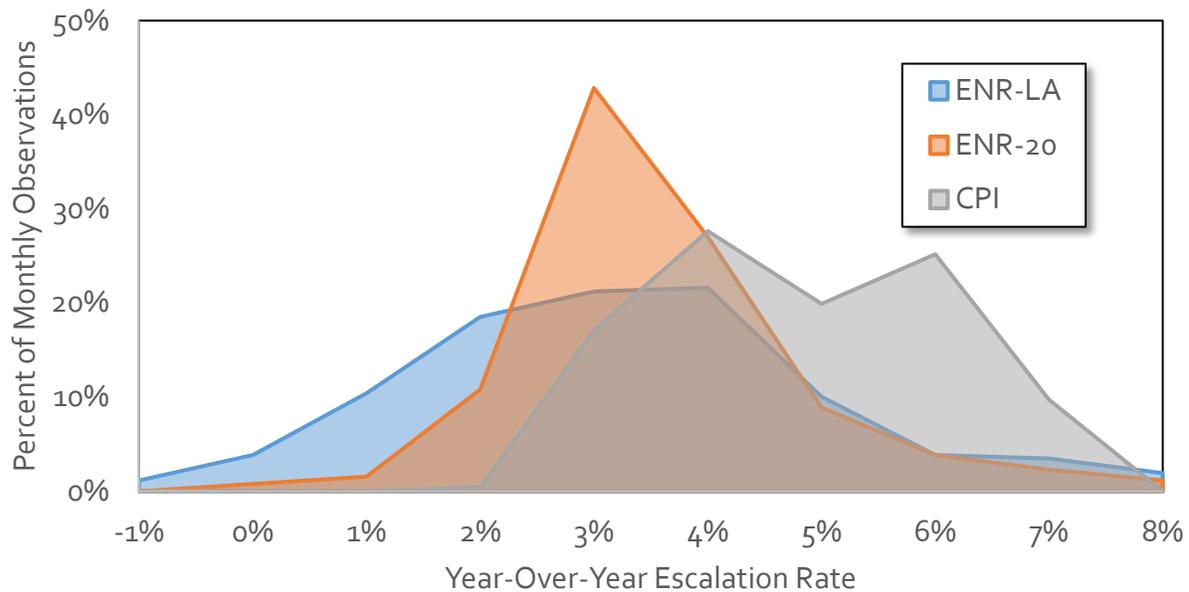


Figure 4 Comparative Histograms for Three Major Indices



Forecasting Cost Escalation Rates

Predicting cost escalation brings uncertainty, particularly as projections go beyond five and ten years. At these time scales, the range of potential outcomes substantially increases due to the array of permutations as time goes on. For this reason, when developing a forecast model, it is just as important to look at the confidence intervals of the predicted value as the predicted value itself.

Model Selection and Methodology

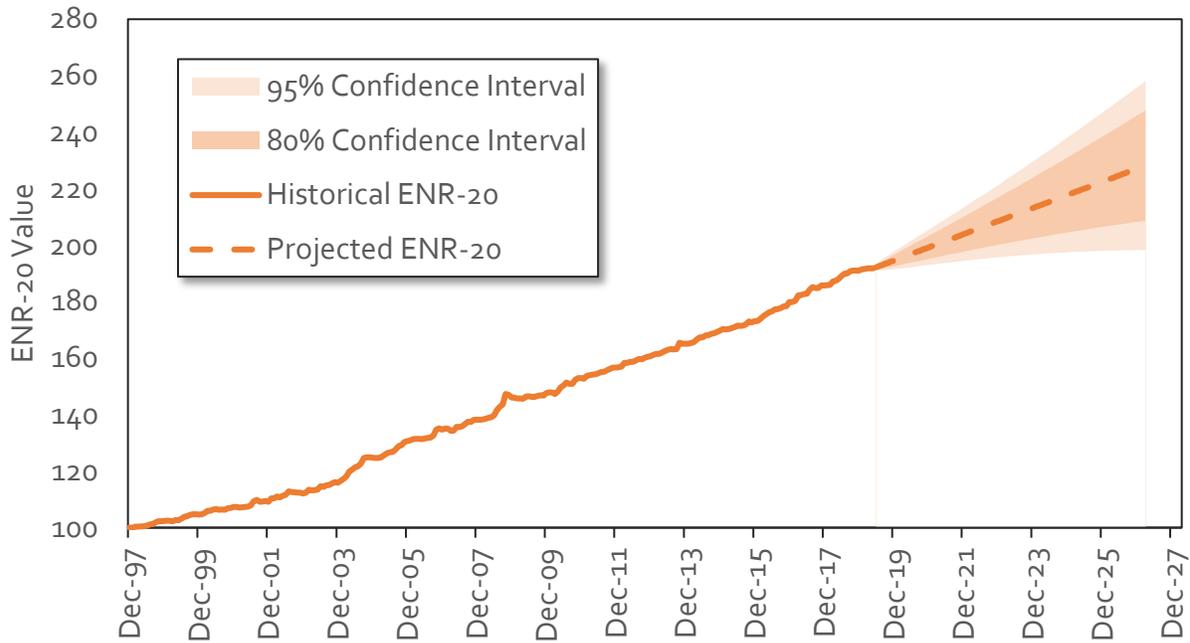
This analysis utilized both Holt-Winters and autoregressive integrated moving average (ARIMA) forecasting models to estimate future cost escalation. The Holt-Winters model is a triple-exponential smoothing method that looks at both seasonality of a measure, and a weighted moving average, with greater weight placed on recent values than “older” values. Similarly, the ARIMA model uses moving average approach, but also allows greater parameter selection for lagged terms. For these reasons, the Holt-Winters model was used for the growth of a baseline value into the future, and the ARIMA model was used for estimating future year-over-year escalation rates.

Results and Discussion

Forecasting ENR Values

The Holt-Winters model was used to forecast the ENR-20 value ten years into the future. This forecast is shown in Figure 6. Taking the forecasted values and calculating a year-over-year escalation rate, the median escalation rate is 2.8 percent. The median year-over-year rate for the upper and lower 95 percent confidence intervals is 3.4 and 0.5 percent, respectively. This is a decrease from the 2017 analysis that placed the 95 percent confidence interval between 0.8 and 4.3 percent.

Figure 5 Historical and Forecasted ENR-20 Values



Forecasting ENR Escalation Rates

Forecasting the escalation rate is an alternative approach to forecasting the benchmark index itself. Using the year-over-year growth rates of the ENR-20 for the past two decades, and developing an ARIMA forecasting model, this analysis estimates the mean escalation rate going forward to 3.1 percent annually, with the upper- and lower-95 percent confidence intervals at 1.0 and 5.4 percent annually. The forecast is shown in Figure 1.

Discussion

While both of these two forecasting approaches converged at approximately 3 percent, the bounds of these forecasts differ significantly. This is due in large part to the higher variance exhibited by the escalation rate used in the ARIMA model, as shown in Figure 1. This variance will increase the potential errors (which in turn impacts the confidence intervals) assumed by the model, and shows a broader range of likely escalation rates. However, given that both of these models converge upon approximately 3 percent at the mean, this supports the recommendation of 3.2 percent annually based on the CAGR of the past twenty years. This trend is unchanged given the additional data from 2017 to 2019, despite a modest decrease in year-over-year inflation rates in that time.

When forecasting costs, underestimating inflation has more negative impacts for a utility than overestimating. For this reason, the highest of the historical and forecasted inflation rates is recommended. Taking this conservative approach and using a slightly higher inflation rate could cover more potential scenarios, while still being based on a reasonable methodology.

Appendix B
J.B. Latham Treatment Plant Ten Year Plan

BACKGROUND

The J. B. Latham Treatment Plant is a conventional activated sludge treatment plant with a secondary treatment design capacity of 13 mgd. The liquid handling portion of the treatment plant is normally operated as two separate plants referred to as Plant No.1 (the 9 mgd or East side) and Plant No.2 (the 4 mgd or West side). The main wastewater treatment processes are screening, aerated grit removal, primary sedimentation, activated sludge aeration and secondary sedimentation. The plant has sodium hypochlorite feed facilities that are used in-plant biological control and disinfection of the non-potable plant water (however, the main effluent discharge from the plant is not chlorinated).

All of the secondary treated effluent is discharged into the San Juan Creek Ocean Outfall. The effluent typically flows through the outfall under gravity; under certain flow and tide conditions the effluent is pumped through the outfall.

Solids treatment at the Latham Treatment Plant consists of dissolved air flotation thickening, anaerobic digestion and mechanical dewatering. Dewatered solids are removed from the facility by plant staff to the County of Orange Prima Deshecha Landfill or by a private contractor to a composting facility. Screenings and grit are transported by a private contractor to a sanitary landfill.

FACILITY HISTORY

The first portion of the modern J. B. Latham Treatment Plant was constructed in 1964 as a 1 mgd secondary

treatment plant with aerobic digestion and solar drying in sludge beds. The project was subsequently expanded and modified. Key projects at the plant included the following:

- 1971: The plant was expanded to 6 mgd. The first two anaerobic digesters were constructed. Centrifuges were installed outdoors for solids dewatering.
- 1974: Plant expanded to 9 mgd. Third and fourth digesters constructed. Dissolved air flotation system added.
- 1978: Plant No.2 (4mgd) plant constructed.
- 1985: Energy Recovery Building constructed to house dewatering equipment, sludge-hauling truck loading bay, cogeneration equipment and maintenance shop. Centrifuges replaced with belt filter presses that are installed in the Energy Recovery Building.
- 1989: Aeration blower driven by digester gas powered engine installed in the Energy Recovery Building.
- 1991: Digester system piping re-vamped to match system at the Regional Treatment Plant.
- 1992: Operations Building constructed on parcel adjacent to the J. B. Latham Treatment site.
- 1992: New effluent pump station constructed.

- 1998: First centrifuge and solids conveyor system installed in the Energy Recovery Building through a design-build project.
- 1998: Existing headworks equipment was enclosed by constructing two new structures. Odor control systems upgraded with chemical scrubber.
- 2001: Expansion of the Operations Building completed. Administration staff relocated to the newly expanded facility.
- 2003: Construction completed on the modification of the Energy Recovery Building that included the replacement of the last two belt filter presses with centrifuges.
- 2005: Plant SCADA system upgrade completed.
- 2006: Rehabilitation of Digesters No. 1 and No.2 completed.
- 2008: Conversion of chlorine handling to a sodium hypochlorite feed system.
- 2010: Construction of Plant No.1 Electrical Building (prefabricated) and replacement of Plant No.1 switchgear.
- 2012: Rehabilitation of Digester No.3 and retrofit of Plant No.2 headworks.
- 2017: Package 'A/C' Improvements completed including installation of new aeration system, upgrade of Plant No.2 secondary sedimentation basins, installation of new co-generation system, rebuilding of electrical gear in

Plant No.2 Blower Building, construction of new Plant No.2 Electrical Building, and replacement of the Plant No.2 switchgear.

FACILITY OWNERSHIP

The J. B. Latham Treatment Plant is owned and operated by SOCWA on behalf of four member agencies:

- Moulton Niguel Water District
- City of San Juan Capistrano
- Santa Margarita Water District
- South Coast Water District

The collective group within SOCWA that owns capacity in the J. B. Latham Treatment Plant is called Project Committee 2. The percentage of ownership held by each of the agencies is shown in Table B.1.

Table B.1
Current Percent Ownership at the J. B. Latham Treatment Plant

	% Liquids	% Common	% Solids
Moulton Niguel Water District	23.08%	22.35%	21.62%
City of San Juan Capistrano	30.77%	30.38%	30.00%
Santa Margarita Water District	17.31%	22.85%	28.38%
South Coast Water District	28.84%	24.42%	20.00%
Total	100.00%	100.00%	100.00%

CAPACITY UTILIZATION

The J. B. Latham Treatment Plant (JBLTP) has a capacity of 13 million gallons per day (mgd). The plant operates far below that capacity. Flows have steadily decreased over time as a function of both water conservation and upstream water reclamation. Plant 1 flows have dropped from an average 7.5 mgd in 2014 to 4.7 mgd in 2018. Plant 2 flows have decreased from an average 1.4 mgd in 2014 to 1.1 mgd in 2018. Decreased plant utilization may have an impact on capital investment. Over the recent years the SOCWA Operations staff has been periodically able to operate the JBLTP while using only Plant 1. This would suggest a future approach where either Plant 2 is abandoned (or portions of Plant 1 and Plant 2 are abandoned). This would both decrease the capital investment for

rehabilitation of existing facilities and increase space for other uses. Spatial restrictions at the JBLTP impact both potential future water reclamation and modified solids handling.

There are two factors that require the maintenance of the existing capacity at the JBLTP:

- The periodic shutdown of upstream water reclamation plants during which sewage flows are sent downstream to the Latham Plant.
- Peak wet weather events which appear to exceed the original design criteria for the treatment plant.

As part of the planning for the Package ‘B’ Facilities Improvements, SOCWA retained Carollo Engineers to perform both process and hydraulic modeling to further evaluate utilization of the JBLTP capacity.

PROCESS MODELING

Process modeling done for the Package ‘B’ Facilities Improvements Project was done with a goal of identifying the number of basins needed under different operating scenarios. Four flow scenarios were considered:

- Current Operating Flow: 8.4 mgd (based on flows at the time of the modeling in 2016).
- Reduced Operating Flow: 6.2 mgd based on 6 mgd extended operation at Plant 3A (assuming a future expansion of Plant 3A).

- Increased Flow: 12.2 mgd based on bypass of upstream Oso and Plant 3A plants.
- Plant Capacity: 13 mgd.

The two latter scenarios are considered effectively the same. The process modeling was also performed for three treatment scenarios:

- Carbonaceous biochemical oxygen demand (CBOD) only, current mixed liquor suspended solids (MLSS), no enhanced primary treatment (EPT).
- CBOD only, increased MLSS, no EPT.
- CBOD only, current MLSS, include EPT.

The scenarios for increased mixed liquor suspended solids and enhanced primary treatment were not utilized in the development of the current version of the Ten Year Plan.

The current Ten Year Plan focuses on the existing scenario with the treatment scheme of carbonaceous biochemical oxygen demand only, current mixed liquor suspended solids concentration, and no enhanced primary treatment (EPT). Plant 1 can be expected to handle the influent flow effectively at a plant flow rate of 6.2 mgd as shown in Figure B.1. Plant 1 could also handle the loadings at 8.5 mgd although there would be no spare basins available to allow periodic maintenance or failures. These issues underpinned the development of the Package 'B' Facility Improvements Project which largely focuses on improvements to the Plant 1 basins with only limited improvements for Plant 2.

HYDRAULIC MODELING

Figure B.2 shows the current flow pattern through the treatment plant. A limited hydraulic model was prepared for the Package 'B' Facility Improvements project. The Excel-based model looked at the hydraulic profile from the primary influent channel to the chlorine contact basins. The model was run for multiple conditions including a peak storm event with a flow of 29.9 mgd. The 29.9 mgd flow value was based on the plant capacity multiplied by a peak factor of 2.3. This model was initially run to match the existing situation where it is not possible to control the flow split between Plant 1 and Plant 2. The model predicted 23 mgd flowing into Plant 1 with the following results:

- Hydraulic level exceeds the top of concrete in Plant 1.
- Weirs submerged and less than 6 inches of freeboard in Plant 2.

Another model scenario was conducted with the ability to control the split of the flow between Plant 1 and Plant 2. This model run showed a uniform condition across Plants 1 and 2:

- Weirs submerged and less than 6 inches of freeboard in Plants 1 and 2.

This modeling indicates the importance of implementing the Bypass Control Project in the Ten Year Plan (Project 2052). The hydraulic modeling also identified a potential bottleneck at the Plant 1 secondary effluent pipe.

After the completion of the Package 'B' planning effort the Latham Plant was subjected to a series of storm events during the winter of 2017. Flow into the treatment plant reach levels of approximately 35 mgd (effluent flow metering is uncertain at these levels). Those storm events were marked by the following conditions in the treatment plant:

- Weirs submerged and less than 6 inches of freeboard in Plant 1 (at points the water level came close to overtopping the basins).
- The capacity in Plant 2 was underutilized.

There are ongoing discussions between SOCWA and the member agencies regarding the source of the high wet weather peak flows. Based on the 2017 storm event it appears that SOCWA may not have the option of removing basins from long term operation. The evaluation of basin utilization will be expanded as part of the Hydraulic Modeling and Peak Flow Management Plan in the Ten Year Plan (Project 2103).

WET WEATHER EVENTS

The intensity of peak wet weather events over the past ten years has increased. SOCWA facilities have experience significant winter storm events in 2010, 2017, and 2019. The ratio of peak flow to average daily flow during a ten-year period during these events has ranged between 4:1 to 5:1 (the accuracy of these estimates are limited by the plant flow metering capability) over a three hour period.

The current version of the Ten Year Plan includes relatively few improvements related to the handling of the peak wet weather flow events at the JBLTP. The general approach of SOCWA and its member agencies is to evaluate ways of limiting storm flows within the member agency collection systems. When those options have been exhausted there will be additional planning to determine in-plant improvements to handle storm events.

BASIN IMPROVEMENTS

The hydraulic and process modeling indicate that the number of basins needed for operation is controlled by the hydraulic requirements of peak wet weather events. Without some modification of flow events, the Package 'D' Improvements will need to complete the basin upgrades begun in Packages 'A/C' and 'B'. Alternative approaches to equipping the Plant 2 basins was addressed in the Package 'B' planning work. These issues are to be reviewed as part of the Hydraulic Modeling and Peak Flow Management Plan project prior to embarking on the Package 'D' Facility Improvements design.

PROJECT COMMITTEE 2 AGREEMENT

The fifty year term of the Project Committee (PC) 2 agreement expires in 2023. That expiration date falls within the fifteen-year planning span used in this document. Both the Moulton Niguel Water District (MNWD) and the Santa Margarita Water District (SMWD) are reviewing their need for capacity within the Latham Plant. The development of

Facility Improvements Package 'D' and subsequent projects depends on the changed ownership that may result from the negotiation of the new PC 2 agreement. As identified in the prior sections the modified agreement should address wet weather capacity.

WATER RECLAMATION STUDIES PRIOR TO 2010

The SOCWA J. B. Latham Treatment is the only one of the three SOCWA treatment plants that does not have water reclamation capability. There have been several aborted attempts to develop Title 22 water recycling in the past. These plans largely focused on the potential utilization of recycled water within the City of San Juan Capistrano. Past evaluations included a study prepared by CGvL Engineers in 2000. This effort focused on the development of facilities similar to the tertiary treatment processes at the Regional and Coastal Treatment Plants. Plan development was stopped due to the anticipated cost of the recycled water.

In 2006, CH2M HILL performed a study on technologies for advanced water treatment (AWT) and evaluated membrane bioreactors, cloth media filters, and pressurized membrane filters as potential technologies for producing Title 22 effluent. Both cloth media filtration and pressurized membrane filters were further evaluated due to similar cost and relatively small footprint. This study noted that little information existed at the time on how cloth media filters would perform at a facility operating under non-nitrifying solids retention times (SRTs). Subsequently, CH2MHILL recommended that pilot testing of cloth media and pressurized membrane

filters be done at JBLTP.

Pilot tests were performed in 2008 and showed definitively that cloth media filters did not perform well at JBLTP. However, pressurized membranes worked well during pilot testing, which led to a second technical memo where CH2MHILL updated their 2006 study based on pilot testing results. This 2009 memo further investigated the feasibility of producing Title 22 effluent with pressurized membrane filters (microfiltration) with low-pressure, high-intensity ultraviolet (UV) disinfection. This effort was eventually ended due to projected costs.

SALINITY

Studies conducted prior to 2010 did not address the high total dissolved solids (TDS) in JBLTP's secondary effluent. Plant 1 typically produces secondary effluent with 1,000 mg/L to 1,100 mg/L TDS, and Plant 2 normally produces 2,000 mg/L TDS. A non-potable effluent level of 900 mg/L TDS is considered to be an appropriate goal for SOCWA. This goal necessitates the use of microfiltration /ultrafiltration (MF/UF) with side-stream reverse osmosis (RO) to reduce overall TDS in Title 22 effluent to 900 mg/L.

PACKAGE 'B' PLANNING FOR REUSE

A study on effluent management was prepared in 2017 by Carollo Engineers as part of the plant development for the Package 'B' Facility Improvements project. It was not

anticipated that Package 'B' would include any improvements related to water recycling. However, planning for a future AWT was performed to determine the spatial and process issues that might have an impact on the Package 'B' Facility Improvements Project (or subsequent rehabilitation projects). The planning effort considered different options for providing Title 22 quality effluent for non-potable reuse and direct potable reuse (DPR). Indirect potable reuse was not considered due to the lack of groundwater recharge basins or surface water basins in the area.

TITLE 22 RECYCLING ALTERNATIVES

The Latham Plant site is very limited on space which greatly limits options for implementation of an Advanced water Treatment (AWT) facility. The Package 'B' planning effort considered the following options:

- Plant operating at 13 mgd (full capacity).
- Plant operating at 8.4 mgd (plant operating rate at time of Package 'B' study).
- Plant operating at 6.2 mgd (plant operating with more upstream diversions to Plant 3A).

Based on the CH2MHill study for the AWT and on the needed TDS reduction, the evaluation of the Title 22 effluent process focused on pressurized membrane filtration (MF/UF) in combination with UV disinfection. This approach would also reverse osmosis for a portion of the side stream. A schematic of this treatment

stream is present in Figure B.3.

The site plan presented in Figure B.4 shows the spatial requirements for a facility that could produce 6.2 mgd of Title 22 treatment effluent. This scenario is based on maximum utilization of Plant 3A (or other upstream water reclamation facilities). This scenario was favored in that only one of the existing basins is used for the AWT. One aeration basin is retrofit with MF/UF equipment. This approach provides the maximum flexibility in utilizing the existing basins for the handling of wet weather events or the temporary shutdowns of upstream water reclamation facilities. This approach does have three shortcomings:

- Engineering trailer eliminated; requires relocation of staff.
- Significant construction along the south side of the treatment plan adjacent to the new development.
- Facility construction may impact utilization of site by sludge trucks.

DIRECT POTABLE REUSE ALTERNATIVES

While Direct Potable Reuse (DPR) is an important potential future option for California, it is not yet regulated in the state. This makes the development of long-term scenarios for the implementation of DPR highly speculative. Several process trains for DPR were considered as part of the Package 'B' planning effort. The recommended process train for further development is presented in Figure B.5. This process train would use membrane

bioreactors followed by pasteurization, RO, granular activated carbon (GAC) filtration, UV advanced oxidation, and engineered storage.

Figure B.6 shows a site layout for a 6.2 mgd DPR facility following the process set forth in Figure B.5. The consideration of this approach involves the following factors:

- The plant flow is limited to 6.2 mgd; there are no basins for handling major wet weather events and upstream reclamation plant diversions.
- The engineered storage is located off-site.
- Engineering trailer eliminated; requires relocation of staff.
- The process train depends on future regulatory development.

CURRENT BIOSOLIDS HANDLING

The South Orange County Wastewater Authority (SOCWA) performs solids treatment at two of its treatment plants: the J.B. Latham Treatment Plant (JBLTP) and the Regional Treatment Plant (RTP). The biosolids are anaerobically digested at each of the plants. The digested biosolids are then dewatered by centrifuges and disposed of off-site.

Solids processing at the JBLTP includes dissolved air flotation thickeners (DAFTs), anaerobic digesters, and dewatering centrifuges. The centrifuges typically produce a biosolids cake that is 23% to 26% solids concentration. Dewatered solids from the centrifuges drop into one of

the truck trailers inside the Energy Building. The dewatered solids are hauled away and disposed of off-site. A hauling truck trailer can hold approximately 25 wet tons of sludge. One truckload is typically hauled from the JBLTP each day. Dewatered solids are trucked to one of the following systems/locations:

- Synagro South Kern County Composting Facility.
- Nursery Products Composting Facility (located near Adelanto).
- County of Orange Prima Deshecha Landfill.

The JBLTP also treats waste activated sludge (WAS) from the Santa Margarita Water District's Oso Water Reclamation Plant (Oso). The sludge is discharged to the collection system tributary to Plant 1. The JBLTP may also receive all or some portion of the sewage tributary to Oso when that facility is off-line.

ALTERNATIVE BIOSOLIDS HANDLING OPTIONS

SOCWA will need to make a significant capital investment in the solids handling system at the J. B. Latham Treatment Plant over the next ten years. The need for this investment comes at a time when other factors may make it appropriate to consider alternatives methods for handling solids at the JBLTP. These factors include the following issues:

- A potential future ban on the disposal of wastewater biosolids in landfills in

the State of California.

- Changed regulations and public perception regarding the land application of biosolids.
- The evolution of technologies that offer advantages in energy efficiency.
- The JBLTP has no fixed storage; only the space available in trailers. This becomes problematic if a problem arises with services with one of the contracted haulers.
- Neighborhood concerns regarding odors and truck noise associated with solids.

Another potential driver to an alternative means of handling biosolids is the possible avoidance in capital investment in the existing solids processes at the JBLTP.

SOCWA has done past evaluations of alternative methods of handling biosolids. SOCWA has developed conceptual plans for the implementation of heat drying at both the J. B. Latham and the Regional Treatment Plants. SOCWA also investigated participation in the Irvine Ranch Water District (IRWD) Michelson Water Reclamation Plant Heat Drying Facility in 2010. SOCWA elected not to pursue these approaches due to the higher biosolids unit costs that would result.

In the spring of 2019 SOCWA issued a Request for Proposals (RFP's) to vendors of innovative biosolids technologies. Six proposals were received. These proposals will be reviewed by a Technical Advisory Committee (TAC) through the summer of 2019. This version of the Ten Year Plan does not reflect the implementation of an

innovative biosolids technology. The only proposed project involved with this item is the Solids Management Plan (Project 2538) included in Fiscal Year 2019/20. This plan is meant to reevaluate needed capital improvements to the solids handling systems.

ASSET PLANNING FOR SOLIDS HANDLING

The current version of the Ten Year Plan focuses on the asset replacement aspect of the solids handling system. The primary functional areas of the solids handling system are the dissolved air flotation thickeners (the DAFT's), the anaerobic digesters, and the dewatering centrifuges. A fourth area involves the co-generation system that utilizes digester gas in the production of electricity. The existing co-generation system was installed as part of Facility Improvement Package 'A/C' in 2017. No improvements to the co-generation system are anticipated as part of the Ten Year Plan. However, the co-generation system operation is sensitive to other changes within the treatment plant.

THICKENING

The existing DAFTs are in need of major rehabilitation to continue operation into the foreseeable future. Condition assessments have been performed by Carollo and Lee & Ro. The Package 'B' planning study analyzed alternative approaches to thickening at the Latham Plant. Retrofit of the two existing DAFT's was found to be the most cost effect approach. Recommended upgrades to the DAFT's include the following:

- New sludge collection mechanisms and drives.
- New covers and walkway.
- Concrete repair and recoating.
- New thickened sludge pumps.
- New pressurization skid and recirculation pump.

These improvements are included as part of the Package 'B' Improvements. The contract for the Package 'B' Improvements was awarded by the SOCWA Board of Directors on April 4, 2019.

SOCWA ASSETS

The original listing of SOCWA assets was prepared by TetraTech in 2005 as part of an Asset Management Study. This listing provided a comprehensive list of mechanical items and systems. SOCWA has expanded the list with structural, structural appurtenances, electrical and instrumentation components, site facilities and buried piping. The list was also amended to include structures and equipment associated with new projects. The current asset list for the J. B. Latham Treatment Plant includes over 470 items. The SOCWA asset listing is maintained in an Excel spreadsheet.

BASIS FOR EXPECTED LIFE

The current version of the Ten Year Plan is largely based on targeting assets for replacement that have exceeded their useful lives or are expected to exceed their useful life during the 15 year span of the

capital improvement program. The 'expected life' can be defined as that point in time when (1) the asset can no longer reliably serve its function, (2) the asset deteriorates to the point that it poses a safety risk, (3) the asset deteriorates to the point that continued maintenance is more expensive than replacement, or (4) the asset is no longer supported by vendors (e.g. can no longer obtain replacement parts). There is no single source defining the expected lives for all of the components in a wastewater treatment plant. The 2005 Asset Management Study prepared by Tetra Tech identified expected lives for many components. During the preparation of this report Carollo Engineers transmitted a list of expected lives typically used in their analyses. These values were comparable to the numbers 2005 numbers utilized by TetraTech. The Carollo expected life values are presented in Table B.2 in the column titled 'Life as Recommended by Consultant'. SOCWA staff expanded this listing and modified some of the values. Some of these values were provided at the recommendation of suppliers and installers. However, this list largely reflects the experience of SOCWA staff based on the local conditions found at SOCWA facilities. These values are presented in Table B.2 in the column 'Life Utilized, Modified or Added by SOCWA Staff'. The values presented in this column are used in this analysis.

CONDITION ASSESSMENTS

Condition assessments are conducted either informally by the SOCWA Operations staff (through their observations of visual condition,

performance, and maintenance history) or by external consultants. SOCWA began a program of contracting condition assessments in 2016. The assessments conducted thus far include the following:

- Plant 1 Basins and Channels
- Plant 2 Basins and Channels
- Dewatering System

The listing of projects in Appendices C and D note where additional condition assessments are anticipated in the future.

COST ALLOCATION

The capital project costs are allocated based on the appropriate cost center. The three cost centers for the J. B. Latham Treatment Plant are as follows:

- Liquids
- Common
- Solids

Many items that are listed as 'Common' projects reflect a blend of Liquids, Common, and Solid attributes. For instance, a motor control center may have breakers that feed devices that are associated with different cost centers. When these projects are formally budgeted, they should undergo a more thorough allocation of costs. Projects that have these blended cost centers include but are not limited to the following project types:

- Motor Control Centers
- SCADA
- Electrical Manhole Repair
- Buried Piping

It should also be noted that some uses in the Latham Plant have changed cost

centers since the original plant construction. An example would be the Chlorine Building. Costs associated with the chlorine handling portion of the building were traditionally allocated to Liquids. However, the chlorine handling has been eliminated. This portion of the building is now used for storage which would be appropriately allocated to common. These issues of changed usage should be reviewed with the Engineering Committee.

PACKAGE 'B' FACILITY IMPROVEMENTS

A significant portion of the capital improvement cost for Years 1 and 2 are associated with the construction of the Package 'B' Facility Improvements Project. This project includes the following elements:

- Rehabilitation of piping and valves at the Effluent Pump Station.
- Limited equipment rehabilitation of Plant 2 Secondary Sedimentation Basins (Scum Skimmers and Telescoping Valve replacement).
- Structural and equipment rehabilitation of the Plant 1 Secondary Sedimentation Basins.
- Structural and equipment rehabilitation of the Primary Effluent Channel (Plant 1 portion).
- Structural and equipment rehabilitation of the Plant 1 Primary Influent Channel and Sedimentation Basins.
- Structural and equipment rehabilitation of the Plant 2 Primary Influent Channel Basins.

- Structural and equipment rehabilitation of Dissolved Air Flotation Thickener Nos. 1 and 2.
- Construction of a new Thickened Waste Activated Sludge Pump Station.
- Cleaning and equipment rehabilitation of the Digester 1 and 2 mixing and heating systems.
- Structural rehabilitation of the Digesters 1 and 2 Control Building roof.
- Equipment rehabilitation of the Digester 3 and Digester 4 heating systems.
- Replacement of the Digesters 3 and 4 Control Building roof stairs.
- Construction of a new boiler inside of the Energy Recovery Building.
- Removal of the existing boiler within the Digesters 1/2 Control Building.
- Seismic improvements to the Energy Building.
- Structural rehabilitation of the Dewatering Building and Energy Recovery Building roof including the replacement of the skylights.
- Construction of a new monorail system inside of the Energy Building.
- Demolition of the existing Laboratory Building.
- Miscellaneous plant-wide safety improvements for fall protection.
- Structural and coating repair within Digester 4; also, mechanical, electrical and instrumentation improvements.

Work on the Plant 2 basins was limited pending further review of member agency utilization.

A contract for the construction of the Package 'B' Facility Improvements was awarded to Olsson Construction on April 4, 2019.

PACKAGE 'D' FACILITY

IMPROVEMENTS

The follow-up project to the Package 'B' Facility Improvements project is the Package 'D' Facility Improvements Project. The design for the Package 'D' is programmed in Year 2 (2020/2021) of the Ten Year Plan. There are two predecessor projects in Year 1 (2019/2020): The Plant Hydraulic Model and Flow Management Plan (Project 4203-000) and the Solids Management Plan (Project 4214-000). The discussions between the member agencies regarding the PC 2 agreement will also have an impact on the Package 'D' scope. The key elements of Package 'D' are as follows:

- Plant 2 Primary Sedimentation Basin Upgrade (including sludge collectors, scum collectors, troughs and basin covers).
- Plant 2 Secondary Sedimentation Basin Upgrade (including launders, sludge collectors and drain valves).
- MCC M Replacement.
- Improvements to Centrifuge System.
- Replace of screws in Solids Conveyors.
- Replacement of Trailer Load Cells and other improvements in Truck Bay.
- Replacement of the Gas Flare.
- Modification of MCC CF and removal of MCC 2.

The replacement of the gas flare is contingent upon new air quality regulations.

ADDRESSING UNCERTAINTY

There has been a significant level in capital investment in the replacement and rehabilitation of systems at the J. B. Latham Treatment Plant over the past 20 years. Some systems and devices are recently reconstructed and not projected for replacement within the 15-year span of the draft Ten Year Plan. Examples of these systems include the following:

- Plant 1 and Plant 2 Switchgear
- Co-Generation System
- Primary Aeration Blowers (located in the Plant 1 Blower Building)
- Aeration Basin Diffusers

The Ten Year Plan for the Latham Treatment Plant also does not contemplate the reconstruction of major concrete structures. The anticipated live of concrete structures in a wastewater environment is 50 years. The majority of concrete structures were completed between 1965 and 1983 which would indicate an anticipated end of life ranging from 2015 to 2033. However, visual inspections of concrete structure have only identified superficial deficiencies. No projects have been identified for the replacement of major structures.

TEN YEAR PLAN PROJECTS

Table B.3 summarizes the proposed capital improvement projects and costs. This table identifies projects in the fiscal year that they would be added to the SOCWA capital improvement budget. Descriptions of each of the projects in Table B.3 are provided in Appendix C. Tables showing the derivation of project costs are shown in Appendix D.

The current version of the Ten Year Plan marks a significant increase in the capital investment for the J. B. Latham Treatment (and for other SOCWA facilities) from the 2010 version of the Ten Year Plan. The reasons for this increase are based on the following factors:

- More assets were evaluated in the current plan.
- Projects were more rigorously based on the anticipated “book” life.
- More detailed cost estimating was done for the current plan.
- Existing assets have aged over the past ten years (unless replaced or rehabilitated during that period).

The result is what is believed to be a very conservative cost estimate. For example, Table B.3 shows over \$7.4 million (inflation based) in improvements in Fiscal Year 2022/23. This cost includes over \$5.5 million in improvements association with Blower Building No.1 and the systems it houses. The structure itself dates to 1965. However, a condition assessment is included in Fiscal Year 2019/20 (Project 2058) that will provide more information on the scope, cost, and timing of improvements. Not all condition assessments are included in the first year of the Ten Year Plan; work is spread out based on the anticipated condition and risk associated with the area of the plant. The Ten Year Plan can then be updated on annual basis.

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
1	Preliminary Treatment	Diversion Structure	1979	50	2029
2	Preliminary Treatment	Diversion Structure Gate No.1	1978	30	2008
3	Preliminary Treatment	Diversion Structure Gate No.2	2005	30	2035
4	Preliminary Treatment	Gate No.1 Electric Actuator	2005	20	2025
5	Preliminary Treatment	Gate No.2 Electric Actuator	2005	20	2025
6	Preliminary Treatment	Plant 1 Headworks Building Structure	1999	50	2049
7	Preliminary Treatment	Plant 1 Headworks Building Roof	1999	30	2029
8	Preliminary Treatment	Plant 1 Headworks Building Architectural Hardware	1999	35	2034
9	Preliminary Treatment	Plant 1 Headworks Building Electrical	1999	35	2034
10	Preliminary Treatment	Plant 1 Headworks Building Concrete Ramp and Terrace	2009	50	2059
11	Preliminary Treatment	Plant No.1 Electrical Building	2009	40	2049
12	Preliminary Treatment	Plant No.1 Electrical Building Power and Lighting	2009	35	2044
13	Preliminary Treatment	Plant No.1 Electrical Building Mechanical	2009	20	2029
14	Preliminary Treatment	Main Panel "MA"-9 MGD	2009	30	2039
15	Preliminary Treatment	EMCC - BL	2009	30	2039
16	Preliminary Treatment	EMCC - DR	2009	30	2039
17	Preliminary Treatment	PLC - EEB	2009	20	2029
18	Preliminary Treatment	MCC-EAI	1997	20	2017
19	Preliminary Treatment	Plant 1 Headworks Building Mechanical	1999	20	2019
20	Preliminary Treatment	Plant 1 Bar Screens	2005	20	2025
21	Preliminary Treatment	Plant 1 Screenings Conveyor	2005	20	2025
22	Preliminary Treatment	Plant 1 Screenings Compactor	2005	10	2015
23	Preliminary Treatment	Plant 1 Grit Classifier	2005	10	2015
24	Preliminary Treatment	Plant 1 Aerated Grit Removal Tank Structure1	1964	50	2014
25	Preliminary Treatment	Plant 1 Aerated Grit Removal Tank Covers	1995	25	2020
26	Preliminary Treatment	Plant 1 Aerated Grit Removal Tank Mechanical	1964	20	1984
27	Preliminary Treatment	Plant 1 Grit Basin Channel Slide Gates	1974	30	2004
28	Preliminary Treatment	Plant 1 Grit Pump Drywell Structure	1978	50	2028
29	Preliminary Treatment	Plant 1 Grit Pump Drywell Handrail	1978	40	2018
30	Preliminary Treatment	Plant 1 Grit Pumps	1978	5	1983
31	Preliminary Treatment	Plant 1 Grit Pump Mechanical	1978	15	1993
32	Preliminary Treatment	Plant 1 Grit Pump Electrical	2002	25	2027
33	Preliminary Treatment	Plant 1 RSPS/Blower Building Structure	1965	40	2005
34	Preliminary Treatment	Plant 1 RSPS/Blower Building Crane	1964	40	2004
35	Preliminary Treatment	Plant 1 RSPS/Blower Building Mechanical	1992	15	2007
36	Preliminary Treatment	Plant 1 RSPS/Blower Building Air Conditioner	1995	8	2003
37	Preliminary Treatment	Plant 1 RSPS/Blower Building Electrical	1988	25	2013
38	Preliminary Treatment	MCC-A-1	1997	20	2017
39	Preliminary Treatment	EMCC-B	2007	30	2037
40	Preliminary Treatment	Plant 1 ATS	2007	30	2037
41	Preliminary Treatment	Plant 1 Raw Sewage Wetwell	1964	50	2014
42	Preliminary Treatment	Plant 1 Raw Sewage Pumps	1989	10	1999

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
43	Preliminary Treatment	Plant 1 Raw Sewage Pumps VFD	2007	5	2012
44	Preliminary Treatment	Plant 1 Standby Power Generator # 1	1989	20	2009
45	Preliminary Treatment	Plant 1 Emergency Standby Pumps	2010	25	2035
46	Preliminary Treatment	Plant 1 Emergency Standby Pump Control Valves	2010	20	2030
47	Preliminary Treatment	Plant 2 Headworks Building Structure	1997	50	2047
48	Preliminary Treatment	Plant 2 Headworks Building Roof	1997	30	2027
49	Preliminary Treatment	Plant 2 Headworks Building Architectural Hardware	1997	35	2032
50	Preliminary Treatment	Plant 2 Headworks Building Electrical	1997	15	2012
51	Preliminary Treatment	Plant 2 Power Building Structure	2016	50	2066
52	Preliminary Treatment	Plant 2 Power Building Roof	2016	30	2046
53	Preliminary Treatment	Plant 2 Power Building Architectural Hardware	2016	35	2051
54	Preliminary Treatment	Plant 2 Power Building Mechanical	2016	20	2036
55	Preliminary Treatment	Plant 2 Power Building Electrical	2016	35	2051
56	Preliminary Treatment	Main Panel "MA"- 4 MGD	2016	20	2036
57	Preliminary Treatment	Plant 2 Headworks Building Mechanical	1998	15	2013
58	Preliminary Treatment	Plant 2 Bar Screen	2012	12	2024
59	Preliminary Treatment	Plant 2 Bar Rack	1999	20	2019
60	Preliminary Treatment	Plant 2 Screenings Conveyor	1988	10	1998
61	Preliminary Treatment	Plant 2 Grit Classifier	1995	12	2007
62	Preliminary Treatment	Plant 2 Aerated Grit Removal Tank Structures	1978	50	2028
63	Preliminary Treatment	Plant 2 Aerated Grit Removal Tank Covers	1995	15	2010
64	Preliminary Treatment	Plant 2 Aerated Grit Removal Tank Mechanical	1995	10	2005
65	Preliminary Treatment	Plant 2 Grit Pump Drywell Structure	1978	50	2028
66	Preliminary Treatment	Plant 2 Grit Pump Drywell Handrail	1978	40	2018
67	Preliminary Treatment	Plant 2 Grit Pumps	1978	5	1983
68	Preliminary Treatment	Plant 2 Grit Pump Mechanical	1988	15	2003
69	Preliminary Treatment	Plant 2 Grit Pump Electrical	1988	25	2013
70	Preliminary Treatment	EMCC-J1	1997	30	2027
71	Preliminary Treatment	Plant 2 Grit Tank Bypass Valve 1&2	1978	30	2008
72	Preliminary Treatment	Plant 2 RSPS/Blower Building Structure	1979	40	2019
73	Preliminary Treatment	Plant 2 RSPS/Blower Building Crane	1979	30	2009
74	Preliminary Treatment	Plant 2 RSPS/Blower Building Mechanical	1978	15	1993
75	Preliminary Treatment	Plant 2 RSPS/Blower Building Electrical	1988	25	2013
76	Preliminary Treatment	MCC-J	2016	30	2046
77	Preliminary Treatment	ESBD-J	2016	30	2046
78	Preliminary Treatment	Plant 2 Raw Sewage Wetwell	1978	50	2028
79	Preliminary Treatment	Plant 2 Raw Sewage Pumps	1978	20	1998
80	Preliminary Treatment	Plant 2 Raw Sewage Pumps VFD's	2016	5	2021

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
81	Preliminary Treatment	Plant 2 Standby Power Generator # 2	1979	28	2007
82	Primary Treatment	Plant 1 Primary Influent Channel	1974	50	2024
83	Primary Treatment	Plant 1 Primary Influent Channel Cover Diamond Plate	1974	25	1999
84	Primary Treatment	Plant 1 Primary Sedimentation Basin Structural	1964	50	2014
85	Primary Treatment	Plant 1 Primary Hopper Valves (1 to 12)	1964	15	1979
86	Primary Treatment	Pneumatic Actuators (Plant 1)	1964	10	1974
87	Primary Treatment	Plant 1 Primary Sedimentation Basin Covers	1995	25	2020
88	Primary Treatment	Plant 1 Primary Sedimentation Sludge Collectors	2010	10	2020
89	Primary Treatment	Plant 1 Primary Sedimentation Sludge Collector Drives	2010	35	2045
90	Primary Treatment	Plant 1 Primary Sedimentation Scum Collectors- Skimmers	1990	18	2008
91	Primary Treatment	Plant 1 Primary Sedimentation Basin Electrical	1988	25	2013
92	Primary Treatment	Scum Pump Station	1979	50	2029
93	Primary Treatment	Scum Pump Station Wetwell	1979	50	2029
94	Primary Treatment	Scum Pump Station Architectural Hardware	1979	35	2014
95	Primary Treatment	Scum Pump Station Mechanical	1979	20	1999
96	Primary Treatment	Scum Pump Station Electrical	1979	35	2014
97	Primary Treatment	Scum Pump	1979	6	1985
98	Primary Treatment	MCC-G	1971	20	1991
99	Primary Treatment	Plant 1 Primary Sedimentation Launderers	1971	35	2006
100	Primary Treatment	Plant 1 Primary Sludge Pumps	2000	6	2006
101	Primary Treatment	Plant 1 Primary Sludge Flow Meter	2002	15	2017
102	Primary Treatment	Plant 1 Primary Sedimentation Basin Influent Gates	1964	30	1994
103	Primary Treatment	Plant 1 Primary Effluent Channel	1974	50	2024
104	Primary Treatment	Plant 1 Primary Effluent Channel Diamond Plate	1974	25	1999
105	Primary Treatment	Plant 2 Primary Influent Channel	1980	50	2030
106	Primary Treatment	Plant 2 Primary Influent Channel Cover Diamond Plate	1980	25	2005
107	Primary Treatment	Plant 2 Primary Sedimentation Basin Structures	1978	50	2028
108	Primary Treatment	Plant 2 Primary Hopper Valves (# 13 -18)	1978	15	1993
109	Primary Treatment	Pneumatic Actuators (Plant 2)	1978	10	1988
110	Primary Treatment	Plant 2 Primary Sedimentation Basin Covers	1995	15	2010
111	Primary Treatment	Plant 2 Primary Sedimentation Sludge Collectors # 7-9	1995	10	2005
112	Primary Treatment	Plant 2 Primary Sedimentation Sludge Collectors Drives	1978	25	2003

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
113	Primary Treatment	Plant 2 Primary Sedimentation Scum Collectors-Skimers	1990	15	2005
114	Primary Treatment	Plant 2 Primary Sedimentation Launderers	1978	35	2013
115	Primary Treatment	Plant 2 Primary Sedimentation Basin Electrical	1990	25	2015
116	Primary Treatment	Plant 2 Primary Sludge Pumps	2001	6	2007
117	Primary Treatment	Plant 2 Primary Sludge Flow Meter	2002	15	2017
118	Primary Treatment	Plant 2 Primary Sedimentation Basin Influent Gates	1978	30	2008
119	Primary Treatment	Plant 2 Primary Effluent Channel	1974	50	2024
120	Primary Treatment	Plant 2 Primary Effluent Channel Diamond Plate	1974	25	1999
121	Secondary Treatment	East Aeration Basin Structure	1989	50	2039
122	Secondary Treatment	Plant No.1 Aeration Basin Handrail	1974	40	2014
123	Secondary Treatment	Plant 1 Aeration Basin Air Piping	2016	20	2036
124	Secondary Treatment	Plant 1 Aeration Air Flow Meters	2016	20	2036
125	Secondary Treatment	Plant 1 Aeration Dissolved Oxygen Analyzers, sensors, data recorders	2016	20	2036
126	Secondary Treatment	Plant 1 Aeration Control Valves	2016	20	2036
	Secondary Treatment	Plant 1 Aeration Basin Control Valve Actuators	2016	20	2036
127	Secondary Treatment	Plant 1 Aeration Air Diffusion System	2016	20	2036
128	Secondary Treatment	Plant 1 Aeration Basin Influent Gates	2016	20	2036
129	Secondary Treatment	Plant 1 Aeration Basin Effluent Gates	2016	20	2036
130	Secondary Treatment	Plant 1 Aeration Basin Mechanical	1989	20	2009
131	Secondary Treatment	Aeration Tank Sump Pumps	1989	15	2004
132	Secondary Treatment	Plant 1 Aeration Basin Electrical	1989	25	2014
133	Secondary Treatment	Plant 2 Aeration Basin Structure	1989	50	2039
134	Secondary Treatment	Plant 2 Aeration Basin Handrail	1978	40	2018
135	Secondary Treatment	Plant 2 Aeration Basin Air Piping	2016	20	2036
136	Secondary Treatment	Plant 2 Aeration Air Flow Meters	2016	20	2036
137	Secondary Treatment	Plant 2 Aeration Dissolved Oxygen Analyzers, sensors, data recorders	2016	20	2036
138	Secondary Treatment	Plant 2 Aeration Control Valves	2016	20	2036
139	Secondary Treatment	Plant 2 Aeration Control Valve Actuators	2016	20	2036
140	Secondary Treatment	Plant 2 Aeration Air Diffusion System	2016	20	2036
141	Secondary Treatment	Plant 2 Aeration Basin Influent Gates	2016	20	2036
142	Secondary Treatment	Plant 2 Aeration Basin Effluent Gates	2016	20	2036
143	Secondary Treatment	Plant 2 Aeration Basin Mechanical	1989	20	2009
144	Secondary Treatment	Plant 2 Aeration Basin Electrical	1989	25	2014
145	Secondary Treatment	Plant 1 Blower Building Multistage Blowers	1984	25	2009
146	Secondary Treatment	Plant 1 Blower Building Air Compressors	2000	15	2015

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
147	Secondary Treatment	Plant 1 Blower Building Aeration Piping	1989	25	2014
148	Secondary Treatment	Plant 2 Blower Building Multistage Blowers	2016	32	2048
149	Secondary Treatment	Plant 2 Blower Building Air Compressors	1995	15	2010
150	Secondary Treatment	Plant 2 Blower Building Aeration Piping	2016	25	2041
151	Secondary Treatment	Plant 1 Mixed Liquor Channel	1974	50	2024
152	Secondary Treatment	Plant 1 Mixed Liquor Channel Grating	1974	40	2014
153	Secondary Treatment	Plant 2 Mixed Liquor Channel	1978	50	2028
154	Secondary Treatment	Plant 2 Mixed Liquor Channel Grating	1978	40	2018
155	Secondary Treatment	Mixed Liquor Channel Isolation Gate	1978	30	2008
156	Secondary Treatment	Plant 1 Secondary Sedimentation Basin Structures	1964	50	2014
157	Secondary Treatment	Plant 1 Secondary Sedimentation Basin Handrails	1974	40	2014
158	Secondary Treatment	Plant 1 Secondary Sedimentation Basin Sludge Collectors	1964	25	1989
159	Secondary Treatment	Plant 1 Secondary Sedimentation Basin Sludge Collectors Drives	2016	25	2041
160	Secondary Treatment	Plant 1 Secondary Sedimentation Basin Effluent Weirs	2016	35	2051
161	Secondary Treatment	Plant 1 Secondary Sedimentation Basin Mechanical	1988	20	2008
162	Secondary Treatment	Plant 1 Secondary Sedimentation Basin Influent Gates	2016	45	2061
163	Secondary Treatment	Plant 1 Secondary Sedimentation Basin Electrical	1978	25	2003
164	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Structures	1978	50	2028
165	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Handrail	1978	40	2018
166	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Sludge Collectors	1978	25	2003
167	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Sludge Collectors Drives	1978	25	2003
168	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Scum Collectors	1978	20	1998
169	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Effluent Weirs	1978	35	2013
170	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Mechanical	1978	20	1998
171	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Influent Gates	1978	30	2008
172	Secondary Treatment	Plant 2 Secondary Sedimentation Basin Electrical	1978	25	2003
173	Secondary Treatment	Plant 1 Basins Perimeter Handrail	1974	40	2014
174	Secondary Treatment	Plant 2 Basins Perimeter Handrail	1978	40	2018
175	Secondary Treatment	Plant 1 RAS Scope Valves	1992	20	2012
176	Secondary Treatment	Plant 1 RAS Pumps	1984	20	2004

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
177	Secondary Treatment	Plant 1 RAS Pump Station Mechanical	1984	20	2004
178	Secondary Treatment	Plant 1 RAS Pump Station Electrical	1984	25	2009
179	Secondary Treatment	Plant 1 RAS Pump Flow Meters	2002	15	2017
180	Secondary Treatment	Plant 2 RAS Scope Valves	1992	20	2012
181	Secondary Treatment	Plant 2 RAS Pumps	1978	20	1998
182	Secondary Treatment	Plant 2 RAS Pump Station Mechanical	1979	20	1999
183	Secondary Treatment	Plant 2 RAS Pump Station Electrical	1979	25	2004
184	Secondary Treatment	Plant 2 RAS Pump Flow Meters	2002	15	2017
185	Secondary Treatment	Plant 1 WAS Pumps	1999	10	2009
186	Secondary Treatment	Plant 1 WAS Flow Meters	1998	15	2013
187	Secondary Treatment	Plant 1 WAS Pumping Mechanical	1998	20	2018
188	Secondary Treatment	Plant 1 WAS Pumping Electrical	1998	25	2023
189	Secondary Treatment	Plant 2 WAS Pumps	1999	10	2009
190	Secondary Treatment	Plant 2 WAS Flow Meters	1998	15	2013
191	Secondary Treatment	Plant 2 WAS Pumping Mechanical	1998	20	2018
192	Secondary Treatment	Plant 2 WAS Pumping Electrical	1998	25	2023
193	Secondary Treatment	Auxiliary RAS PS Building	1974	50	2024
194	Secondary Treatment	Auxiliary RAS PS Building Architectural Hardware	1974	35	2009
195	Secondary Treatment	Auxiliary RAS PS Building RAS Pump	1974	20	1994
196	Secondary Treatment	Auxiliary RAS PS Building Mechanical	1974	20	1994
197	Secondary Treatment	Auxiliary RAS PS Building Electrical	1974	35	2009
198	Ferric Chloride System	Ferric Chloride Storage Tanks	1988	20	2008
199	Ferric Chloride System	Ferric Chloride Tanks Level Indicator	2003	5	2008
200	Ferric Chloride System	Ferric Chloride Metering Pumps	2004	8	2012
201	Ferric Chloride System	Ferric Chloride Containment System	1988	25	2013
202	Ferric Chloride System	Ferric Chloride Mechanical	2004	10	2014
203	Ferric Chloride System	Ferric Chloride Electrical	1988	25	2013
204	Sodium Hydroxide (Caustic) System	Scrubber 1 Caustic Storage Tank	1998	15	2013
205	Sodium Hydroxide (Caustic) System	Scrubber 1 Caustic Pump and Piping	1998	15	2013
206	Sodium Hydroxide (Caustic) System	Scrubber 2 Caustic Storage Tank	2003	15	2018
207	Sodium Hydroxide (Caustic) System	Scrubber 2 Caustic Pump and Piping	2003	15	2018
208	Sodium Hypochlorite System	Scrubber 1 NaOCI Storage Tank	1998	15	2013
209	Sodium Hypochlorite System	Scrubber 1 NaOCI Storage Pump and Piping	1998	15	2013
210	Sodium Hypochlorite System	Scrubber 2 NaOCI Storage Tank	2003	15	2018
211	Sodium Hypochlorite System	Scrubber 2 NaOCI Pump and Piping	2003	15	2018
212	Sodium Hypochlorite System	Scrubber No 1 Containment Structure	1998	50	2048
213	Sodium Hypochlorite System	Scrubber No2 Containment Structure	2003	50	2053
214	Sodium Hypochlorite System	NaOCI Containment Area	2008	50	2058
215	Sodium Hypochlorite System	NaOCI Containment Area Shade	2008	50	2058
216	Sodium Hypochlorite System	NaOCI Storage Tank	2008	30	2038
217	Sodium Hypochlorite System	NaOCI Metering Pumps	2008	15	2023

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J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
218	Sodium Hypochlorite System	NaOCl Piping and Valves	2008	15	2023
219	Sodium Hypochlorite System	NaOCl Containment Mechanical	2008	15	2023
220	Sodium Hypochlorite System	NaOCl Containment Electrical	2008	30	2038
221	Chlorine System	Chlorine Contact Tank Isolation Gates	1988	30	2018
222	Chlorine System	Chlorine Building	1972	50	2022
223	Chlorine System	Chlorine Building Roof	1972	30	2002
224	Chlorine System	Chlorine Building Architectural Hardware	1972	35	2007
225	Chlorine System	Chlorine Mechanical	1971	15	1986
226	Chlorine System	Chlorine Electrical	1971	25	1996
227	Effluent Management	Effluent Pump Station Structure	1993	40	2033
228	Effluent Management	Effluent Pump Station Structure Roof	1993	30	2023
229	Effluent Management	Effluent Pump Station Structure Architectural Hardware	1993	35	2028
230	Effluent Management	Effluent Pumps	1993	20	2013
231	Effluent Management	Effluent Pump Acoustic Enclosure	2001		2001
232	Effluent Management	Effluent Flow Meter (Plant 1 and Plant 2)	2006	15	2021
233	Effluent Management	Effluent Meter No.2 (Outfall Meter)	1991	15	2006
234	Effluent Management	Outfall/EPS Data Recorder & Data Flow RTU	1999	15	2014
235	Effluent Management	Effluent Pumps Station Engine	1993	20	2013
236	Effluent Management	Effluent Pump Station Standby Power Generator	1993	20	2013
237	Effluent Management	Effluent Pump Station Mechanical:	1993	15	2008
238	Effluent Management	Effluent Pump Station Blower	1993	15	2008
239	Effluent Management	Effluent Pump Station Fans	1993	15	2008
240	Effluent Management	Effluent Pump Station Electrical	1993	25	2018
241	Effluent Management	MCC-M	1991	20	2011
242	Effluent Management	SC-1	1991	20	2011
243	Administration	Administration Building	1994	40	2034
244	Administration	Air Conditioners	1995	8	2003
245	Administration	Furnaces	1995	15	2010
246	Administration	Document Storage Building	1964	40	2004
247	Administration	Lab Building	1965	40	2005
248		Lab Building Roof	1972		1972
249		Lab Building Architectural Hardware	1972	35	2007
250	Administration	Lab Building Mechanical	2004	10	2014
251	Administration	Lab Building Electrical	1964	25	1989
252	Administration	MCC-C	2002	20	2022
253	Administration	Laboratory Benchwork	1964	15	1979
254	Administration	Laboratory Equipment	1987	7	1994
255	Solids	Energy Building Structural	1987	40	2027
256	Solids	Energy Building Roof	1987		1987
257	Solids	Energy Building Skylights	2002		2002
258	Solids	Energy Building Architectural Hardware	1987	35	2022
259	Solids	Energy Building Mechanical	1987	20	2007
260	Solids	Energy Building Electrical	1987	25	2012
261	Solids	DAF Bulk Polymer Storage Tanks	1974	15	1989
262	Solids	Bulk Polymer Storage Tank Level Meter	2003	15	2018
263	Solids	DAF Bulk Polymer Transfer Pumps	1999	8	2007
264	Solids	DAF Polymer Day Tanks	1974	33	2007
265	Solids	DAF Polymer Mixer	1974	10	1984
266	Solids	Polymer Mixers DAFS	2003	10	2013
267	Solids	DAF Polymer Feeders	1990	8	1998

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
268	Solids	DAF Polymer Mechanical	1990	10	2000
269	Solids	DAF Polymer Electrical	1990	25	2015
270	Solids	DW Bulk Polymer Storage Tank	2003	15	2018
271	Solids	DW Bulk Polymer Level Meter	2003	5	2008
272	Solids	DW Bulk Polymer Structural Containment	2003	30	2033
273	Solids	DW Polymer Recirculation Pump	2003	8	2011
274	Solids	DW Polymer Feeders	2003	8	2011
275	Solids	DW Polymer Mechanical	2003	10	2013
276	Solids	DW Polymer Electrical	2003	25	2028
277	Solids	DAF Structures 1&2	1971	35	2006
278	Solids	DAF Covers	1995	15	2010
279	Solids	DAF Collectors	1971	25	1996
280	Solids	DAF Compressors	1971	15	1986
281	Solids	DAF Recirculation Pumps	2003	15	2018
282	Solids	DAF Dissolution Tanks	1971	25	1996
283	Solids	DAF Flow Meter (1&2)	1993	15	2008
284	Solids	TWAS Pumps	1995	8	2003
285	Solids	TWAS Flow Meter	1995	15	2010
286	Solids	DAF Mechanical	1971	20	1991
287	Solids	DAF Electrical	1995	25	2020
288	Solids	MCC-D	2000	20	2020
289	Solids	MCC-L	2009	30	2039
290	Solids	Digester Structures (1 and 2)	1971	50	2021
291	Solids	Digester Supernate Gates (1 and 2)	1991	20	2011
292	Solids	Digester Domes (1 and 2)	2006	35	2041
293	Solids	Digester Pump Mixing System (1 and 2)	2006	20	2026
294	Solids	Digester Circulation Pumps (1 and 2)	2000	15	2015
295	Solids	Digester Heat Loops (1 and 2)	1980	10	1990
296	Solids	Digester Mechanical (1 and 2)	1980	20	2000
297	Solids	Digester Electrical (1 and 2)	1980	25	2005
298	Solids	MCC-F	2002	20	2022
299	Solids	Digester Control Building (1 and 2)	1975	50	2025
300	Solids	Digester Control Building (1 and 2) Roof	1975	40	2015
301	Solids	Digester Control Building (1 and 2) Architectural Hardware	1975	35	2010
302	Solids	Digester Control Building Mechanical (1 and 2)	1975	20	1995
303	Solids	Digester Control Building (1 and 2) Electrical	1975	25	2000
304	Solids	Digester Gas Flow Meters (1 and 2)	1990	20	2010
305	Solids	Digester Boiler (1 and 2)	1989	25	2014
306	Solids	Digester Structure (3)	1972	50	2022
307	Solids	Digester Structure (4)	1972	50	2022
308	Solids	Digester Dome (4)	1972	35	2007
309	Solids	Digester Supernate Gates (4)	1991	20	2011
310	Solids	Digester Gas Mixing System (3 and 4)	1998	20	2018
311	Solids	Digester Gas Circulation Units (3 and 4)	1998	20	2018
312	Solids	Digester Circulation Pumps (3 and 4)	2000	15	2015
313	Solids	Digester Heat Loops (3 and 4)	1980	10	1990
314	Solids	Digester Mechanical (3 and 4)	1980	20	2000
315	Solids	Digester Electrical (3 and 4)	1980	25	2005
316	Solids	MCC-B	2002	20	2022
317	Solids	Digester Control Building (3 and 4)	1972	40	2012
318	Solids	Digester Control Building (3 and 4) Roof	1972	40	2012

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
319	Solids	Digester Control Building (3 and 4) Architectural Hardware	1972		
320	Solids	Digester Control Building Mechanical (3 and 4)	1980	20	2000
321	Solids	Digester Control Building (3 and 4) Electrical	1980	25	2005
322	Solids	Digester Gas Flow Meters (3 and 4)	1990	15	2005
323	Solids	Digester Total Gas Meter	1990	15	2005
324	Solids	Digester Boiler (3 and 4)	1974	35	2009
325	Solids	Digested Sludge Pumps	1998	6	2004
326	Solids	Digested Sludge Flow Meters (Centrifuge Flow Meters 1-3)	2003	15	2018
327	Solids	Sludge Grinder	2002	7	2009
328	Solids	Centrifuges - D5LL	2003	15	2018
329	Solids	Centrifuge - D5L	1999	15	2014
330	Solids	Diverters Gates	2002	30	2032
331	Solids	Conveyor 1	1999	15	2014
332	Solids	Conveyor 2	1999	15	2014
333	Solids	Conveyor 3	1999	15	2014
334	Solids	Conveyor 4	1999	15	2014
335	Solids	Truck Loads Cells	2001	40	2041
336	Solids	Dewatering System Mechanical	1999	20	2019
337	Solids	Dewatering System Electrical	1999	25	2024
338	Solids	MCC-CF	2003	20	2023
339	Solids	Dewatering Room Hoist	2003	30	2033
340	Odor Control	Odor Control Transfer Fan	1998	10	2008
341	Odor Control	Fresh Air Fans	1984	30	2014
342	Odor Control	Foul Air Fan	1984	30	2014
343	Odor Control	Odor Control Scrubber No.1	1998	15	2013
344	Odor Control	Odor Control Scrubber No.1 Ducting & Exhaust Fan	1998	15	2013
345	Odor Control	Odor Control Scrubber No.1 Electrical	1998	20	2018
346	Odor Control	Odor Control Scrubber No.2	2002	15	2017
347	Odor Control	Odor Control Scrubber No.2 Ducting & Exhaust Fan	2002	15	2017
348	Odor Control	Odor Control Scrubber No.2 Electrical	2002	20	2022
349	Odor Control	MCC 1&2	1985	30	2015
350	Energy	Hot Water Circulation Pumps	1986	15	2001
351	Energy	Waste Gas Burner	1983	20	2003
352	Energy	Waste Heat Boilers	1990	15	2005
353	Energy	Air Compressor Equipment	2004	15	2019
354	Energy	Energy Area Mechanical	1987	20	2007
355	Energy	Energy Area Electrical	1987	25	2012
356	Energy	Service Air System/compressors	2000	10	2010
357	Energy	Natural Gas Thermal Flow Meter	2017	20	2037
358	Energy	Digester Gas Thermal Flow Meter	2017	20	2037
359	Energy	Digester Gas PIT	2017	20	2037
360	Energy	Digester Gas TIT	2017	20	2037
361	Energy	Digester Gas Solenoid Valve	2017	20	2037
362	Energy	Digester Gas Motorized Valve	2017	20	2037
363	Energy	Digester Gas Piping and Valving (Gas Treatment Skid to Energy Building)	2017	30	2047
364	Energy	Natural Gas Solenoid Valve	2017	20	2037
365	Energy	Natural Gas Motorized Valve	2017	20	2037
366	Energy	Natural Gas Piping and Valving (Energy Building)	2017	30	2047
367	Energy	Lube Oil Solenoid Valve	2017	20	2037
368	Energy	Lube Oil Piping and Valving	2017	30	2047
369	Energy	Cogen Water Regulating Valve	2017	20	2037
370	Energy	Cogen Jacket Water Inlet Strainer	2017	30	2047
371	Energy	Cogen Jacket Water Pump	2017	25	2042

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
372	Energy	Cogen Jacket Water Piping and Valving	2017	25	
373	Energy	Cogen Jacket Water Heat Exchanger	2017	25	
374	Energy	Cogen Jacket Water Decoupling Heat Exchanger Pump	2017	25	
375	Energy	Engine Generator	2017	40	
376	Energy	Urea Storage Tank	2017	25	
377	Energy	Urea Injection Pump	2017	15	
378	Energy	Urea Piping and Valving	2017	20	
379	Energy	Exhaust Piping	2017	25	
380	Energy	Cogen Exhaust Heat Recovery Unit	2017	25	2042
381	Energy	Cogen Exhaust Thermal Flow Meter	2017	20	2037
382	Energy	Hot Water Supply Flow Meter	2017	20	2037
383	Energy	Hot Water Supply Temperature Indicator	2017	20	2037
384	Energy	Hot Water Supply Piping and Valving	2017	25	2042
385	Energy	Cogeneration Heat Exchanger	2017	25	2042
386	Energy	Jacket Water High Piping and Valving	2017	25	2042
387	Energy	Jacket Water High Pressure Regulating Valves	2017	25	2042
388	Energy	Cogen Waste Heat Radiator	2017	25	2042
389	Energy	Cogen Jacket Water High Inlet Strainer	2017	30	2047
390	Energy	Cogen Jacket Water High Pump	2017	25	2042
391	Energy	Hot Water Return Regulating Valve	2017	25	2042
392	Energy	Hot Water Return Inlet Strainer	2017	30	2047
393	Energy	Hot Water Return System Pump	2017	25	2042
394	Energy	Hot Water Return Piping and Valving	2017	25	2042
395	Energy	Clean Lube Oil Tank	2017	30	2047
396	Energy	Clean Lube Oil Pump	2017	25	2042
397	Energy	Clean Oil Lube Day Tank	2017	30	2047
398	Energy	Clean Lube Oil Flow Meter	2017	20	2037
399	Energy	Clean Lube Oil Piping and Valving	2017	25	2042
400	Energy	Waste Lube Oil Piping and Valving	2017	25	2042
401	Energy	Waste Lube Oil Storage Tank	2017	30	2047
402	Energy	Waste Lube Oil Pump	2017	25	2042
403	Energy	Waste Coolant Tank	2017	30	2047
404	Energy	Waste Coolant Pump	2017	25	2042
405	Energy	Waste Coolant Piping and Valving	2017	25	2042
406	Energy	Gas Treatment System	2017	20	2037
407	Energy	Cogeneration System Electrical	2017	25	2042
408	Energy	Switchgear CG	2017	30	2047
409	Energy	Solids Area PLC	2017	15	2032
410	Plant Water	Plant Water Pumps	2007	20	2027
411	Plant Water	Plant Water Strainers	1988	20	2008
412	Plant Water	Plant Water Pump Mechanical	2004	15	2019
413	Plant Water	Plant Water Pump Electrical	2004	25	2029
414	Plant Water	MCC-M	1988	20	2008
415	Plant Water	Air Gap System-Mechanical	2003	15	2018
416	Maintenance Shop	Bench Work	1988	20	2008
417	Maintenance Shop	Crane	1988	30	2018
418	Maintenance Shop	Equipment	1988	25	2013
419	Maintenance Shop	Electrical	1988	25	2013
420	Storage	Storage Building 1 (East)	1990	20	2010
421	Storage	Container Unit	2005	30	2035
422	Storm Water	Storm Water Pump Station Structure	1985	40	2025

Table B.2
J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
423	Storm Water	Storm Water Pump Station Engine	1982	25	2007
424	Storm Water	Storm Water Pump Station Pump	1993	15	2008
425	Storm Water	Storm Water Pump Station Structure Gates	1982	20	2002
426	Storm Water	Storm Water Pump Station Mechanical	1993	15	2008
427	Underground Piping	Dana Point Metering Structure	1978	50	2028
428	Underground Piping	Dana Point Parshall Flume	1978	50	2028
429	Underground Piping	Influent Sewer from Dana Point Metering Structure to Plant 2 Headworks	1978	75	2053
430	Underground Piping	Influent Sewer from Diversion Structure to Plant 1 Headworks	1974	75	2049
431	Underground Piping	Influent Sewer Bypass from Diversion Structure to Plant 2 Headworks	1986	75	2061
432	Underground Piping	Capistrano Beach Influent Sewer Force Main	1990	50	2040
433	Underground Piping	Influent Sewer from Plant 1 Grit Chamber to Plant 1 Raw Wetwell	1974	75	2049
434	Underground Piping	Suction Pipeline from Plant 1 Grit Basins to Emergency Pumps	2010	50	2060
435	Underground Piping	Discharge Pipe from Emergency Pumps to Plant 1 Primary Influent Channel	2010	50	2060
436	Underground Piping	Influent Sewer from Plant 2 Headworks to Plant 2 Raw Wetwell	1978	75	2053
437	Underground Piping	Scum Piping	1978	50	2028
438	Underground Piping	Plant 1 Waste Activate Sludge Piping	1974	50	2024
439	Underground Piping	Plant 2 Waste Activated Sludge Piping	1978	50	2028
440	Underground Piping	Thickened Waste Activate Sludge Piping	1974	50	2024
441	Underground Piping	Plant 1 Primary Sludge Piping	1974	50	2024
442	Underground Piping	Plant 2 Primary Sludge Piping	1978	50	2028
443	Underground Piping	Digester Transfer Piping	1992	50	2042
444	Underground Piping	Digested Sludge Piping (Below Ground)	1988	50	2038
445	Underground Piping	Digested Sludge Piping (Above Ground)	1988	50	2038
446	Underground Piping	Centrate Pipe	2007	100	2107
447	Underground Piping	DAF Overflow Pipe	1974	75	2049
448	Underground Piping	Drainage Piping	1978	75	2053
449	Underground Piping	Process Water Piping	1988	75	2063
450	Underground Piping	Potable Water Piping	1988	75	2063
	Underground Piping	Effluent Pipe	1980	75	2055
451	Underground Piping	Underground Electrical: Cable	1978	29	2007
452	Underground Piping	Underground Electrical: Conduit	1978	29	2007
453	Underground Piping	Underground Electrical: Manholes	1978	30	2008
454	Instrumentation	PLC WRAS	2003	15	2018
455	Instrumentation	PLC WRSP	2003	15	2018
456	Instrumentation	PLC WPSP	2003	15	2018
457	Instrumentation	PLC EPSP	2003	15	2018
458	Instrumentation	PLC ERSP	2003	15	2018
459	Instrumentation	PLC EHW	2005	15	2020
460	Instrumentation	PLC Digester 1/2	2003	15	2018
461	Instrumentation	PLC Digester 3/4	2003	15	2018
462	Instrumentation	PLC Master Centrifuge	2003	15	2018
463	Site	Paving	1986	40	2026
464	Site	Gate 1	2010	40	2050
465	Site	Gate 2	2010	40	2050
466	Site	Administration Building Parking Paving	1992	40	2032

Table B.2
 J. B. Latham Treatment Plant Asset Listing

Item No.	System/Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
467	Site	West Wall	2003	40	2043
468	Site	South Wall	2017	50	2067
469	Site	East Fence	1986	40	2026
470	Site	North Fence	1986	40	2026
471	Site	Abandoned Effluent Pump Station Wetwell and Structure	1965	50	2015

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 1 (19/20)								
	3216-000	Package B Common II	\$ 877,000	\$ 877,000	\$ 196,000	\$ 267,000	\$ 200,000	\$ 214,000
	3220-000	Package B Liquids II	\$ 3,657,000	\$ 3,657,000	\$ 844,000	\$ 1,125,000	\$ 633,000	\$ 1,055,000
	3287-000	Package B Solids II	\$ 4,767,000	\$ 4,767,000	\$ 1,031,000	\$ 1,430,000	\$ 1,353,000	\$ 953,000
	4201-000	Plant 1 Blower Building Condition Assessment	\$ 86,000	\$ 86,000	\$ 20,000	\$ 26,000	\$ 15,000	\$ 25,000
	4202-000	Pipeline Condition Assessment Methodology Evaluation	\$ 50,000	\$ 50,000	\$ 12,000	\$ 16,000	\$ 9,000	\$ 15,000
	4203-000	Plant Hydraulic Model and Flow Management Plan	\$ 177,000	\$ 177,000	\$ 41,000	\$ 54,000	\$ 31,000	\$ 51,000
	4204-000	Electrical Manhole Condition Assessment	\$ 91,000	\$ 91,000	\$ 20,000	\$ 28,000	\$ 21,000	\$ 22,000
	4214-000	Solids Management Plan	\$ 101,000	\$ 101,000	\$ 22,000	\$ 30,000	\$ 29,000	\$ 20,000
		Small Cap Liquids	\$ 252,000	\$ 252,000	\$ 58,000	\$ 78,000	\$ 44,000	\$ 73,000
		Small Cap Solids	\$ 213,000	\$ 213,000	\$ 46,000	\$ 64,000	\$ 60,000	\$ 43,000
		Small Cap Common	\$ 221,000	\$ 221,000	\$ 49,000	\$ 67,000	\$ 50,000	\$ 54,000
		TOTALS	\$ 10,492,000	\$ 10,492,000	\$ 2,339,000	\$ 3,185,000	\$ 2,444,000	\$ 2,524,000

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD	
YEAR 2 (20/21)									
	3216-000	Package B Common III	\$ 587,000	\$ 587,000	\$ 131,000	\$ 178,000	\$ 134,000	\$ 143,000	
	3220-000	Package B Liquids III	\$ 3,740,000	\$ 3,740,000	\$ 863,000	\$ 1,151,000	\$ 647,000	\$ 1,079,000	
	3227-000	Package D Design Liquids	\$ 305,000	\$ 305,000	\$ 70,000	\$ 94,000	\$ 53,000	\$ 88,000	
	3229-000	Drainage Pump Station Reconstruction	\$ 179,000	\$ 179,000	\$ 40,000	\$ 54,000	\$ 41,000	\$ 44,000	
	3234-000	Centrate Piping Reconstruction	\$ 199,000	\$ 199,000	\$ 43,000	\$ 60,000	\$ 56,000	\$ 40,000	
	3235-000	Package D Solids Design	\$ 916,000	\$ 916,000	\$ 198,000	\$ 275,000	\$ 260,000	\$ 183,000	
	3285-000	Main Plant Drain Line Reconstruction	\$ 279,000	\$ 279,000	\$ 64,000	\$ 86,000	\$ 48,000	\$ 80,000	
	3287-000	Package B Solids III	\$ 4,085,000	\$ 4,085,000	\$ 883,000	\$ 1,226,000	\$ 1,159,000	\$ 817,000	
	4205-000	Influent Flow Metering Evaluation	\$ 51,000	\$ 51,000	\$ 12,000	\$ 16,000	\$ 9,000	\$ 15,000	
	4206-000	Plant 1 Grit Handling Evaluation	\$ 51,000	\$ 51,000	\$ 12,000	\$ 16,000	\$ 9,000	\$ 15,000	
	4207-000	Chlorine Contact Basin/Effluent Pump Station Condition Assessment	\$ 66,000	\$ 66,000	\$ 15,000	\$ 20,000	\$ 11,000	\$ 19,000	
	4208-000	Dana Point Influent Sewer Condition Assessment	\$ 66,000	\$ 66,000	\$ 15,000	\$ 20,000	\$ 11,000	\$ 19,000	
	4209-000	Plant 1 Influent Sewer Condition Assessment	\$ 86,000	\$ 86,000	\$ 20,000	\$ 27,000	\$ 15,000	\$ 25,000	
	4210-000	Plant 1 Bypass Sewer Condition Assessment	\$ 41,000	\$ 41,000	\$ 9,000	\$ 12,000	\$ 7,000	\$ 12,000	
	4211-000	Site Storage Evaluation	\$ 61,000	\$ 61,000	\$ 14,000	\$ 19,000	\$ 14,000	\$ 15,000	
	4212-000	Buried Utility Master Plan	\$ 152,000	\$ 152,000	\$ 34,000	\$ 46,000	\$ 35,000	\$ 37,000	
	4213-000	Electrical Conduit and Cable Master Plan	\$ 61,000	\$ 61,000	\$ 14,000	\$ 19,000	\$ 14,000	\$ 15,000	
			Small Cap Liquids	\$ 260,000	\$ 260,000	\$ 60,000	\$ 80,000	\$ 45,000	\$ 75,000
			Small Cap Solids	\$ 219,000	\$ 219,000	\$ 47,000	\$ 66,000	\$ 62,000	\$ 44,000
		Small Cap Common	\$ 228,000	\$ 228,000	\$ 51,000	\$ 69,000	\$ 52,000	\$ 56,000	
		TOTALS	\$ 11,632,000	\$ 11,632,000	\$ 2,596,000	\$ 3,532,000	\$ 2,683,000	\$ 2,820,000	

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 3 (21/22)								
	2054	Plant 1 Headworks Condition Assessment	\$ 45,000	\$ 47,000	\$ 11,000	\$ 15,000	\$ 8,000	\$ 14,000
	2095	Capistrano Beach Influent Sewer Condition Assessment	\$ 100,000	\$ 105,000	\$ 24,000	\$ 32,000	\$ 18,000	\$ 30,000
	2098	Plant 2 Primary Sedimentation Upgrade	\$ 2,076,000	\$ 2,185,000	\$ 504,000	\$ 672,000	\$ 378,000	\$ 630,000
	2099	Plant 2 Secondary Sedimentation Upgrade	\$ 2,013,000	\$ 2,119,000	\$ 489,000	\$ 652,000	\$ 367,000	\$ 611,000
	2334	MCC M Replacement	\$ 336,000	\$ 353,000	\$ 79,000	\$ 107,000	\$ 81,000	\$ 86,000
	2530	Dewatering System Reconstruction	\$ 950,000	\$ 1,000,000	\$ 216,000	\$ 300,000	\$ 284,000	\$ 200,000
	2531	Solids Conveyor Replacement	\$ 167,000	\$ 176,000	\$ 38,000	\$ 53,000	\$ 50,000	\$ 35,000
	2532	Storage and Truck loading Rehabilitation	\$ 853,000	\$ 898,000	\$ 194,000	\$ 269,000	\$ 255,000	\$ 180,000
	2533	Gas Flare Replacement	\$ 1,668,000	\$ 1,756,000	\$ 380,000	\$ 527,000	\$ 498,000	\$ 351,000
	2536	MCC 2 and CF Replacement	\$ 723,000	\$ 761,000	\$ 165,000	\$ 228,000	\$ 216,000	\$ 152,000
		Small Cap Liquids	\$ 260,000	\$ 268,000	\$ 62,000	\$ 83,000	\$ 46,000	\$ 77,000
		Small Cap Solids	\$ 219,000	\$ 226,000	\$ 49,000	\$ 68,000	\$ 64,000	\$ 45,000
		Small Cap Common	\$ 228,000	\$ 235,000	\$ 52,000	\$ 71,000	\$ 54,000	\$ 57,000
	TOTALS	\$ 9,638,000	\$ 10,129,000	\$ 2,263,000	\$ 3,077,000	\$ 2,319,000	\$ 2,470,000	

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 4 ('22/'23)								
	2057	Plant 1 Grit Handling Upgrade	\$ 253,000	\$ 283,000	\$ 65,000	\$ 87,000	\$ 49,000	\$ 82,000
	2059	Plant 1 Blower Building Structural and Infrastructure Upgrade	\$ 614,000	\$ 685,000	\$ 158,000	\$ 211,000	\$ 119,000	\$ 198,000
	2060	Plant 1 Raw Sewage Pump Station Upgrade	\$ 1,596,000	\$ 1,781,000	\$ 411,000	\$ 548,000	\$ 308,000	\$ 514,000
	2061	Plant 1 Raw Sewage Pump VFD Upgrade	\$ 157,000	\$ 175,000	\$ 40,000	\$ 54,000	\$ 30,000	\$ 51,000
	2062	Plant 1 RAS and WAS Pump System Upgrade	\$ 1,099,000	\$ 1,226,000	\$ 283,000	\$ 377,000	\$ 212,000	\$ 354,000
	2063	Plant 1 Primary Sludge Pumping Upgrade	\$ 639,000	\$ 713,000	\$ 164,000	\$ 219,000	\$ 123,000	\$ 206,000
	2065	MCC-A-1 Replacement	\$ 521,000	\$ 581,000	\$ 134,000	\$ 179,000	\$ 101,000	\$ 168,000
	2066	Plant 1 Emergency Generator	\$ 564,000	\$ 630,000	\$ 145,000	\$ 194,000	\$ 109,000	\$ 182,000
	2079	Aeration Basin Drainage Pumps	\$ 423,000	\$ 472,000	\$ 109,000	\$ 145,000	\$ 82,000	\$ 136,000
	2083	Chlorine Contact Basin Isolation Gates and Structural Rehabilitation	\$ 297,000	\$ 331,000	\$ 76,000	\$ 102,000	\$ 57,000	\$ 96,000
	2322	Chlorine Building and Storm Water Pump Station Condition Assessment	\$ 45,000	\$ 50,000	\$ 11,000	\$ 15,000	\$ 11,000	\$ 12,000
		Small Cap Liquids	\$ 260,000	\$ 277,000	\$ 64,000	\$ 85,000	\$ 48,000	\$ 80,000
		Small Cap Solids	\$ 219,000	\$ 234,000	\$ 50,000	\$ 70,000	\$ 66,000	\$ 47,000
	Small Cap Common	\$ 228,000	\$ 242,000	\$ 54,000	\$ 74,000	\$ 55,000	\$ 59,000	
	TOTALS	\$ 6,915,000	\$ 7,680,000	\$ 1,767,000	\$ 2,360,000	\$ 1,371,000	\$ 2,182,000	

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 5 (23/24)								
	2067	Plant 2 Headworks Condition Assessment	\$ 45,000	\$ 51,000	\$ 12,000	\$ 16,000	\$ 9,000	\$ 15,000
	2069	Plant 2 Blower Building Condition Assessment	\$ 55,000	\$ 63,000	\$ 15,000	\$ 19,000	\$ 11,000	\$ 18,000
	2078	Scum Pump Station Upgrade	\$ 584,000	\$ 669,000	\$ 154,000	\$ 206,000	\$ 116,000	\$ 193,000
	2088	Effluent Pipeline Condition Assessment	\$ 200,000	\$ 229,000	\$ 53,000	\$ 70,000	\$ 40,000	\$ 66,000
	2089	Effluent Flow Metering Evaluation	\$ 60,000	\$ 69,000	\$ 16,000	\$ 21,000	\$ 12,000	\$ 20,000
	2335	Administration Building Condition Assessment	\$ 25,000	\$ 29,000	\$ 6,000	\$ 9,000	\$ 7,000	\$ 7,000
	2336	Administration Building Spatial Evaluation	\$ 40,000	\$ 46,000	\$ 10,000	\$ 14,000	\$ 10,000	\$ 11,000
	2522	DAF Polymer System Upgrade	\$ 648,000	\$ 741,000	\$ 160,000	\$ 222,000	\$ 210,000	\$ 148,000
	2526	Anaerobic Digester No.3 and No.4 Mechanical Upgrade	\$ 1,449,000	\$ 1,657,000	\$ 358,000	\$ 497,000	\$ 470,000	\$ 331,000
	2527	Anaerobic Digester No.3 and No.4 Control Building Upgrade	\$ 816,000	\$ 934,000	\$ 202,000	\$ 280,000	\$ 265,000	\$ 187,000
	2534	Buried Digester Piping Reconstruction	\$ 685,000	\$ 783,000	\$ 169,000	\$ 235,000	\$ 222,000	\$ 157,000
		Small Cap Liquids	\$ 260,000	\$ 286,000	\$ 66,000	\$ 88,000	\$ 49,000	\$ 82,000
		Small Cap Solids	\$ 219,000	\$ 241,000	\$ 52,000	\$ 72,000	\$ 68,000	\$ 48,000
	Small Cap Common	\$ 228,000	\$ 250,000	\$ 56,000	\$ 76,000	\$ 57,000	\$ 61,000	
	TOTALS	\$ 5,314,000	\$ 6,047,000	\$ 1,330,000	\$ 1,826,000	\$ 1,547,000	\$ 1,345,000	

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 6 (24/25)								
	2080	Odor Control Scrubber No.3 Installation	\$ 565,000	\$ 652,000	\$ 150,000	\$ 201,000	\$ 113,000	\$ 188,000
	2090	Odor Control Scrubber No.1 Replacement	\$ 3,257,000	\$ 3,758,000	\$ 867,000	\$ 1,156,000	\$ 650,000	\$ 1,084,000
	2321	Odor Control Scrubber No.2 Replacement	\$ 5,777,000	\$ 6,666,000	\$ 1,490,000	\$ 2,025,000	\$ 1,523,000	\$ 1,628,000
	2521	Odor Control Scrubber No.4 Installation	\$ 495,000	\$ 571,000	\$ 124,000	\$ 171,000	\$ 162,000	\$ 114,000
		Small Cap Liquids	\$ 260,000	\$ 295,000	\$ 68,000	\$ 91,000	\$ 51,000	\$ 85,000
		Small Cap Solids	\$ 219,000	\$ 249,000	\$ 54,000	\$ 75,000	\$ 71,000	\$ 50,000
		Small Cap Common	\$ 228,000	\$ 258,000	\$ 58,000	\$ 78,000	\$ 59,000	\$ 63,000
		TOTALS	\$ 10,801,000	\$ 12,449,000	\$ 2,810,000	\$ 3,797,000	\$ 2,629,000	\$ 3,212,000

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 7 (25/26)								
	2051	Influent Diversion Structure Upgrade	\$ 394,000	\$ 473,000	\$ 109,000	\$ 146,000	\$ 82,000	\$ 136,000
	2055	Plant 1 Headworks Upgrade	\$ 1,672,000	\$ 2,006,000	\$ 463,000	\$ 617,000	\$ 347,000	\$ 579,000
	2081	Sodium Hypochlorite System Reconstruction	\$ 600,000	\$ 720,000	\$ 166,000	\$ 222,000	\$ 125,000	\$ 208,000
	2101	Effluent Pump VFD Replacement	\$ 272,000	\$ 327,000	\$ 75,000	\$ 101,000	\$ 57,000	\$ 94,000
	2337	Administration Building Roof Reconstruction	\$ 345,000	\$ 414,000	\$ 93,000	\$ 126,000	\$ 95,000	\$ 101,000
	2338	Administration Building HVAC Reconstruction	\$ 167,000	\$ 200,000	\$ 45,000	\$ 61,000	\$ 46,000	\$ 49,000
	2342	Maintenance Shop Rehabilitation	\$ 203,000	\$ 244,000	\$ 55,000	\$ 74,000	\$ 56,000	\$ 60,000
	2350	Buried Water Pipe Reconstruction	\$ 1,027,000	\$ 1,232,000	\$ 275,000	\$ 374,000	\$ 281,000	\$ 301,000
	2540	Dewatering System Replacement	\$ 4,234,000	\$ 5,080,000	\$ 1,098,000	\$ 1,524,000	\$ 1,442,000	\$ 1,016,000
		Small Cap Liquids	\$ 260,000	\$ 304,000	\$ 70,000	\$ 94,000	\$ 53,000	\$ 88,000
		Small Cap Solids	\$ 219,000	\$ 257,000	\$ 56,000	\$ 77,000	\$ 73,000	\$ 51,000
		Small Cap Common	\$ 228,000	\$ 266,000	\$ 60,000	\$ 81,000	\$ 61,000	\$ 65,000
	TOTALS	\$ 9,622,000	\$ 11,524,000	\$ 2,564,000	\$ 3,496,000	\$ 2,716,000	\$ 2,748,000	

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 8 (26/27)								
	2052	Bypass Flow Installation	\$ 623,000	\$ 767,000	\$ 177,000	\$ 236,000	\$ 133,000	\$ 221,000
	2346	Storage Building Replacement	\$ 468,000	\$ 576,000	\$ 129,000	\$ 175,000	\$ 131,000	\$ 141,000
	2523	Dewatering Polymer System Upgrade	\$ 277,000	\$ 341,000	\$ 74,000	\$ 102,000	\$ 97,000	\$ 68,000
	2524	MCC D Replacement	\$ 372,000	\$ 457,000	\$ 99,000	\$ 137,000	\$ 130,000	\$ 91,000
	2528	Digested Sludge Pump Station Upgrade	\$ 375,000	\$ 461,000	\$ 100,000	\$ 138,000	\$ 131,000	\$ 92,000
	2529	MCC B Replacement	\$ 406,000	\$ 500,000	\$ 108,000	\$ 150,000	\$ 142,000	\$ 100,000
	2537	Digester 5 Construction	\$ 10,148,000	\$ 12,493,000	\$ 2,701,000	\$ 3,748,000	\$ 3,545,000	\$ 2,499,000
		Small Cap Liquids	\$ 260,000	\$ 314,000	\$ 72,000	\$ 97,000	\$ 54,000	\$ 91,000
		Small Cap Solids	\$ 219,000	\$ 265,000	\$ 57,000	\$ 79,000	\$ 75,000	\$ 53,000
		Small Cap Common	\$ 228,000	\$ 275,000	\$ 61,000	\$ 84,000	\$ 63,000	\$ 67,000
	TOTALS	\$ 13,375,000	\$ 16,448,000	\$ 3,578,000	\$ 4,946,000	\$ 4,501,000	\$ 3,423,000	

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 9 (27/28)								
	2333	Chlorine Building Rehabilitation	\$ 240,000	\$ 314,000	\$ 70,000	\$ 95,000	\$ 72,000	\$ 77,000
	2340	Plant Water Pump Station Reconstruction	\$ 648,000	\$ 847,000	\$ 189,000	\$ 257,000	\$ 193,000	\$ 207,000
	2341	Non-Potable Water Pump Station Reconstruction	\$ 634,000	\$ 829,000	\$ 185,000	\$ 252,000	\$ 189,000	\$ 202,000
	2343	SCADA System Upgrade Project/1st Phase	\$ 584,000	\$ 764,000	\$ 171,000	\$ 232,000	\$ 174,000	\$ 186,000
	2347	Storm Water Pump Station Reconstruction	\$ 377,000	\$ 493,000	\$ 110,000	\$ 150,000	\$ 113,000	\$ 120,000
		Small Cap Liquids	\$ 260,000	\$ 324,000	\$ 75,000	\$ 100,000	\$ 56,000	\$ 94,000
		Small Cap Solids	\$ 219,000	\$ 273,000	\$ 59,000	\$ 82,000	\$ 78,000	\$ 55,000
		Small Cap Common	\$ 228,000	\$ 284,000	\$ 63,000	\$ 86,000	\$ 65,000	\$ 69,000
		TOTALS	\$ 3,190,000	\$ 4,128,000	\$ 923,000	\$ 1,254,000	\$ 940,000	\$ 1,010,000

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 10 (28/29)								
	2070	Plant 2 Blower Building Structural and Infrastructure Upgrade	\$ 496,000	\$ 652,000	\$ 150,000	\$ 201,000	\$ 113,000	\$ 188,000
	2071	Plant 2 Raw Sewage Pump Station Upgrade	\$ 983,000	\$ 1,293,000	\$ 298,000	\$ 398,000	\$ 224,000	\$ 373,000
	2072	Plant 2 Raw Sewage Pump VFD Upgrade	\$ 190,000	\$ 249,000	\$ 58,000	\$ 77,000	\$ 43,000	\$ 72,000
	2073	Plant 2 RAS and WAS Pump System Upgrade	\$ 870,000	\$ 1,145,000	\$ 264,000	\$ 352,000	\$ 198,000	\$ 330,000
	2074	Plant 2 Primary Sludge Pumping Upgrade	\$ 514,000	\$ 676,000	\$ 156,000	\$ 208,000	\$ 117,000	\$ 195,000
	2075	Plant 2 Emergency Generator	\$ 490,000	\$ 645,000	\$ 149,000	\$ 198,000	\$ 112,000	\$ 186,000
	2076	Plant 2 Meter Vault Upgrade	\$ 326,000	\$ 429,000	\$ 99,000	\$ 132,000	\$ 74,000	\$ 124,000
	2077	Plant 2 Grit Handling Upgrade	\$ 649,000	\$ 854,000	\$ 197,000	\$ 263,000	\$ 148,000	\$ 246,000
	2520	Ferric Chloride System Reconstruction	\$ 776,000	\$ 1,022,000	\$ 221,000	\$ 307,000	\$ 290,000	\$ 204,000
		Small Cap Liquids	\$ 260,000	\$ 335,000	\$ 77,000	\$ 103,000	\$ 58,000	\$ 97,000
		Small Cap Solids	\$ 219,000	\$ 282,000	\$ 61,000	\$ 85,000	\$ 80,000	\$ 56,000
		Small Cap Common	\$ 228,000	\$ 293,000	\$ 65,000	\$ 89,000	\$ 67,000	\$ 72,000
	TOTALS	\$ 6,001,000	\$ 7,876,000	\$ 1,796,000	\$ 2,412,000	\$ 1,524,000	\$ 2,144,000	

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

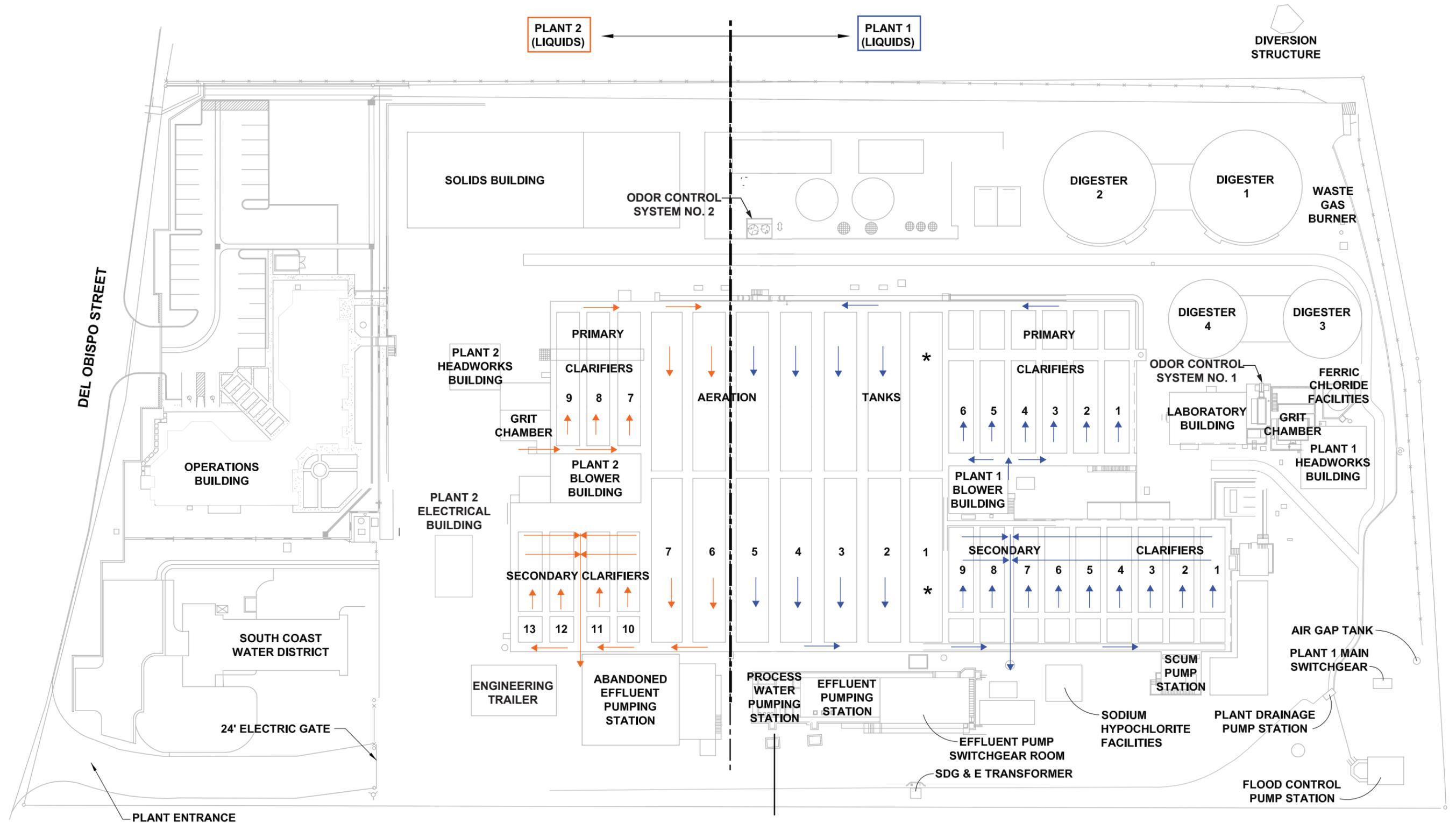
Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 11 ('29/'30)								
	2096	Plant 1 Liquids Buried Piping Reconstruction	\$ 442,000	\$ 614,000	\$ 142,000	\$ 189,000	\$ 106,000	\$ 177,000
	2097	Plant 2 Liquids Buried Piping Reconstruction	\$ 689,000	\$ 958,000	\$ 221,000	\$ 295,000	\$ 166,000	\$ 276,000
	2351	Buried Drainage Pipe Reconstruction	\$ 632,000	\$ 878,000	\$ 196,000	\$ 267,000	\$ 201,000	\$ 214,000
	2354	Natural Gas Pipeline Replacement	\$ 772,000	\$ 1,073,000	\$ 240,000	\$ 326,000	\$ 245,000	\$ 262,000
		Small Cap Liquids	\$ 260,000	\$ 345,000	\$ 80,000	\$ 106,000	\$ 60,000	\$ 100,000
		Small Cap Solids	\$ 219,000	\$ 291,000	\$ 63,000	\$ 87,000	\$ 83,000	\$ 58,000
		Small Cap Common	\$ 228,000	\$ 302,000	\$ 68,000	\$ 92,000	\$ 69,000	\$ 74,000
		TOTALS	\$ 3,243,000	\$ 4,461,000	\$ 1,009,000	\$ 1,362,000	\$ 929,000	\$ 1,161,000
YEAR 12 ('30/'31)								
	2525	Anaerobic Digester No.1 and No.2 Mechanical Upgrade	\$ 3,702,000	\$ 5,203,000	\$ 1,125,000	\$ 1,561,000	\$ 1,476,000	\$ 1,041,000
		Small Cap Liquids	\$ 260,000	\$ 356,000	\$ 82,000	\$ 110,000	\$ 62,000	\$ 103,000
		Small Cap Solids	\$ 219,000	\$ 300,000	\$ 65,000	\$ 90,000	\$ 85,000	\$ 60,000
		Small Cap Common	\$ 228,000	\$ 312,000	\$ 70,000	\$ 95,000	\$ 71,000	\$ 76,000
		TOTALS	\$ 4,409,000	\$ 6,171,000	\$ 1,342,000	\$ 1,855,000	\$ 1,695,000	\$ 1,280,000

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 13 ('31/'32)								
	2085	Effluent Pump Station Rehabilitation	\$ 354,000	\$ 541,000	\$ 125,000	\$ 166,000	\$ 94,000	\$ 156,000
	2086	Effluent Pump Reconstruction	\$ 1,493,000	\$ 2,282,000	\$ 527,000	\$ 702,000	\$ 395,000	\$ 658,000
	2087	Effluent Pump Station Standby Power Generator Replacement	\$ 611,000	\$ 933,000	\$ 215,000	\$ 287,000	\$ 161,000	\$ 269,000
		Small Cap Liquids	\$ 260,000	\$ 368,000	\$ 85,000	\$ 113,000	\$ 64,000	\$ 106,000
		Small Cap Solids	\$ 219,000	\$ 310,000	\$ 67,000	\$ 93,000	\$ 88,000	\$ 62,000
		Small Cap Common	\$ 228,000	\$ 322,000	\$ 72,000	\$ 98,000	\$ 74,000	\$ 79,000
		TOTALS	\$ 3,164,000	\$ 4,755,000	\$ 1,090,000	\$ 1,459,000	\$ 875,000	\$ 1,330,000
YEAR 14 ('32/'33)								
	2068	Plant 2 Headworks Upgrade	\$ 574,000	\$ 907,000	\$ 209,000	\$ 279,000	\$ 157,000	\$ 262,000
		Small Cap Liquids	\$ 260,000	\$ 380,000	\$ 88,000	\$ 117,000	\$ 66,000	\$ 109,000
		Small Cap Solids	\$ 219,000	\$ 320,000	\$ 69,000	\$ 96,000	\$ 91,000	\$ 64,000
		Small Cap Common	\$ 228,000	\$ 332,000	\$ 74,000	\$ 101,000	\$ 76,000	\$ 81,000
		TOTALS	\$ 1,281,000	\$ 1,939,000	\$ 440,000	\$ 593,000	\$ 389,000	\$ 516,000

Table B.3 - J.B. Latham Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 15 ('33/'34)								
	2064	Plant 1 Aeration Blower System Replacement	\$ 550,000	\$ 875,000	\$ 202,000	\$ 269,000	\$ 152,000	\$ 253,000
	2345	Site Pavement Reconstruction	\$ 932,000	\$ 1,484,000	\$ 332,000	\$ 451,000	\$ 339,000	\$ 362,000
	2353	Perimeter Fencing Replacement	\$ 108,000	\$ 173,000	\$ 39,000	\$ 52,000	\$ 39,000	\$ 42,000
		Small Cap Liquids	\$ 260,000	\$ 392,000	\$ 90,000	\$ 121,000	\$ 68,000	\$ 113,000
		Small Cap Solids	\$ 219,000	\$ 330,000	\$ 71,000	\$ 99,000	\$ 94,000	\$ 66,000
		Small Cap Common	\$ 228,000	\$ 343,000	\$ 77,000	\$ 104,000	\$ 78,000	\$ 84,000
		TOTALS	\$ 2,296,000	\$ 3,596,000	\$ 811,000	\$ 1,096,000	\$ 770,000	\$ 920,000

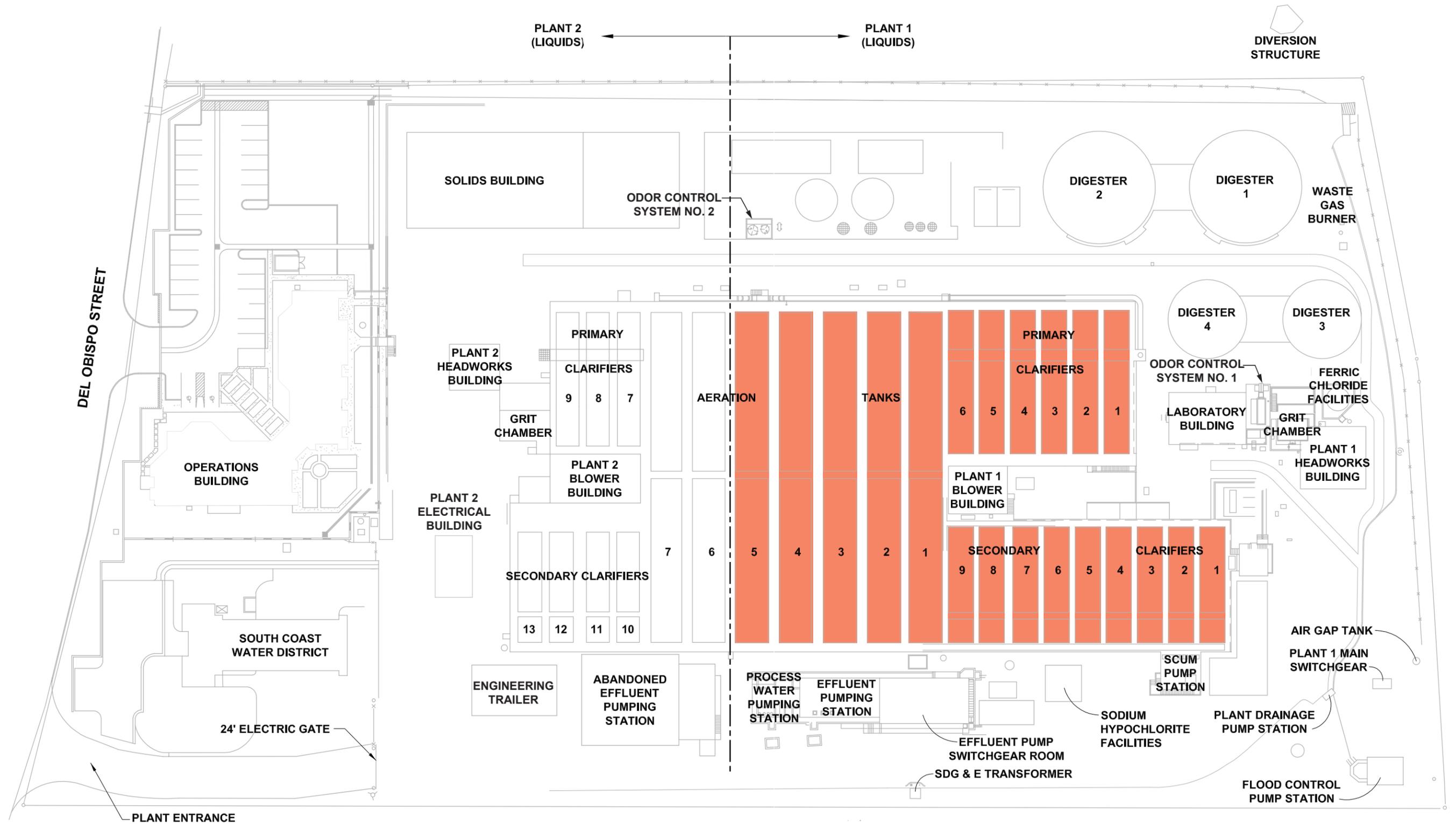


SITE PLAN



*Aeration Tank No.1 will be Permanently Taken Out of Service

Figure B.2
Overall Site Plan and Flow Path



Legend

Indicates Required Basins under Specified Operating Condition

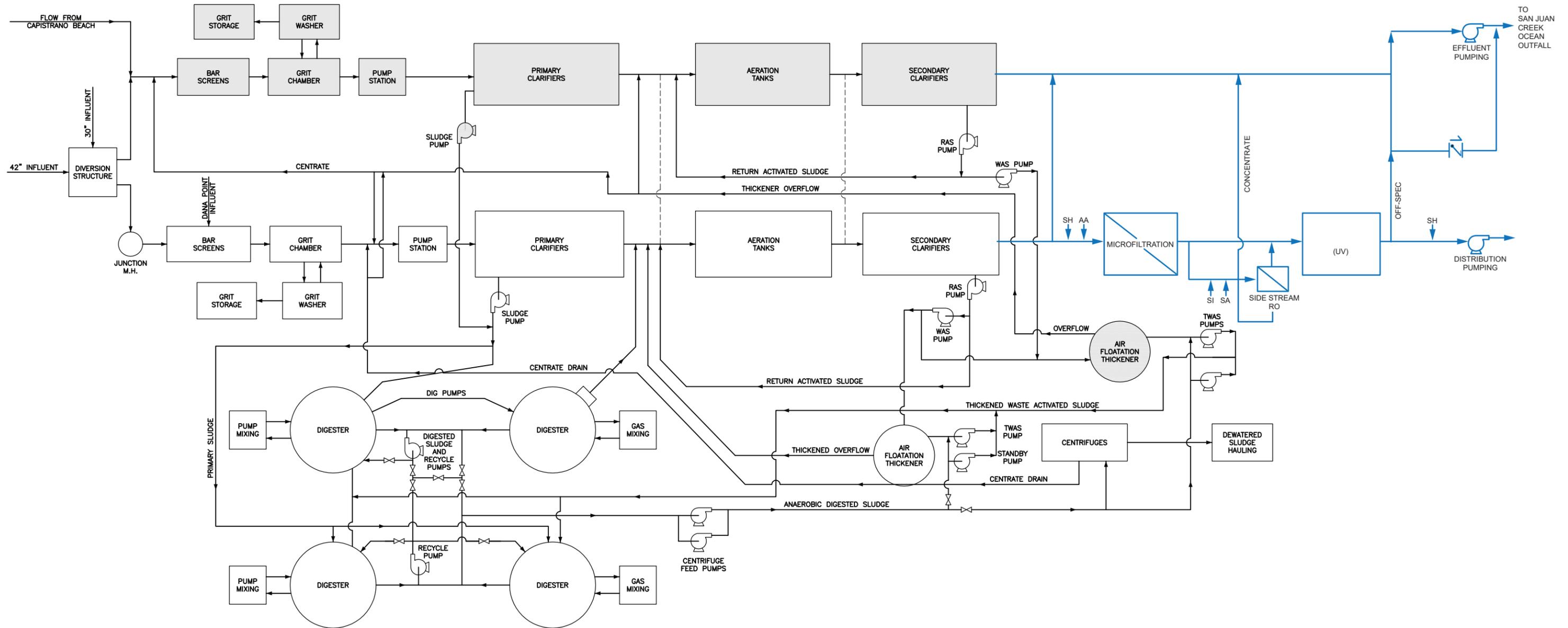
SITE PLAN



Figure B.1
Basin Requirement at 6.2 MGD
Average Annual Daily Flow

Prepared By:





Chemicals

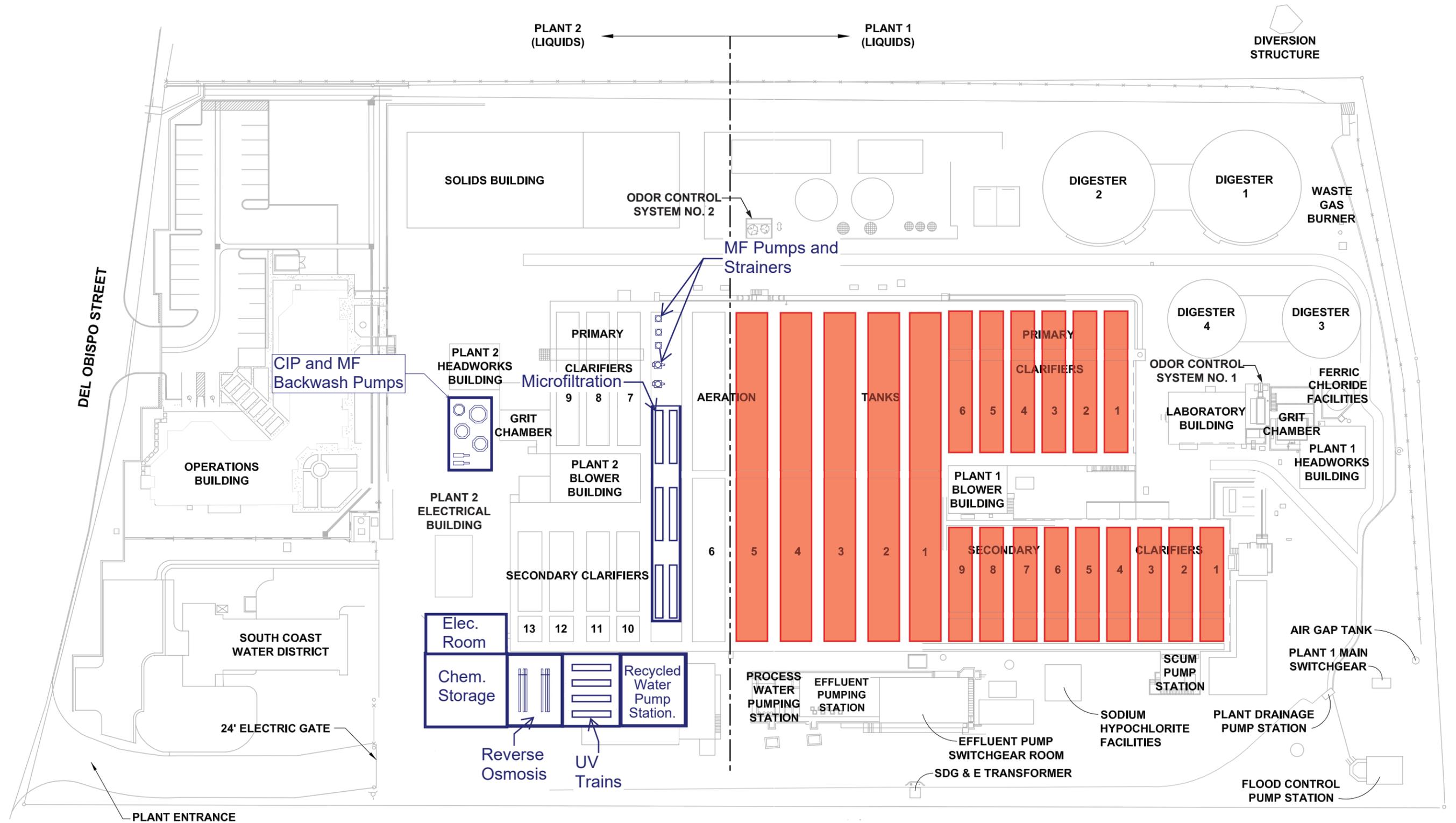
- AA - AQUA AMMONIA
- SA - SULFURIC ACID
- SH - SODIUM HYPOCHLORITE
- SI - SCALE INHIBITOR

Legend

	Plant 2
	Plant 1

Figure B.3
 Title 22 Effluent - Alternative:
 Existing Secondary Treatment

Prepared By:



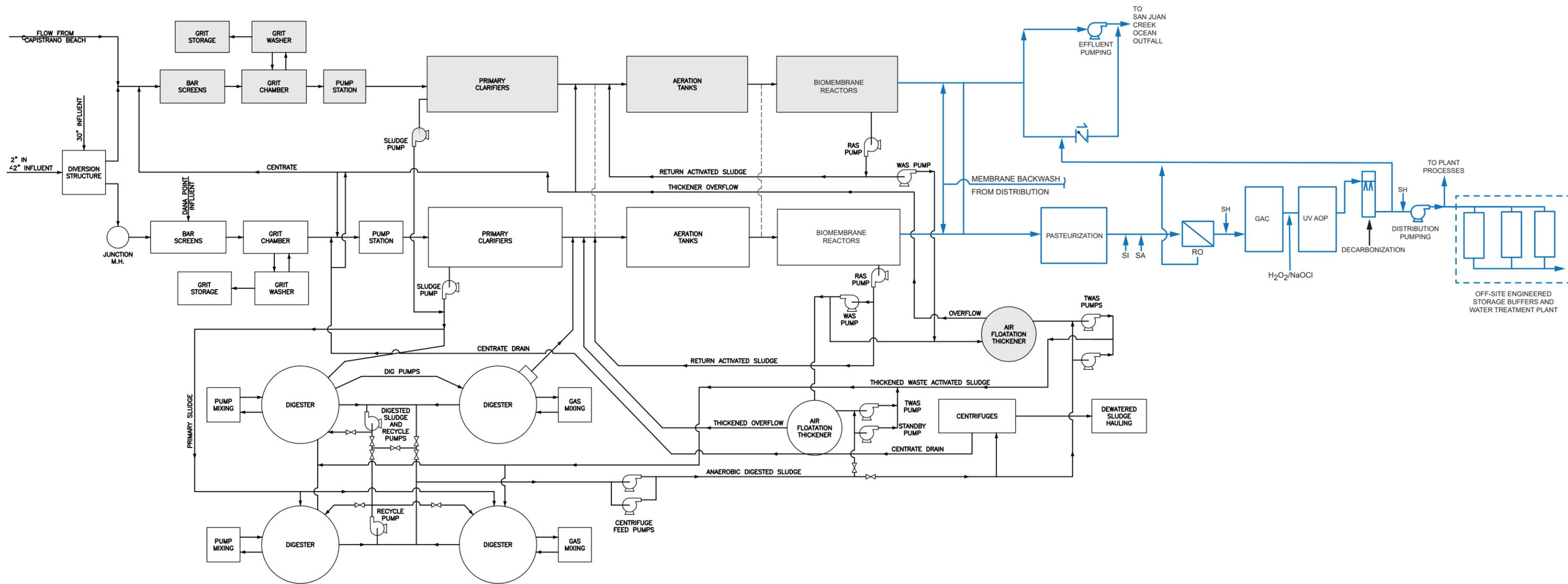
Legend

Indicates Required Basins under Specified Operating Condition

SITE PLAN



Figure B.4
 Site Layout - 6.2 MGD Title 22
 Effluent Treatment System with
 Existing Secondary Treatment
 Recommended Configuration

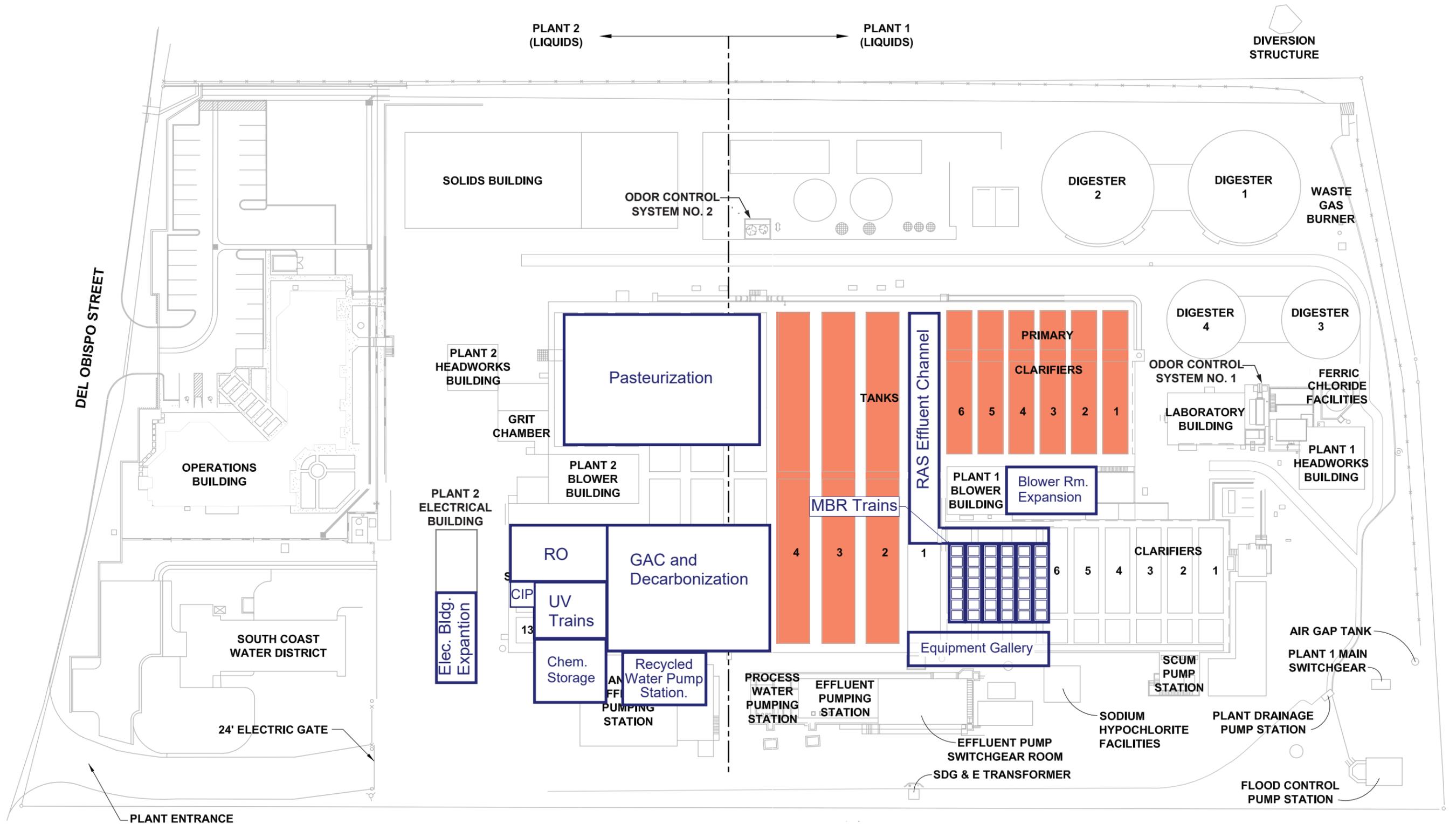


Chemicals

- AA - AQUA AMMONIA
- SA - SULFURIC ACID
- SH - SODIUM HYPOCHLORITE
- SI - SCALE INHIBITOR

Legend	
	Plant 2
	Plant 1

Figure B.5
 Direct Potable Reuse
 Alternative: Submerged
 Membranes



Legend

Indicates Required Basins under Specified Operating Condition

Notes
 1. MBR equipment gallery contains WAS pumps, process pumps, and piping.

SITE PLAN



Figure B.6
 Site Layout - 6.2 MGD DPR with MBR Secondary Treatment

Appendix C
J.B. Latham Treatment Plant Project Descriptions

Capital Improvement Program – Project Description

Project No.: 2051
Project Name: Influent Diversion Structure Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2026
Project Status: Short Term Planning



Project Description: Project involves the replacement of two actuated gates and the access hatch at the diversion gate. Scope also includes replacement of lining within the structure as well replacement of the fencing around the Diversion Structure.

Project Need: The Diversion Structure was constructed in 1978 as part of the Oso Trabuco Sewer Project. One isolation gate was replaced and concrete repairs were performed in 2004.

Key Issues: This facility will be included as part of the Plant 1 Headworks Condition Assessment (Project 02054). It is believed that the work in the Diversion Structure can be done without a major flow bypass based on the experiences with replacement of the one structure gates in 2004.

Estimated Project Amount (in 2018 \$):		
Condition Assessment:	\$	0
Conceptual Study:	\$	8,000
Design:	\$	17,000
Construction:	\$	336,000
Construction Support:	\$	34,000
Total Budget:	\$	394,000

Capital Improvement Program – Project Description

Project No.: 2052
 Project Name: Bypass Flow Installation
 Facility: JB Latham
 Cost Center: PC 2 Liquids
 Anticipated Fiscal Year: 2027
 Project Status: Short Term Planning

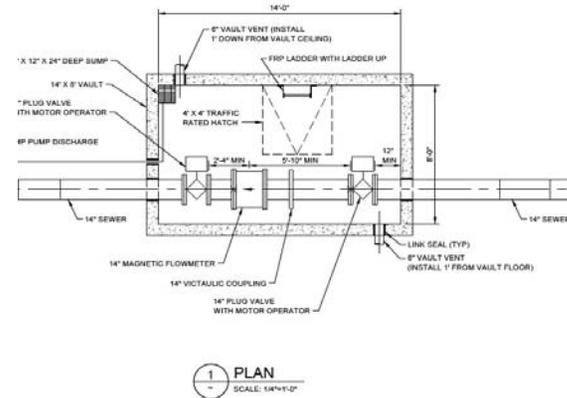
Project Description: Project involves the construction of two new vaults on the existing bypass pipeline between Plants 1 and 2. One vault would contain a control gate; the second vault would include a flow meter.

Project Need: The Latham Plant's ability to handle changed flow conditions would be enhanced by the ability to control diversions between Plant 1 and Plant 2.

Key Issues: This project was defined in a study by TetraTech prepared in 2012. The project has not been implemented to avoid potential interference with a future project to construct Digester No.5.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	51,000
Construction:	\$	508,000
Construction Support:	\$	64,000
Total Budget:	\$	623,000



Capital Improvement Program – Project Description

Project No.: 2054
Project Name: Plant 1 Headworks Condition Assessment
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: This condition assessment would evaluate all structures and systems associated with Plant 1 Headworks Building, the Plant 1 Grit Pumping Drywell, and the Diversion Structure.

Project Need: Each of the involved systems involves either a corrosive atmosphere or a system handling abrasives. The Plant 1 Grit Pump Drywell dates to 1971 and is showing signs of wear.

Key Issues: Project should include isolation and investigation of conditions in raw sewage channels within the Headworks Building.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	45,000
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	45,000

Capital Improvement Program – Project Description

Project No.: 2055
Project Name: Plant 1 Headworks Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2026
Project Status: Short Term Planning

Project Description: Project includes the replacement of two bar screens, two screenings conveyors, one screenings compactor and associated discharge tube and one grit classifier. The project also includes reconstruction of the power feed to the main devices, replacement of channel level sensors and building gas monitors.

Project Need: Most of the Plant 1 Headworks equipment was replaced in 2005. Equipment in the harsh headworks environment is typically expected to have a life between 15 to 20 years.

Key Issues: The scope of this project will largely be dictated by the Plant 1 Headworks condition assessment (Project 02054). This project may result in additional upgrades of architectural, structural and HVAC components of the Headworks Building. This project may also be impacted if SOCWA determines to proceed with the construction of a consolidated headworks.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	107,000
Construction:	\$	1,423,000
Construction Support:	\$	142,000
Total Budget:	\$	1,672,000



Capital Improvement Program – Project Description

Project No.: 2057
Project Name: Plant 1 Grit Handling Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning



Project Description: Project entails the replacement of two grit pumps and the associated piping and valving located in the Plant 1 Grit Pump drywell.

Project Need: In 2019 SOCWA staff undertook reconstruction of the existing pumps and replacement of several valves. Other components of the system date back to the original construction in the 1970's.

Key Issues: The scope of this project will largely be defined by the Plant 1 Headworks condition assessment (Project 02054). The aeration equipment within the grit basins is being replaced as part of the 2018/2019 Grit Basin Upgrade project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	20,000
Construction:	\$	203,000
Construction Support:	\$	30,000
Total Budget:	\$	253,000

Capital Improvement Program – Project Description

Project No.: 2059
Project Name: Plant 1 Blower Building Structural and Infrastructure Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning

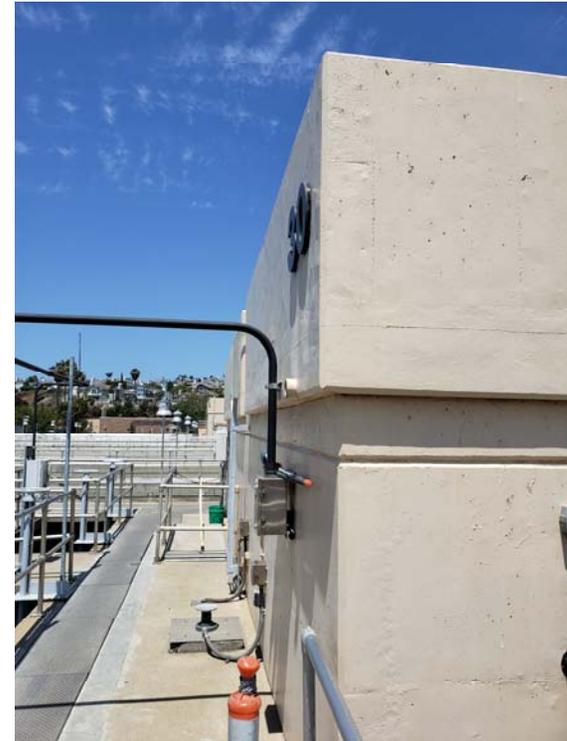
Project Description: The project includes repairs to the building roof, miscellaneous concrete upgrades, replacement of the single and double doors, replacement of the ladder to the lower level, installation of a new monorail and hoist, replacement of the HVAC system and installation of a new lighting system. The project also includes improvements to the Plant 1 Primary Gallery.

Project Need: The Plant 1 Blower Building was constructed in 1965. Many of the components have been replaced or upgraded; many other components are over 40 years old.

Key Issues: The scope for this project will be refined by the Plant 1 Blower Building condition assessment (Project 02058). A key element of this project will be how to complete the upgrade while keeping the systems within the building in operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	74,000
Construction:	\$	491,000
Construction Support:	\$	49,000
Total Budget:	\$	614,000



Capital Improvement Program – Project Description

Project No.: 2060
Project Name: Plant 1 Raw Sewage Pump Station Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning



Project Description: This project will replace the three Plant 1 raw sewage pumps along with the associate piping and valving. The VFD's for the pumps are to be addressed in a separate project (Project 02061). The pump wetwell will also be repair and recoated as part of this project.

Project Need: The raw sewage pumps are all over 30 years old. Some components of the system date to the original building construction in the 1960's.

Key Issues: The scope for this project will be further developed by the Plant 1 Blower Building Condition assessment (Project 02058). The relining of the wetwell will require a bypass pumping operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	133,000
Construction:	\$	1,330,000
Construction Support:	\$	133,000
Total Budget:	\$	1,596,000

Capital Improvement Program – Project Description

Project No.: 2061
Project Name: Plant 1 Raw Sewage Pump VFD Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning



Project Description: This project will replace the three variable frequency drives (VFD's) for the Plant 1 raw sewage pumps. The existing VFD cabinets are not included in the proposed replacement.

Project Need: The raw sewage pumps VFD's and cabinets were replaced in 2005. The units appear to be relatively good condition.

Key Issues: The scope for this project will be further defined by the Plant 1 Blower Building Condition assessment (Project 02058). Even if the units are found to be in good condition their replacement may be made necessary by the raw sewage pump replacement (Project 02060) if the pump characteristics change.

Estimated Project Amount (in 2018 \$):		
Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	13,000
Construction:	\$	131,000
Construction Support:	\$	13,000
Total Budget:	\$	157,000

Capital Improvement Program – Project Description

Project No.: 2062
Project Name: Plant 1 RAS and WAS Pump System Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning



Project Description: The project entails the replace of three return activated sludge (RAS) pumps and two waste activated sludge (WAS) pumps along with the associated piping, valves and variable frequency drives. The project also includes recoating of the RAS wetwell.

Project Need: The Plant 1 RAS and WAS systems were reconstructed in 1998. Portions of the system date back to the original construction in the 1970's.

Key Issues: The scope and timing for this project will be further developed by the Plant 1 Blower Building Condition assessment (Project 02058). A key factor in delivering the project will be identifying how to bypass the RAS system while the wetwell is being recoated.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	70,000
Construction:	\$	935,000
Construction Support:	\$	94,000
Total Budget:	\$	1,099,000

Capital Improvement Program – Project Description

Project No.: 2063
Project Name: Plant 1 Primary Sludge Pumping Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning



Project Description: Project includes the replacement of two primary sludge pumps, associated piping and valving, pump VFD's, ten actuated sludge withdrawal valves and the primary sludge flow meter.

Project Need: The primary sludge pumps have been replaced in the past 20 years. However, most of the piping and valving dates to the early 1980's.

Key Issues: The scope for this project will be defined by the Plant 1 Blower Building Condition assessment (Project 02058). The project cost is based on replacing the sludge withdrawal valves pneumatic actuators in kind. If electric actuators are to be used an increase in cost will be necessary to account for the added electrical distribution system.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	47,000
Construction:	\$	472,000
Construction Support:	\$	71,000
Total Budget:	\$	589,000

Capital Improvement Program – Project Description

Project No.: 2064
Project Name: Plant 1 Aeration Blower System Replacement
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2034
Project Status: Short Term Planning



Project Description: Project would replace the three multistage aeration blowers located in the Plant 1 Blower Building.

Project Need: The three blowers were installed between 1974 and 1986. Although SOCWA Operations and Maintenance staff have had success reconstructing the blowers, the units have exceeded their anticipated lives.

Key Issues: The Plant 1 Blowers serve as back-up units to the high efficiency turbo blowers located in the Plant 2 Blower Building. The scope and timing for this project will be defined by the Plant 1 Blower Building Condition Assessment (Project 02058).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	11,000
Design:	\$	34,000
Construction:	\$	458,000
Construction Support:	\$	46,000
Total Budget:	\$	550,000

Capital Improvement Program – Project Description

Project No.: 2065
Project Name: MCC-A-1 Replacement
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning

Project Description: The project involves the replacement of MCC-A-1 located in the Plant 1 Blower Building.

Project Need: The motor control center was installed in 1974 and has exceeded its anticipated lives.

Key Issues: The scope and timing for this project will be defined by the Plant 1 Blower Building Condition Assessment (Project 02058).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	43,000
Construction:	\$	425,000
Construction Support:	\$	43,000
Total Budget:	\$	510,000



Capital Improvement Program – Project Description

Project No.: 2066
Project Name: Plant 1 Emergency Generator
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning

Project Description: This project entails the replacement of the Plant 1 Standby Power Generator.

Project Need: The existing generator is over 30 years old. It was scheduled for replacement as part of the Fiscal Year 2017/18 budget. However, the plant staff requested that the unit be upsized to handle a greater portion of the Plant 1 load.

Key Issues: The sizing of the generator and associated improvements are being reviewed as part of an Electrical System Evaluation in the Fiscal Year 2018/19 budget.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	47,000
Construction:	\$	470,000
Construction Support:	\$	47,000
Total Budget:	\$	564,000



Capital Improvement Program – Project Description

Project No.: 2067
Project Name: Plant 2 Headworks Condition Assessment
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning

Project Description: This condition assessment would evaluate all structures and systems associated with Plant 2 Headworks Building, the Plant 2 Grit Basins, and the Plant 2 Grit Pumping Drywell.

Project Need: Each of the involved systems involves either a corrosive atmosphere or a system handling abrasives.

Key Issues: Project should include isolation and investigation of conditions in raw sewage channels within the Headworks Building.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	45,000
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	45,000



Capital Improvement Program – Project Description

Project No.: 2068
Project Name: Plant 2 Headworks Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2033
Project Status: Short Term Planning

Project Description: Project includes the replacement of one bar screen, one manual rack, one screenings compactor, one conveyor, one screenings compactor and associated discharge tube and one grit classifier. The project also includes reconstruction of the power feed to the main devices, replacement of channel level sensors and building gas monitors.

Project Need: The Plant 2 Influent bar screen was replaced in 2012 along with the four channel isolation gates. Other elements have been periodically changed out by the Operations and Maintenance staff. Equipment within the headworks has a relatively short life due t

Key Issues: The scope of this project will largely be dictated by the Plant 2 Headworks condition assessment (Project 02067). This project may result in additional upgrades of architectural, structural and HVAC components of the Headworks Building. This project may also be impacted if SOCWA determines to proceed with the construction of a consolidated headworks.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	37,000
Construction:	\$	488,000
Construction Support:	\$	49,000
Total Budget:	\$	574,000



Capital Improvement Program – Project Description

Project No.: 2069
Project Name: Plant 2 Blower Building Condition Assessment
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: This condition assessment will address the Plant 2 Blower Building along with the associated Raw Sewage Pump Station, Return Activated Sludge Pump Station, Waste Activated Pump Station, and Primary Sludge Pump Station.

Project Need: The Plant 2 Blower Building was constructed in 1983. Many of the components have been replaced or upgraded; many other components are over 30 years old.

Key Issues: This condition assessment will help to define several rehabilitation projects. For this assessment to be effective the evaluation must be comprehensive enough to address minor systems such as lighting, 120 volt power distribution, and water piping. These systems have not historically received as much attention as the large pumps, blowers and control panels.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	55,000
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	55,000

Capital Improvement Program – Project Description

Project No.: 2070
Project Name: Plant 2 Blower Building Structural and Infrastructure Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning



Project Description: The project includes repairs to the building roof, miscellaneous concrete upgrades, replacement of doors (two single, one double, and one roll-up), replacement of the ladder to the roof, replacement of the HVAC system and installation of a new lighting system.

Project Need: The Plant 2 Blower Building was constructed in 1982. Many of the components have been replaced or upgraded; many other components are over 30 years old.

Key Issues: The scope for this project will be refined by the Plant 2 Blower Building condition assessment (Project 02069). A key element of this project will be how to complete the upgrade while keeping the systems within the building in operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	41,000
Construction:	\$	413,000
Construction Support:	\$	41,000
Total Budget:	\$	496,000

Capital Improvement Program – Project Description

Project No.: 2071
Project Name: Plant 2 Raw Sewage Pump Station Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning



Project Description: This project will replace the four Plant 2 raw sewage pumps along with the associate piping and valving. The VFD's for the pumps are to be addressed in a separate project (Project 02072). The pump wetwell will also be repair and recoated as part of this project.

Project Need: The raw sewage pumps are all over 30 years old.

Key Issues: The scope for this project will be further developed by the Plant 2 Blower Building Condition assessment (Project 02070). Relining of the wetwell can probably be done while plant flows are diverted to Plant 1.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	63,000
Construction:	\$	836,000
Construction Support:	\$	84,000
Total Budget:	\$	983,000

Capital Improvement Program – Project Description

Project No.: 2072
Project Name: Plant 2 Raw Sewage Pump VFD Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning

Project Description: This project will replace the four variable frequency drives (VFD's) for the Plant 2 raw sewage pumps. The existing VFD cabinets are not included in the proposed replacement.

Project Need: The raw sewage pumps VFD's and cabinets were replaced in 2017.

Key Issues: The scope for this project will be further defined by the Plant 2 Blower Building Condition assessment (Project 02070). Even if the units are found to be in good condition their replacement may be made necessary by the raw sewage pump replacement (Project 02071) if the pump characteristics change.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	16,000
Construction:	\$	158,000
Construction Support:	\$	16,000
Total Budget:	\$	190,000



Capital Improvement Program – Project Description

Project No.: 2073
Project Name: Plant 2 RAS and WAS Pump System Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning



Project Description: The project entails the replace of three return activated sludge (RAS) pumps and two waste activated sludge (WAS) pumps along with the associated piping, valves and variable frequency drives. The project also includes recoating of the RAS wetwell.

Project Need: Portions of the Plant 2 RAS and WAS systems have been replaced by the Operations and Maintenance staff. The remaining system components date to the 1980's.

Key Issues: The scope and timing for this project will be further developed by the Plant 2 Blower Building Condition assessment (Project 02070). Work in the wet well may be accomplished while flows to Plant 2 or bypassed to Plant 1.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	56,000
Construction:	\$	741,000
Construction Support:	\$	74,000
Total Budget:	\$	870,000

Capital Improvement Program – Project Description

Project No.: 2074
Project Name: Plant 2 Primary Sludge Pumping Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning



Project Description: Project includes the replacement of two primary sludge pumps, associated piping and valving, pump VFD's, six actuated sludge withdrawal valves and the primary sludge flow meter.

Project Need: The primary sludge pumps have been replaced in the past 20 years. However, most of the piping and valving dates to the early 1980's.

Key Issues: The scope for this project will be defined by the Plant 2 Blower Building Condition assessment (Project 02070). The project cost is based on replacing the sludge withdrawal valves pneumatic actuators in kind. If electric actuators are to be used an increase in cost will be necessary to account for the added electrical distribution system.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	38,000
Construction:	\$	379,000
Construction Support:	\$	57,000
Total Budget:	\$	474,000

Capital Improvement Program – Project Description

Project No.: 2075
Project Name: Plant 2 Emergency Generator
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning

Project Description: The Plant 2 Standby Power Generator will be replaced as part of this project.

Project Need: The existing generator is approximately 30 years old.

Key Issues: The cost estimate for this replacement assumes that the new generator would handle the loads for the Plant 2 Headworks and Raw Sewage Pumping Station. The load requirements for the generator will need to be reviewed before budgeting for the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	10,000
Design:	\$	31,000
Construction:	\$	408,000
Construction Support:	\$	41,000
Total Budget:	\$	490,000



Capital Improvement Program – Project Description

Project No.: 2076
Project Name: Plant 2 Meter Vault Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning



Project Description: The project will replace the venturi insert within the meter vault, repair concrete as needed and replace the vault hatch. The project will also replace the level instrumentation used in calculation of the flow.

Project Need: The Plant 2 Meter Vault was constructed in 1982. Portions of the vault have deteriorated through exposure to raw sewage and the associated atmosphere. The range of flow has changed since the original construction.

Key Issues: The project will be defined as part of the Condition Assessment (Project 02093). Information regarding the anticipated flow range will be developed during the Hydraulic Modeling (Project 02103). The project would require a temporary bypass of influent sewage while the upgrade work is being done.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 7,000
Conceptual Study:	\$ 7,000
Design:	\$ 26,000
Construction:	\$ 261,000
Construction Support:	\$ 26,000
Total Budget:	\$ 326,000

Capital Improvement Program – Project Description

Project No.: 2077
Project Name: Plant 2 Grit Handling Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning

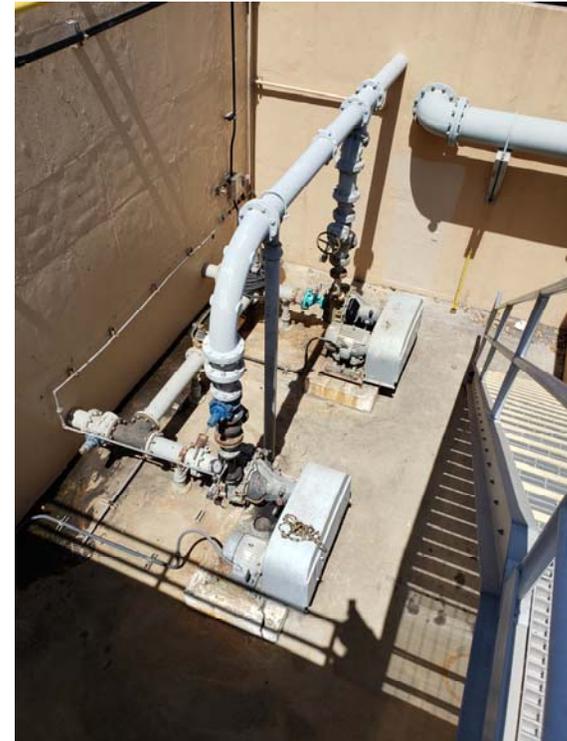
Project Description: Project entails the replacement of two grit pumps and the associated piping and valving located in the Plant 2 Grit Pump drywell, concrete and coating repairs within the Grit Basins, replacement of the basin aluminum covers and installation of a new air diffuser system in the basins.

Project Need: The Plant 2 Grit Handling system components are over 30 years old and have exceeded their expected lives.

Key Issues: The scope of this project will largely be defined by the Plant 2 Headworks condition assessment (Project 02067).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	54,000
Construction:	\$	541,000
Construction Support:	\$	54,000
Total Budget:	\$	649,000



Capital Improvement Program – Project Description

Project No.: 2078
Project Name: Scum Pump Station Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning

Project Description: The project involves the replacement of two scum pumps, one grinder along with the associated piping and valving. The existing level system will be replaced with a new bubbler system. A new Motor Control Center G will installed in the Chlorine Building.

Project Need: The scum handling equipment is over 30 years old. The electrical gear is vulnerable to the flooding of the drywell.

Key Issues: The scum wetwell was relined in 2015. The existing pump consist of one progressive cavity pump and one centrifugal pump. The equipment layout would need to be reconfigured to accommodate two progressive cavity pumps.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 12,000
Conceptual Study:	\$ 12,000
Design:	\$ 47,000
Construction:	\$ 468,000
Construction Support:	\$ 47,000
Total Budget:	\$ 584,000



Capital Improvement Program – Project Description

Project No.: 2079
Project Name: Aeration Basin Drainage Pumps
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning



Project Description: Project includes removal of the existing aeration basin sump pumps and installation of new submersible sump pumps

Project Need: The aeration sump pumps were installed in 1989. There is one sump pump per aeration basin. The nominal useful life for these sump pumps is 15 years. Therefore, these pumps have gone beyond the useful life.

Key Issues: Need to take the aeration basin down during pump replacement. Therefore, improvements need to be done in stages.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	16,000
Construction:	\$	313,000
Construction Support:	\$	31,000
Total Budget:	\$	359,000

Capital Improvement Program – Project Description

Project No.: 2080
Project Name: Odor Control Scrubber No.3 Installation
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2025
Project Status: Short Term Planning

Project Description: Foul air collected from the scum wetwell and the RAS channels are currently handled by existing Chemical Scrubber No.1. These odor sources would be isolated and handled by a new bio scrubber identified as Scrubber No.3.

Project Need: Scrubber No.1 is over 30 years old. The system has performed effectively. However, a new technology may remove a broader range of compounds.

Key Issues: The concept for Scrubber No.3 was developed in 2017 as part of the Foul Air System Evaluation developed by DHK Engineers. The proposed plan met the goals identified by SOCWA staff; however, the capital cost of the proposed system was significant. The proposed program should be reviewed prior to initiating design. This project must be completed prior to replacement of Scrubber No.1.



Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	12,000
Design:	\$	35,000
Construction:	\$	471,000
Construction Support:	\$	47,000
Total Budget:	\$	565,000

Capital Improvement Program – Project Description

Project No.: 2081
Project Name: Sodium Hypochlorite System Reconstruction
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2026
Project Status: Short Term Planning

Project Description: This project will replace the four sodium hypochlorite along with the associate piping and valves. This project will also replace the coating system in the containment area.

Project Need: The existing sodium hypochlorite system was installed in 2007.

Key Issues: A condition assessment should be completed before beginning this project. It likely that the fiberglass bulk storage tanks will last longer than the current extent of the Ten Year Plan.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	37,000
Construction:	\$	490,000
Construction Support:	\$	74,000
Total Budget:	\$	600,000



Capital Improvement Program – Project Description

Project No.: 2083
Project Name: Chlorine Contact Basin Isolation Gates and Structural Rehabilitation
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning



Project Description: Project includes the replacement of five slide gates and concrete repair within the basins.

Project Need: The Contact Basins were installed in the early 1970's. Deterioration of the concrete is visible in locations

Key Issues: The timing and scope for the project will be defined by the Contact Basin Condition Assessment (Project 02082).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	25,000
Construction:	\$	248,000
Construction Support:	\$	25,000
Total Budget:	\$	297,000

Capital Improvement Program – Project Description

Project No.: 2085
Project Name: Effluent Pump Station Rehabilitation
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2032
Project Status: Short Term Planning



Project Description: Project includes replacement of the Effluent Pump Station roof, structural and architectural hardware

Project Need: The Effluent Pump Station was constructed in 1993. There have been deteriorations related to structural and architectural elements.

Key Issues: The timing and scope for the project will be defined by the Effluent Pump Station Condition Assessment (Project 02082).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	29,000
Construction:	\$	289,000
Construction Support:	\$	36,000
Total Budget:	\$	354,000

Capital Improvement Program – Project Description

Project No.: 2086
Project Name: Effluent Pump Reconstruction
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2032
Project Status: Short Term Planning



Project Description: Project includes replacement of the effluent pumps, control valves, air conditioner, drainage sump pump, liquid propane storage tanks, blower, fans and electrical.

Project Need: The effluent pump system was installed in 1993.

Key Issues: The timing and scope for the project will be defined by the Effluent Pump Station Condition Assessment (Project 02082). The effluent pumps run every day during high tide, therefore replacement will need to be coordinated according to the tides.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	122,000
Construction:	\$	1,219,000
Construction Support:	\$	152,000
Total Budget:	\$	1,493,000

Capital Improvement Program – Project Description

Project No.: 2087
Project Name: Effluent Pump Station Standby Power Generator Replacement
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2032
Project Status: Short Term Planning



Project Description: Project includes replacement of the Effluent Pump Station standby power generator

Project Need: The Effluent Pump Station standby power generator was installed in 1993.

Key Issues: There should be backup power during the replacement of the standby power generator.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	51,000
Construction:	\$	509,000
Construction Support:	\$	51,000
Total Budget:	\$	611,000

Capital Improvement Program – Project Description

Project No.: 2088
Project Name: Effluent Pipeline Condition Assessment
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: This project is intended to provided a condition assessment for the Effluent Pipeline from the Effluent Pump Station to the San Juan Creek crossing.

Project Need: The existing pipeline was installed in 1979. The Effluent Pipeline represents a significant vulnerability for the Latham Plant.

Key Issues: The cost of the condition assessment will be determined to a great degree of accuracy by the Condition Assessment Methodology Evaluation. (Project 02091). An assessment of the Effluent Pipeline will be challenging as there is no way to reroute the effluent.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 200,000
Conceptual Study:	\$ 0
Design:	\$ 0
Construction:	\$ 0
Construction Support:	\$ 0
Total Budget:	\$ 200,000

Capital Improvement Program – Project Description

Project No.: 2089
Project Name: Effluent Flow Metering Evaluation
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: This study will address the addition of an effluent flow meter to the effluent pipeline in the southside plant access road.

Project Need: The plant uses two existing propeller flow meters to measure Plant 1 and Plant 2 effluent flow within the Chlorine Contact Basins. The accuracy of these meters is uncertain for both high wet weather peak flows and low late night/early morning flows.

Key Issues: A prior evaluation by Hazen & Sawyer indicated that there was no effective way of improving flow metering accuracy between the main basins and the Chlorine Contact Basins. The only effective approach appears to be to locate a meter in a longer stretch of straight effluent pipe.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	60,000
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	60,000

Capital Improvement Program – Project Description

Project No.: 2090
Project Name: Odor Control Scrubber No.1 Replacement
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2025
Project Status: Short Term Planning



Project Description: Existing Scrubber No.1 handling the Plant 1 Headworks and Primary Basins would be replaced in this project with a combination biotower and chemical scrubber system. Project would include new chemical storage system, foul airs and fans.

Project Need: Scrubber No.1 is over 30 years old. The system has performed effectively. However, a new approach may treat a broader range of odor causing compounds while providing more system redundancy for maintenance.

Key Issues: The concept for Scrubber No.1 was developed in 2017 as part of the Foul Air System Evaluation developed by DHK Engineers. The proposed plan met the goals identified by SOCWA staff; however, the capital cost of the proposed system was significant. The proposed program should be reviewed prior to initiating design.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	68,000
Design:	\$	204,000
Construction:	\$	2,714,000
Construction Support:	\$	271,000
Total Budget:	\$	3,257,000

Capital Improvement Program – Project Description

Project No.: 2095
Project Name: Capistrano Beach Influent Sewer Condition Assessment
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: This project involves the condition assessment of the force main beneath San Juan Creek between the Victoria Lift Station and the J. B. Latham Treatment Plant.

Project Need: It is believed that this pipeline was constructed in the 1970's to convey effluent from the Capistrano Beach Sanitary District Treatment Plant to the Latham Plant. This pipeline was converted to raw sewage use in the late 1990's when the Capistrano Beach

Key Issues: This pipeline is the property of the South Coast Water District. It may be more appropriate for the project to be conducted by that agency.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	100,000
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	100,000

Capital Improvement Program – Project Description

Project No.: 2096
Project Name: Plant 1 Liquids Buried Piping Reconstruction
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2030
Project Status: Short Term Planning



Project Description: This project includes replacing underground piping for Plant 1. Utilities included in this phase are the Hot Water Supply and Return, Natural Gas, Low-pressure Sludge Gas, and Waste Activated Sludge.

Project Need: The below grade piping at the facility is largely direct buried steel and ductile iron installed over various phases of the construction of the plant.

Key Issues: Much of the underground piping is buried under access roads at the facility and traffic flow will be a large part of the coordination of this project. In addition, key utilities may require temporary bypasses and other considerations to keep the facility operational during the project. The full extent of these impacts have not been reviewed and may have further cost implications to the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	11,000
Construction:	\$	375,000
Construction Support:	\$	56,000
Total Budget:	\$	442,000

Capital Improvement Program – Project Description

Project No.: 2097
Project Name: Plant 2 Liquids Buried Piping Reconstruction
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2030
Project Status: Short Term Planning

Project Description: This project includes replacing underground piping for Plant 2. Utilities included in this phase are the Hot Water Supply and Return, Natural Gas, Low-pressure Sludge Gas, and Waste Activated Sludge.

Project Need: The below grade piping at the facility is largely direct buried steel and ductile iron installed over various phases of the construction of the plant.

Key Issues: Much of the underground piping is buried under access roads at the facility and traffic flow will be a large part of the coordination of this project. In addition, key utilities may require temporary bypasses and other considerations to keep the facility operational during the project. The full extent of these impacts have not been reviewed and may have further cost implications to the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	18,000
Construction:	\$	584,000
Construction Support:	\$	88,000
Total Budget:	\$	689,000



Capital Improvement Program – Project Description

Project No.: 2098
Project Name: Plant 2 Primary Sedimentation Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: Project includes Plant 2 primary sedimentation concrete repair, sludge collectors, drives, scum skimmers, launders and electrical; in addition, primary effluent channel concrete and diamond plates will be repaired/replaced

Project Need: Plant 2 primary sedimentation equipment was installed in 1995, therefore operating beyond its useful life.

Key Issues: The improvements will most likely to be part of Package “D”. During the improvement, flow will be diverted to Plant 1.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	169,000
Construction:	\$	1,695,000
Construction Support:	\$	212,000
Total Budget:	\$	2,076,000

Capital Improvement Program – Project Description

Project No.: 2099
Project Name: Plant 2 Secondary Sedimentation Upgrade
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: Project includes Plant 2 secondary sedimentation basins concrete repair, sludge collectors, drives, effluent weirs, and electrical

Project Need: Plant 2 secondary sedimentation equipment was installed around 1978, therefore operating beyond its useful life.

Key Issues: The improvements will most likely to be part of Package “D”. During the improvement, flow will be diverted to Plan 1.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	164,000
Construction:	\$	1,643,000
Construction Support:	\$	205,000
Total Budget:	\$	2,013,000

Capital Improvement Program – Project Description

Project No.: 2101
Project Name: Effluent Pump VFD Replacement
Facility: JB Latham
Cost Center: PC 2 Liquids
Anticipated Fiscal Year: 2026
Project Status: Short Term Planning

Project Description: Project would replace the four Effluent Pump variable frequency drives (VFD's) within the existing unit cabinets.

Project Need: The existing VFD's were installed in 1992 and have exceeded the anticipated 15 year lives. The VFD cabinets appear to remain in good condition.

Key Issues: The scope and timing for this project will be defined by the Effluent Pump Station Condition Assessment (Project 02100).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	11,000
Conceptual Study:	\$	0
Design:	\$	22,000
Construction:	\$	218,000
Construction Support:	\$	22,000
Total Budget:	\$	272,000



Capital Improvement Program – Project Description

Project No.: 2321
Project Name: Odor Control Scrubber No.2 Replacement
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2025
Project Status: Short Term Planning



Project Description: Existing Scrubber No.2 handling the Plant 2 Headworks and Primary Basins, the DAF's and the Energy Building would be replaced in this project with a combination biotower and chemical scrubber system. Project would include new chemical storage system, foul airs and fans.

Project Need: Scrubber No.2 is over 15 years old. The system has performed effectively. However, a new approach may address a broader range of odor causing compounds while providing more system redundancy for maintenance.

Key Issues: The concept for Scrubber No.2 was developed in 2017 as part of the Foul Air System Evaluation developed by DHK Engineers. The proposed plan met the goals identified by SOCWA staff; however, the capital cost of the proposed system was significant. The proposed program should be reviewed prior to initiating design.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	120,000
Design:	\$	361,000
Construction:	\$	4,814,000
Construction Support:	\$	481,000
Total Budget:	\$	5,777,000

Capital Improvement Program – Project Description

Project No.: 2322
Project Name: Chlorine Building and Storm Water Pump Station Condition Assessment
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning



Project Description: This project includes a condition assessment of the structure, the roof, the architectural hardware, the HVAC system, the electrical panels, the 120 volt power distribution system and the lighting in both the Chlorine Building and the Storm Water Pump Station. The project will also involve evaluation of the pump station wetwell, pump/generator set, pump controls and instrumentation, and gas storage.

Project Need: The Chlorine Building was constructed in 1971. The building is no longer used to handle chlorine gas; it is now used for storage. Many of the components have deteriorated through 45 years of use. The Storm Water Pump Station was constructed in the earl

Key Issues: The Storm Water Pump Station has been the subject of discussion over the past five years due to its joint use by the property on the south side of the Latham Treatment Plant.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	45,000
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	45,000

Capital Improvement Program – Project Description

Project No.: 2333
Project Name: Chlorine Building Rehabilitation
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2028
Project Status: Short Term Planning



Project Description: The project includes repairs to the building roof, miscellaneous concrete upgrades, replacement of doors (two single and one roll-up), installation of a new monorail hoist, replacement of a window and a louver, and reconstruction of the lighting and power system.

Project Need: The Chlorine Building was constructed in 1971. The building is no longer used to handle chlorine gas; it is now used for storage. Many of the components have deteriorated through 45 years of use.

Key Issues: The scope for this project will be further refined by the Chlorine Building and Storm Water Pump Station condition assessment (Project 02322). The project may also be impacted by the Site Storage Evaluation (Project 02344).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 9,000
Conceptual Study:	\$ 0
Design:	\$ 23,000
Construction:	\$ 189,000
Construction Support:	\$ 19,000
Total Budget:	\$ 240,000

Capital Improvement Program – Project Description

Project No.: 2334
Project Name: MCC M Replacement
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning

Project Description: This project will replace Motor Control Center M with a new facility to be located inside the Chlorine Building for better environmental control.

Project Need: Motor Control Center M was installed in 1989 large to distribute power to the Non-Potable Water Pumps. The gear shows signs of deterioration due to the outdoor location near the ocean.

Key Issues: This project is being further defined as part of an Electrical Service Evaluation being conducted through Fiscal Year 2018/19 budget.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	305,000
Construction Support:	\$	31,000
Total Budget:	\$	336,000



Capital Improvement Program – Project Description

Project No.: 2335
Project Name: Administration Building Condition Assessment
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: Project involves a condition assessment of the Administration Building including the overall structure, roof, locker room facilities, fire suppression system, plumbing, HVAC system, electrical panels, standby power generator, and lighting.

Project Need: The Administration Building was constructed in 1993 and expanded in 2001. The building sees heavy use due to both its occupancy and its role as the central meeting place for SOCWA.

Key Issues: It may appropriate to perform the Condition Assessment in conjunction with the Administration Building Spatial Evaluation (Project 02336).

Estimated Project Amount (in 2018 \$):	
Condition Assessment:	\$ 25,000
Conceptual Study:	\$ 0
Design:	\$ 0
Construction:	\$ 0
Construction Support:	\$ 0
Total Budget:	\$ 25,000

Capital Improvement Program – Project Description

Project No.: 2336
Project Name: Administration Building Spatial Evaluation
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: The Administration Building Spatial Evaluation will update the 2003 spatial analysis prepared by Malcolm Pirnie. The evaluation will consider needs for offices, meeting space, work space, and operator utilization.

Project Need: The Administration Building at the Latham Plant is fully utilized. There is no space available on the Latham Plant site to accommodate any spatial expansion.

Key Issues: The ability to expand or to modify the Administration Building is in part impacted by City of Dana Point building permit requirements. Spatial requirements are also tied to long term planning initiatives regarding staffing levels.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	40,000
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	40,000

Capital Improvement Program – Project Description

Project No.: 2337
Project Name: Administration Building Roof Reconstruction
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2026
Project Status: Short Term Planning



Project Description: This project involves reconstruction of the Administration Building roof including gutters and vents. The project will also include a significant condition assessment to address potential repairs needed for roof sheathing.

Project Need: The Administration Building roof exists largely as it was constructed in 1993. Portions of the roof were added and modified as part of the Building expansion in 2001. Operations and Maintenance staff have periodically dealt with the roof leaks.

Key Issues: The scope and the timing of the roof reconstruction are to be tied to the Administration Building Condition Assessment (Project 02335). It may be appropriate for the roof reconstruction project to be timed with the HVAC Upgrade (Project 02338).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 14,000
Conceptual Study:	\$ 0
Design:	\$ 28,000
Construction:	\$ 276,000
Construction Support:	\$ 28,000
Total Budget:	\$ 345,000

Capital Improvement Program – Project Description

Project No.: 2338
Project Name: Administration Building HVAC Reconstruction
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2026
Project Status: Short Term Planning



Project Description: Project involves reconstruction of the Administration Building HVAC system including three condenser/fan coil/heat pump units. The basis of design for the HVAC system will be reevaluated with potential changes to the ducting system.

Project Need: The existing HVAC system is largely as reconstructed in 2001. Portions of the system have since been replaced by the Operations and Maintenance staff.

Key Issues: The scope and the timing of the HVAC reconstruction are to be defined in the Administration Building Condition Assessment (Project 02335).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 7,000
Conceptual Study:	\$ 7,000
Design:	\$ 16,000
Construction:	\$ 131,000
Construction Support:	\$ 7,000
Total Budget:	\$ 167,000

Capital Improvement Program – Project Description

Project No.: 2340
Project Name: Plant Water Pump Station Reconstruction
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2028
Project Status: Short Term Planning



Project Description: Project includes pumps, strainers, air gap control valve, air gap tank, piping, valves and appurtenances and instrumentation upgrades.

Project Need: The existing plant potable water pump station dates to the 1980's. Portions of the system have been replaced in the interim by SOCWA Operations and Maintenance staff.

Key Issues: A conceptual design for the reconstructed plant potable water system needs to address (a) uses, (b) diurnal requirements, and (c) regulatory restriction for potable water systems on wastewater treatment plant sites.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	53,000
Construction:	\$	529,000
Construction Support:	\$	66,000
Total Budget:	\$	648,000

Capital Improvement Program – Project Description

Project No.: 2341
Project Name: Non-Potable Water Pump Station Reconstruction
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2028
Project Status: Short Term Planning



Project Description: This project will include the replacement of the two main pumps, the two jockey pumps, and the associated strainers, above ground piping and valves. The electrical feed is largely be constructed with the replacement of Motor Control Center M (Project 02334).

Project Need: The original non-potable pumps were installed in 1989. Two of the four pumps were replace with smaller jockey pumps in 2008. Valves, strainers and pump bases show signs of deterioration.

Key Issues: The Non-Potable Water Pump Station may evolve into two separate project depending on need: (a) strainers and valves, and (b) pumps.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 13,000
Conceptual Study:	\$ 0
Design:	\$ 40,000
Construction:	\$ 528,000
Construction Support:	\$ 53,000
Total Budget:	\$ 634,000

Capital Improvement Program – Project Description

Project No.: 2342
Project Name: Maintenance Shop Rehabilitation
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2026
Project Status: Short Term Planning

Project Description: Project includes new benchwork, cabinetry, ventilation, lighting and plumbing.

Project Need: The JB Latham maintenance shop has not been the subject of a major reconstruction project since the facility construction in 1986.

Key Issues: The project has significant component for condition and needs assessment prior to beginning design.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	5,000
Construction:	\$	180,000
Construction Support:	\$	18,000
Total Budget:	\$	203,000



Capital Improvement Program – Project Description

Project No.: 2343
Project Name: SCADA System Upgrade Project/1st Phase
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2028
Project Status: Short Term Planning

Project Description: Project includes the replacement of seven PLC's and three PLC cabinets.



Project Need: This project is based on the future obsolescence of the Allen Bradley ControlLogix and CompactLogix PLC's currently in use.

Key Issues: A condition assessment should be completed at least two years prior to the budgeting of this project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 12,000
Conceptual Study:	\$ 12,000
Design:	\$ 47,000
Construction:	\$ 467,000
Construction Support:	\$ 47,000
Total Budget:	\$ 584,000

Capital Improvement Program – Project Description

Project No.: 2345
Project Name: Site Pavement Reconstruction
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2034
Project Status: Short Term Planning



Project Description: Project includes reconstruction of asphalt pavement throughout the plant including the main loop around the plant perimeter. Work includes saw cutting and removing AC pavement, installing new AC pavement (4 inches of AC over 8 inches of AB) and AC overlay (1-1/2 inches).

Project Need: The J. B. Latham Treatment Plant has been the subject of many localized repairs and overlay projects over the past 30 years.

Key Issues: Project should be coordinated with buried piping replacement project to avoid tearing up new pavement system directly after completion. Need to perform the work in sections to keep the plant accessible. The cost estimate is based on a 2004 analysis by TetraTech. This evaluation needs to be updated. Note that this estimate does not address concrete pavement, curbs and gutters; nor does the estimate include manhole covers and hatches.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	20,000
Conceptual Study:	\$	0
Design:	\$	41,000
Construction:	\$	810,000
Construction Support:	\$	61,000
Total Budget:	\$	932,000

Capital Improvement Program – Project Description

Project No.: 2346
Project Name: Storage Building Replacement
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2027
Project Status: Short Term Planning



Project Description: Project includes a new storage building that is 25 feet wide by 40 feet long. Building fits roughly into space where existing laboratory is to be demolished.

Project Need: Projected building is estimated to replace storage facility to be removed by potential Digester No.5 project.

Key Issues: This project will be preceded by Project 02344 Site Storage Evaluation which will do the conceptual design for the new storage building.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	44,000
Construction:	\$	368,000
Construction Support:	\$	55,000
Total Budget:	\$	468,000

Capital Improvement Program – Project Description

Project No.: 2347
Project Name: Storm Water Pump Station Reconstruction
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2028
Project Status: Short Term Planning

Project Description: This project includes reconstruction of the building roof, repair of concrete surfaces, replacement of the wetwell grating and supports, installation of new architectural hardware, replacement of pump/engine combination, retrofit of slide gate, replacement of piping and valving, and installation of new pump controls. Project also entails replacement of building HVAC, power supply and lighting.

Project Need: The Storm Water Pump Station was constructed in the early 1980's by the County of Orange. The facility has only been lightly used.

Key Issues: The timing and scope for this project will be further refined through the Chlorine Building and Storm Water Pump Station Condition Assessment (Project 02322). The impact of the joint use of the facility by the adjoining property must be developed as part of this project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 7,000
Conceptual Study:	\$ 15,000
Design:	\$ 30,000
Construction:	\$ 296,000
Construction Support:	\$ 30,000
Total Budget:	\$ 377,000



Capital Improvement Program – Project Description

Project No.: 2350
Project Name: Buried Water Pipe Reconstruction
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2026
Project Status: Long Term Planning

Project Description: Project includes replacement of the process and potable water pipelines.

Project Need: The potable and process water pipelines were constructed in 1998, possibly approaching the end of the useful life.

Key Issues: Condition assessment should be performed prior to replacement.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 21,000
Conceptual Study:	\$ 0
Design:	\$ 82,000
Construction:	\$ 821,000
Construction Support:	\$ 103,000
Total Budget:	\$ 1,027,000



Capital Improvement Program – Project Description

Project No.: 2351
Project Name: Buried Drainage Pipe Reconstruction
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2030
Project Status: Long Term Planning

Project Description: Project includes replacement of the buried drainage pipe

Project Need: The buried drainage pipe was installed in 1988 and possibly reaching the end of its useful life

Key Issues: Condition assessment and actual location of pipe.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	52,000
Construction:	\$	516,000
Construction Support:	\$	65,000
Total Budget:	\$	632,000



Capital Improvement Program – Project Description

Project No.: 2353
Project Name: Perimeter Fencing Replacement
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2034
Project Status: Short Term Planning



Project Description: Project includes the replacement of 1,200 linear feet of chain link fencing along the perimeter of the plant.

Project Need: Most of the fence dates to the late 1970's and early 1980's. This project has been included as a project based on the anticipated life of the fencing.

Key Issues: The cost estimate does not include temporary fencing during construction.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	9,000
Construction:	\$	92,000
Construction Support:	\$	7,000
Total Budget:	\$	108,000

Capital Improvement Program – Project Description

Project No.: 2354
Project Name: Natural Gas Pipeline Replacement
Facility: JB Latham
Cost Center: PC 2 Common
Anticipated Fiscal Year: 2030
Project Status: Long Term Planning

Project Description: Project includes replacement of the natural gas pipeline

Project Need: The natural gas pipeline was installed in 1988, possibly reaching its end of useful life.

Key Issues: Condition assessment and actual location of pipe, and continue to supply natural gas.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	63,000
Construction:	\$	630,000
Construction Support:	\$	79,000
Total Budget:	\$	772,000



Capital Improvement Program – Project Description

Project No.: 2520
Project Name: Ferric Chloride System Reconstruction
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2029
Project Status: Short Term Planning



Project Description: The project includes the replacement of the ferric chloride system including bulk storage tank, chemical metering pumps, associated piping and valves, system controls and instrumentation. The project also includes recoating of the concrete containment area.

Project Need: The existing Ferric Chloride feed system was installed over 30 years ago. Some components of the system have been replaced in recent years.

Key Issues: A condition assessment should be completed on this system two years prior to the budgeting of the project. The cost for the project is based on the assumptions that the containment structure can be reused with a new coating system. The installation of the new system will require the use of a temporary system.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	16,000
Conceptual Study:	\$	16,000
Design:	\$	62,000
Construction:	\$	621,000
Construction Support:	\$	62,000
Total Budget:	\$	776,000

Capital Improvement Program – Project Description

Project No.: 2521
Project Name: Odor Control Scrubber No.4 Installation
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2025
Project Status: Short Term Planning



Project Description: Foul air collected from the DAF thickeners is currently handled by existing Chemical Scrubber No.2. These odor sources would be isolated and handled by a new bio scrubber identified as Scrubber No.4.

Project Need: Scrubber No.2 is over 15 years old. The system has performed effectively. However, a new technology may remove a broader range of compounds.

Key Issues: The concept for Scrubber No.4 was developed in 2017 as part of the Foul Air System Evaluation developed by DHK Engineers. The proposed plan met the goals identified by SOCWA staff; however, the capital cost of the proposed system was significant. The proposed program should be reviewed prior to initiating design. This project must be completed prior to replacement of Scrubber No.2.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	10,000
Design:	\$	31,000
Construction:	\$	413,000
Construction Support:	\$	41,000
Total Budget:	\$	495,000

Capital Improvement Program – Project Description

Project No.: 2522
Project Name: DAF Polymer System Upgrade
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: Project includes the replacement of the bulk emulsion polymer storage tank, the transfer pump, the mixing pump and the associated piping.

Project Need: The fiberglass storage tank was replaced in 2011. The pump and piping system is in poor condition; the Operations staff has been replacing components on as-needed basis.

Key Issues: The concrete containment area remains in good condition and does not appear to require replacement. This project is separated from the proposed shade construction (Project 17541).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	52,000
Construction:	\$	518,000
Construction Support:	\$	78,000
Total Budget:	\$	648,000

Capital Improvement Program – Project Description

Project No.: 2523
Project Name: Dewatering Polymer System Upgrade
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2027
Project Status: Short Term Planning



Project Description: This project includes the replacement of the bulk chemical storage tank, the system piping, valves and instrumentation and the power supply for the emulsion polymer feeder system in the truck bay of the Energy Building.

Project Need: The existing polymer system was installed in 2003. The emulsion polymer feeders are being replaced in 2019 and 2020.

Key Issues: A condition assessment should be completed on this system two years prior to the budgeting of the project. Replacement of the storage tank will require the use of chemical totes tied to the existing feeders to maintain the system in operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 6,000
Conceptual Study:	\$ 6,000
Design:	\$ 17,000
Construction:	\$ 231,000
Construction Support:	\$ 17,000
Total Budget:	\$ 277,000

Capital Improvement Program – Project Description

Project No.: 2524
Project Name: MCC D Replacement
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2027
Project Status: Short Term Planning

Project Description: Project includes the installation of a new MCC D in a new electrical building that will be included as part of the Digester No.5 construction (Project 02537).

Project Need: MCC D was installed in 2002. The MCC would need to be relocated to allow for the construction of Digester 5.

Key Issues: The existing MCC D must be kept on line until the installation of the new unit to maintain the associated solids equipment in operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	31,000
Construction:	\$	310,000
Construction Support:	\$	31,000
Total Budget:	\$	372,000



Capital Improvement Program – Project Description

Project No.: 2525
Project Name: Anaerobic Digester No.1 and No.2 Mechanical Upgrade
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2031
Project Status: Short Term Planning

Project Description: This project includes rehabilitating the domes on each digester, upgrading the mix system, upgrading the heat exchanger and rehabilitating the digesters and associated piping.

Project Need: The components in this project will be upgraded during the 2019 Package B project and will be at or near their expected end of usefull life for this project.

Key Issues: The plant cannot currently run with only two digesters online and the time to take one digester down (drain and clean) and start one up can be lengthy. It is likely that this project will span multiple years in order to reduce disruptions to plant operations.



Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	308,000
Construction:	\$	3,085,000
Construction Support:	\$	308,000
Total Budget:	\$	3,702,000

Capital Improvement Program – Project Description

Project No.: 2526
Project Name: Anaerobic Digester No.3 and No.4 Mechanical Upgrade
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: This project includes rehabilitating the domes on each digester, upgrading the mix system, upgrading the heat exchanger and rehabilitating the digesters and associated piping.

Project Need: Some of the components in this project will be upgraded during the 2019 Package B project and will be at or near their expected end of useful life for this project.

Key Issues: The plant cannot currently run with only two digesters online and the time to take one digester down (drain and clean) and start one up can be lengthy. It is likely that this project will span multiple years in order to reduce disruptions to plant operations.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	121,000
Construction:	\$	1,207,000
Construction Support:	\$	121,000
Total Budget:	\$	1,449,000

Capital Improvement Program – Project Description

Project No.: 2527
Project Name: Anaerobic Digester No.3 and No.4 Control Building Upgrade
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: This project includes roof upgrades, boiler demolition and various piping, valving, and electrical improvements in the control building.

Project Need: The building roof is in need of replacement and structural upgrades. A replacement boiler will be installed prior to this project and the existing boiler can be demolished. The boiler is well beyond its useful life. Electrical upgrades will bring the syst

Key Issues: The roof supports stairs and a walkway and may require additional structural and seismic considerations. The boiler insulation could contain asbestos which will need to be sampled to verify prior to demolition.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	67,000
Construction:	\$	667,000
Construction Support:	\$	83,000
Total Budget:	\$	816,000

Capital Improvement Program – Project Description

Project No.: 2528
Project Name: Digested Sludge Pump Station Upgrade
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2027
Project Status: Short Term Planning

Project Description: This project will upgrade the three current sludge pumps to chopper pumps as well as replacement of valving and piping.

Project Need: The current pumps will be past their current useful life at the time of this project. The chopper pumps will also add additional benefit to operation of the solids system by helping to avoid ragging of pumps and valves.

Key Issues: Plant operations will need to be considered during the replacement if the new pumps will have a different footprint than the current pumps.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	31,000
Construction:	\$	306,000
Construction Support:	\$	38,000
Total Budget:	\$	375,000



Capital Improvement Program – Project Description

Project No.: 2529
Project Name: MCC B Replacement
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2027
Project Status: Short Term Planning

Project Description: Project includes the installation of a new MCC B in a new electrical building that will be included as part of the Digester No.5 construction (Project 02537).

Project Need: MCC B was installed in 2002. The MCC has shown deterioration in the outdoor location due to the coastal atmosphere.

Key Issues: The existing MCC B must be kept on line until the installation of the new unit to maintain the associated digester equipment in operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	34,000
Construction:	\$	338,000
Construction Support:	\$	34,000
Total Budget:	\$	406,000



Capital Improvement Program – Project Description

Project No.: 2530
Project Name: Dewatering System Reconstruction
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: This project addresses the major elements of a Carollo condition assessment conducted on the dewatering system in 2017. The project will conduct limited mechanical upgrades to the centrifuges to improve longevity as well as upgrading the diverter gates and centrate piping.

Project Need: The Carollo condition assessment found some improvements and upgrades that will assist operations and increase the life of the current system.

Key Issues: This project should have minimal impacts on operations. The centrate work should be in line with the current plans to upgrade the centrate drainage system.

Estimated Project Amount (in 2018 \$):		
Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	367,000
Construction Support:	\$	46,000
Total Budget:	\$	950,000

Capital Improvement Program – Project Description

Project No.: 2531
Project Name: Solids Conveyor Replacement
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning

Project Description: This project addresses the major elements of a Carollo condition assessment conducted on the dewatering system in 2017. The project will replace the screws, covers, and add additional safety functions to the dewatering conveyance system.

Project Need: The Carollo condition assessment found some improvements and upgrades that will assist operations and increase the life of the current system.

Key Issues: This project should have minimal impacts on operations. Impacts on solids storage and handling should be reviewed prior to the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	148,000
Construction Support:	\$	19,000
Total Budget:	\$	167,000



Capital Improvement Program – Project Description

Project No.: 2532
Project Name: Storage and Truck Loading Rehabilitation
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: This project addresses the major elements of a Carollo condition assessment conducted on the dewatering system in 2017. This project will upgrade the current truck scales, repair the concrete floor and provide additional electrical and room upgrades.

Project Need: The current scales are sensitive to moisture and problematic for staff to operate and maintain. The proposed options will increase accuracy and ease of operation.

Key Issues: During construction of new scales, solids handling will be impacted and trailer deliveries will need to be carefully managed possibly requiring off-hours support from operations staff.

Estimated Project Amount (in 2018 \$):		
Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	758,000
Construction Support:	\$	95,000
Total Budget:	\$	853,000

Capital Improvement Program – Project Description

Project No.: 2533
Project Name: Gas Flare Replacement
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: This project will address upcoming South Coast AQMD regulations for flares. The current flare will likely not meet these new regulations.

Project Need: The current flare is an integral part in energy management as well as air quality. If the current flare will not meet the new regulations, the flare will need to be replaced in order to support operation of the cogeneration system and maintain compliance

Key Issues: The current cost includes only one flare. It may be beneficial to have a dual flare system installed for reliability. The new flares have a much larger footprint and require large offsets from other buildings and property lines. The siting for the new flare may impact other projects and available real estate at the facility.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	196,000
Construction:	\$	1,309,000
Construction Support:	\$	164,000
Total Budget:	\$	1,668,000

Capital Improvement Program – Project Description

Project No.: 2534
Project Name: Buried Digester Piping Reconstruction
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: This project will replace the buried digester gas piping between the digesters and to the flare.

Project Need: A portion of the gas piping was replaced with the installation of the new cogeneration system, but the remaining underground portions of piping have not been replaced since originally installed. Valve maintenance, pipe integrity, and redundancy will all b

Key Issues: The replacement of the flare should be considered in the design of this project. A backup option to the flare will be needed during construction in the event the cogeneration system is not available.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	56,000
Construction:	\$	559,000
Construction Support:	\$	70,000
Total Budget:	\$	685,000

Capital Improvement Program – Project Description

Project No.: 2536
Project Name: MCC 2 and CF Replacement
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning

Project Description: Project entails replacement of MCC 2 and MCC CF in the Solids Building.

Project Need: MCC 2 dates to the construction of the Solids Building in 1986. The unit is in poor condition; many of the loads have removed from the unit. MCC CF dates from 2002. Several loads have also been removed from this unit.

Key Issues: A temporary MCC may be needed to maintain the associated equipment in the Solids Building in operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 15,000
Conceptual Study:	\$ 0
Design:	\$ 59,000
Construction:	\$ 590,000
Construction Support:	\$ 59,000
Total Budget:	\$ 723,000



Capital Improvement Program – Project Description

Project No.: 2537
Project Name: Digester 5 Construction
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2028
Project Status: Long Term Planning



Project Description: Project includes construction of Digester No. 5, heating, electrical and instrumentation

Project Need: Provide operational flexibility when one of the large digester is out of service for cleaning

Key Issues: Project includes construction of Digester No. 5, heating, electrical and instrumentation

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	828,000
Construction:	\$	8,284,000
Construction Support:	\$	1,036,000
Total Budget:	\$	10,148,000

Capital Improvement Program – Project Description

Project No.: 2540
Project Name: Dewatering System Replacement
Facility: JB Latham
Cost Center: PC 2 Solids
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning



Project Description: This project includes the replacement of the three centrifuges based on a condition assessment conducted by Carollo in 2017. The project also includes replacing the VFDs, control panels, and various upgrades and repairs to the solids dewatering system.

Project Need: The projecting timing is based on life expectancy provided in the Carollo report.

Key Issues: Project timing and solids handling will need to be considered during the planning for this project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	353,000
Construction:	\$	3,528,000
Construction Support:	\$	353,000
Total Budget:	\$	4,234,000

Appendix D
J.B. Latham Treatment Plant Project Cost Tables

J. B. Latham Treatment Plant

Project Number 02051

Influent Diversion Structure Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 30,000	\$ 30,000
Isolation Gates	2	EA	\$ 15,000	\$ 30,000	50%	\$ 15,000	\$ 45,000
Replacement of Coating System	1	LS	\$ 12,000	\$ 12,000	200%	\$ 24,000	\$ 36,000
Fencing	1	LS	\$ -	\$ -	0%	\$ 20,000	\$ 20,000
Replacement of Access Manway	1	LS	\$ 5,000	\$ 5,000	200%	\$ 50,000	\$ 55,000
Electrical	1	LS	\$ 20,000	\$ 20,000	50%	\$ 10,000	\$ 30,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 58,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 5,000

Project Contingency@

20% \$ 56,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 336,000
Current Estimate	2019 Dollars	\$ 336,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	2.5%	\$ 8,390	0%	\$ -	\$ -	\$ 8,000
Design	5.0%	\$ 16,781	0%	\$ -	\$ -	\$ 17,000
Engr. During Construction	5.0%	\$ 16,781	0%	\$ -	\$ -	\$ 17,000
Construction Mgt.	5.0%	\$ 16,781	0%	\$ -	\$ -	\$ 17,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 394,000

Notes:

J. B. Latham Treatment Plant

Project Number 02052

Bypass Control Flow Meter Installation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 15,000	\$ 15,000
Sitework	1	LS	\$ -	\$ -	0%	\$ 45,000	\$ 45,000
Vaults	2	EA	\$ 6,000	\$ 12,000	75%	\$ 9,000	\$ 21,000
Sluice Gate w/Motor Op	1	EA	\$ 15,000	\$ 15,000	40%	\$ 6,000	\$ 21,000
Flow Meter	1	EA	\$ 3,500	\$ 3,500	25%	\$ 875	\$ 4,000
Miscellaneous Piping	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000
Relocate Utilities/Retaining Wall	1	LS	\$ 10,000	\$ 10,000	0%	\$ 10,000	\$ 20,000
Electrical	1	LS	\$ 75,000	\$ 75,000	100%	\$ 75,000	\$ 150,000
Subtotal							\$ 326,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 88,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 9,000

Project Contingency@

20% \$ 85,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 508,000
Current Estimate	2019 Dollars	\$ 508,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 50,848	0%	\$ -	\$ -	\$ 51,000
Engr. During Construction	5.0%	\$ 25,424	0%	\$ -	\$ -	\$ 25,000
Construction Mgt.	7.5%	\$ 38,136	0%	\$ -	\$ -	\$ 38,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 623,000

Notes:

- 1 Based on Alternative 2 from Tetra Tech technical memorandum on dated 4/12/2012.

J. B. Latham Treatment Plant

Project Number 02054

Plant 1 Headworks Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ -
Shipping Rate	0%						\$ included
Sale Tax	8.00%						\$ -
Project Contingency@	20%						\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ -
Current Estimate	2019 Dollars						\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ 45,000.00	0%	\$ -	\$ -	\$ 45,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 45,000

Notes:

- 1 Assume no bypass pumping cost; channel investigation to be done during night while flows diverted to Plant 2

J. B. Latham Treatment Plant

Project Number 02055

Plant 1 Headworks Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Bar Screens ¹	2	Ea	\$ 200,000	\$ 400,000	25%	\$ 100,000	\$ 500,000
	Grit Classifiers ²	1	LS	-	-	-	-	\$ 95,000
	Screenings Compactors ²	1	LS	\$ -	\$ -	0%	\$ -	\$ 50,000
	Conveyors ³	1	LS	-	-	-	-	\$ 190,000
	Power Supply Upgrade	1	LS	-	-	-	-	\$ 75,000
	Instrumentation Upgrade	1	LS	-	-	-	-	\$ 45,000
	Other	1	LS	-	-	-	-	\$ 50,000
					\$ 400,000			

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$ 149,000
Shipping Rate	0%		included
Sale Tax	8.00%		\$ 32,000
Project Contingency@	20%		\$ 237,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 1,423,000
Current Estimate	2019 Dollars	\$ 1,423,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 106,695	0%	\$ -	\$ 107,000
Engr. During Construction	5.0%	\$ 71,130	0%	\$ -	\$ 71,000
Construction Mgt.	5.0%	\$ 71,130	0%	\$ -	\$ 71,000

Total Project Cost (Present Value in 2019 Dollars) \$ 1,672,000

Notes:

- 1 Based on 2011 Plant 2 Headworks Upgrade Project.
- 2 Based on prior replacement by SOCWA Operations Department.
- 3 Based on bids for equipment as installed in 2005.

J. B. Latham Treatment Plant

Project Number 02057

Plant 1 Grit Handling Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19
 Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	\$	-	\$	-	\$	15,000
	Installation of Grit Pump	2	Ea	\$	22,000	\$	44,000	25%	\$ 11,000
	Misc. Piping and Valves	1	LS						\$ 50,000
Subtotal									\$ 120,000

General Conditions, Contractor Overhead and Profit,

and Bonds and Insurance @

27% \$ 32,400

Shipping Rate

0% included

Sale Tax

8.00% \$ 3,520

Project Contingency@

30% \$ 46,776

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate 2019 Dollars \$ 202,696

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 20,270	0%	\$ -	\$ 20,270
Engr. During Construction	10.0%	\$ 20,270	0%	\$ -	\$ 20,270
Construction Mgt.	5.0%	\$ 10,135	0%	\$ -	\$ 10,135
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 253,370

Notes:

J. B. Latham Treatment Plant

Project Number 02059

Plant 1 Blower Building Structural and Infrastructure Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹							
Demolition	1	LS	\$	-		\$	50,000
Roof Reconstruction	1	LS	\$	-		\$	55,000
Concrete Repairs	1	LS	\$	-		\$	50,000
Replace Single Door	1	LS	\$	-		\$	9,000
Replace Double Door	1	LS	\$	-		\$	12,000
Install Monorail and Hoist	1	LS	\$	-		\$	25,000
Replace Ladder	1	LS	\$	-		\$	10,000
Replace HVAC System	1	LS	\$	-		\$	40,000
Replace Lighting and Power Receptacles	1	LS	\$	-		\$	55,000
Other	1	LS	\$	-		\$	50,000
Subtotal						\$	356,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%				\$	96,000
Shipping Rate		0%				included	
Sale Tax		8.00%				\$	-
Project Contingency@		30%				\$	135,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars					\$	491,000
Current Estimate	2019 Dollars					\$	491,000
Project Phases Cost							
	Rate	Amount	Contingency	Subtotal	Minimum	Total	
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -	-
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -	-
Design	15.0%	\$ 73,642	0%	\$ -	\$ -	\$ -	74,000
Engr. During Construction	5.0%	\$ 24,547	0%	\$ -	\$ -	\$ -	25,000
Construction Mgt.	5.0%	\$ 24,547	0%	\$ -	\$ -	\$ -	25,000
Total Project Cost (Present Value in 2019 Dollars)							\$ 614,000

Notes:

1 Architectural hardware costs based on unit values provided by Hazen & Sawyer

J. B. Latham Treatment Plant

Project Number 02060

Plant 1 Raw Sewage Pump Station Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Plant 1 Raw Sewage Pumping ¹	1	LS	-	-	-	-	\$	602,000
	Temporary Pumping System	1	LS	\$	-	\$	0%	\$	125,000
	Wetwell Recoating	1	LS	-	-	-	-	\$	40,000
	Power	1	LS	-	-	-	-	\$	75,000
	Instrumentation	1	LS	-	-	-	-	\$	20,000
	Other	1	LS	-	-	-	-	\$	50,000
					\$	-			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$	196,000
Shipping Rate	0%		included	
Sale Tax	8.00%		\$	-
Project Contingency@	20%		\$	222,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	1,330,000
Current Estimate	2019 Dollars	\$	1,330,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 133,003	0%	\$ -	\$ 133,000
Engr. During Construction	5.0%	\$ 66,502	0%	\$ -	\$ 67,000
Construction Mgt.	5.0%	\$ 66,502	0%	\$ -	\$ 67,000

Total Project Cost (Present Value in 2019 Dollars) \$ 1,596,000

Notes:

1 Based on Hazen and Sawyer estimate.

J. B. Latham Treatment Plant

Project Number 02061

Plant 1 Raw Sewage Pump Variable Frequency Drive Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 10,000
	VFD	3	Ea	\$ 12,500	\$ 37,500	25%	\$ 9,375	\$ 47,000
	Electrical	1	LS	-	-	-	-	\$ 20,000
				\$ -	\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 20,756.25
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ 3,000
Project Contingency@	30%							\$ 30,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 131,000
Current Estimate	2019 Dollars							\$ 131,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 13,082	0%	\$ -	\$ 13,000
Engr. During Construction	5.0%	\$ 6,541	0%	\$ -	\$ 7,000
Construction Mgt.	5.0%	\$ 6,541	0%	\$ -	\$ 7,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 157,000

Notes:

J. B. Latham Treatment Plant

Project Number 02062

Plant 1 RAS and WAS Pump Station Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Plant 1 RAS Pumping System ¹	1	LS	-	-	-	-	\$	276,000
	Plant 1 WAS Pumping System ¹	1	LS	-	-	-	-	\$	112,000
	Temporary Pumping System	1	LS	\$	-	\$	0%	\$	75,000
	Wetwell Recoating	1	LS	-	-	-	-	\$	40,000
	VFD Replacement ²	1	LS	-	-	-	-	\$	38,000
	Power	1	LS	-	-	-	-	\$	75,000
	Instrumentation	1	LS	-	-	-	-	\$	20,000
	Other	1	LS	-	-	-	-	\$	50,000
					\$	-			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$	95,000
Shipping Rate	0%							included	
Sale Tax	8.00%							\$	-
Project Contingency@	20%							\$	156,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$	935,000
Current Estimate	2019 Dollars							\$	935,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 70,137	0%	\$ -	\$ 70,000
Engr. During Construction	5.0%	\$ 46,758	0%	\$ -	\$ 47,000
Construction Mgt.	5.0%	\$ 46,758	0%	\$ -	\$ 47,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 1,099,000

Notes:

- 1 Based on Hazen and Sawyer estimate.
- 2 Assumes reuse of existing cabinets.

J. B. Latham Treatment Plant

Project Number 02063

Plant 1 Primary Sludge Pump System Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition of Existing System	1	LS	\$	-	0%	\$	-	\$	25,000
	Primary Sludge Pump and Piping	2	Ea	\$ 25,000	\$	50,000	25%	\$	12,500	\$ 62,500
	Primary Sludge Pump Bases	1	LS	\$	-	0%	\$	-	\$	10,000
	Primary Sludge Removal Valve and Actuator	6	Ea	\$ 9,000	\$	54,000	25%	\$	13,500	\$ 67,500
	Piping and Valving Inside Blower Bldg	1	LS	\$	-	0%	\$	-	\$	50,000
	Primary Sludge Flow Meter	1	LS	\$ 6,000	\$	6,000	25%	\$	1,500	\$ 7,500
	Pumps Power and Controls ¹	1	LS	\$	-	0%	\$	-	\$	75,000
	Programming	1	LS	\$	-	0%	\$	-	\$	5,000
Subtotal									\$	302,500

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 81,675

Shipping Rate

0% included

Sale Tax

8.00% \$ 8,800

Project Contingency@

20% \$ 78,595

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	471,570
Current Estimate	2019 Dollars	\$	471,570

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 47,157	0%	\$ -	\$ 47,157
Engr. During Construction	10.0%	\$ 47,157	0%	\$ -	\$ 47,157
Construction Mgt.	5.0%	\$ 23,579	0%	\$ -	\$ 23,579
Total Project Cost (Present Value in 2019 Dollars)					\$ 589,463

Notes:

1 Assumes New Panel, VFD and PLC

J. B. Latham Treatment Plant

Project Number 02064

Plant 1 Aeration Blower System Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 25,000	\$ 25,000
Multistage Blowers	2	EA	\$ 60,000	\$ 120,000	50%	\$ 60,000	\$ 180,000
Piping and Valves	1	LS	\$ -	\$ -	0%	\$ -	\$ 25,000
Blower Pads	1	LS	\$ -	\$ -	0%	\$ -	\$ 10,000
Electrical	1	LS	\$ -	\$ -	0%	\$ -	\$ 50,000
Programming	1	LS	\$ -	\$ -	0%	\$ -	\$ 3,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%					\$	79,000
Shipping Rate	0%					included	
Sale Tax	8.00%					\$	10,000
Project Contingency@	20%					\$	76,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars					\$	458,000
Current Estimate	2019 Dollars					\$	458,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	2.5%	\$ 11,451	0%	\$ -	\$ -	\$ 11,000
Design	7.5%	\$ 34,354	0%	\$ -	\$ -	\$ 34,000
Engr. During Construction	5.0%	\$ 22,903	0%	\$ -	\$ -	\$ 23,000
Construction Mgt.	5.0%	\$ 22,903	0%	\$ -	\$ -	\$ 23,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 550,000

Notes:

1 Based on RTP Sodium Hypochlorite Upgrade bids

J. B. Latham Treatment Plant

Project Number 02065

MCC A1 Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demolition	1	LS	\$ -	\$ -	0%	\$ -	\$ 20,000
Motor Control Center ¹	1	EA	\$ 118,000	\$ 118,000	40%	\$ 47,200	\$ 165,000
Temporary Power Supply	1	LS	\$ -	\$ -	0%	\$ -	\$ 35,000
Conduit and Cable	1	LS	\$ -	\$ -	0%	\$ -	\$ 30,000
Subtotal							\$ 250,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 68,000
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 9,000
Project Contingency@		30%					\$ 98,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate		2019 Dollars					\$ 425,000
Current Estimate		2019 Dollars					\$ 425,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 42,535	0%	\$ -	\$ -	\$ 43,000
Engr. During Construction	5.0%	\$ 21,268	0%	\$ -	\$ -	\$ 21,000
Construction Mgt.	5.0%	\$ 21,268	0%	\$ -	\$ -	\$ 21,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 510,000

Notes:

- 1 Based on review with Maddox Electric.

J. B. Latham Treatment Plant

Project Number 02066

Plant 1 Standby Power Generator Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demo	1	LS	\$ -	\$ -	0%	\$ -	\$ 10,000
Standby Power Generator	1	EA	\$ 200,000	\$ 200,000	25%	\$ 50,000	\$ 250,000
Auto Transfer Switch	1	LS	\$ -	\$ -	0%	\$ -	\$ 25,000
Electrical	1	LS	\$ 25,000	\$ 25,000	50%	\$ 12,500	\$ 38,000
Subtotal							\$ 323,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 87,000
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 18,000
Project Contingency@		10%					\$ 43,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate		2019 Dollars					\$ 470,000
Current Estimate		2019 Dollars					\$ 470,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 47,033	0%	\$ -	\$ -	\$ 47,000
Engr. During Construction	5.0%	\$ 23,517	0%	\$ -	\$ -	\$ 24,000
Construction Mgt.	5.0%	\$ 23,517	0%	\$ -	\$ -	\$ 24,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 564,000

Notes:

J. B. Latham Treatment Plant

Project Number 02067

Plant 2 Headworks Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$	-
Shipping Rate	0%							included
Sale Tax	8.00%						\$	-
Project Contingency@	20%						\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	-
Current Estimate	2019 Dollars						\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ 45,000.00	0%	\$ -	\$ -	\$ 45,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 45,000

Notes:

- 1 Assume no bypass pumping cost; channel investigation to be done during night while flows diverted to Plant 1

J. B. Latham Treatment Plant

Project Number 02068

Plant 2 Headworks Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Grit Classifiers ¹	1	LS	-	-	-	-	\$	95,000
	Screenings Compactor ¹	1	LS	\$	-	\$	0%	\$	50,000
	Conveyor	1	LS	-	-	-	-	\$	60,000
	Manual Rack	1	LS	-	-	-	-	\$	30,000
	Power Supply Upgrade	1	LS	-	-	-	-	\$	45,000
	Instrumentation Upgrade	1	LS	-	-	-	-	\$	35,000
	Other	1	LS	-	-	-	-	\$	50,000
					\$	-			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$	42,000
Shipping Rate	0%							included	
Sale Tax	8.00%							\$	-
Project Contingency@	20%							\$	81,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$	488,000
Current Estimate	2019 Dollars							\$	488,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 36,617	0%	\$ -	\$ 37,000
Engr. During Construction	5.0%	\$ 24,411	0%	\$ -	\$ 24,000
Construction Mgt.	5.0%	\$ 24,411	0%	\$ -	\$ 24,000

Total Project Cost (Present Value in 2019 Dollars) \$ 574,000

Notes:

1 Based on prior replacement by SOCWA Operations Department.

J. B. Latham Treatment Plant

Project Number 02069

Plant 2 Blower Building Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$	-
Shipping Rate	0%							included
Sale Tax	8.00%						\$	-
Project Contingency@	20%						\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	-
Current Estimate	2019 Dollars						\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ 55,000.00	0%	\$ -	\$ -	\$ 55,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 55,000

Notes:

J. B. Latham Treatment Plant

Project Number 02070

Plant 1 Blower Building Structural and Infrastructure Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	Apr-19
Estimate Update	Apr-19
Prepared By	BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost¹

Demolition	1	LS	\$	-		\$	15,000
Roof Reconstruction	1	LS	\$	-		\$	65,000
Reflective Ceiling Replacement	1	LS	\$	-		\$	8,000
Concrete Repairs	1	LS	\$	-		\$	10,000
Replace Single Doors (2)	1	LS	\$	-		\$	17,000
Replace Double Door	1	LS	\$	-		\$	12,000
Replace Roll Up Door	1	LS	\$	-		\$	14,000
Replace Windows (2)	1	LS	\$	-		\$	16,000
Replace Ladder	1	LS	\$	-		\$	13,000
Replace HVAC System	1	LS	\$	-		\$	45,000
Replace Lighting and Power Receptacles	1	LS	\$	-		\$	35,000
Other	1	LS	\$	-		\$	50,000

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$	81,000
Shipping Rate	0%		included	
Sale Tax	8.00%		\$	-
Project Contingency@	30%		\$	114,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	413,000
Current Estimate	2019 Dollars	\$	413,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 41,292	0%	\$ -	\$ -	\$ 41,000
Engr. During Construction	5.0%	\$ 20,646	0%	\$ -	\$ -	\$ 21,000
Construction Mgt.	5.0%	\$ 20,646	0%	\$ -	\$ -	\$ 21,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 496,000

Notes:

1 Architectural hardware costs based on unit values provided by Hazen & Sawyer

J. B. Latham Treatment Plant

Project Number 02071

Plant 2 Raw Sewage Pump Station Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Plant 2 Raw Sewage Pumping ¹	1	LS	-	-	-	-	\$	410,000
	Wetwell Manhole Cover Replace	1	LS	\$	-	\$	0%	\$	13,000
	Wetwell Recoating	1	LS	-	-	-	-	\$	40,000
	Power	1	LS	-	-	-	-	\$	75,000
	Instrumentation	1	LS	-	-	-	-	\$	20,000
	Other	1	LS	-	-	-	-	\$	25,000
					\$	-			

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$	114,000
Shipping Rate	0%							included	
Sale Tax	8.00%							\$	-
Project Contingency@	20%							\$	139,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$	836,000
Current Estimate	2019 Dollars							\$	836,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 62,730	0%	\$ -	\$ 63,000
Engr. During Construction	5.0%	\$ 41,820	0%	\$ -	\$ 42,000
Construction Mgt.	5.0%	\$ 41,820	0%	\$ -	\$ 42,000

Total Project Cost (Present Value in 2019 Dollars) \$ 983,000

Notes:

1 Based on Hazen and Sawyer estimate.

J. B. Latham Treatment Plant

Project Number 02072

Plant 2 Raw Sewage Pump Variable Frequency Drive Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 10,000
	VFD	4	Ea	\$ 12,500	\$ 50,000	25%	\$ 12,500	\$ 63,000
	Electrical	1	LS	-	-	-	-	\$ 20,000
				\$ -	\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 24,975.00
Shipping Rate	0%							included
Sale Tax	8.00%							\$ 4,000
Project Contingency@	30%							\$ 36,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 158,000
Current Estimate	2019 Dollars							\$ 158,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 15,792	0%	\$ -	\$ 16,000
Engr. During Construction	5.0%	\$ 7,896	0%	\$ -	\$ 8,000
Construction Mgt.	5.0%	\$ 7,896	0%	\$ -	\$ 8,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 190,000

Notes:

- 1 Assume cabinets installed in 2006 remain in good condition.

J. B. Latham Treatment Plant

Project Number 02073

Plant 2 RAS and WAS Pump Station Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Plant 2 RAS Pumping System ¹	1	LS	-	-	-	-	\$	232,000
	Plant 2 WAS Pumping System ¹	1	LS	-	-	-	-	\$	110,000
	Wetwell Manhole Cover Replace	1	LS	\$	-	\$	0%	\$	13,000
	Wetwell Recoating	1	LS	-	-	-	-	\$	40,000
	VFD Replacement ²	1	LS	-	-	-	-	\$	38,000
	Power	1	LS	-	-	-	-	\$	75,000
	Instrumentation	1	LS	-	-	-	-	\$	20,000
	Other	1	LS	-	-	-	-	\$	25,000
					\$	-			

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$	66,000
Shipping Rate	0%							included	
Sale Tax	8.00%							\$	-
Project Contingency@	20%							\$	123,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$	741,000
Current Estimate	2019 Dollars							\$	741,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 55,540	0%	\$ -	\$ 56,000
Engr. During Construction	5.0%	\$ 37,027	0%	\$ -	\$ 37,000
Construction Mgt.	5.0%	\$ 37,027	0%	\$ -	\$ 37,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 870,000

Notes:

- 1 Based on Hazen and Sawyer estimate.
- 2 Assumes reuse of existing cabinets.

J. B. Latham Treatment Plant

Project Number 02074

Plant 2 Primary Sludge Pump System Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19
 Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition of Existing System	1	LS	\$	-	0%	\$	-	\$	20,000
	Primary Sludge Pump and Piping	2	Ea	\$ 25,000	\$	50,000	25%	\$	12,500	\$ 62,500
	Primary Sludge Pump Bases	1	LS	\$	-	0%	\$	-	\$	10,000
	Primary Sludge Removal Valve and Actuator	3	Ea	\$ 9,000	\$	27,000	25%	\$	6,750	\$ 33,750
	Piping and Valving Inside Blower Bldg	1	LS	\$	-	0%	\$	-	\$	30,000
	Primary Sludge Flow Meter	1	LS	\$ 6,000	\$	6,000	25%	\$	1,500	\$ 7,500
	Pumps Power and Controls ¹	1	LS	\$	-	0%	\$	-	\$	75,000
	Programming	1	LS	\$	-	0%	\$	-	\$	5,000
Subtotal									\$	243,750

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

	27%	\$	65,813
Shipping Rate	0%	included	
Sale Tax	8.00%	\$	6,640
Project Contingency@	20%	\$	63,241

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	379,443
Current Estimate	2019 Dollars	\$	379,443

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 37,944	0%	\$ -	\$ 37,944
Engr. During Construction	10.0%	\$ 37,944	0%	\$ -	\$ 37,944
Construction Mgt.	5.0%	\$ 18,972	0%	\$ -	\$ 18,972

Total Project Cost (Present Value in 2019 Dollars)		\$	474,304
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Notes:

1 Assumes New Panel, VFD and PLC

J. B. Latham Treatment Plant

Project Number 02075

Plant 2 Standby Power Generator Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demo	1	LS	\$ -	\$ -	0%	\$ -	\$ 10,000
Standby Power Generator	1	EA	\$ 150,000	\$ 150,000	25%	\$ 37,500	\$ 188,000
Auto Transfer Switch	1	LS	\$ -	\$ -	0%	\$ -	\$ 22,000
Electrical	1	LS	\$ 25,000	\$ 25,000	50%	\$ 12,500	\$ 38,000
Subtotal							\$ 257,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 69,000
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 14,000
Project Contingency@		20%					\$ 68,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate		2019 Dollars					\$ 408,000
Current Estimate		2019 Dollars					\$ 408,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	2.5%	\$ 10,212	0%	\$ -	\$ -	\$ 10,000
Design	7.5%	\$ 30,635	0%	\$ -	\$ -	\$ 31,000
Engr. During Construction	5.0%	\$ 20,423	0%	\$ -	\$ -	\$ 20,000
Construction Mgt.	5.0%	\$ 20,423	0%	\$ -	\$ -	\$ 20,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 490,000

Notes:

J. B. Latham Treatment Plant

Project Number 02076

Plant 2 (Dana Point) Influent Flow Meter Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$	15,000
	Replace Insert	1	LS	\$	-	\$	0%	\$	25,000
	Concrete Repair	1	LS	-	-	-	-	\$	10,000
	Replace Hatch	1	LS	-	-	-	-	\$	10,000
	Instrumentation	1	LS	-	-	-	-	\$	5,000
	Bypass Pumping	1	LS	-	-	-	-	\$	125,000

\$ -

Subtotal \$ 190,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 11,000

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 60,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	261,000
Current Estimate	2019 Dollars	\$	261,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 6,526	0%	\$ -	\$ 7,000
Conceptual Study	2.5%	\$ 6,526	0%	\$ -	\$ 7,000
Design	10.0%	\$ 26,104	0%	\$ -	\$ 26,000
Engr. During Construction	5.0%	\$ 13,052	0%	\$ -	\$ 13,000
Construction Mgt.	5.0%	\$ 13,052	0%	\$ -	\$ 13,000

Total Project Cost (Present Value in 2019 Dollars) \$ 326,000

Notes:

J. B. Latham Treatment Plant

Project Number 02077

Plant 2 Grit Handling Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost	Demolition	1	LS	\$	-	\$	- \$ 40,000
	Concrete Repairs ¹	1	LS	\$	-	\$	- \$ 40,000
	Recoating ¹	1	LS	\$	-	\$	- \$ 55,000
	Aluminum Cover Replacement ¹	1	LS	\$	-	\$	- \$ 45,000
	Air Diffuser Replacement ¹	1	LS	\$	-	\$	- \$ 40,000
	Installation of Grit Pump	2	Ea	\$ 22,000	\$ 44,000	25%	\$ 11,000 \$ 55,000
	Misc. Piping and Valves	1	LS				\$ 50,000
Subtotal							\$ 325,000
General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 87,750
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 3,520
Project Contingency@		30%					\$ 124,881
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 541,151

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 54,115	0%	\$ -	\$ 54,115
Engr. During Construction	5.0%	\$ 27,058	0%	\$ -	\$ 27,058
Construction Mgt.	5.0%	\$ 27,058	0%	\$ -	\$ 27,058
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 649,381

Notes:

1. Based on 2019 Plant 1 Grit Basin Upgrade Project bid

J. B. Latham Treatment Plant
Project Number 02078
Scum Pumping System Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demo	1	LS	\$ -	\$ -	0%	\$ -	\$ 20,000
New Scum Pumps	2	EA	\$ 25,000	\$ 50,000	25%	\$ 12,500	\$ 63,000
New Grinder	1	EA	\$ 25,000	\$ 25,000	25%	\$ 6,250	\$ 31,000
Piping and Valving	1	LS	\$ -	\$ -	0%	\$ -	\$ 20,000
New Pump Pads	1	LS	\$ -	\$ -	0%	\$ -	\$ 15,000
MCC G	1	EA	\$ 34,000	\$ 34,000	40%	\$ 13,600	\$ 48,000
Electrical	1	LS	\$ -	\$ -	0%	\$ -	\$ 70,000
Bubbler Panel	1	LS	\$ -	\$ -	0%	\$ -	\$ 10,000
Programming	1	LS	\$ -	\$ -	0%	\$ -	\$ -
Subtotal				\$ 109,000		\$ -	\$ 276,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 75,000
Shipping Rate		0%				included	
Sale Tax		8.00%					\$ 9,000
Project Contingency@		30%					\$ 108,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 468,000
Current Estimate	2019 Dollars						\$ 468,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	2.5%	\$ 11,690	0%	\$ -	\$ -	\$ 12,000
Conceptual Study	2.5%	\$ 11,690	0%	\$ -	\$ -	\$ 12,000
Design	10.0%	\$ 46,759	0%	\$ -	\$ -	\$ 47,000
Engr. During Construction	5.0%	\$ 23,379	0%	\$ -	\$ -	\$ 23,000
Construction Mgt.	5.0%	\$ 23,379	0%	\$ -	\$ -	\$ 23,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 584,000

Notes:

- 1 Equipment Cost estimate provided by TetraTech
- 2 New MCC G to be located in Chlorine Building.

J. B. Latham Treatment Plant

Project Number 02079

Aeration Basin Drainage Pumps

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demolition of Existing System	1	LS	\$ -	\$ -	0%	\$ 30,000	\$ 30,000
Drainage Pumps Piping and Valves	7	EA	\$ 15,000	\$ 105,000	25%	\$ 26,250	\$ 131,000
Pumps Power and Controls	1	LS	\$ 35,000	\$ 35,000	0%	\$ -	\$ 35,000
Subtotal				\$ 140,000			\$ 196,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 53,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 11,000

Project Contingency@

20% \$ 52,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 313,000
Current Estimate	2019 Dollars	\$ 313,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	5.0%	\$ 15,626	0%	\$ -	\$ -	\$ 16,000
Engr. During Construction	5.0%	\$ 15,626	0%	\$ -	\$ -	\$ 16,000
Construction Mgt.	5.0%	\$ 15,626	0%	\$ -	\$ -	\$ 16,000

Total Project Cost (Present Value in 2019 Dollars) \$ 359,000

Notes:

J. B. Latham Treatment Plant

Project Number 02080

Odor Control Scrubber No.3 Replacement (Handling Scum Wetwell)

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Odor Control System ¹	1	LS	-	-	-	-	\$ 248,000
	Electrical and Inst ²	1	LS	-	-	-	-	\$ 37,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 77,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ -
Project Contingency@	30%							\$ 109,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 471,000
Current Estimate	2019 Dollars							\$ 471,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 11,772	0%	\$ -	\$ 12,000
Design	7.5%	\$ 35,315	0%	\$ -	\$ 35,000
Engr. During Construction	5.0%	\$ 23,543	0%	\$ -	\$ 24,000
Construction Mgt.	5.0%	\$ 23,543	0%	\$ -	\$ 24,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 565,000

Notes:

- 1 Foul Air System Evaluation J. B. Latham Treatment Plant -DHK Engineers (12/17)
- 2 Electrical and instrumentation cost is taken as 15% of balance of construction costs.

J. B. Latham Treatment Plant

Project Number 02081

Sodium Hypochlorite System Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	EA	\$ -	\$ -	0%	\$ 30,000	\$ 30,000
Metering Pumps	4	EA	\$ 17,500	\$ 70,000	50%	\$ 35,000	\$ 105,000
Replacement of Coating System	1	LS	\$ 25,000	\$ 25,000	100%	\$ 25,000	\$ 50,000
Temporary Chemical Feed System	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000
Electrical	1	LS	\$ 50,000	\$ 50,000	50%	\$ 25,000	\$ 75,000
Programming	1	LS	\$ -	\$ -	0%	\$ 2,500	\$ 3,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ 84,000
Shipping Rate	0%					included	
Sale Tax	8.00%						\$ 12,000
Project Contingency@	20%						\$ 82,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ 490,000
Current Estimate	2019 Dollars						\$ 490,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	7.5%	\$ 36,763	0%	\$ -	\$ -	\$ 37,000
Engr. During Construction	7.5%	\$ 36,763	0%	\$ -	\$ -	\$ 37,000
Construction Mgt.	7.5%	\$ 36,763	0%	\$ -	\$ -	\$ 37,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 600,000

Notes:

1 Based on RTP Sodium Hypochlorite Upgrade bids

J.B. Latham Treatment Plant

Project Number 02083

Chlorine Contact Basin Isolation Gates and Structural Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Sep-18
 Estimate Update Sep-18
 Const. Year

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ³							
Demolition	1	LS	\$	10,000	\$	10,000	\$ 20,000
Structural rehabilitation of the chlorine contact basir	1	LS	\$	50,000	\$	50,000	\$ 100,000
Replacement of 24-inch sluice gates	1	LS	\$	20,000	\$	10,000	\$ 30,000
Subtotal							\$ 150,000
General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 40,500
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 12,000
Project Contingency@		30%					\$ 45,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 247,500
Current Estimate	2019 Dollars						\$ 247,500
Total Main Project Cost (CAMP Report Year)							

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 24,750	0%	\$ -	\$ -	\$ 24,750
Engr. During Construction	5.0%	\$ 12,375	0%	\$ -	\$ -	\$ 12,375
Construction Mgt.	5.0%	\$ 12,375	0%	\$ -	\$ -	\$ 12,375
Total Project Cost (Present Value in 2019 Dollars)						\$ 297,000

Notes:

- 1 Cost estimate provided by Hazen for CTP TYP

J.B. Latham Treatment Plant

Project Number 02085

Effluent Pump Station Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	Sep-18
Estimate Update	Sep-18
Const. Year	

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ³							
Demolition	1	LS			\$ 5,000	\$ 5,000	\$ 5,000
Effluent Pump Station Roof	1	LS		\$ 20,000	\$ 5,000	\$ 25,000	\$ 25,000
Effluent Pump Station Structural Rehabilitation	1	LS		\$ 50,000	\$ 25,000	\$ 75,000	\$ 75,000
Effluent Pump Station Architectural Hardware	1	LS		\$ 50,000	\$ 25,000	\$ 75,000	\$ 75,000
Subtotal							\$ 175,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @			27%				\$ 47,250
Shipping Rate			0%			included	
Sale Tax			8.00%				\$ 14,000
Project Contingency@			30%				\$ 52,500
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 288,750
Current Estimate	2019 Dollars						\$ 288,750
Total Main Project Cost (CAMP Report Year)							

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 28,875	0%	\$ -	\$ -	\$ 28,875
Engr. During Construction	5.0%	\$ 14,438	0%	\$ -	\$ -	\$ 14,438
Construction Mgt.	7.5%	\$ 21,656	0%	\$ -	\$ -	\$ 21,656
Total Project Cost (Present Value in 2019 Dollars)						\$ 353,719

Notes:

1 Cost Estimate provided by Hazen from CTP TYP

J.B. Latham Treatment Plant

Project Number 02086

Effluent Pump Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Sep-18
 Estimate Update Sep-18
 Const. Year

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Demolition	1	LS				\$ 50,000	\$ 50,000
Temporary bypass	1	LS		\$ 25,000		\$ 50,000	\$ 75,000
Effluent Pumps	1	LS		\$ 160,000		\$ 104,000	\$ 264,000
Mechanical equipment and appurtenances	1	LS		\$ 40,000		\$ 65,000	\$ 105,000
Mechanical Piping and Fittings	1	LS		\$ 91,150		\$ 138,600	\$ 229,750
Electrical	1	LS		\$ 25,000		\$ 37,650	\$ 62,650

Subtotal

\$ 786,400

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 212,328
 0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ 62,912

Project Contingency@

20% \$ 157,280

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 1,218,920
Current Estimate	2019 Dollars	\$ 1,218,920

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 121,892	0%	\$ -	\$ -	\$ 121,892
Engr. During Construction	5.0%	\$ 60,946	0%	\$ -	\$ -	\$ 60,946
Construction Mgt.	7.5%	\$ 91,419	0%	\$ -	\$ -	\$ 91,419

Total Project Cost (Present Value in 2019 Dollars)

\$ 1,493,177

Notes:

- 1 Cost Estimate provided by Hazen in August 2018

J. B. Latham Treatment Plant

Project Number 02087

Effluent Pump Station Standby Power Generator Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demo	1	LS	\$ -	\$ -	0%	\$ -	\$ 15,000
Standby Power Generator	1	EA	\$ 175,000	\$ 175,000	25%	\$ 43,750	\$ 219,000
Mechanical Appurtenances	1	LS	\$ -	\$ -	0%	\$ -	\$ 50,000
Electrical	1	LS	\$ 25,000	\$ 25,000	50%	\$ 12,500	\$ 38,000
Subtotal							\$ 321,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 87,000
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 16,000
Project Contingency@		20%					\$ 85,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate		2019 Dollars					\$ 509,000
Current Estimate		2019 Dollars					\$ 509,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 50,879	0%	\$ -	\$ -	\$ 51,000
Engr. During Construction	5.0%	\$ 25,439	0%	\$ -	\$ -	\$ 25,000
Construction Mgt.	5.0%	\$ 25,439	0%	\$ -	\$ -	\$ 25,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 611,000

Notes:

J. B. Latham Treatment Plant

Project Number 02089

Effluent Flow Meter Evaluation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$	-
Shipping Rate	0%							included
Sale Tax	8.00%						\$	-
Project Contingency@	20%						\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	-
Current Estimate	2019 Dollars						\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ 60,000.00	0%	\$ -	\$ -	\$ 60,000
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 60,000

Notes:

J. B. Latham Treatment Plant

Project Number 02090
Odor Control Scrubber No.1 Replacement (Handling Plant 1 Liquids Stream)

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Odor Control System ¹	1	LS	-	-	-	-	\$ 1,549,000
	Electrical and Inst ²	1	LS	-	-	-	-	\$ 232,000
					\$ -			
Subtotal								\$ 1,781,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @ 27% \$ 481,000
 Shipping Rate 0% included
 Sale Tax 8.00% \$ -
 Project Contingency@ 20% \$ 452,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 2,714,000
Current Estimate	2019 Dollars	\$ 2,714,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 67,856	0%	\$ -	\$ 68,000
Design	7.5%	\$ 203,569	0%	\$ -	\$ 204,000
Engr. During Construction	5.0%	\$ 135,713	0%	\$ -	\$ 136,000
Construction Mgt.	5.0%	\$ 135,713	0%	\$ -	\$ 136,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 3,257,000

Notes:

- 1 Foul Air System Evaluation J. B. Latham Treatment Plant -DHK Engineers (12/17)
- 2 Electrical and instrumentation cost is taken as 15% of balance of construction costs.

J. B. Latham Treatment Plant

Project Number 02096

Pant 1 Burried Pipe Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Mobilization/Demobilization	1	EA	\$ 75,000	\$ 75,000		\$ -	\$ 75,000
Primary Sludge	100	LF	\$ 100	\$ 10,000	50%	\$ 5,000	\$ 15,000
Primary Scum	100	LF	\$ 100	\$ 10,000	50%	\$ 5,000	\$ 15,000
Waste Activated Sludge	450	LF	\$ 100	\$ 45,000	50%	\$ 22,500	\$ 68,000
Thickened Waste Activated Sludge	100	LF	\$ 100	\$ 10,000	50%	\$ 5,000	\$ 15,000
Other	250	LF	\$ 125	\$ 31,250	50%	\$ 15,625	\$ 47,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%					\$	63,000
Shipping Rate	0%					included	
Sale Tax	8.00%					\$	15,000
Project Contingency@	20%					\$	62,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	375,000
Current Estimate	2019 Dollars	\$	375,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	3.0%	\$ 11,238	0%	\$ -	\$ -	\$ 11,000
Engr. During Construction	10.0%	\$ 37,459	0%	\$ -	\$ -	\$ 37,000
Construction Mgt.	5.0%	\$ 18,729	0%	\$ -	\$ -	\$ 19,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 442,000

Notes:

1 Unit costs provided by Lee and Ro

J. B. Latham Treatment Plant

Project Number 02097

Plant 2 Burried Pipe Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Mobilization/Demobilization	1	EA	\$ 75,000	\$ 75,000	0%	\$ 75,000	\$ 150,000
Primary Sludge	350	LF	\$ 100	\$ 35,000	50%	\$ 17,500	\$ 53,000
Primary Scum	350	LF	\$ 100	\$ 35,000	50%	\$ 17,500	\$ 53,000
Waste Activated Sludge	450	LF	\$ 100	\$ 45,000	50%	\$ 22,500	\$ 68,000
Other	250	LF	\$ 125	\$ 31,250	50%	\$ 15,625	\$ 47,000
				\$ -		\$ -	\$ -

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%					\$	100,000
Shipping Rate	0%					included	
Sale Tax	8.00%					\$	18,000
Project Contingency@	20%					\$	97,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars					\$	584,000
Current Estimate	2019 Dollars					\$	584,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	3.0%	\$ 17,525	0%	\$ -	\$ -	\$ 18,000
Engr. During Construction	10.0%	\$ 58,417	0%	\$ -	\$ -	\$ 58,000
Construction Mgt.	5.0%	\$ 29,208	0%	\$ -	\$ -	\$ 29,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 689,000

Notes:

1 Equipment Cost estimate provided by Lee and Rc

J.B. Latham Treatment Plant

Project Number 02098

Plant 2 Primary Sedimentation Upgrade

Main Project Type

Key Dates

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Initial Estimate	Sep-18
Estimate Update	Sep-18
Const. Year	

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Demolition	1	LS				\$ 50,000	\$ 50,000
Temporary Bypass	1	LS		\$ 50,000		\$ 150,000	\$ 200,000
Primary sedimentation basin concrete repairs	1	LS		\$ 70,000		\$ 80,000	\$ 150,000
Primary sedimentation basin concrete coating	1	LS		\$ 25,000		\$ 40,000	\$ 65,000
Primary sedimentation basin sludge collectors	1	LS		\$ 120,000		\$ 100,000	\$ 220,000
Primary sedimentation basin sludge collector drives	1	LS		\$ 30,000		\$ 20,000	\$ 50,000
Primary sedimentation basin scum skimmers	1	LS		\$ 50,000		\$ 50,000	\$ 100,000
Primary sedimentation basin launders	1	LS		\$ 50,000		\$ 25,000	\$ 75,000
Primary sedimentation basin electrical upgrades	1	LS		\$ 50,000		\$ 50,000	\$ 100,000
Primary Effluent Channel concrete repair	1	LS		\$ 20,000		\$ 10,000	\$ 30,000
Primary Effluent Channel concrete coating	1	LS		\$ 10,000		\$ 10,000	\$ 20,000
Primary Effluent Channel diamond plate Replacement	1	LS		\$ 30,000		\$ 20,000	\$ 50,000

Subtotal

General Conditions, Contractor Overhead and Profit,
and Bonds and Insurance @

Shipping Rate

Sale Tax

Project Contingency@

27%	\$ 299,700
0%	included
8.00%	\$ 2,400
20%	\$ 282,420

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 1,694,520
Current Estimate	2019 Dollars	\$ 1,694,520

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 169,452	0%	\$ -	\$ -	\$ 169,452
Engr. During Construction	5.0%	\$ 84,726	0%	\$ -	\$ -	\$ 84,726
Construction Mgt.	7.5%	\$ 127,089	0%	\$ -	\$ -	\$ 127,089
Total Project Cost (Present Value in 2019 Dollars)						\$ 2,075,787

Notes:

- 1 Cost estimate provided by Carollo as part of Package 'B' design

J.B. Latham Treatment Plant

Project Number 02099

Plant 2 Secondary Sedimentation Upgrade

Main Project Type

Key Dates

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Initial Estimate May-18
 Estimate Update May-18
 Const. Year

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ³							
Demolition	1	LS	\$	-		\$ 70,000	\$ 70,000
Temporary bypass	1	LS	\$	70,000		\$ 190,000	\$ 260,000
Secondary sedimentation basin concrete repair	1	LS	\$	90,000		\$ 110,000	\$ 200,000
Secondary sedimentation basin concrete coating	1	LS	\$	50,000		\$ 50,000	\$ 100,000
Secondary sedimentation sludge collectors	1	LS	\$	160,000		\$ 130,000	\$ 290,000
Secondary sedimentation sludge collector drives	1	LS	\$	70,000		\$ 70,000	\$ 140,000
Secondary sedimentation effluent weirs	1	LS	\$	90,000		\$ 50,000	\$ 140,000
Secondary sedimentation electrical upgrades	1	LS	\$	100,000		\$ 90,000	\$ 190,000
Subtotal							\$ 1,060,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @			27%				\$ 286,200
Shipping Rate			0%			included	
Sale Tax			8.00%				\$ 84,800
Project Contingency@			20%				\$ 212,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 1,643,000
Current Estimate	2019 Dollars						\$ 1,643,000
Total Main Project Cost (CAMP Report Year)							

Project Phases Cost	Rate ²	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 164,300	0%	\$ -	\$ -	\$ 164,300
Engr. During Construction	5.0%	\$ 82,150	0%	\$ -	\$ -	\$ 82,150
Construction Mgt.	7.5%	\$ 123,225	0%	\$ -	\$ -	\$ 123,225
Total Project Cost (Present Value in 2019 Dollars)						\$ 2,012,675

Notes:

1 Cost estimate based on Package "B" bid from Olsson Construction

J.B. Latham Treatment Plant

Project Number 02101

Effluent Pump VFD Replacement

Main Project Type

Key Dates

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Initial Estimate Sep-18
 Estimate Update Sep-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ³							
	Demolition	1	LS	\$ -		\$ 10,000	\$ 10,000
	VFD	4	EA	\$ 17,500	\$ 70,000	25% \$ 17,500	\$ 87,500
	Electrical	1	LS	\$ -		\$ -	\$ 30,000
Subtotal							\$ 127,500
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 34,425
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 5,600
Project Contingency@		30%					\$ 50,258
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 217,783
Current Estimate	2019 Dollars						\$ 217,783

Total Main Project Cost (CAMP Report Year)							
Project Phases Cost	Rate ²	Amount	Contingency	Subtotal	Minimum	Total	
Condition Assessment	5.0%	\$ 10,889	0%	\$ -	\$ -	\$ -	\$ 10,889
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -	
Design	10.0%	\$ 21,778	0%	\$ -	\$ -	\$ -	\$ 21,778
Engr. During Construction	5.0%	\$ 10,889	0%	\$ -	\$ -	\$ -	\$ 10,889
Construction Mgt.	5.0%	\$ 10,889	0%	\$ -	\$ -	\$ -	\$ 10,889
Total Project Cost (Present Value in 2019 Dollars)							\$ 272,228

Notes:

J. B. Latham Treatment Plant

Project Number 02321

Odor Control Scrubber No.2 Replacement (Handling Plant 2 Liquid Stream and Energy Building)

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Odor Control System ¹	1	LS	-	-	-	-	\$ 2,536,000
	Electrical and Inst ²	1	LS	-	-	-	-	\$ 380,000
					\$ -			
Subtotal								\$ 2,916,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 787,000
Shipping Rate	0%							included
Sale Tax	8.00%							\$ -
Project Contingency@	30%							\$ 1,111,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 4,814,000
Current Estimate	2019 Dollars							\$ 4,814,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 120,355	0%	\$ -	\$ 120,000
Design	7.5%	\$ 361,066	0%	\$ -	\$ 361,000
Engr. During Construction	5.0%	\$ 240,711	0%	\$ -	\$ 241,000
Construction Mgt.	5.0%	\$ 240,711	0%	\$ -	\$ 241,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 5,777,000

Notes:

- 1 Foul Air System Evaluation J. B. Latham Treatment Plant -DHK Engineers (12/17)
- 2 Electrical and instrumentation cost is taken as 15% of balance of construction costs.

J. B. Latham Treatment Plant

Project Number 02322

Plant 2 Chlorine Contact Basin and Effluent Pump Station Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$	-
Shipping Rate	0%							included
Sale Tax	8.00%						\$	-
Project Contingency@	20%						\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	-
Current Estimate	2019 Dollars						\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ 45,000.00	0%	\$ -	\$ -	\$ 45,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 45,000

Notes:

- Note significant confined space entry to evaluate wetwell of Storm Water PS

J. B. Latham Treatment Plant

Project Number 02333

[Go To Projects Sheet](#)

Chlorine Building Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost¹

Roof Reconstruction	1	LS	\$	-		\$	45,000
Replace Single Doors (2)	1	LS	\$	-		\$	17,000
Replace Roll Up Door	1	LS	\$	-		\$	12,000
Replace Window	1	LS	\$	-		\$	8,000
Replace Monorail Hoist	1	LS	\$	-		\$	15,000
Replace Louver (1)	1	LS	\$	-		\$	10,000
Replace Lighting and Power Receptacles	1	LS	\$	-		\$	30,000

Subtotal

\$ 137,000

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 37,000

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 52,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	189,000
Current Estimate	2019 Dollars	\$	189,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	5.0%	\$ 9,460	0% \$ -	\$ -	\$ -	\$ 9,000
Conceptual Study	0.0%	\$ -	0% \$ -	\$ -	\$ -	\$ -
Design	12.0%	\$ 22,704	0% \$ -	\$ -	\$ -	\$ 23,000
Engr. During Construction	5.0%	\$ 9,460	0% \$ -	\$ -	\$ -	\$ 9,000
Construction Mgt.	5.0%	\$ 9,460	0% \$ -	\$ -	\$ -	\$ 9,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 240,000

Notes:

1 Architectural hardware costs based on unit values provided by Hazen & Sawyer

J. B. Latham Treatment Plant

Project Number 02334

MCC M Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demolition	1	LS	\$ -	\$ -	0%	\$ -	\$ 10,000
Motor Control Center ¹	1	EA	\$ 58,000	\$ 58,000	40%	\$ 23,200	\$ 81,000
Conduit and Cable ²	1	LS	\$ -	\$ -	0%	\$ -	\$ 90,000
Subtotal							\$ 181,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 49,000
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 5,000
Project Contingency@		30%					\$ 70,000

Total Main Project Cost (Year of Estimate or Estimate Update)			
Original Estimate	2019 Dollars		\$ 305,000
Current Estimate	2019 Dollars		\$ 305,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	5.0%	\$ 15,260	0%	\$ -	\$ -	\$ 15,000
Construction Mgt.	5.0%	\$ 15,260	0%	\$ -	\$ -	\$ 15,000

Total Project Cost (Present Value in 2019 Dollars)						\$ 336,000
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Notes:

- 1 Based on review with Maddox Electric.
- 2 Based on location of new unit within existing Chlorine Building

J. B. Latham Treatment Plant

Project Number 02335

Administration Building Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$	-
Shipping Rate	0%							included
Sale Tax	8.00%						\$	-
Project Contingency@	20%						\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	-
Current Estimate	2019 Dollars						\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ 25,000.00	0%	\$ -	\$ -	\$ 25,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 25,000

Notes:

- 1 Assuming that a seismic evaluation of structure is not needed
- 2 Original construction was ADA compliant but this should be review to address changes in code

J. B. Latham Treatment Plant

Project Number 02336

Administration Building Spatial Analysis

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	1	LS	-	-	-	-	\$ -
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Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ -
Shipping Rate	0%						included
Sale Tax	8.00%						\$ -
Project Contingency@	20%						\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ -
Current Estimate	2019 Dollars						\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ 40,000
Design	7.5%	\$ -	0%	\$ -	\$ -
Engr. During Construction	5.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 40,000

Notes:

J. B. Latham Treatment Plant

Project Number 02337

Administration Building Roof Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹							
Roof Reconstruction	1	LS	\$	-		\$	150,000
Gutters	1	LS	\$	-		\$	10,000
Vents	1	LS	\$	-		\$	15,000
Other	1	LS	\$	-		\$	25,000
Subtotal						\$	200,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%				\$	54,000
Shipping Rate		0%				included	
Sale Tax		8.00%				\$	-
Project Contingency@		30%				\$	76,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars					\$	276,000
Current Estimate	2019 Dollars					\$	276,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	5.0%	\$ 13,810	0% \$ -	\$ -	\$ -	\$ 14,000
Conceptual Study	0.0%	\$ -	0% \$ -	\$ -	\$ -	\$ -
Design	10.0%	\$ 27,620	0% \$ -	\$ -	\$ -	\$ 28,000
Engr. During Construction	5.0%	\$ 13,810	0% \$ -	\$ -	\$ -	\$ 14,000
Construction Mgt.	5.0%	\$ 13,810	0% \$ -	\$ -	\$ -	\$ 14,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 345,000

Notes:

- 1 Based on bid tabulation for RTP Operations Building Roof Reconstruction

J. B. Latham Treatment Plant
Project Number 02338
Administration Building HVAC Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹							
Fan Coils/Heat Pumps	1	LS	\$	-		\$	40,000
System Ducting	1	LS	\$	-		\$	25,000
Restroom Fans	1	LS	\$	-		\$	5,000
Power and Controls	1	LS	\$	-		\$	25,000
Subtotal						\$	95,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%				\$	26,000
Shipping Rate		0%				included	
Sale Tax		8.00%				\$	-
Project Contingency@		30%				\$	36,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate		2019 Dollars				\$	131,000
Current Estimate		2019 Dollars				\$	131,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	5.0%	\$ 6,560	0% \$ -	\$ -	\$ -	\$ 7,000
Conceptual Study	5.0%	\$ 6,560	0% \$ -	\$ -	\$ -	\$ 7,000
Design	12.0%	\$ 15,743	0% \$ -	\$ -	\$ -	\$ 16,000
Engr. During Construction	2.5%	\$ 3,280	0% \$ -	\$ -	\$ -	\$ 3,000
Construction Mgt.	2.5%	\$ 3,280	0% \$ -	\$ -	\$ -	\$ 3,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 167,000

Notes:

1 Based on bid tabulation for RTP Operations Building HVAC Reconstruction

J.B. Latham Treatment Plant

Project Number 02340

Plant Water Pump Station Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	Sep-18
Estimate Update	Sep-18
Const. Year	

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Replacement of Strainer	1	LS	\$	66,000	\$	24,000	\$ 90,000
Replacement of Pumps	1	LS	\$	159,000	\$	52,000	\$ 211,000
Replacement of Piping	1	LS	\$	500	\$	200	\$ 700
Equipment Pad	1	LS	\$	1,280			\$ 1,280
Electrical Upgrades	1	LS	\$	7,200	\$	16,200	\$ 23,400
Subtotal							\$ 326,380
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @			27%				\$ 88,123
Shipping Rate			0%			included	
Sale Tax			8.00%				\$ 26,110
Project Contingency@			20%				\$ 88,123
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 528,736
Current Estimate	2019 Dollars						\$ 528,736
Total Main Project Cost (CAMP Report Year)							

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 52,874	0%	\$ -	\$ -	\$ 52,874
Engr. During Construction	5.0%	\$ 26,437	0%	\$ -	\$ -	\$ 26,437
Construction Mgt.	7.5%	\$ 39,655	0%	\$ -	\$ -	\$ 39,655
Total Project Cost (Present Value in 2019 Dollars)						\$ 647,701

Notes:

- 1 Cost estimate provided by Hazen in August 2018

J. B. Latham Treatment Plant

Project Number 02341

Non Potable Water Pump Station Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demolition	1	LS	\$ -	\$ -	0%	\$ -	\$ 20,000
Non Potable Water Pumps and Appurt ¹	1	LS	\$ -	\$ -	0%	\$ -	\$ 327,000
Electrical and Instrumentation	1	LS	\$ -	\$ -	0%	\$ -	\$ 20,000
Subtotal							\$ 367,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 88,000
Shipping Rate		0%					included
Sale Tax		8.00%					\$ -
Project Contingency@		20%					\$ 73,000

Total Main Project Cost (Year of Estimate or Estimate Update)			
Original Estimate	2019 Dollars		\$ 528,000
Current Estimate	2019 Dollars		\$ 528,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	2.5%	\$ 13,202.95	0%	\$ -	\$ -	\$ 13,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	7.5%	\$ 39,609	0%	\$ -	\$ -	\$ 40,000
Engr. During Construction	5.0%	\$ 26,406	0%	\$ -	\$ -	\$ 26,000
Construction Mgt.	5.0%	\$ 26,406	0%	\$ -	\$ -	\$ 26,000

Total Project Cost (Present Value in 2019 Dollars)						\$ 634,000
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Notes:

- 1 Based on Hazen and Sawyer estimate.

Regional Treatment Plant

Project Number 02342

Primary Gallery Upgrade Phase II

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Upgraded Equipment	1	LS	\$ 25,000	\$ 25,000		\$ -	\$ 25,000
Storage	1	LS	\$ 10,000	\$ 10,000	25%	\$ 2,500	\$ 13,000
Rehab Office Space	1	LS	\$ 10,000	\$ 10,000	100%	\$ 10,000	\$ 20,000
Electrical upgrades	1	LS	\$ 25,000	\$ 25,000	50%	\$ 12,500	\$ 38,000
Concrete Rehabilitation	1	LS	\$ 12,000	\$ 12,000	50%	\$ 6,000	\$ 18,000
			\$ -	\$ -		\$ -	\$ -

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 31,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 7,000

Project Contingency@

20% \$ 30,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 180,000
Current Estimate	2018 Dollars	\$ 180,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	3.0%	\$ 5,403	0%	\$ -	\$ -	\$ 5,000
Engr. During Construction	10.0%	\$ 18,008	0%	\$ -	\$ -	\$ 18,000
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)						\$ 203,000

Notes:

Project Number 02343
SCADA System Upgrade

Main Project Type

- New Facility
- Facility Rehabilitation
- Major maintenance
- Asset Replacement
- Special Study

X
X

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19
 Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	PLC's	7	EA	\$ 15,000	\$ 105,000	100%	\$ 105,000	\$ 210,000
	PLC Cabinets	3	EA	\$ 12,500	\$ 37,500	50%	\$ 18,750	\$ 56,000
	Programming	1	LS		\$ -		\$ -	\$ 25,000
Subtotal								\$ 291,000
General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @		27%						\$ 57,000
Shipping Rate		0%					included	
Sale Tax		8.00%						\$ 11,000
Project Contingency@		30%						\$ 108,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 467,000
Current Estimate	2019 Dollars	\$ 467,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 11,679	0%	\$ -	\$ 12,000
Conceptual Study	2.5%	\$ 11,679	0%	\$ -	\$ 12,000
Design	10.0%	\$ 46,716	0%	\$ -	\$ 47,000
Engr. During Construction	5.0%	\$ 23,358	0%	\$ -	\$ 23,000
Construction Mgt.	5.0%	\$ 23,358	0%	\$ -	\$ 23,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 584,000

Notes:

J. B. Latham Treatment Plant

Project Number 02345

Site Pavement Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19
 Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Asphalt Pavement	1	LS	\$	-	\$	-	\$ 675,000
Subtotal								\$ 675,000
General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @		27%					included	
Shipping Rate		0%					included	
Sale Tax		8.00%					\$	-
Project Contingency@		20%					\$	135,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	810,000
Current Estimate	2019 Dollars	\$	810,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 20,250	0%	\$ -	\$ 20,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	5.0%	\$ 40,500	0%	\$ -	\$ 41,000
Engr. During Construction	2.5%	\$ 20,250	0%	\$ -	\$ 20,000
Construction Mgt.	5.0%	\$ 40,500	0%	\$ -	\$ 41,000

Total Project Cost (Present Value in 2019 Dollars)

\$ 932,000

Notes:

1 Cost estimate derived from 2004 Study by TetraTech.

J. B. Latham Treatment Plant

Project Number 02346

New Storage Building

Main Project Type

New Facility	X
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Foundation	1	LS	-	-	-	-	\$ 15,000
	Pavement Modifications	1	LS	-	-	-	-	\$ 10,000
	Building	1	LS	-	-	-	-	\$ 148,000
	Plumbing	1	LS	-	-	-	-	\$ 15,000
	Finishes	1	LS	-	-	-	-	\$ 20,000
	Skylights	1	LS	-	-	-	-	\$ 15,000

\$ -

Subtotal

\$ 223,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27%

\$ 60,000

Shipping Rate

0%

included

Sale Tax

8.00%

\$ -

Project Contingency@

30%

\$ 85,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 368,000
Current Estimate	2019 Dollars	\$ 368,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	12.0%	\$ 44,181	0%	\$ -	\$ 44,000
Engr. During Construction	5.0%	\$ 18,409	0%	\$ -	\$ 18,000
Construction Mgt.	10.0%	\$ 36,817	0%	\$ -	\$ 37,000

Total Project Cost (Present Value in 2019 Dollars) \$ 468,000

Notes:

- 1 Assumes building to fit location of existing laboratory

J. B. Latham Treatment Plant

Project Number 02347

Storm Water Pump Station Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demolition	1	LS		\$ -			\$ 20,000
Roof Reconstruction	1	LS		\$ -			\$ 15,000
Wetwell Grating Replacement	1	LS		\$ -			\$ 8,000
Concrete Repairs	1	LS		\$ -			\$ 10,000
Replace Single Doors	1	LS		\$ -			\$ 9,000
Replace Double Door	1	LS		\$ -			\$ 12,000
Replace Ladder	1	LS		\$ -			\$ 13,000
Pump	1	EA	\$ 10,000	\$ 10,000	25%	\$ 2,500	\$ 13,000
Engine	1	EA	\$ 25,000	\$ 25,000	25%	\$ 6,250	\$ 31,000
Slide Gate	2	EA	\$ 12,000	\$ 24,000	25%	\$ 6,000	\$ 30,000
Piping and Valving	1	LS	\$ -	\$ -	0%	\$ -	\$ 15,000
Replace HVAC System	1	LS		\$ -			\$ 5,000
Replace Lighting and Power Receptacles	1	LS		\$ -			\$ 10,000
Power	1	LS		\$ -			\$ 15,000
Instrumentation	1	LS		\$ -			\$ 10,000

Subtotal

\$ 214,000

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

27%

\$ 58,000

Shipping Rate

0%

included

Sale Tax

8.00%

\$ -

Project Contingency@

30%

\$ 82,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 296,000
Current Estimate	2019 Dollars	\$ 296,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	2.5%	\$ 7,397	0%	\$ -	\$ -	\$ 7,000
Conceptual Study	5.0%	\$ 14,794	0%	\$ -	\$ -	\$ 15,000
Design	10.0%	\$ 29,588	0%	\$ -	\$ -	\$ 30,000
Engr. During Construction	5.0%	\$ 14,794	0%	\$ -	\$ -	\$ 15,000
Construction Mgt.	5.0%	\$ 14,794	0%	\$ -	\$ -	\$ 15,000
Total Project Cost (Present Value in 2019 Dollars)						\$ 377,000

Notes:

J.B. Latham Treatment Plant

Project Number 02350

Buried Water Pipe Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	Sep-18
Estimate Update	Sep-18
Const. Year	

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Demolition						\$ 200,000	\$ 200,000
Excavation						\$ 100,000	\$ 100,000
Asphalt				\$ 50,000		\$ 50,000	\$ 100,000
1-inch process water pipeline replacement	1	LS		\$ 400		\$ 320	\$ 720
2-inch process water pipeline replacement	1	LS		\$ 1,200		\$ 960	\$ 2,160
2.5-inch process water pipeline replacement	1	LS		\$ 1,250		\$ 1,000	\$ 2,250
3-inch process water pipeline replacement	1	LS		\$ 7,750		\$ 4,650	\$ 12,400
4-inch process water pipeline replacement	1	LS		\$ 6,150		\$ 4,100	\$ 10,250
6-inch process water pipeline replacement	1	LS		\$ 24,500		\$ 17,500	\$ 42,000
10-inch process water pipeline replacement	1	LS		\$ 2,000		\$ 800	\$ 2,800
12-inch process water pipeline replacement	1	LS		\$ 8,000		\$ 3,200	\$ 11,200
1.5-inch potable water pipeline replacement	1	LS		\$ 3,800		\$ 3,040	\$ 6,840
2-inch potable water pipeline replacement	1	LS		\$ 1,500		\$ 1,200	\$ 2,700
4-inch Potable water pipeline replacement	1	LS		\$ 3,000		\$ 1,500	\$ 4,500

Subtotal

General Conditions, Contractor Overhead and Profit,
and Bonds and Insurance @

	27%						\$ 134,411
Shipping Rate	0%						included
Sale Tax	8.00%						\$ 39,826
Project Contingency@	30%						\$ 149,346

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ 821,403
Current Estimate	2019 Dollars						\$ 821,403

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	2.5%	\$ 20,535	0%	\$ -	\$ -	\$ 20,535
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 82,140	0%	\$ -	\$ -	\$ 82,140
Engr. During Construction	5.0%	\$ 41,070	0%	\$ -	\$ -	\$ 41,070
Construction Mgt.	7.5%	\$ 61,605	0%	\$ -	\$ -	\$ 61,605

Total Project Cost (Present Value in 2019 Dollars)

\$ 1,026,754

Notes:

1 Cost estimate provided by Hazen for CTP TYP

J.B. Latham Treatment Plant

Project Number 02351

Buried Drainage Pipe Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	Jul-18
Estimate Update	Jul-18
Const. Year	

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Demolition	1	LS	\$	-	\$	50,000	\$	50,000
Excavation	1	LS	\$	-	\$	100,000	\$	100,000
Asphalt	1	LS	\$	-	\$	100,000	\$	100,000
4-inch drain pipe replacement	1	LS	\$	1,500	\$	750	\$	2,250
6-inch drain pipe replacement	1	LS	\$	8,750	\$	6,250	\$	15,000
10-inch drain pipe replacement	1	LS	\$	7,500	\$	3,000	\$	10,500
12-inch drain pipe replacement	1	LS	\$	25,000	\$	10,000	\$	35,000

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%	\$	84,442.50
Shipping Rate	0%	included	
Sale Tax	8.00%	\$	25,020
Project Contingency@	30%	\$	93,825

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	516,038
Current Estimate	2019 Dollars	\$	516,038

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 51,604	0%	\$ -	\$ -	\$ 51,604
Engr. During Construction	5.0%	\$ 25,802	0%	\$ -	\$ -	\$ 25,802
Construction Mgt.	7.5%	\$ 38,703	0%	\$ -	\$ -	\$ 38,703
Total Project Contingency ⁵	0.0%	\$ -	0%	\$ -	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 632,146

Notes:

- 1 Cost estimate provided by Hazen for CTP TYP

J. B. Latham Treatment Plant

Project Number 2353

Perimeter Fence Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	Perimeter Fence Removal ¹	1	LS	-	-	-	-	\$ 19,000
	Perimeter Fence Replacement ²	1	LS	-	-	-	-	\$ 47,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 18,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ -
Project Contingency@	10%							\$ 8,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 92,000
Current Estimate	2019 Dollars							\$ 92,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 9,220	0%	\$ -	\$ 9,000
Engr. During Construction	2.5%	\$ 2,305	0%	\$ -	\$ 2,000
Construction Mgt.	5.0%	\$ 4,610	0%	\$ -	\$ 5,000
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)					\$ 108,000
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Notes:

- 1 Cost estimate provided by Hazen & Sawyer; \$16/lf of fence removal
- 2 Cost estimate provided by Hazen & Sawyer; \$39/lf of fence installation
- 3 Based on 1200 liner feet of perimeter fencing

J.B. Latham Treatment Plant

Project Number 02354

Natural Gas Pipeline Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	Sep-18
Estimate Update	Sep-18
Const. Year	

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ³							
Demolition	1	LS				\$ 100,000	\$ 100,000
Alternative supply of natural gas	1	LS		\$ 48,000		\$ 50,000	\$ 98,000
Excavation	1	LS				\$ 100,000	\$ 100,000
2-inch natural gas pipeline replacement	1	LS		\$ 48,000		\$ 36,000	\$ 84,000
Subtotal							\$ 382,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 103,140
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 30,560
Project Contingency@		30%					\$ 114,600
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 630,300
Current Estimate	2019 Dollars						\$ 630,300
Total Main Project Cost (CAMP Report Year)							

Project Phases Cost	Rate ²	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment		\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 63,030	0%	\$ -	\$ -	\$ 63,030
Engr. During Construction	5.0%	\$ 31,515	0%	\$ -	\$ -	\$ 31,515
Construction Mgt.	7.5%	\$ 47,273	0%	\$ -	\$ -	\$ 47,273
Total Project Cost (Present Value in 2019 Dollars)						\$ 772,118

Notes:

1 Cost estimate provided by Hazen for CTP TYP

J. B. Latham Treatment Plant

Project Number 02520

Ferric Chloride System Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 25,000
	Storage Tank	1	Ea	\$ 60,000	\$ 60,000	25%	\$ 15,000	\$ 75,000
	Metering Pump	3	Ea	\$ 20,000	\$ 60,000	25%	\$ 15,000	\$ 75,000
	Piping, Valves and Appurtenances	1	LS	-	-	-	-	\$ 30,000
	Coating	1	LS	-	-	-	-	\$ 50,000
	Metal Appurtenances	1	LS	-	-	-	-	\$ 5,000
	Electrical and Instrumentation	1	LS	-	-	-	-	\$ 100,000
	Temporary System	1	LS	-	-	-	-	\$ 40,000
					\$ 120,000			

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 108,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ 10,000
Project Contingency@	20%							\$ 104,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 621,000
Current Estimate	2019 Dollars							\$ 621,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 15,528	0%	\$ -	\$ 16,000
Conceptual Study	2.5%	\$ 15,528	0%	\$ -	\$ 16,000
Design	10.0%	\$ 62,112	0%	\$ -	\$ 62,000
Engr. During Construction	5.0%	\$ 31,056	0%	\$ -	\$ 31,000
Construction Mgt.	5.0%	\$ 31,056	0%	\$ -	\$ 31,000

Total Project Cost (Present Value in 2019 Dollars)					\$ 776,000
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Notes:

- 1 Assumes that existing concrete containment area can be reused with new coating system.

J. B. Latham Treatment Plant

Project Number 02521
Odor Control Scrubber No.3 Replacement (Handling DAF System)

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Odor Control System ¹	1	LS	-	-	-	-	\$ 217,000
	Electrical and Inst ²	1	LS	-	-	-	-	\$ 33,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 67,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ -
Project Contingency@	30%							\$ 95,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 413,000
Current Estimate	2019 Dollars							\$ 413,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 10,314	0%	\$ -	\$ 10,000
Design	7.5%	\$ 30,943	0%	\$ -	\$ 31,000
Engr. During Construction	5.0%	\$ 20,629	0%	\$ -	\$ 21,000
Construction Mgt.	5.0%	\$ 20,629	0%	\$ -	\$ 21,000
Total Project Cost (Present Value in 2019 Dollars)					\$ 495,000

Notes:

- 1 Foul Air System Evaluation J. B. Latham Treatment Plant -DHK Engineers (12/17)
- 2 Electrical and instrumentation cost is taken as 15% of balance of construction costs.

J.B. Latham Treatment Plant

Project Number 02522

DAF Polymer System upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	Feb-19
Estimate Update	Feb-19
Prepared By	JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³								
	Demo	1	LS	\$	-	\$	-	\$40,000
	Mechanical Upgrades	1	LS	\$	-	\$	-	\$50,000
	Metering Pumps and VFDs	1	LS	\$	-	\$	-	\$75,000
	PLC, HMI, and Programming	1	LS	\$	-	\$	-	\$150,000
	Bulk Tanks	1	EA	\$ 37,500	\$ 37,500	\$	-	\$37,500
Subtotal				\$	-	\$	-	\$352,500

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$95,175
Shipping Rate	0%						included	
Sale Tax	8.00%							\$0
Project Contingency@	20%							\$70,500

Total Main Project Cost (Year of Estimate or Estimate Update)		
Original Estimate	2019 Dollars	\$518,175
Current Estimate	2019 Dollars	\$518,175

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 51,818	0%	\$ -	\$ -	\$ 51,818
Engr. During Construction	10.0%	\$ 51,818	0%	\$ -	\$ -	\$ 51,818
Construction Mgt.	5.0%	\$ 25,909	0%	\$ -	\$ -	\$ 25,909
Total Project Cost (Present Value in 2019 Dollars)						\$ 647,719

Notes:

J. B. Latham Treatment Plant

Project Number 02523

Dewatering Polymer System Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 15,000
	Storage Tank	1	Ea	\$ 60,000	\$ 60,000	25%	\$ 15,000	\$ 75,000
	Piping, Valves and Appurtenances	1	LS	-	-	-	-	\$ 25,000
	Metal Appurtenances	1	LS	-	-	-	-	\$ 3,000
	Electrical and Instrumentation	1	LS	-	-	-	-	\$ 20,000
	Temporary System	1	LS	-	-	-	-	\$ 10,000
					\$ 60,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 40,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ 5,000
Project Contingency@	20%							\$ 38,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 231,000
Current Estimate	2019 Dollars							\$ 231,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 5,764	0%	\$ -	\$ 6,000
Conceptual Study	2.5%	\$ 5,764	0%	\$ -	\$ 6,000
Design	7.5%	\$ 17,291	0%	\$ -	\$ 17,000
Engr. During Construction	2.5%	\$ 5,764	0%	\$ -	\$ 6,000
Construction Mgt.	5.0%	\$ 11,528	0%	\$ -	\$ 12,000

Total Project Cost (Present Value in 2019 Dollars)					\$ 277,000
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Notes:

- 1 Assumes that existing concrete containment area can be reused.
- 2 Assumes that polymer feeders replacement units installed in 2019 and 2020 are still in good operating condition.

J. B. Latham Treatment Plant

Project Number 02524

MCC D Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demolition	1	LS	\$ -	\$ -	0%	\$ -	\$ 5,000
Motor Control Center ¹	1	EA	\$ 94,000	\$ 94,000	40%	\$ 37,600	\$ 132,000
Conduit and Cable ²	1	LS	\$ -	\$ -	0%	\$ -	\$ 45,000
Subtotal							\$ 182,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 49,000
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 8,000
Project Contingency@		30%					\$ 71,000

Total Main Project Cost (Year of Estimate or Estimate Update)		
Original Estimate	2019 Dollars	\$ 310,000
Current Estimate	2019 Dollars	\$ 310,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 30,960	0%	\$ -	\$ -	\$ 31,000
Engr. During Construction	5.0%	\$ 15,480	0%	\$ -	\$ -	\$ 15,000
Construction Mgt.	5.0%	\$ 15,480	0%	\$ -	\$ -	\$ 15,000

Total Project Cost (Present Value in 2019 Dollars)		Total
		\$ 372,000

Notes:

- 1 Based on review with Maddox Electric.
- 2 Based on location of new unit within existing Chlorine Building

J.B. Latham Treatment Plant

Project Number 02525

Anaerobic Digester No.1 and No. 2 Mechanical Upgrades

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jan-19
 Estimate Update Jan-19
 Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Mixing Pump	2	EA	\$ 50,000	\$ 100,000	50%	\$ 25,000	\$125,000
Piping, Valves, & Supports	1	LS	\$ 200,000	\$ 200,000	100%	\$ 200,000	\$400,000
Heat Exchanger	2	EA	\$ 60,000	\$ 120,000	100%	\$ 60,000	\$180,000
Dome Upgrades	2	EA	\$ 200,000	\$ 400,000		\$ -	\$400,000
Stairs	2	EA	\$ 250,000	\$ 500,000		\$ -	\$500,000
Other	1	LS	\$ 400,000	\$ 400,000		\$ -	\$400,000
Subtotal				\$ 1,720,000		\$ 285,000	\$2,005,000

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

27% \$541,350

Shipping Rate

0% included

Sale Tax

8.00% \$137,600

Project Contingency@

20% \$401,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$3,084,950
Current Estimate	2019 Dollars	\$3,084,950

Total Main Project Cost (CAMP Report Year)

Project Phases Cost		Rate	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA	Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 CS	Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 DS	Design	10.0%	\$ 308,495	0%	\$ -	\$ -	\$ 308,495
1.1.005 EDC	Engr. During Construction	5.0%	\$ 154,248	0%	\$ -	\$ -	\$ 154,248
1.1.005 CM	Construction Mgt.	5.0%	\$ 154,248	0%	\$ -	\$ -	\$ 154,248
1.1.005 CY	Total Project Contingency ⁵	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)							\$ 3,701,940

Notes:

J.B. Latham Treatment Plant

Project Number 02526

Anaerobic Digesters NO. 3 and No. 4 Mechanical Upgrades

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jan-19
 Estimate Update Jan-19

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Mixing Pump	2	EA	\$ 40,000	\$ 80,000	50%	\$ 20,000	\$100,000
Piping, Valves, & Supports	1	LS	\$ 150,000	\$ 150,000	100%	\$ 150,000	\$300,000
Heat Exchanger	1	EA	\$ 45,000	\$ 45,000	100%	\$ 45,000	\$90,000
Dome Upgrades	2	EA	\$ 150,000	\$ 300,000		\$ -	\$300,000
Stairs	0	EA	\$ 200,000	\$ -		\$ -	\$0
Other	0	LS	\$ 200,000	\$ -		\$ -	\$0
Subtotal				\$ 575,000		\$ 215,000	\$790,000

General Conditions. Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$213,300

Shipping Rate

0% included

Sale Tax

8.00% \$46,000

Project Contingency@

20% \$158,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$1,207,300
Current Estimate	2019 Dollars	\$1,207,300

Total Main Project Cost (CAMP Report Year)

Project Phases Cost		Rate ²	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA	Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 CS	Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 DS	Design	10.0%	\$ 120,730	0%	\$ -	\$ -	\$ 120,730
1.1.005 EDC	Engr. During Construction	5.0%	\$ 60,365	0%	\$ -	\$ -	\$ 60,365
1.1.005 CM	Construction Mgt.	5.0%	\$ 60,365	0%	\$ -	\$ -	\$ 60,365
1.1.005 CY	Total Project Contingency ⁵	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)							\$ 1,448,760

Notes:

J.B. Latham Treatment Plant

Project Number 02527

Anaerobic Digester No. 3 and No. 4 Control Building Upgrades

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jan-19
 Estimate Update Jan-19
 Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Roof Upgrades	1	LS	\$ 80,000	\$ 80,000	\$ -	\$80,000
Boiler Demo	1	LS	\$ 50,000	\$ 50,000	\$ -	\$50,000
Piping and Valving	1	LS	\$ 150,000	\$ 150,000	\$ -	\$150,000
Electrical Upgrades	1	EA	\$ 150,000	\$ 150,000	\$ -	\$150,000

Subtotal

\$ 430,000 \$ - \$430,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$116,100

Shipping Rate

0% included

Sale Tax

8.00% \$34,400

Project Contingency@

20% \$86,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$666,500
Current Estimate	2019 Dollars	\$666,500

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 66,650	0%	\$ -	\$ -	\$ 66,650
Engr. During Construction	5.0%	\$ 33,325	0%	\$ -	\$ -	\$ 33,325
Construction Mgt.	7.5%	\$ 49,988	0%	\$ -	\$ -	\$ 49,988
Total Project Contingency ⁵	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)						\$ 816,463

Notes:

J.B. Latham Treatment Plant

Project Number 02528

Digested Sludge Pump Station Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Sep-18
 Estimate Update Sep-18
 Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Replace Sludge Pumps (chopper)	3	EA	\$ 14,000	\$ 42,000	50%	\$ 7,000	\$49,000
Replace Piping/Valves	1	LS	\$ 30,000	\$ 30,000	75%	\$ 22,500	\$52,500
Electrical	1	LS	\$ 50,000	\$ 50,000	100%	\$ 50,000	\$100,000
	1	LS		\$ -		\$ -	\$0
	1	LS		\$ -		\$ -	
	1	LS		\$ -		\$ -	
Subtotal				\$ 122,000		\$ 79,500	\$201,500

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

27% \$54,405

Shipping Rate

0% included

Sale Tax

8.00% \$9,760

Project Contingency@

20% \$40,300

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$305,965
Current Estimate	2019 Dollars	\$305,965

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 30,597	0%	\$ -	\$ -	\$ 30,597
Engr. During Construction	5.0%	\$ 15,298	0%	\$ -	\$ -	\$ 15,298
Construction Mgt.	7.5%	\$ 22,947	0%	\$ -	\$ -	\$ 22,947
Total Project Cost (Present Value in 2019 Dollars)						\$ 374,807

Notes:

J. B. Latham Treatment Plant

Project Number 02529

MCC B Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Apr-19
 Estimate Update Apr-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demolition	1	LS	\$ -	\$ -	0%	\$ -	\$ 10,000
Motor Control Center ¹	1	EA	\$ 82,000	\$ 82,000	40%	\$ 32,800	\$ 115,000
Conduit and Cable ²	1	LS	\$ -	\$ -	0%	\$ -	\$ 75,000
Subtotal							\$ 200,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 54,000
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 7,000
Project Contingency@		30%					\$ 78,000

Total Main Project Cost (Year of Estimate or Estimate Update)			
Original Estimate	2019 Dollars		\$ 338,000
Current Estimate	2019 Dollars		\$ 338,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 33,840	0%	\$ -	\$ -	\$ 34,000
Engr. During Construction	5.0%	\$ 16,920	0%	\$ -	\$ -	\$ 17,000
Construction Mgt.	5.0%	\$ 16,920	0%	\$ -	\$ -	\$ 17,000

Total Project Cost (Present Value in 2019 Dollars)						\$ 406,000
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Notes:

- 1 Based on review with Maddox Electric.
- 2 Based on location of new unit within proposed Digester 5 Utility Building

J.B. Latham Treatment Plant

Project Number 02530

Dewatering System Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Sep-17
 Estimate Update Sep-17

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Mechanical Upgrades to existing Centrifuges	3	EA	\$ 35,000	\$ 105,000	75%	\$ 26,250	\$131,250
Replace Diverter Gates	1	LS	\$ 30,000	\$ 30,000	100%	\$ 30,000	\$60,000
Replace Centrate Piping	1	LS	\$ 25,000	\$ 25,000	100%	\$ 25,000	\$50,000
			\$ -	\$ -		\$ -	\$0
			\$ -	\$ -		\$ -	
			\$ -	\$ -		\$ -	
Subtotal				\$ 160,000		\$ 81,250	\$241,250

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$65,138

Shipping Rate

0% included

Sale Tax

8.00% \$12,800

Project Contingency@

20% \$48,250

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$367,438
Current Estimate	2019 Dollars	\$367,438

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	5.0%	\$ 18,372	0%	\$ -	\$ -	\$ 18,372
Construction Mgt.	7.5%	\$ 27,558	0%	\$ -	\$ -	\$ 27,558
Total Project Cost (Present Value in 2019 Dollars)						\$ 950,216.19

Notes:

1 Values based on Carollo September 2017 Dewatering and Digester Gas Control and Heating Condition Assessment

J.B. Latham Treatment Plant

Project Number 02531

Solids Conveyor Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Sep-17
 Estimate Update Sep-17

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Replace Screws	1	LS	\$ 45,000	\$ 45,000	75%	\$ 33,750	\$78,750
Repair Conveyor Covers	1	LS	\$ 7,500	\$ 7,500	50%	\$ 3,750	\$11,250
Install Safety Wire Shutoff	1	LS	\$ 6,000	\$ 6,000	25%	\$ 1,500	\$7,500
	1	LS		\$ -		\$ -	\$0
	1	LS		\$ -		\$ -	
	1	LS		\$ -		\$ -	

Subtotal

\$ 58,500 \$ 39,000 \$97,500

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$26,325

Shipping Rate

0% included

Sale Tax

8.00% \$4,680

Project Contingency@

20% \$19,500

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate 2019 Dollars

Current Estimate 2019 Dollars

\$148,005

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	5.0%	\$ 7,400	0%	\$ -	\$ -	\$ 7,400
Construction Mgt.	7.5%	\$ 11,100	0%	\$ -	\$ -	\$ 11,100
Total Project Cost (Present Value in 2019 Dollars)						\$ 166,506

Notes:

1 Values based on Carollo September 2017 Dewatering and Digester Gas Control and Heating Condition Assessment

J.B. Latham Treatment Plant

Project Number 02532

Storage and Truck Loading Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Sep-17
 Estimate Update Sep-17

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Install Truck Scales	1	LS	\$ 356,000	\$ 356,000	\$ -	\$356,000
Room Repairs	1	LS	\$ 73,000	\$ 73,000	\$ -	\$73,000
Repair Concrete Floor	1	LS	\$ 45,000	\$ 45,000	\$ -	\$45,000
Electrical Upgrades	1	LS	\$ 15,000	\$ 15,000	\$ -	\$15,000
	1	LS		\$ -	\$ -	
	1	LS		\$ -	\$ -	
Subtotal				\$ 489,000	\$ -	\$489,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$132,030

Shipping Rate

0% included

Sale Tax

8.00% \$39,120

Project Contingency@

20% \$97,800

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$757,950
Current Estimate	2019 Dollars	\$757,950

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Engr. During Construction	5.0%	\$ 37,898	0%	\$ -	\$ -	\$ 37,898
Construction Mgt.	7.5%	\$ 56,846	0%	\$ -	\$ -	\$ 56,846
Total Project Contingency ⁵	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)						\$ 852,694

Notes:

1 Values based on Carollo September 2017 Dewatering and Digester Gas Control and Heating Condition Assessmen

J.B. Latham Treatment Plant

Project Number 02533

Gas Flare Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Mar-07
 Estimate Update Sep-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Flare	1	EA	\$ 400,000	\$ 400,000	50%	\$ 200,000	\$600,000
Replace Piping/Valves	1	LS	\$ 50,000	\$ 50,000	75%	\$ 37,500	\$87,500
Electrical	1	LS	\$ 60,000	\$ 60,000	100%	\$ 60,000	\$120,000
	1	LS		\$ -		\$ -	\$0
	1	LS		\$ -		\$ -	
	1	LS		\$ -		\$ -	
Subtotal				\$ 510,000		\$ 297,500	\$807,500

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

27% \$218,025

Shipping Rate

0% included

Sale Tax

8.00% \$40,800

Project Contingency@

30% \$242,250

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate 2019 Dollars

Current Estimate 2019 Dollars

\$1,308,575

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	15.0%	\$ 196,286	0%	\$ -	\$ -	\$ 196,286
Engr. During Construction	5.0%	\$ 65,429	0%	\$ -	\$ -	\$ 65,429
Construction Mgt.	7.5%	\$ 98,143	0%	\$ -	\$ -	\$ 98,143
Total Project Cost (Present Value in 2019 Dollars)						\$ 1,668,433

Notes:

1 Costs based on DHK Engineers 2013 Estimate. Upcoming SCAQMD regulations could impact the cost of this project.

J.B. Latham Treatment Plant

Project Number 02534

Buried Digester Piping Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Mar-07
 Estimate Update Sep-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Install Above Ground Piping and Supports	1	LS	\$ 175,000	\$ 175,000	75%	\$ 131,250	\$306,250
Moisture Traps	1	LS	\$ 30,000	\$ 30,000	75%	\$ 22,500	\$52,500
Electrical	1	LS	\$ 5,000	\$ 5,000	100%	\$ 5,000	\$10,000
	1	LS		\$ -		\$ -	\$0
	1	LS		\$ -		\$ -	
	1	LS		\$ -		\$ -	
Subtotal				\$ 210,000		\$ 158,750	\$368,750

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

27% \$99,563

Shipping Rate

0% included

Sale Tax

8.00% \$16,800

Project Contingency@

20% \$73,750

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$558,863
Current Estimate	2019 Dollars	\$558,863

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 55,886	0%	\$ -	\$ -	\$ 55,886
Engr. During Construction	5.0%	\$ 27,943	0%	\$ -	\$ -	\$ 27,943
Construction Mgt.	7.5%	\$ 41,915	0%	\$ -	\$ -	\$ 41,915
Total Project Cost (Present Value in 2019 Dollars)						\$ 684,607

Notes:

- 1 This project should coincide with the flare replacement project

J.B. Latham Treatment Plant

Project Number 02537

Digester No. 5 Construction

Main Project Type

New Facility	X
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	

Key Dates

Initial Estimate Mar-17
 Estimate Update Sep-18
 Const. Year

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ³							
Site Work	1	LS					\$ 1,110,000
Concrete	1	LS					\$ 1,065,000
Masonry	1	LS					\$ 100,000
Metal	1	LS					\$ 615,000
Thermal and Moisture Protection	1	LS					\$ 70,000
Doors and Windows	1	LS					\$ 21,000
Finishes	1	LS					\$ 196,000
Specialties	1	LS					\$ 4,000
Equipment	1	LS					\$ 396,000
Mechanical	1	LS					\$ 514,000
Electrical	1	LS					\$ 613,000
Instrumentation	1	LS					\$ 409,000
Subtotal							\$ 5,113,000
General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @			27%				\$ 1,380,510
Shipping Rate			0%				included
Sale Tax			0.00%				\$ -
Project Contingency@			30%				\$ 1,533,900
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2017 Dollars						\$ 8,027,410
Current Estimate	2019 Dollars						\$ 8,284,287
Total Main Project Cost (CAMP Report Year)							
Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total	
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -	-
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -	-
Design	10.0%	\$ 828,429	0%	\$ -	\$ -	\$ -	828,429
Engr. During Construction	5.0%	\$ 414,214	0%	\$ -	\$ -	\$ -	414,214
Construction Mgt.	7.5%	\$ 621,322	0%	\$ -	\$ -	\$ -	621,322
Total Project Cost (Present Value in 2019 Dollars)							\$ 10,148,252

Notes:

1 Cost estimate provided by Carollo Engineers as part of Package 'B' Planning

J.B. Latham Treatment Plant

Project Number 02540

Dewatering System replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Sep-17
 Estimate Update Sep-17

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Centrifuge Piping Modifications	1	LS	\$ 75,000	\$ 75,000	100%	\$ 75,000	\$150,000
Replace Centrifuges	3	EA	\$ 450,000	\$ 1,350,000	50%	\$ 225,000	\$1,575,000
Replace Centrifuge VFDs	6	EA	\$ 15,000	\$ 90,000	50%	\$ 7,500	\$97,500
Replace Centrifuge Control Panel	3	EA	\$ 20,000	\$ 60,000	50%	\$ 10,000	\$70,000
Centrifuge Floor Repairs	1	LS	\$ 25,000	\$ 25,000	200%	\$ 50,000	\$75,000
Electrical	1	LS	\$ 150,000	\$ 150,000	75%	\$ 112,500	\$262,500
Programming	1	LS	\$ -	\$ -	0%	\$ 75,000	\$75,000
				\$ -		\$ -	\$0
Subtotal				\$ 1,750,000		\$ 555,000	\$2,305,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$622,350

Shipping Rate

0% included

Sale Tax

8.00% \$140,000

Project Contingency@

20% \$461,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$3,528,350
Current Estimate	2019 Dollars	\$3,528,350

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 352,835	0%	\$ -	\$ -	\$ 352,835
Engr. During Construction	5.0%	\$ 176,418	0%	\$ -	\$ -	\$ 176,418
Construction Mgt.	5.0%	\$ 176,418	0%	\$ -	\$ -	\$ 176,418
Total Project Cost (Present Value in 2019 Dollars)						\$ 4,234,020

Notes:

1 Values based on Carollo September 2017 Dewatering and Digester Gas Control and Heating Condition Assessment

Appendix E
San Juan creek Ocean Outfall Ten Year Plan

BACKGROUND

The San Juan Creek Land and Ocean Outfall was constructed in 1978. The system carries treated secondary effluent from five upstream water reclamation plants. The San Juan Creek Outfall facilities are shown in Figure E.1. There are three visible landmarks for the outfall system along the east side of San Juan Creek: the Surge Tower, the Meter Station and the Junction Structure. The land and ocean outfalls begin at the Surge Tower. The Junction Structure is the dividing point between the land and the ocean outfall sections. The pipelines were constructed of 57-inch diameter reinforced concrete pipe (RCP) except for a portion of the land section crossing under the Pacific Coast Highway. This section is a cement mortar lined and coated steel pipe. The steel pipe joints are single gasket Carnegie joints. The ocean outfall extends approximately 10,334 feet off shore into to the Pacific Ocean. As shown in Figure E.1 a diffuser section of the outfall continues at a right angle from the main ocean outfall. The diffuser section is 1,488 feet long with 125 diffuser ports, sixteen at 2.65 inches in diameter one hundred seven at 3.03 inches in diameter, and two at 5.0 inches in diameter. The outfall discharges at depths ranging from 94.5 to 97.5 feet below mean sea level (MSL).

The outfall system was modified in the early 1990's with rising outfall flows and the construction of the new J. B. Latham Treatment Plant Effluent Pump Station. These modifications include the following:

- The Surge Tower (which originally had a grated open top) was converted into a pressure structure including the addition of an air/vacuum valve and a surge relief valve.
- The Junction Structure (which originally had a four-foot square bolted steel access hatch at the top) had a reinforced concrete cap built over the top of the structure.

OUTFALL CAPACITY

The capacity of the San Juan Creek Outfall became a point of discussion in 2005-2006 at which time the potential use of the outfall to receive flows from a future desalination facility was initially discussed. Although several hydraulic studies were conducted in the early 1990's there lacked a definitive statement of the capacity. Carollo Engineers was retained in 2006 to analyze both system hydraulics and pipe/structure strengths. The evaluation recommended a conservative capacity of 85 mgd for the outfall. However, the capacity evaluation and a subsequent structural evaluation identified a potential weakness in the concrete openings of the Junction Structure where the 57-inch pipe entered and exited. This portion of the structure would only become stressed when flows in the system exceeded 60 mgd. A repair project was recommended.

JUNCTION STRUCTURE UPGRADE

The San Juan Creek Ocean Outfall Junction Structure is located inside the Doheny State Beach as shown in Figure E.2. A profile of the existing original ten-foot diameter reinforced concrete Junction Structure is presented in Figure E.3. The original concept for the rehabilitation of the structure was to excavate to the foundation of the structure and install a concrete collar around the pipe openings. A constructability review indicated that this approach might not be feasible due to potential destabilization of the Junction Structure. Black & Veatch was retained to develop an alternative approach that could be implemented while keeping the system in operation without destabilizing the structure. Black & Veatch developed a two-step process involving internal modifications to the structure:

1. Create an access opening in the top of the Junction Structure during a low-flow, low-tide period. Enter the Junction Structure to make measurements. Install a new access hatch that could be pressurized to handle periods of higher hydraulic grade through the structure. This step is shown in Figure E.4.
2. Insert a series of fabricated pipe sleeves connecting the entering and exiting 57-inch pipelines. This approach would remove all hydrostatic pressure associated with the effluent flow thus removing the structural vulnerability. The inserted sleeve is shown in section view in Figure E.5.

The steps would be split across two seasons (spring – fall or fall – spring) to allow time for the custom fabrication of the sleeves after measurements have been taken in Step 1. The project is currently being designed and permitted with funds already collected from the member agencies. The Ten Year Plan anticipates construction of the project in Year 2 (Step 1 in the fall of 2020 and Step 2 in the spring of 2021).

DIFFUSER MODIFICATIONS

SOCWA retained Michael Baker Inc. (MBI) in 2018 and then again in 2019 to evaluate potential modifications to the Ocean Outfall diffuser system. The proposals would be necessary if SOCWA sought to obtain a 200:1 dilution credit for the San Juan Creek Outfall. The initial evaluation by MBI indicated that the desired dilution could be achieved by retrofitting 175 diffuser ports with duckbill check valves. Further modeling of the system indicated that the target dilution could be obtained by adding the duckbill check valves to only 17 of the ports.

There is no timetable to reach a dilution credit of 200:1. This Ten Year Plan is based on the assumed installation of the valves in Year 6 of the Plan.

INSPECTIONS AND ASSESSMENTS

The San Juan Creek Ocean Outfall is a relatively static system. The Junction Structure rehabilitation is a unique project to address a reliability issue. The diffuser modifications reflect a potential regulatory

issue. The remainder of the projects in the Ten Year Plan for the outfall represent inspections, condition assessments and small asset replacements.

The San Juan Creek Ocean Outfall undergoes an external inspection with a remotely operated vehicle every three to four years. The external inspection is typically followed by a port cleaning project. The outfalls diffuser ports tend to become partially obstructed over time by plant growth and/or shifting sands. The external inspections and the port cleanings have historically been included in the SOCWA Operations budget.

The San Juan Creek Outfall does not have any mechanism for internal inspections (which is different from the Aliso Creek Ocean Outfall). The ability to perform internal inspections has been a quandary for California wastewater utilities with ocean outfalls over the past decade. Ocean outfalls are operated under leases with the California State Lands Commission. These leases come up for periodic renewal. In recent lease renewals the Lands Commission has been presenting agencies with a lease requirement to conduct internal and external inspections. Most agencies have conducted periodic external inspections; however, there is little available technology to allow remote inspections of the interiors of the submerged or partially submerged outfalls. Many agencies do not have a ready point of access to the interior of outfalls. This is the situation with the San Juan Outfall. During the concept development of the Junction Structure Rehabilitation Project Black & Veatch

identified the construction of a new hatch at the Surge Tower as the simplest point of access into the San Juan Creek Ocean Outfall. This is not optimal for diver access as there is a long distance from the Surge Tower to even the surf zone of the Outfall. A project is included in Year 1 for the review of options for access and internal monitoring. It is possible that this review may identify a new capital project in a subsequent version of the Ten Year Plan (prior to lease renewal in 2023).

Year 4 of the Ten Year Plan includes an added dimension to the periodic external inspection of the outfall. The scope would be expanded to include taking and analyzing a core sample from the wall of the submerged outfall. It is reported that other agencies (including the Encina Wastewater Authority) have done similar corings that have revealed a concrete strength higher than after placing the outfall into service (through the lengthy extended cure time). However, the assessment is a prudent precautionary process in identifying any needed improvements.

Years 7 and 9 include the concept development and the implementation of an internal inspection of the land portion of the San Juan Creek Ocean Outfall. This work has been included late in the Ten Year Plan based on the potential for augmented water recycling at the upstream plants tributary to the outfall. Water recycling would provide a short window to allow access into the outfall in a low- or no-flow condition. This work would also be contingent upon the development of an access point which is included in the \$750,000

base cost estimate in Year 9.

TEN YEAR PLAN PROJECTS

The project capital projects for Project Committee 5 are presented in Table E.1. The projects identified in Years 5 to 10 are highly speculative including the installation of the diffuser port duckbill check valves. Condition assessments programmed into the Ten Year Plan may identify additional needed improvements. The values presented in Table E.1 do not include administration costs. These costs are added to the costs presented in Chapter 8 of the Ten Year Plan.

Table E.1
San Juan Creek Ocean Outfall Capital Improvement Program

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSC	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 1 ('19/'20)									
	4601-000	Monitoring Evaluations Options	\$75,730	\$75,730	\$11,746	\$12,586	\$8,391	\$33,564	\$9,444
		TOTALS	\$75,730	\$75,730	\$11,746	\$12,586	\$8,391	\$33,564	\$9,444
YEAR 2 ('20/'21)									
	3605-000	Junction Structure Construction - Access Way	\$104,057	\$104,057	\$16,139	\$17,294	\$11,530	\$46,118	\$12,976
	3606-000	Junction Structure Construction - Sleeve Insert	\$365,000	\$376,680	\$58,423	\$62,604	\$41,736	\$166,945	\$46,972
	4602-000	Land Outfall Facility Condition Assessment	\$52,326	\$52,326	\$8,116	\$8,697	\$5,798	\$23,191	\$6,525
		TOTALS	\$156,383	\$156,383	\$24,255	\$25,991	\$17,327	\$69,309	\$19,501
YEAR 4 ('22/'23)									
	05055	Surge System Air Valve Replacement	\$35,000	\$38,469	\$5,966	\$6,393	\$4,262	\$17,049	\$4,797
	05056	Marine Outfall Core Sample and Condition Assessment	\$125,000	\$137,388	\$21,309	\$22,834	\$15,223	\$60,890	\$17,132
		TOTALS	\$160,000	\$175,857	\$27,275	\$29,227	\$19,485	\$77,940	\$21,929

Table E.1
San Juan Creek Ocean Outfall Capital Improvement Program

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) CSC	Project cost (adjusted) CSJC	Project cost (adjusted) SMWD	Project cost (adjusted) SCWD
YEAR 5 ('23/'24)									
	05057	Diffuser Port Duckbill Design	\$34,040	\$38,610	\$5,988	\$6,417	\$4,278	\$17,112	\$4,815
		TOTALS	\$34,040	\$38,610	\$5,988	\$6,417	\$4,278	\$17,112	\$4,815
YEAR 6 ('24/'25)									
	05058	Diffuser Port Duckbill Construction	\$339,260	\$397,129	\$61,595	\$66,003	\$44,002	\$176,008	\$49,522
		TOTALS	\$339,260	\$397,129	\$61,595	\$66,003	\$44,002	\$176,008	\$49,522
YEAR 7 ('25/'26)									
	05060	Outfall Inspection Concept Development	\$75,000	\$96,494	\$14,966	\$16,037	\$10,691	\$42,766	\$12,033
	05059	Monitoring Vault Reconstruction	\$165,000	\$199,905	\$31,005	\$33,224	\$22,150	\$88,598	\$24,928
		TOTALS	\$240,000	\$296,399	\$31,005	\$33,224	\$22,150	\$88,598	\$24,928
YEAR 9 ('27/'28)									
	05061	Land Outfall Inspection	\$750,000	\$964,937	\$149,662	\$160,372	\$106,915	\$427,660	\$120,328
		TOTALS	\$750,000	\$964,937	\$149,662	\$160,372	\$106,915	\$427,660	\$120,328



Prepared by



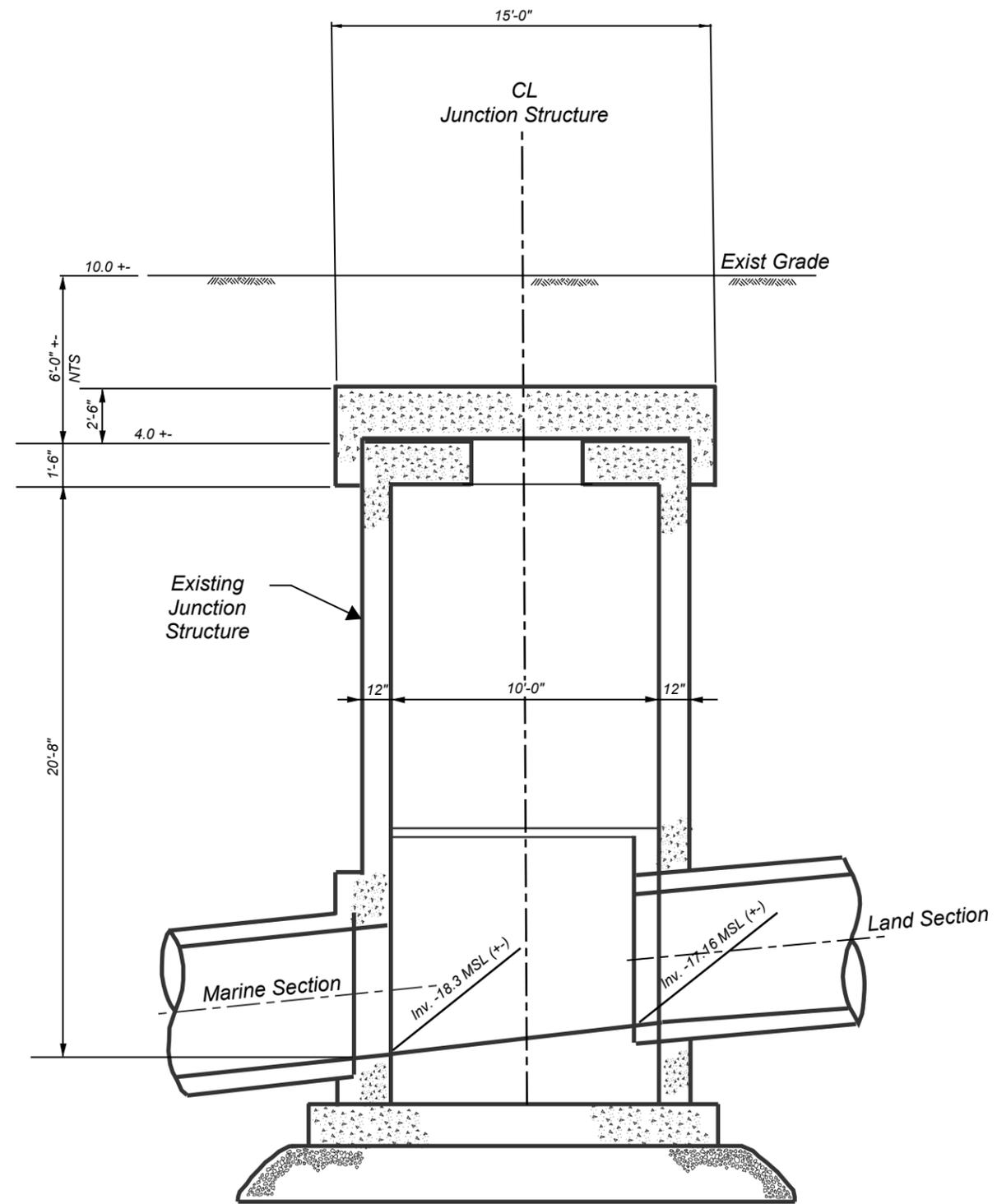
Figure E.1
San Juan Creek Ocean Outfall



Prepared by



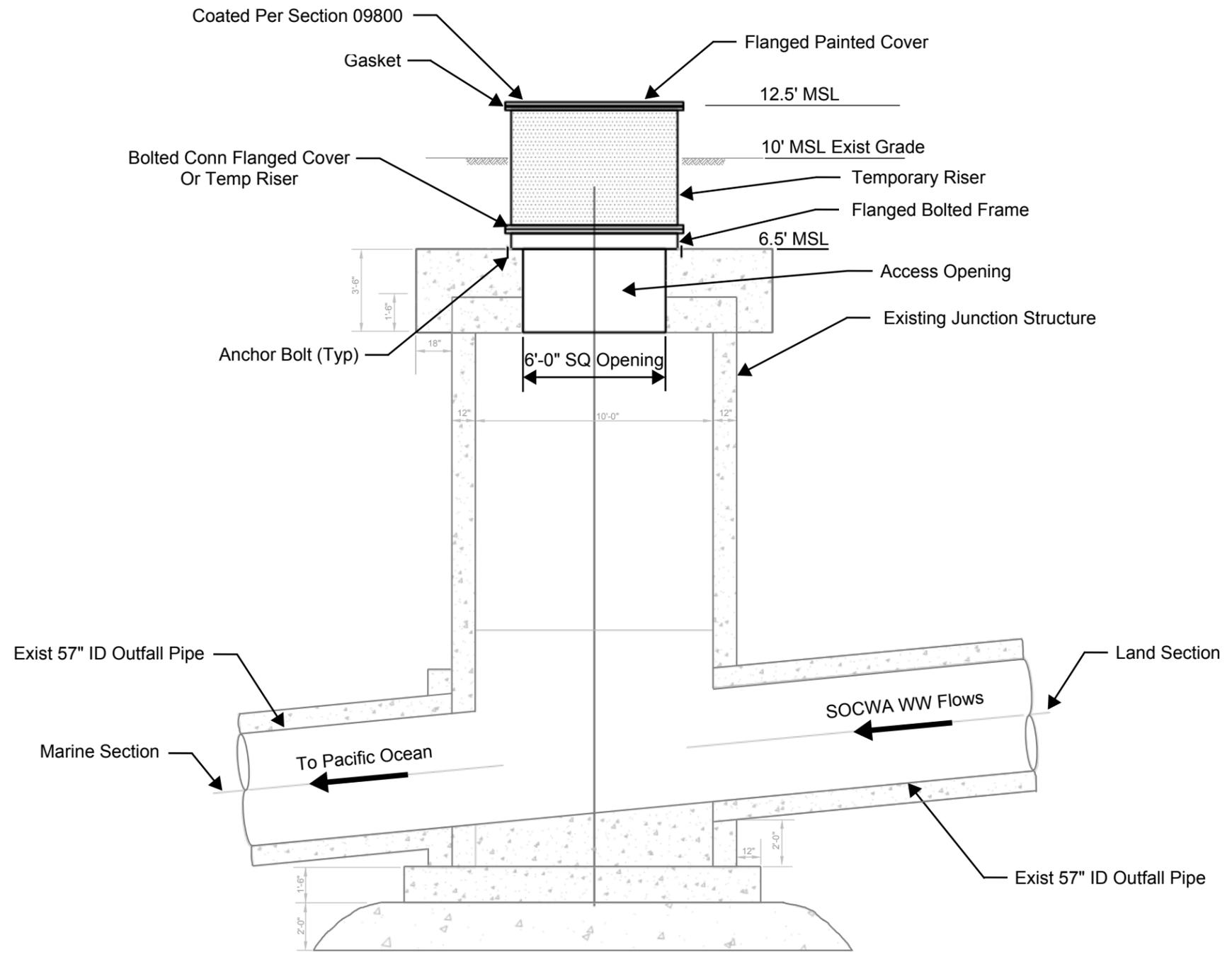
Figure E.2
Facilities at Doheny Beach



Prepared by



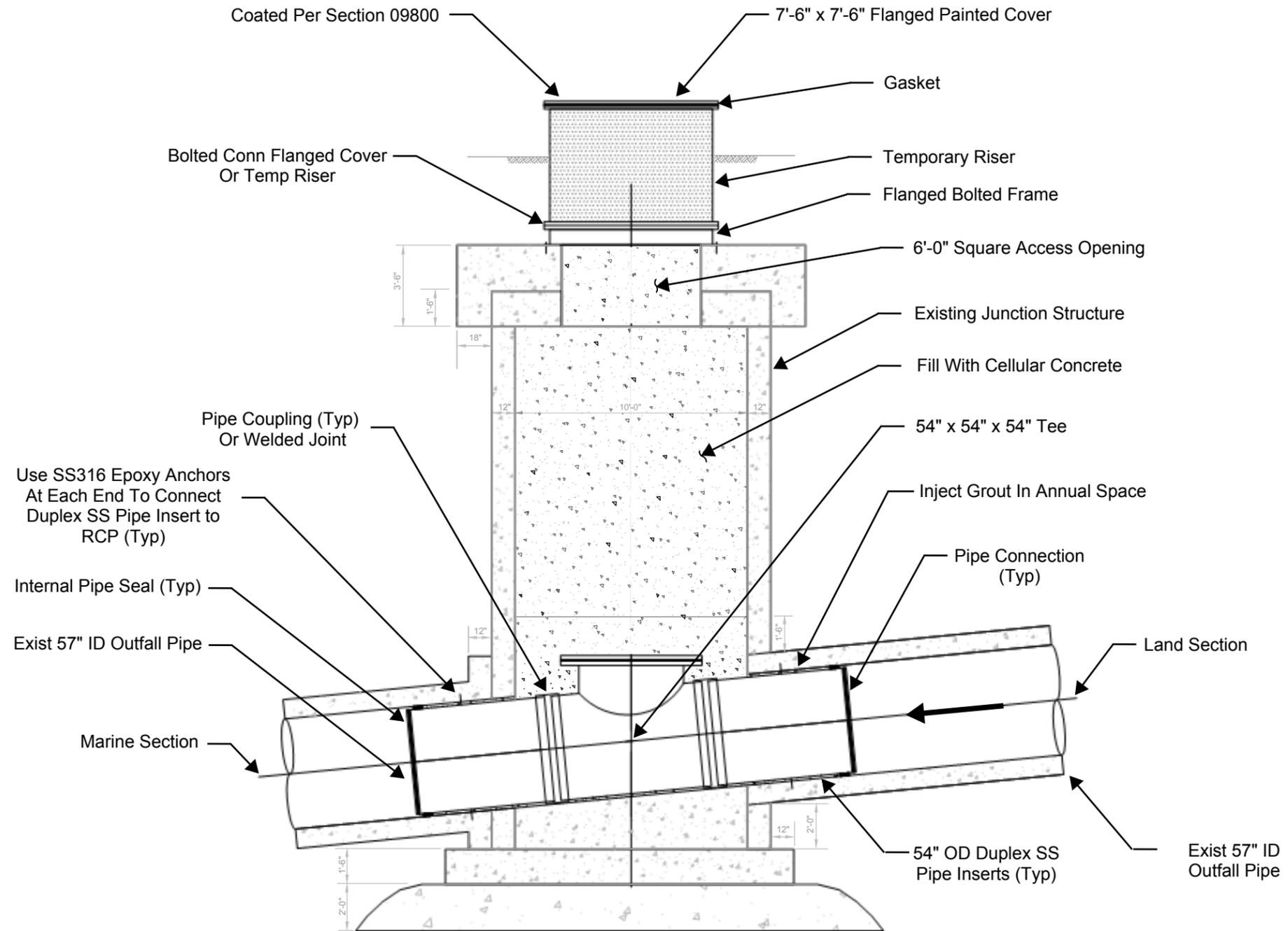
Figure E.3
Junction Structure - Existing Profile



Prepared by



Figure E.4
Junction Structure Entry



Prepared by



Figure E.5
Junction Structure
Sleeve and Closure

Appendix F
Coastal Treatment Plant Ten Year Plan

BACKGROUND

The Coastal Treatment Plant (CTP) is a conventional activated sludge treatment plant with a secondary treatment design capacity of 6.7 mgd. The main wastewater treatment processes are screening, aerated grit removal, primary sedimentation, activated sludge aeration and secondary sedimentation. A schematic of the CTP process flow diagram is presented in Figure F.1.

A portion of secondary treated effluent is reclaimed through an advanced water treatment (AWT) facility consisting of chemical addition, coagulation (with mechanical mixing), filtration and chlorine disinfection. The remaining portion of the secondary effluent is discharged into the Aliso Creek Ocean Outfall.

Primary sludge and thickened waste activated sludge (TWAS) from the Coastal Treatment Plant are pumped through a force main to the Regional Treatment Plant (RTP) solids facility for treatment and disposal. Screenings and grit are transported from the Coastal Treatment Plant by a private contractor to a sanitary landfill.

The current plant site plan is shown in Figure F.2.

FACILITY HISTORY

The Coastal Treatment Plant site has been in use for municipal wastewater handling since the late 1940's.

The 1940's

The site of the existing Coastal Treatment

Plant was initially used for a treatment plant serving the southern portion of Laguna Beach. This original facility included two Imhoff tanks. Only one of the Imhoff tanks currently remains. This tank is now utilized as the Effluent Equalization Tank which serves as the source of supply for the Advanced Wastewater Treatment Facility (AWT).

The 1960's

A project in 1967 initiated the modern form of the CTP. This project was done under the auspices of the South Coast County Water District (now the South Coast Water District). The project constructed one grit basin (a second was added in the 1970's), two primary sedimentation basins, three aeration basins (one was initially used as an aerobic digester), four secondary sedimentation basins and a chlorine contact basin. These structures remain intact and are generally referred to as the East Plant. The plant also included a package filter system, a belt press, an incinerator, sludge drying beds, and a reclaimed water storage tank. All of these facilities have been removed with the exception of the reclaimed water storage tank (which has been out of service for over 20 years). Several structures from this construction remain including the Personnel Building (originally the Administration Building), the Maintenance Shop (originally housed the sludge incinerator) and the Auxiliary Blower Building.

The plant also provided sewage treatment for the Moulton Niguel Water District (MNWD). In the late 1960's the MNWD constructed an 18-inch diameter vitrified clay pipe gravity sewer from

Alicia Parkway to the CTP adjacent to the east embankment of Aliso Creek. A pump station was also constructed on the CTP site to lift the MNWD flow into the plant. Over time this pump station was modified to receive drain and process waste flows from the plant; the pump station would receive the name of “Drainage Pump Station (DPS)”.

The 1980’s

The treatment plant would expand to the current capacity in the early 1980’s. This work would be done as part of the Clean Water Act program. A construction project beginning in 1982 added one grit basin, three primary sedimentation basins, two aeration basins, and three secondary sedimentation basins. These structures are referred to as the West Plant. Most of the mechanical equipment in the East Plant was also replaced at that time. The plant also added a new headworks facility (including three rotary screens), a return activated sludge (RAS)/waste activated sludge (WAS) pump station, a new electrical building (complete with switchboard fed from Southern California Edison (SCE) and standby power generator), and a new Operations Building (including full service laboratory). The project also modified the way the sludge was handled at the treatment plant. Two dissolved air flotation (DAF) thickeners were constructed for the handling of waste activated sludge. An Export Sludge Pump Station was constructed to send waste sludge to the Regional Treatment Plant.

Another major project was constructed at the site in the mid-1980’s. The project provided a new tertiary process. The facility included coagulation, flocculation, sand filtration and chlorination. The

coagulation and flocculation processes have not been utilized since the original installation. The filters were expanded in 1989 to bring the facility to a tertiary capacity of 2.82 mgd.

Subsequent projects added a recycled water pump station, a recycle water storage tank, and a pre-fabricated metal storage building to the CTP.

The early 1980’s also saw the construction of the infrastructure supporting the CTP (and other facilities in the Aliso Creek watershed). Raw sewage was moved from the City of Laguna Beach to the CTP through the new North Coast Interceptor. Secondary effluent flows were moved from the CTP (and other facilities in the Aliso Creek watershed) through the Effluent Transmission Main (ETM) on the way to the new Aliso Creek Ocean Outfall. Sludge from the CTP was moved to the Regional Treatment Plant through two new 4-inch diameter ductile iron pipe force mains. A new paved road (termed the AWMA Road) along the west side of Aliso Creek connected the CTP to Alicia Parkway. The new roadway included two bridges across Aliso Creek including one at the CTP site. This latter bridge was destroyed by a 1992 storm and was subsequently rebuilt.

The early 1980’s project established the capacity of the Coastal Treatment Plant at 6.70 mgd. This is set forth in both the amended Project Committee 15 agreement and the NPDES permit for the Aliso Creek Ocean Outfall (the most recent approved permit is the Region 9 Regional Water Quality Control Board Order R9-2012-0013. Amendment No.2 to the Project Committee 15 agreement

divided the capacity ownership between the City of Laguna Beach, the South Coast Water District, and the Emerald Bay Service District. Provisions were also made for a future expansion to accommodate the Irvine Ranch Water District (IRWD). IRWD would subsequently withdraw from PC 15 in the 1990's. Amendment No.2 also reflected that the Moulton Niguel Water District (MNWD) elected to not participate in the CTP as its flow would be redirected to the newly constructed Regional Treatment Plant.

The 1980's also brought an institutional change to the area surrounding the CTP. In the mid-1980's the Mission Viejo Company transferred its property in Aliso Canyon to the County of Orange. This area was then dedicated as the County of Orange Aliso and Wood Canyons Wilderness Park.

Capacity Ownership in the 1990's

During the late 1990's the ownership agreement for Project Committee 15 was amended. The modified agreement resulted in the acquisition of 1.96 mgd in capacity by the Moulton Niguel Water District (MNWD). This led to the current ownership of capacity at the CTP as shown in Table F.1.

Table F.1
Current Capacity Ownership at the Coastal Treatment Plant

	% Ownership	Capacity Ownership (mgd)
Emerald Bay Service District	2.99%	0.20
City of Laguna Beach	37.91%	2.54
Moulton Niguel Water District	29.25%	1.96
South Coast Water District	29.85%	2.00
Total	100.00%	6.70

The capacity ownership identified in Table F.1 refers to ownership in the liquids portion of the treatment plant including preliminary treatment, primary treatment, secondary treatment, RAS chlorination, thickening and export sludge handling. The AWT portion of the CTP including secondary effluent equalization, applied water pumping, filtration, recycled water disinfection, chlorine contact, and reclaimed water pumping are owned completely by the South Coast Water District.

Facility Rehabilitation in the 2000's

The CTP has been subject to a series of projects since the year 2000. These projects have focused on rehabilitation; the projects have not modified the capacity or the form of the treatment plant. Upgrade facilities have included (1) reconstructed headworks screens, (2) replacement and relocation of the headworks motor control center (MCC),

(3) rehabilitation of the primary sedimentation basins, (4) replacement of aeration diffusers and blowers, (5) upgrade of the RAS/WAS pumps station controls, (6) reconstruction of the plant Supervisory Control and Data Acquisition (SCADA) system, (7) improvements to the plant storm water system, (8) retrofit of the filters, (9) reconstruction of the plant sodium hypochlorite system, (10) installation of a new plant influent flow meter, (11) installation of a new Effluent Equalization Tank cover, (12) miscellaneous structural repairs, (13) improved fire proofing of buildings and (14) a new foul air treatment system. A new Export Sludge Equalization Tank was also constructed on the site.

CTP ASSET REVIEW

The current version of the CTP Ten Year Plan focuses on the replacement of existing assets as opposed to facility expansion or process replacement. Table F.2 presents a listing of SOCWA assets at the Coastal Treatment Plant. Each listing includes a year of installation, an expected life and a replacement (or rehabilitation) year. This table serves as the basis for the upgrade projects identified in this Ten Year Plan.

CTP FACILITY IMPROVEMENTS PLAN

The Coastal Treatment Plant has been the subject to a series of evaluations over the past six years. CH2MHill was retained to prepare the Coastal Treatment Plant (CTP) Facility Plan in 2013. This evaluation proposed a large project for the upgrade of the treatment plant simply identified as the Facility Improvements

Project. This project was intended to upgrade existing assets to preserve the value of the facility and to improve operating efficiency.

Facility Improvements Project originally included the following elements:

- Aeration System Upgrades
- Secondary Sedimentation Basins
- Drainage Pump Station
- Ferric Chloride System
- Screenings Compaction Facility
- Switchgear and Electrical System Improvements
- Structural Improvements
- Safety Improvements

The recommendations of the Facility Improvements Plan were not immediately implemented to allow a series of additional issues to be reviewed. These issues include the following:

- The California drought lasted over five years. California utilities including SOCWA's member agencies embarked on stringent conservation plans. This has resulted in a reduction in flow which impacts plant utilization.
- The Moulton Niguel Water District (MNWD) does not currently utilize its capacity in the CTP. The MNWD does not intend to renew its participation in the PC 15 Agreement when it expires.

- The level of treatment provided by the CTP was raised in a series of focus group meetings conducted by the City of Laguna Beach.
- The drought has also raised questions regarding new sources of water supply. Approximately half the treated secondary effluent from the CTP is discharged to the Pacific Ocean. This flow is a potential resource for reclamation.

PLANT UTILIZATION

The Annual average flow rate in the five years from 2014 to 2018 ranged between 2.83 and 3.12 mgd. The operation of the plant at less than half of its rated capacity has created operational issues. The most significant of these issues has been the operation of the aeration system. The oxygen demand in the wastewater can fall to a point below which the existing multistage blowers cannot effectively supply air. This can have one of two negative impacts: (1) the system overfeeds air causing the system to slip into nitrification, or (2) the system must blow off air during which the process becomes very energy inefficient.

Improvements at the CTP are impacted by facility utilization. The original concept for the Facility Improvements Project evaluation was updated by CH2MHill to consider improvement costs at two different plant capacities: the original design capacity of 6.7 mgd and a reduced capacity that would reflect the departure of the Moulton Niguel Water District (MNWD) from Project Committee 15. The MNWD owns 1.96 mgd capacity at the CTP. The

most straight forward approach would be to reset the facility capacity at 4.74 mgd (6.70 mgd less 1.96 mgd). However, the 4.74 mgd appears to be more capacity than needed by the remaining three Project Committee 15. A reduced capacity of 4.0 mgd was set based on review of historical data and in consultation with the Project Committee 15 member agencies.

Hydraulic and process modeling was completed to determine the number of basins needed for both the current capacity of 6.7 mgd and the reduced capacity of 4.0 mgd. The modeling confirmed that the entire facility is needed to handle the original 6.7 mgd capacity. The modeling for the 4.0 mgd scenario identified the basin utilization as shown in Figure F.3.

The unutilized structures may serve a modified role if the function of the facility changes in the future. Aeration Basin W2 may serve as an equalization facility if needed in the future. Secondary Sedimentation Basins E3 and E4 could be retrofit with submerged membrane filters as part of a future upgrade or expansion of the Advanced Water Treatment (AWT) system.

PROJECT COMMITTEE 15 AGREEMENT

The fifty year term of the Project Committee 15 agreement expires in 2030. That expiration date falls within the fifteen-year planning span used in this document. The agreement expiration date could have a significant impact on capital investment at the Coastal Treatment Plant. If the treatment

plant were to be either demolished or repurposed in 2030 this would create a goal of extending equipment life through modifications over the next ten years. The continued operation of the plant in its existing form beyond the 2030 agreement expiration date would require ongoing replacement of assets. The City of Laguna Beach (CLB), the South Coast Water District (SCWD), and the Emerald Bay Service District (EBSD) have tentatively indicated their intent for utilization of the treatment plant past 2030; as noted previously the MNWD has signaled that it will not participate in Project Committee 15 beyond the expiration of the agreement.

The currently proposed Ten Year Plan is based on asset replacement based on expected life as identified in Table F.2. A series of condition assessments are planned over the next ten years to verify the need for various replacement projects. The goal is asset replacement to avoid increased risk of failure that might impact facility operations.

It is recommended that the Project Committee 15 members meet to review plant capacity utilization, long term wastewater treatment needs, and the disposition of assets after the end of the current project committee agreement.

PROCESS SELECTION

The Evaluation of treatment processes at the CTP focuses on re-using the existing concrete basins as, with some repairs, these facilities are believed to have a remaining life of at least 20 to 25 years. The key treatment process in this configuration is secondary treatment. It was assumed for this evaluation that only

those treatment processes that had been effectively and widely used in the municipal wastewater industry over the past ten years would be considered.

Five scenarios were initially considered in the evaluation by CH2MHill for the CTP:

- Conventional Activated Sludge (CAS) with Short Solids Retention Time (SRT<2 days) (current mode of operation)
- CAS (Current Process) with Chemically Enhanced Primary Treatment (CEPT) (SRT<2 days)
- CAS with Nitrification
- CAS with Nitrification/Denitrification (N/deN)
- Membrane Bioreactor (MBR)

The Facility Improvements evaluation concluded that the most cost-effective current option for the Coastal Treatment Plant was to continue operating in the CAS mode.

FACILITY IMPROVEMENTS PROJECT

The Facility Improvements Project is the largest project included in the current version of the Ten Year Plan. As previously indicated the 2013 Plan identified the following elements:

- Aeration System Upgrades
- Secondary Sedimentation Basins
- Drainage Pump Station
- Ferric Chloride System

- Screenings Compaction Facility
- Switchgear and Electrical System Improvements
- Structural Improvements
- Safety Improvements

The scope of the Ten Year Plan was reviewed with regard to the issues identified regarding plant utilization and long term asset replacement. It was determined that the elements to be included in the project would meet the following criteria:

- Implementation needed to provide for staff and public safety
- Implementation required to improve facility efficiency and reliability
- Implementation not a function of capacity

Two elements of the original scope were ultimately removed:

- Aeration System Upgrades: The aeration upgrade was removed from the scope to allow member agency discussion regarding capacity utilization to progress. This item is discussed in a separate section below.
- Screenings Compaction Facility: The screening compaction facility was a very difficult project element to implement where the project benefits were not immediately needed. It was determined to schedule this project later in the duration of the Ten Year Plan.

One element was added to the Facility Improvements Project:

- Headworks Valves Replacement: A prior construction project in the Screenings and Grit Building encountered problems due to leakage past three knife gate valves; the replacement of the valves was deemed necessary to allow future maintenance activities.

The remaining elements of the Facility Improvements Project are described below.

Secondary Sedimentation Basins Upgrades

The secondary sedimentation basins are the only unit process at the Coastal Treatment Plant (CTP) that have not been the subject of a rehabilitation project in over 20 years. The proposed overhaul of the basins includes the following:

- Replacement of the chain and flight sludge collectors
- Replacement of the sludge collector drives
- Installation of new scum skimmers, scum beaches and drives
- Modification of the baffles within the tanks
- Replacement of the launders and weirs
- Installation of new mud valves along the basin floor
- Replacement of the telescoping valves (for removal of sludge from the basins)
- Replacement of conduit and wire to each of the drive units

There are seven secondary sedimentation basins at the CTP. The three larger West Basins have been the workhorses for the facility. The four smaller East Basins have been used only when one of the West Basins needs to be removed from service. The process modeling by CH2MHill has indicated that at a 4 mgd flow rate only the three West Basins and two of the four East Basins are needed; at a 6.7 mgd flow rate all seven secondary sedimentation basins are needed. The assumption for the 4 mgd scenario is that two of the East Basins will be left out of service without demolition. SOCWA staff determined that the Facility Improvements Project include the rehabilitation of the three West Basins and two of the four East Basins. This would allow facility to operate at current rates while maintaining the long-term capacity to handle the full plant capacity.

Drainage Pump Station

The existing Drainage Pump Station (DPS) was originally built in the 1960's to handle flow discharged into a Moulton Niguel Water District (MNWD) 18-inch gravity sewer along the east bank of Aliso Creek, which had been discharged to the Coastal Treatment Plant. It is located west of the headworks and primaries in an enclosed building. The station location is within the flood zone of Aliso Creek. The station was modified in the 1980's to handle flows from several CTP processes, including filter backwash waste flow, Dissolved Air Flotation Thickener (DAFT) overflow, and drainage flow from primary clarifiers, aeration basins, secondary clarifiers, or tertiary filters (when these tanks are drained). In the absence of regular flow from the MNWD the DPS was intended to handle emergency overflow from MNWD's Alicia Parkway Lift Station.

The objective of constructing a new the DPS is to move the majority of the pumping function out of the flood zone and to gain the ability to return the process recycles and plant drains to the primary clarify influent channel, without interfering with the plant influent sampling. It should be noted that the MNWD has indicated that it does not intend to send sewage to the existing DPS or to the CTP. The proposed location of the new DPS is on the west side of the West Primary Sedimentation Basins.

Ferric Chloride System Reconstruction

Ferric chloride is used at the Coastal Treatment Plant (CTP) to (a) reduce sulfide levels (which aids in the operation of the odor control system and (b) to aid in settling in the primary sedimentation basins. The ferric chloride system was installed in the 1990's by CTP staff. The existing system does not have automated control to allow pacing of the chemical feed with the rate of influent plant flow. The containment area is constructed with masonry block walls which is not compliant with the appropriate codes. A coating system was installed in the 1990's to provide more adequate containment. The coating system has failed in several locations. The existing pumping equipment, valves and piping are in poor condition after over 20 years of service.

A new ferric chloride system will be constructed on the existing chemical containment slab. New pumps, tankage and piping will be constructed in a modified containment structure. The system will be equipped with a new

Programmable Logic Controller (PLC) for automated system control.

Electrical System Improvements

Much of the power supply system for the Coastal Treatment Plant (CTP) dates to the 1983 expansion of the treatment plant. Many of the existing panels are showing corrosion with exposed cables showing minor deterioration of the insulation. However, the key concern is the inability to obtain replacement parts for key components such as the main breaker in the Main Switchgear. The Electrical System Improvements includes the following items:

- Replacement of the Plant Main Switchgear. The intent is to put a full frame switchgear into a modified Chlorine Building.
- Replacement of Motor Control Center 8 (MCC-8) at the Operations Building with a small distribution panel.
- Replacement of MCC-E15M and MCC-15M in the DAF Utility Building. Work includes replacement of doors and the installation of an air conditioning system.

The project will also include the completion of the 2014 Electrical Distribution System Upgrade. That project contemplated the replacement of all 480-volt cable between the existing main switchgear and the motor control centers. The 2014 project included the installation of a new duct bank extending from the Switchgear Building to the northern Headworks Power Building. The earlier project also included the new cable from the switchgear to MCC-1 and MCC-E1. The Facility Improvements

Project will complete the purpose of the 2014 project with the following items:

- Installation of new 480-volt cable from the switchgear to MCC-E13M in the Auxiliary Blower Building.
- Installation of new 480-volt cable from the switchgear to MCC-15M and MCC-E15M in the DAF Utility Building.
- Installation of new 480-volt cable from the switchgear to MCC-E8M in the Operations Building.

Structural and Safety Improvements

The structures at the Coastal Treatment Plant largely date to either the 1967 or the 1983 construction projects. Engineering evaluation of the structures has found the concrete to be in largely good condition for its age. However, there are areas of deterioration that require remediation to prevent these areas from becoming either safety issues or developing more severe degradation. In addition, an independent evaluation by the engineering firm Arcadis identified specific safety issues to be addressed. The structural upgrade elements of the Facility Improvements Project are as listed below:

- Replacement of grating rebate that has corroded to the point of damaging the adjoining rebate.
- Removal of joint material that was initially installed in 1982 for a future expansion of the facility; this material has deteriorated along the west side of the basin complex.

- Addressing cracking concrete and exposed rebar at miscellaneous locations throughout the treatment plant.
- Removal of abandoned piping, pipe supports and metal fasteners. These items are subject to ongoing corrosion that can result in failure of the adjacent concrete.
- The existing concrete roof of the Headworks Building has suffered from hairline fractures that result in leakage into the upper floor of the building during wet weather events. The proposed improvement is the installation of a membrane over the roof. In addition, the three skylights have deteriorated and require replacement.
- Replacement of rotting baffles within the aeration basins.
- Replacement of deteriorating roll-up door at the Headworks Building.
- Replacement of the pipe connecting the East and West Aeration Basin Inlet Channels. The entry of the pipe into each side of the channel is subject to cracking and leakage.
- Modification of the return activated sludge (RAS) channel along the East Secondary Sedimentation Basins. The foundation below the existing channel has eroded so that the originally buried channel bottom is now exposed. In addition, the channel floor is too low to allow it to freely flow through piping to the RAS pump station. The proposed

modification involves removing and reconstructing portions of the channel.

The Arcadis facility safety evaluation identified the need for fall protection systems at the following buildings: Operations Building, Drainage Pump Station, Maintenance Shop, Blower Building, Personnel Building, Disinfection Facility and AWT Building. The evaluation also identified the need for modification to 21 hatches for easier access and opening at the following locations: Operations Building, Headworks Building, Drainage Pump Station, Scum Sump Wetwell, East Aeration Gallery, and Generator Building. The Headworks Building and Scum Sump Wetwell need fixed ladder modifications to meet the minimum ladder length and clearance requirements. Handrailing also needs to be modified on all the basins the RAS Pump Station.

AERATION SYSTEM UPGRADE

The secondary treatment process at the Coastal Treatment Plant (CTP) includes aeration and secondary clarifiers. The aeration system at the CTP has undergone several iterations. Conventional activated sludge (CAS) was included as part of the original late 1960's construction. The plant was subsequently modified to mechanical aerators as part of the 1982 project. The mechanical aerators were switched back to fine bubble aeration as part of an upgrade project completed in 2004. The goal of the 2004 upgrade was to improve energy efficiency at the treatment plant.

The 2004 upgrade retrofitted the East and West aeration basins with Parkson panel air diffusers. There are three East aeration basins (one without diffusers), each with a side water depth (SWD) of approximately 15 feet and two West aeration basins, each with a SWD of approximately 25 feet. Air is provided by three multistage centrifugal blowers, two of which are provided with a speed increasing gear drive that requires cooling water to operate. A pneumatically actuated valve is located on the suction pipe to each blower to allow the blower to operate in its low air flow range without surging. Even with this feature, the turndown for these blowers is between 70 and 80 percent of maximum capacity. One of the blowers is dedicated and sized for the East aeration basins, another is dedicated and sized for the West aeration basins and the third blower is the standby for the other two blowers according to the original design of the facility. The standby blower has a 2-speed motor to allow the air supply at the pressure required for either the East or West aeration basins.

The existing aeration system also has the components to automatically control the blowers based on the amount of air supplied to each basin to maintain each basin's dissolved oxygen (DO) to a predetermined set point (typically between 1.5 and 2 milligrams per liter [mg/L]). Accordingly, each of the aeration systems (East and West) has a dedicated blower with a pneumatically modulating valve on the suction side, a pressure transmitter in its main air header, a pneumatically modulating valve on the main pipe feeding air to each of its basins, and a DO probe in each of its corresponding basins. In addition, the East air header has a pneumatically modulating valve to control

the pressure if one blower is used to supply the two aeration systems. In the automatic mode, the DO in the basin would control the position of the valve feeding air to that basin and the pressure transmitter in the air header would control the position of the valve on the suction of the blower feeding the aeration system. If one blower is used, to serve both sets of basins, the pneumatically modulating valve would be controlled to maintain the pressure in the main East air header.

While the DO probes and transmitters are in working condition, the majority of the pneumatic actuators and butterfly valves have not been in operation for a few years and are not functional currently, hindering automatic control of the blowers. One other hindrance to automatic control of the aeration system at CTP is that the existing blowers cannot be operated much lower than 1,000 scfm without going into surge. To protect against this condition, each blower typically has a shutdown command before a surge condition occurs. This shutdown may be triggered if a blower is dedicated to each aeration system during low air demands.

Because the blowers cannot be operated automatically, Operations staff currently runs one of the blowers in manual mode to supply air to both sets of aeration basins. They set valve positions manually and run the blower based on the electrical current drawn. The blower supplies a constant air flow regardless of the process air demand. By running only one blower, Operations staff limits the power consumption at CTP, but cannot optimize the power consumption or supplied air. Running only one blower

also minimizes cooling water consumption. The aeration is manually controlled, with an operator set point established for the weekday and weekend day operation mode.

The primary operational issue with the aeration system relates to the equipment sizing provided with the 2003 upgrade. That upgrade was constructed with the expectation that the plant would be operating closer to the 6.7 mgd capacity. The challenge with the current scenario is providing a system with the flexibility to treat the existing flow while maintaining the ability to handle a flow closer to the full capacity of the plant.

The originally proposed modification for maintaining the 6.7 mgd capacity involved constructing a new blower building (in place of the demolished Auxiliary Blower Building) which would contain four new high efficiency turbo blowers. The high number of blowers is necessary to achieve the necessary turn-down given the current influent flow rates to the treatment plant. These blowers would service the shallower east aeration basins. Two of the existing multistage blowers in the existing Blower Building would be either replaced or reconstructed. These units would provide service to the deeper west aeration basins. New circular membrane diffusers would be installed in all five of the aeration basins. The project would also include the replacement of the pneumatically operated control valves, sections of piping and the system instrumentation. This option would provide the flexibility to allow the effective handling of flows at plant flow rates of 4.0 mgd and below as well as handling the higher flows approximating the 6.7 mgd capacity. However, this approach involves a significant capital investment to provide

aeration capacity for flow that seems unlikely to ever be transmitted to the Coastal Treatment Plant.

A separate option was developed to handling a facility only at the lower 4.0 mgd capacity. This alternative involves the replacement of the multi-stage blowers in the existing Blower Building with four new high efficiency turbo blowers. These units would provide air to the three east aeration basins which would be retrofitted with the new circular membrane diffusers. This option would also include the addition of a new false floor in the Aeration Basin W1 prior to the installation of the new diffusers. This would make the operation of this basin comparable to the three east aeration basins. The retrofitted west basin could then serve as a back-up to the east aeration basins. Aeration Basin W2 would be gutted and remain available for a future use. The cost estimate for this option is utilized in this version of the Ten Year Plan.

A schematic of the aeration system configuration for the both the 4.0 and 6.7 mgd operating scenarios is presented in Figure F.4

Further discussion is needed between the Project Committee 15 member agencies prior to embarking on the design for this project.

EXISTING RECYCLED WATER PRODUCTION

The California drought from 2013 to 2018 increased the already significant emphasis on water reclamation in Southern California.

SOCWA operates a water recycling system at the Coastal Treatment Plant on the behalf of the South Coast Water District (SCWD). This tertiary treatment system utilizes sand filtration and chlorine disinfection (using sodium hypochlorite) to meet Title 22 requirements. The tertiary treatment system was enhanced when the SCWD constructed the Aliso Creek Water Harvesting Facility in 2014. The system was intended to augment the SCWD water supply with Aliso Creek water. However, the treatment system has principally been used to lower the total dissolved solids (TDS) level in the recycled water supply.

The main tertiary system dates to the 1980's. The filters were reconstructed in 2007 and 2019. SOCWA has used Earl Gehringer, an original technician with the HydroClear (the supplier of the package sand filters at the CTP), to perform a site investigation of the filters every couple of years. Separation inspections by Mr. Gehringer and V&A Consultants indicated that with repairs and recoating the filtration structure should remain in service for another ten years. This expected life roughly coincides with the end of the Project Committee 15 agreement in 2030.

The SCWD has developed its recycled water system to the point that is largely able to reclaim all of its influent flow to the CTP as needed. The influent flow from the City of Laguna Beach and the Emerald Bay Service District is not reused and is discharged to the Pacific Ocean through the Aliso Creek Ocean Outfall.

WATER RECYCLING AND THE FACILITY IMPROVEMENTS PLAN

The Facility Improvements Updated Evaluation by CH2MHill in 2017 considered the future replacement of the existing Advanced Wastewater Treatment (AWT) facilities based on the following:

- The long-term goal for the CTP is to recycle as much of the secondary effluent as possible.
- Recycled water production of the SCWD flow is fully subscribed for Title 22 irrigation; it is unlikely that the SCWD would elect to change usage of reclaimed water to direct or indirect potable use in the future.
- Based on the evaluations by Evoqua (the manufacturer of HydroClear filters) and by V&A it is assumed that the existing filter facility has an additional ten years of remaining life.
- It is assumed that sand filtration technology will not be used in the future replacement of the existing filtration system.
- Total dissolved solids (TDS) will continue to be an important component of the production of Title 22 recycled water at the CTP. This role is currently being fulfilled by the SCWD Aliso Creek Water Harvesting Facility. This evaluation does not include a future replacement cost for the SCWD facility.

- Based on evaluations by V&A it is expected that the chlorine contact basins have at least another remaining 20 years of life.

The Facility Improvement Updated Evaluation considered filtration technologies for the future replacement of the existing tertiary filtration system. Technologies reviewed included cloth media filtration, compressible filtration, pressurized microfiltration, and submerged microfiltration/ultrafiltration. The ultimate selection of a replacement filtration technology will depend on whether the plant continues to operate with conventional activated sludge (CAS) process, converts to nitrification, or is replaced with a more sophisticated membrane bioreactor system. The CH2MHill evaluation indicated that the most cost-effective means of expanding and replacing tertiary filtration would be the installation of microfiltration in pressure vessels or in submerged units (possibly using unused tankage as shown in Figure F.3). This approach would continue to use the secondary treatment process as it is currently configured at the Coastal Treatment Plant.

The City of Laguna Beach (CLB) has expressed interest in the future recovery of the resource value of the secondary effluent derived from the CLB/Emerald Bay Service District (EBS) influent flows. The method in which that resource is to be used is under consideration. Options including the following:

- Production of Title 22 irrigation water at the CTP and construction of a recycled water distribution within the boundaries of the CLB.
- Production of Title 22 irrigation water at the CTP and the sale and transfer of the recycled water to another entity.
- Production of recycled water at the CTP for potable reuse.

The development of a Title 22 water supply at the CTP for CLB/EBS would be similar to that for the reconstruction of the SCWD system (with added facilities for applied water pumping, backwashing handling, disinfection, clear well pumping, storage, and recycled water system pumping). There are two options for potable reuse:

- Indirect Potable Reuse (IPR) is the augmentation of a drinking water source (surface water or groundwater) with recycled water followed by an environmental buffer that precedes normal drinking water treatment.
- Direct Potable Reuse (DPR) is defined as the planned introduction of recycled water either directly into a public water system, as defined in Section 116275 of the Health and Safety Code, or into a raw water supply immediately upstream of a water treatment plant (no environmental buffer).

IPR is not a viable option at the CTP due to the lack of either a surface water reservoir or a groundwater basin. The regulations for DPR are currently under development. It is expected that it will take approximately ten years for these regulations to be implemented. The CH2MHill evaluation proposed a system using ozonation, microfiltration, reverse osmosis, ultraviolet radiation, and engineered storage to achieve DPR.

WATER RECYCLING AND THE TEN YEAR PLAN

This edition of the Ten Year Plan is based on the following assumptions:

- The existing tertiary treatment system at the CTP servicing the SCWD has at least ten years of remaining life. Therefore, the current plan includes only projects to extend the life of the existing facility.
- No short-term projects in the Ten Year Plan addressing the reclamation of CLB/EBSD flows are identified. It is expected that CLB/EBSD will be assessing the potential for water recycling within their own districts.

Modification of the tertiary treatment system is not anticipated until approximately 2030 as this date would coincide with (a) the end of the Project Committee 15 agreement and (b) the potential implementation of rules regarding DPR. The goal of the current Ten Year Plan is to avoid commitment of capital to areas that might be needed in a future expansion and upgrade of the tertiary treatment system. Figure F.4 shows how one scenario to expand tertiary treatment would be accommodated. This scenario involves the implementation of submerged microfiltration and UV radiation. The plan in Figure F.5 shows the following:

- Utilization of Secondary Sedimentation Basin E-3 and E-4 for submerged microfilters. The proposed Facility Improvements Project will not include a process upgrade to these basins.
- Support systems for the microfiltration system would be housed in a new

building located at the current site of the Personnel Building.

- New ultraviolet radiation facilities would be located at the southwest corner of the plant site where there are no other currently planned capital projects.

EXPORT SLUDGE SYSTEM

Project Committee 15 is unique among the treatment plant project committees in that two of the facilities are located outside the boundaries of the treatment plant: the AWMA Road (Coastal Treatment Plant access road) and the Export Sludge piping system. The replacement of the Export Sludge piping system has been an ongoing issue for SOCWA for 20 years. These facilities are shown on Figure F.6.

The expansion of the Coastal Treatment Plant (CTP) in 1982 included the two 4-inch cast iron pipes for the pumping of primary sludge and thickened waste activated sludge (TWAS) to the Regional Treatment Plant for solids processing. These pipelines were installed along the east side of Aliso Creek near the alignment of the Effluent Transmission Main (ETM). This system was termed the Export Sludge System. The piping experienced problems in the early years of operation through a combination of corrosion and internal deposition. The replacement of the sludge piping has been planned since the early 1990's. The South Coast Water District (SCWD), at that time responsible for the administration of the Export Sludge System, planned a three-phase replacement of the Export Sludge piping

system. Phase I involved the construction of a new 6-inch pipeline through the County of Orange Laguna Niguel Regional Park; Phase II involved the installation of a new 6-inch pipeline under a new roadway built by the Aliso Viejo Community Association (AVCA) along the west side of Aliso Creek in the Aliso and Wood Canyon Wilderness Park. The construction of both of these pipelines was completed in 2000. These pipelines have yet to be placed into operation. Phase III of the Export Sludge System was to install the final link of piping along the west side of Aliso Creek in the Wilderness Park in close proximity to the AWMA Road. A decision was made in 2000 to combine Phase III with the planned Aliso Creek Emergency Sewer (ACES) project. The ACES project was to be constructed by the Moulton Niguel Water District (MNWD). The central feature of this project was a new sewer line replacing the MNWD 18-inch sewer along the east side of Aliso Creek. The ACES project proceeded through final design and permitting. However, the project was canceled due to unfavorable economics prior to bidding.

In 2005, SOCWA hired Dudek and Associates to evaluate five alternative sludge pipeline alignments on both the east and west sides of Aliso Creek. Based on the recommendation of the Dudek report and the subsequent review by the SOCWA Engineering Committee the decision was made to construct a new Export sludge pipeline on the east side of Aliso Creek close to the alignment of the existing Export Sludge force mains.

Dudek was hired under separate contracts in 2011 to prepare a preliminary design report and to prepare the Environmental Impact Report (EIR). The EIR process

extended over twenty-one months. The recommended alternative involves the construction of a 6-inch high density polyethylene pipe along the east side of Aliso Creek through the Aliso and Wood Canyons Wilderness Park. The EIR was adopted by the SOCWA Board of Directors on March 7, 2013.

A related project to the replacement of the force main was the construction of a new Export Sludge Equalization Basin on the Coastal Treatment Plant site. This basin holds approximately three days of Export Sludge flow. This storage will allow for periodic flushing of the force main. The basin also supports a trucking operation for the Export Sludge in emergency circumstances when the Export Sludge pipelines must be temporarily shut down.

The proposed Export Sludge system project will replace approximately 3 miles of two 4-inch diameter ductile iron pipelines with one new 6-inch diameter high density polyethylene pipeline. The design firm Dudek has completed preliminary plans and specifications. The proposed project received the approval of the California Coastal Commission in June, 2016. Implementation of the project is pending approval by the United States Army Corps of Engineers and the United States Fish and Wildlife Service. The Ten Year Plan is predicated on the construction of the replacement of the Export Sludge System beginning in Year 1 (Fiscal Year 2019/20).

One of the alternatives considered in the development of the Ten Year was construction of a solids handling system at the Coastal Treatment Plant. This option was rejected in favor the new

pipeline on the east side of Aliso Creek. The expiration of the project committee agreements (Project Committee 17 in 2029; Project Committee 15 in 2030) might merit future consideration of solids handling at the Coastal Plant.

ALISO CREEK

Erosion along Aliso Creek has been a significant issue since the 1980's. The down-cutting impacts facilities along the east side of Aliso Creek including the Coastal Treatment Plant, the Export Sludge system, and the Effluent Transmission Main (Project Committee 21). The winter storms of 1997 triggered an emergency project to place rip-rap along several hundred feet of the east embankment near Alicia Parkway.

The routing of the new Export Sludge system was developed based on an evaluation of erosion vulnerability prepared by Tetra Tech in 2012. A small feature was added to the Export Sludge project during design. Three rock groins or dikes at selected locations were configured to redirect flows along the channel bank away from the Aliso Creek bank to the south of the ACHWEP structure.

The AWMA Road on the west side of Aliso Creek has also been vulnerable to erosion. Significant embankment failures in 2006 resulted in a rerouting of the roadway south of the ACHWEP structure. Winter storms in 2017 and 2019 have revealed the exposure not just to erosion in the main channel but also to overflows from the Wood Creek system.

Erosion in Aliso Creek has been the subject of evaluation by the United States

Army Corps of Engineers (USACOE). The USACOE in conjunction with the County of Orange has developed two versions of an Aliso Creek project:

- Stabilization, Utility Protection, Environmental Restoration (SUPER) Project: The County of Orange Watersheds group embarked upon this ambitious project for reshaping Aliso Creek through the Wilderness Park. The County has been successful in securing \$5 million in funding from the State of California; the County has been trying to secure additional funding from the Federal government.
- Environmental Restoration Project (ERP): The SUPER Project has been modified and redesignated as ERP.

The concept plan that the USACOE unveiled for the ERP failed to gain local support. The future of a large Federal rehabilitation project in Aliso Creek is uncertain.

The Ten Year Plan includes three project related to embankment protection:

- Project 3542-000 South Section Embankment Protection: This entails repairs to the embankment between the CTP Bridge and the southwest corner of the CTP site.
- Project 15713 North Section Embankment Protection: This project would add rip-rap to the slope between the CTP Bridge and the northwest corner of the CTP site.
- Project 15714 Aliso – Sulfur Creek Confluence Protection: This is a multi-benefit project which would address

the area to the south of Aliso Creek; this is a joint project with Project Committee 21.

In the absence of a long term Federal and/or County program for Aliso Creek it is likely that more projects will need to be included in the SOCWA Capital Improvement Plan for embankment protection in the future.

TEN YEAR PLAN PROJECTS

Table F.3 summarizes the proposed capital improvement projects and costs. This table identifies projects in the fiscal year that they would be added to the SOCWA capital improvement budget. Costs for SOCWA administration are added to each project in the summary sheets in the main body of the Ten Year Plan.

Table F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
1	Electrical	Main Normal Switchboard	1982	30	2012
2	Preliminary Treatment	SCWD Influent Flow Meter	2009	20	2029
3	Preliminary Treatment	CLB Influent Flow Meter	2009	20	2029
4	Preliminary Treatment	Headworks Building Structure	1982	50	2032
5	Preliminary Treatment	Headworks Building Structure Roof	1982	30	2012
6	Preliminary Treatment	Headworks Building Roll-Up Doors	2001	40	2041
7	Preliminary Treatment	Headworks Building Access Ladder	1982	40	2022
8	Preliminary Treatment	Headworks Electrical Building	2009	50	2059
9	Preliminary Treatment	Headworks Building Electrical	1982	30	2012
10	Preliminary Treatment	MCC-1M	2012	30	2042
11	Preliminary Treatment	Headworks Building Mechanical	1982	25	2007
12	Preliminary Treatment	Main Process Gate Valves	2011	30	2041
13	Preliminary Treatment	Headworks Roto Screen	2011	30 (15)	2041
14	Preliminary Treatment	Hoppers	2011	40	2051
15	Preliminary Treatment	Headworks Grit Gate Valves	1982	30	2012
16	Preliminary Treatment	Grit Classifier	2010	30	2040

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
17	Preliminary Treatment	Grit Pumps	2008	20	2028
18	Preliminary Treatment	Aerated Grit Removal Tank Structures	1982	50	2032
19	Preliminary Treatment	Aerated Grit Removal Tank Covers	2012	25	2037
20	Preliminary Treatment	Outdoor Metals at Grit Basins/ Grating	1982	30	2012
21	Preliminary Treatment	Primary Influent Channel	1982	50 (30)	2032
22	Preliminary Treatment	Overflow Channel	1982	50 (30)	2032
23	Preliminary Treatment	Aerated Grit Removal Tank Mechanical	1999	25	2024
24	Preliminary Treatment	Foul Air Fans Inside Headworks Building	2001	20	2021
25	Preliminary Treatment	Aerated Grit Removal Tank Withdrawal Valves	1990	20	2010
26	Preliminary Treatment	Aerated Grit Removal Tank Withdrawal Valves-Electric Actuators	2009	20	2029
27	Primary Treatment	West Primary Sedimentation Basin Structural	1982	50	2032
28	Primary Treatment	West Primary Sedimentation Basin Covers	2012	25	2037
29	Primary Treatment	West Primary Effluent Channel	1982	50 (30)	2032
30	Primary Treatment	West Primary Sedimentation Sludge Collectors	2012	20	2032

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
31	Primary Treatment	West Primary Sedimentation Scum Collectors	2012	30 (20)	2042
32	Primary Treatment	West Primary Sedimentation Weirs	1982	30	2012
33	Primary Treatment	West Primary Sedimentation Basin Electrical	2012	35	2047
34	Primary Treatment	West Primary Sludge Pumps	2012	20	2032
35	Primary Treatment	West Primary Sludge Removal Valves	2012	20	2032
36	Primary Treatment	West Primary Sludge Removal Valves - Electric Actuators	2012	20	2032
37	Primary Treatment	West Primary Sludge Flow Meter	2012	20	2032
38	Primary Treatment	East Primary Sedimentation Basin Structural	1968	50	2018
39	Primary Treatment	East Primary Sedimentation Basin Covers	2014	40	2054
40	Primary Treatment	East Primary Effluent Channel	1968	50 (30)	2018
41	Primary Treatment	East Primary Sedimentation Sludge Collectors	2012	30 (20)	2042
42	Primary Treatment	East Primary Sedimentation Scum Collectors	2012	20	2032

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
43	Primary Treatment	East Primary Sedimentation Weirs	1968	30	1998
44	Primary Treatment	East Primary Sedimentation Basin Electrical	2007	35	2042
45	Primary Treatment	East Primary Sludge Pumps	2011	20	2031
46	Primary Treatment	East Primary Sludge Removal Valves	2011	20	2031
47	Primary Treatment	East Primary Sludge Removal Valves-Electric Actuators	2011	20	2031
48	Primary Treatment	East Primary Sludge Flow Meter	2011	20	2031
49	Primary Treatment	Primary Effluent Channel Crossover Pipe	1982	40	2022
50	Secondary Treatment	West Aeration Basin Structure	1982	50	2032
51	Secondary Treatment	Structural Metals on West Aeration Basins	1982	30	2012
52	Secondary Treatment	Metals Between West Aeration Basins and Primaries/ Grating	1982	30	2012
53	Secondary Treatment	Structural Metals Between West Aeration Basins and Secondaries/ Grating	1982	30	2012
54	Secondary Treatment	West Aeration Basin Air Piping	2004	40	2044
55	Secondary Treatment	West Aeration Air Flow Meters	2004	20	2024
56	Secondary Treatment	West Aeration Dissolved Oxygen Meters	2004	20	2024

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
57	Secondary Treatment	West Aeration Control Valves	2005	25	2030
58	Secondary Treatment	West Aeration Control Valves-Pneumatic Actuators	2005	20	2025
59	Secondary Treatment	West Coarse Bubble Aeration Diffusion System	2004	20	2024
60	Secondary Treatment	West Basin Baffle System	2004	30	2034
61	Secondary Treatment	West Aeration Fine Air Diffusion System	2004	20	2024
62	Secondary Treatment	West Aeration Basin Influent Gates	2004	30	2034
63	Secondary Treatment	West Aeration Basin Effluent Gates	2004	30	2034
64	Secondary Treatment	West Aeration Basin Electrical	2004	30	2034
65	Secondary Treatment	West Aeration Basin Drainage Pumps	2004	2550	4554
66	Secondary Treatment	East Aeration Basin Structure	1967	30	1997
67	Secondary Treatment	Structural Metals on East Aeration Basins	1968	30	1998
68	Secondary Treatment	Metals Between East Aeration Basins and Primaries/ Grating	1968	30	1998
69	Secondary Treatment	Structural Metals Between East Aeration Basins and Secondaries/ Grating	1968	30	1998
70	Secondary Treatment	East Aeration Basin Air Piping	2004	40	2044

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
71	Secondary Treatment	East Aeration Air Flow Meters	2004	20	2024
72	Secondary Treatment	East Aeration Dissolved Oxygen Meters	2004	20	2024
73	Secondary Treatment	East Aeration Control Valves	2004	25	2029
74	Secondary Treatment	East Aeration Control Valves-Pneumatic Actuators	2005	20	2025
75	Secondary Treatment	East Coarse Bubble Aeration Diffusion System	2004	20	2024
76	Secondary Treatment	East Basin Baffle System	2004	30	2034
77	Secondary Treatment	East Aeration Fine Air Diffusion System	2004	20	2024
78	Secondary Treatment	East Aeration Basin Influent Gates	2004	30	2034
79	Secondary Treatment	East Aeration Basin Effluent Gates	2004	30	2034
80	Secondary Treatment	East Aeration Basin Electrical	2004	30	2034
81	Secondary Treatment	Blower Building	2004	50	2054
82	Secondary Treatment	Blower Building Roof	2004	30	2034
83	Secondary Treatment	Multistage Blowers	2004	30	2034
84	Secondary Treatment	Multistage Blowers with Speed Increasers	2004	30	2034
85	Secondary Treatment	Blower Building Aeration Control Valves	2004	25	2029

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
86	Secondary Treatment	Blower Building Aeration Piping	2004	40	2044
87	Secondary Treatment	Blower Building Mechanical	2004	25	2029
88	Secondary Treatment	LP Blowers (Channel Air)	1983	30	2013
89	Secondary Treatment	Blower Building Electrical	2004	35	2039
90	Secondary Treatment	MCC-13001	2004	30	2034
91	Secondary Treatment	MCC-13M & E13M	1983	30	2013
92	Secondary Treatment	West Secondary Sedimentation Basin Structures	1983	50	2033
93	Secondary Treatment	Structural Metals After West Secondaries/ Grating	1983	30	2013
94	Secondary Treatment	West Secondary Sedimentation Basin Sludge Collectors	1992	30	2022
95	Secondary Treatment	West Secondary Sedimentation Basin Effluent Weirs	1992	30	2022
96	Secondary Treatment	West Secondary Sedimentation Basin Effluent Launderers	1992	30	2022
97	Secondary Treatment	West Secondary Sedimentation Basin Mechanical	1983	25	2008

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
98	Secondary Treatment	West Secondary Sedimentation Basin Telescoping Valves	1992	30	2022
99	Secondary Treatment	West Secondary Sedimentation Basin Electrical	1992	30	2022
100	Secondary Treatment	East Secondary Sedimentation Basin Structures	1968	50	2018
101	Secondary Treatment	Structural Metals after East Secondaries/ Grating	1968	30	1998
102	Secondary Treatment	East Secondary Sedimentation Basin Sludge Collectors	1992	30	2022
103	Secondary Treatment	East Secondary Sedimentation Basin Effluent Weirs	1992	30	2022
104	Secondary Treatment	East Secondary Sedimentation Basin Effluent Launderers	1968	30	1998
105	Secondary Treatment	East Secondary Sedimentation Basin Mechanical	1968	25	1993
106	Secondary Treatment	East Secondary Sedimentation Basin Influent Gates	2001	30	2031
107	Secondary Treatment	East Secondary Sedimentation Basin Telescoping Valves	1968	30	1998
108	Secondary Treatment	East Secondary Sedimentation Basin Electrical	1968	30	1998

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
109	Secondary Treatment	RAS/WAS Pump Station Structure	1983	50	2033
110	Secondary Treatment	RAS/WAS Pump Station Doors	1983	40	2023
111	Secondary Treatment	RAS/WAS Pump Station Grating	1983	30	2013
112	Secondary Treatment	RAS Pumps	2003	20	2023
113	Secondary Treatment	RAS Pump VFD's	2011	15	2026
114	Secondary Treatment	RAS/WAS Pump Station Mechanical	1983	25	2008
115	Secondary Treatment	RAS Valves- Gallery	2008	20	2028
116	Secondary Treatment	RAS Valves-Electric Actuators- Gallery	2008	30	2038
117	Secondary Treatment	RAS Piping and Supports - Gallery	1983	30	2013
118	Secondary Treatment	RAS Piping and Supports- RAS/WAS Pump Station	1983	30	2013
119	Secondary Treatment	RAS Pump Station Knife Gate Valves	2008	20	2028
120	Secondary Treatment	RAS/WAS Pump Station Electrical	2008	30	2038
121	Secondary Treatment	West RAS Flow Meter	2011	20	2031
122	Secondary Treatment	East RAS Flow Meter	2011	20	2031
123	Secondary Treatment	West Aeration RAS Flow Meters	2011	20	2031
124	Secondary Treatment	East Aeration RAS Flow Meters	2011	20	2031

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
125	Secondary Treatment	WAS Pumps	2003	20	2023
126	Secondary Treatment	WAS Pump VFD's	2011	15	2026
127	Secondary Treatment	WAS Flow Meters	2011	20	2031
128	Secondary Treatment	WAS Pumping Mechanical	1983	25	2008
129	Secondary Treatment	WAS Pumping Electrical	2008	35	2043
130	Secondary Treatment	Secondary Scum Wet Well	1983	50 (30)	2033
131	Secondary Treatment	Secondary Scum Pumps	2001	25	2026
132	Secondary Treatment	Secondary Scum Mechanical	1983	30	2013
133	Secondary Treatment	Secondary Scum Electrical	1983	2	1985
134	Secondary Treatment	Handrail on basin deck	1983	35	2018
135	Secondary Treatment	Stairways to basin deck	1983	35	2018
136	Ferric Chloride System	Ferric Chloride Storage Tank	1992	20	2012
137	Ferric Chloride System	Ferric Chloride Metering Pumps	2000	15	2015
138	Ferric Chloride System	Ferric Chloride Containment System	1992	25*	2017
139	Ferric Chloride System	Ferric Chloride Mechanical	1992	20	2012
140	Ferric Chloride System	Ferric Chloride Electrical	1992	30	2022

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
141	Chlorine System	Chlorine Building /Storage Building	1968	50	2018
142	Chlorine System	Chlorine Building Roof	1968	25	1993
143	Chlorine System	Chlorine Building Hoist	1968	40	2008
144	Chlorine System	Chlorine Building Electrical	1968	30	1998
145	Hypochlorite System	Containment Structure	2016	50	2066
146	Hypochlorite System	Containment Structure/ Pumps	2016	50	2066
147	Hypochlorite System	Hypochlorite Bleach Tank	2016	30	2046
148	Hypochlorite System	Metering Pumps	2016	15	2031
149	Hypochlorite System	RAS Hypo Metering Pumps	2016	15	2031
150	Hypochlorite System	Hypo System Mechanical	2016	20	2036
151	Hypochlorite System	Hypo System Electrical	2016	30	2046
152	Hypochlorite System	Hypo System Control Panel	2016	30	2046
153	Hypochlorite System	Chlorine Residual Analyzers	2003	20	2023
154	Advanced Wastewater Treatment	Chlorine Contact Basin Structure	1983	50	2033
155	Advanced Wastewater Treatment	Chlorine Contact Basin Mixers	1983	20	2003

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
156	Advanced Wastewater Treatment	Chlorine Contact Basin Mechanical	1983	25	2008
157	Advanced Wastewater Treatment	Chlorine Contact Basin Electrical	1983	25	2008
158	Advanced Wastewater Treatment	Chlorine Contact Basin Sluice Gates	1983	25	2008
159	Advanced Wastewater Treatment	Chlorine Contact Basin Drain Gates	1983	30	2013
160	Advanced Wastewater Treatment	AWT Clearwell Level Indicator & Transmitter	2004	20	2024
161	Advanced Wastewater Treatment	AWT Building	1983	50	2033
162	Advanced Wastewater Treatment	AWT Building Roof	1983	25	2008
163	Advanced Wastewater Treatment	Applied Water Pumps	1983	25	2008
164	Advanced Wastewater Treatment	Applied Water Pumps Mechanical	1983	30	2013
165	Advanced Wastewater Treatment	Applied Water Pumps Electrical	1983	30	2013

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
166	Advanced Wastewater Treatment	AWT Polymer System	1999	15	2014
167	Advanced Wastewater Treatment	AWT Chem Clean System	2009	30	2039
168	Advanced Wastewater Treatment	Chemical Mixers	1983	30	2013
169	Advanced Wastewater Treatment	AWT Building Mechanical	1983	30	2013
170	Advanced Wastewater Treatment	AWT Building Electrical	1983	35	2018
171	Advanced Wastewater Treatment	AWT Flocculators	1983	30	2013
172	Advanced Wastewater Treatment	AWT Filter Structure	1983	50	2033
173	Advanced Wastewater Treatment	AWT Filter Components	2007	30	2037
174	Advanced Wastewater Treatment	Grating System Between Filters	1983	30	2013
175	Advanced Wastewater Treatment	Mudwell	1983	50	2033

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
176	Advanced Wastewater Treatment	Splitter Box Influent Valves	1983	35	2018
177	Advanced Wastewater Treatment	Splitter Box Effluent Valves	1983	35	2018
178	Advanced Wastewater Treatment	AWT Influent Turbidity Meter	2004	20	2024
179	Advanced Wastewater Treatment	AWT Effluent Turbidity Meter	2002	20	2022
180	Advanced Wastewater Treatment	AWT Influent Flowmeter	1983	20	2003
181	Advanced Wastewater Treatment	AWT Mechanical	1983	30	2013
182	Advanced Wastewater Treatment	AWT Inlet Valves	2007	35	2042
183	Advanced Wastewater Treatment	AWT Inlet Valves Pneumatic Actuators	2007	20	2027
184	Advanced Wastewater Treatment	AWT Filtrate Valves	2007	35	2042
185	Advanced Wastewater Treatment	AWT Filtrate Valves Pneumatic Actuators	2007	20	2027

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
186	Advanced Wastewater Treatment	AWT Backwash Water Valves	2007	35	2042
187	Advanced Wastewater Treatment	AWT Backwash Water Valve Pneumatic Actuators	2007	20	2027
188	Advanced Wastewater Treatment	Backwash Pumps	1983	25	2008
189	Advanced Wastewater Treatment	Backwash Pump Piping & Valves	1983	30	2013
190	Advanced Wastewater Treatment	Contact Basin Sampler	1983	20	2003
191	Advanced Wastewater Treatment	AWT Backwash Waste Valves	2007	35	2042
192	Advanced Wastewater Treatment	AWT Backwash Waste Valves Pneumatic Actuators	2007	20	2027
193	Advanced Wastewater Treatment	AWT Backwash Flowmeter	2002	20	2022
194	Advanced Wastewater Treatment	AWT Electrical	1983	30	2013
195	Advanced Wastewater Treatment	MCC-A	1983	30	2013
196	Effluent Management	Effluent Equalization Basin	1952	50	2002

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
197	Effluent Management	Basin Cover	2009	25	2034
198	Effluent Management	Effluent Meter Structure	1989	50	2039
199	Effluent Management	Effluent Basin Weir Structure	2009	30	2039
200	Effluent Management	Effluent Meter	1989	20	2009
201	Effluent Management	Effluent Basin Meter	2009	20	2029
202	Effluent Management	Effluent Basin Sample	2009	20	2029
203	Effluent Management	Effluent Control Valve 1	1989	35	2024
204	Effluent Management	Effluent Control Valve 2	1989	35	2024
205	Effluent Management	Effluent Control Valve 3	1989	35	2024
206	Effluent Management	Effluent Control Valve 4	1989	35	2024
207	Administration	Operations Building	1982	50	2032
208	Administration	Operations Building Roof	2009	30	2039
209	Administration	Operations Building Mech.	2011	20	2031
210	Administration	Operations Building Elect.	1982	35	2017
211	Administration	Operations Building MCCE8M	1982	30	2012
212	Administration	Laboratory Benchwork	1982	30	2012
213	Administration	Laboratory Equipment	1982	30	2012
214	Administration	Personnel Building	1968	50	2018
215	Administration	Personnel Building Roof	1968	25	1993
216	Administration	Personnel Building Mechanical	1968	20	1988

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
217	Administration	Personnel Building Electrical	1968	35	2003
218	Solids	DAF Control Building Structural	1982	50	2032
219	Solids	DAF Control Building Roof	1982	25	2007
220	Solids	DAF Control Building Mechanical	1982	25	2007
221	Solids	DAF Control Building Electrical	1982	35	2017
222	Solids	Polymer Feeders	2000	15	2015
223	Solids	Polymer Mechanical	1991	30	2021
224	Solids	Polymer Pumps	1991	15	2006
225	Solids	Polymer Electrical	1991	35	2026
226	Solids	DAF Structures	1968	50	2018
227	Solids	DAF Collectors	2007	30 (15)	2037
228	Solids	DAF Compressors	2004	20	2024
229	Solids	DAF Dissolution Tanks	1968	20	1988
230	Solids	TWAS Pumps	1983	20	2003
231	Solids	DAF Recirculation Pumps	1982	20	2002
232	Solids	DAF Drain Pump	1968	30	1998
233	Solids	DAF Piping & Valves	1983	20	2003
234	Solids	DAF Electrical	1968	25	1993
235	Solids	Air Control Panels	2009	30	2039
236	Solids	MCC-15M	1982	30	2012
237	Solids	DAF Flow Meter	1982	20	2002
238	Solids	TWAS Flow Meter	2009	20	2029
239	Solids	Export Sludge System Structure	1983	50	2033

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
240	Solids	Export Sludge System Doors & Miscellaneous Metals	1983	35	2018
241	Solids	Monorail & Hoist	1983	40	2023
242	Solids	Export Sludge Wetwell Structure	1983	50 (30)	2033
243	Solids	Export Wetwell-Sludge Sampler and Level	2002	20	2022
244	Solids	Export Sludge Pumps	2009	20	2029
245	Solids	Export Sludge Pump VFDs	2009	15	2024
246	Solids	Export Sludge Flow Meter	2004	20	2024
247	Solids	Export Sludge Mechanical	1983	20	2003
248	Solids	Sludge Grinder	2001	20	2021
249	Solids	Chopper Pump	1983	20	2003
250	Solids	Export Sludge Mixer	2001	20	2021
251	Solids	Export Sludge Electrical	1983	35	2018
252	Solids	Export Sludge Equalization Basin Structure	2014	50	2064
253	Solids	Export Sludge Equalization Basin Ultrasonic Level Transmitter	2014	20	2034
254	Solids	Sludge Mixing Piping, Supports, Fittings and Valves	2014	20	2034
255	Solids	Sludge Inlet Valve Vault	2014	50	2064
256		Sludge Inlet Piping, Supports, Fitting and Valves	2014	20	2034

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
256	Solids	Sludge Outlet Valve Vault	2014	50	2064
257	Solids	Sludge Outlet Piping, Supports, Fittings and Valves	2014	20	2034
258	Odor Control	Odor Control Structural	2002	50	2052
259	Odor Control	Odor Control Scrubber	2002	30 (15)	2032
260	Odor Control	Odor Control Scrubber-Sodium Hydroxide Tank	2006	30	2036
261	Odor Control	Odor Control Scrubber-Bleach Tank	2006	30	2036
262	Odor Control	Odor Control Scrubber Ducting	2002	25	2027
263	Odor Control	Odor Control Scrubber Fans	2002	15	2017
264	Odor Control	Odor Control Scrubber Electrical	2002	25	2027
265	Old Blower Building (Bldg. 13)	Auxiliary Blower Building Structure	1968	50	2018
266	Old Blower Building (Bldg. 13)	Auxiliary Blower Building No. 2 Roof	1982	25	2007
267	Old Blower Building (Bldg. 13)	Auxiliary Blower Building Architectural Metals.	1968	35	2003
268	Old Blower Building (Bldg. 13)	Crane	1983	40	2023
269	Old Blower Building (Bldg. 13)	Auxiliary BB Mechanical	1982	25	2007

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
270	Old Blower Building (Bldg. 13)	Auxiliary BB Electrical	1982	35	2017
271	Old Blower Building (Bldg. 13)	MCC-2	2004	30	2034
272	Old Blower Building (Bldg. 13)	Instrument Air System (Ingersoll Rand)	2004	20	2024
273	Old Blower Building (Bldg. 13)	Service Air Compressor (Sullair)	1985	20	2005
274	Old Blower Building (Bldg. 13)	Process Air Blowers	1985	30	2015
275	Plant Water	Plant Service Water Pumps	2008	25	2033
276	Plant Water	Plant Service Water Mechanical	2005	30	2035
277	Plant Water	Plant Service Water Strainer	2013	30	2043
278	Plant Water	Plant Service Water Electrical	2005	25	2030
279	Plant Water	Plant Service Water Jockey Pump	2001	30	2031
280	Maintenance Shop & Misc. Buildings	Maintenance Shop	1970	50	2020
281	Maintenance Shop & Misc. Buildings	Maintenance Shop Roof	1970	25	1995

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
282	Maintenance Shop & Misc. Buildings	Maintenance Shop Bench Work	1970	30	2000
283	Maintenance Shop & Misc. Buildings	Maintenance Shop Crane	1985	40	2025
284	Maintenance Shop & Misc. Buildings	Maintenance Shop Equipment	1970	30	2000
285	Maintenance Shop & Misc. Buildings	Maintenance Shop Electrical	1970	35	2005
286	Maintenance Shop & Misc. Buildings	Vehicle Storage Building	1983	40	2023
287	Maintenance Shop & Misc. Buildings	Vehicle Storage Building Mezzanine Platform	1983	35	2018
288	Maintenance Shop & Misc. Buildings	Vehicle Storage Building Electrical	1983	35	2018
289	Maintenance Shop & Misc. Buildings	Mechanical Building	1968	50	2018
290	Potable Water	Air Gap System	1990	30	2020
291	Potable Water	Hydropneumatic Tank	1983	30	2013
292	Potable Water	Potable Water Pumps	1990	25	2015
293	Standby Power	Generator Building	1982	50	2032
294	Standby Power	Generator Building Roof	2009	30	2039
295	Standby Power	Standby Power Generator Set	1982	40	2022

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
296	Standby Power	Standby Power Building Mechanical	1982	30	2012
297	Standby Power	Standby Power Building Electrical	1982	35	2017
298	Standby Power	Main Emergency Switchboard	1982	30	2012
299	Standby Power	Standby Power Building-Diesel Tank	1983	30	2013
300	Standby Power	MCC-E1M	2009	30	2039
301	Standby Power	MCC-E15M	1982	30	2012
302	Drainage Pump Station	Drainage Pump Station Structure	1967	50	2017
303	Drainage Pump Station	Drainage Pump Station Roof	1967	25	1992
304	Drainage Pump Station	Drainage Pump Station Structure Architectural Metals	1967	25	1992
305	Drainage Pump Station	Drainage Pump Station Wet Well	1967	50 (25)	2017
306	Drainage Pump Station	Drainage Pumps	1990	25	2015
307	Drainage Pump Station	Submersible Pump	2011	25	2036
308	Drainage Pump Station	Drainage Pump Station Mechanical	1967	30	1997
309	Drainage Pump Station	Drainage Pump Station Electrical	1990	35	2025
310	Drainage Pump Station	Control Panel	1988	30	2018
311	Drainage Pump Station	Drainage Pump Station Flowmeter	1988	20	2008
312	Drainage Pump Station	Regional Moulton Niguel Lift Station Flowmeter	1988	20	2008

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
313	Underground Piping	Underground Electrical: Cable	1983	25	2008
314	Underground Piping	Underground Electrical: Conduit	1968	50	2018
315	Underground Piping	Underground Electrical: Manholes	1970	40	2010
316	Underground Piping	SCWD Influent Force Main	1983	50	2033
317	Underground Piping	CLB Influent Force Main	1983	50	2033
318	Underground Piping	Chemical Injection Manhole	1983	50	2033
319	Underground Piping	Main Plant Drain Pipeline	1983	70	2053
320	Underground Piping	AWT Supply Pipeline	1983	70	2053
321	Underground Piping	Non-Potable Water Pipeline	1983	70	2053
322	Underground Piping	Potable Water Pipeline	1983	70	2053
323	Underground Piping	WAS Pipeline	1983	50	2033
324	Underground Piping	Primary Scum Pipeline	1983	50	2033
325	Underground Piping	Secondary Scum Pipeline	1983	50	2033
326	Underground Piping	Export Pipeline (to North Fence Line)	1983	50	2033
327	Underground Piping	Effluent Pipeline (to West Property Line)	1983	75	2058
328	Underground Piping	Sodium Hypochlorite Pipe (to AWT)	2016	50	2066

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TABLE F.2
Coastal Treatment Plant Asset Listing

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
329	Underground Piping	Sodium Hypochlorite Pipe (to RAS)	2016	50	2066
330	Underground Piping	Ferric Chloride Pipeline (to Feed Point)	1995	50	2045
331	Underground Piping	Miscellaneous Small Buried Pipeline	1983	50	2033
332	Instrumentation	Aeration PLC	2004	15	2019
333	Instrumentation	PLC at Headwork (TC 1)	2004	15	2019
334	Instrumentation	PLC at Mechanical Bldg (TC 2)	2004	15	2019
335	Instrumentation	PLC at DAF Building (TC 3)	2004	15	2019
336	Instrumentation	PLC at Reclaimed Water Building (TC 4)	2004	15	2019
337	Site	Creek Slope Protection-South Property Line to Bridge	-	-	-
338	Site	Creek Slope Protection-Bridge to North Property Line	-	-	-
339	Site	Bridge	1994	50	2044
340	Site	Plant Road System	1983	35	2018
341	Site	Storm Drain- Headworks	2002	40	2042
342	Site	Storm Water Pumps-Effluent Basin	2002	25	2027
343	Site	Storm Water Drain- AWT	2010	40	2050
344	Site	Primary Storm Channel	1983	50	2033
345	Site	Primary Storm Water Detention Basin	2003	5	2008
346	Site	Perimeter Fence & Gates	1983	40	2023

Red: Upgrade of asset included In Facility Improvements Project; Blue: Upgrade of other asset included in other project in Ten Year Plan.

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 1 ('19/'20)								
	3525-000	Personnel Building Reconstruction	\$ 69,000	\$ 69,000	\$ 20,000	\$ 21,000	\$ 26,000	\$ 2,000
	3539-000	Facility Improvements Construction Part I	\$ 6,972,000	\$ 6,972,000	\$ 2,040,000	\$ 2,081,000	\$ 2,643,000	\$ 208,000
	3541-000	Export Sludge System Reconstruction	\$ 4,522,000	\$ 4,522,000	\$ 1,323,000	\$ 1,350,000	\$ 1,714,000	\$ 135,000
	3553-000	Plant Drainage Improvements	\$ 81,000	\$ 81,000	\$ 24,000	\$ 24,000	\$ 31,000	\$ 2,000
	4501-000	Electrical Manhole/Cable Assessment	\$ 61,000	\$ 61,000	\$ 18,000	\$ 18,000	\$ 23,000	\$ 2,000
	4502-000	Building Roof Condition Assessment	\$ 35,000	\$ 35,000	\$ 10,000	\$ 11,000	\$ 13,000	\$ 1,000
		Small Cap Liquids	\$ 581,000	\$ 581,000	\$ 170,000	\$ 173,000	\$ 220,000	\$ 17,000
		Small Cap AWT	\$ 40,000	\$ 40,000	\$ -	\$ 40,000	\$ -	\$ -
	TOTALS	\$ 12,361,000	\$ 12,361,000	\$ 3,604,000	\$ 3,718,000	\$ 4,671,000	\$ 368,000	

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 2 (20/21)								
	15137	Foul Air System Condition Assessment	\$ 75,000	\$ 76,000	\$ 22,000	\$ 23,000	\$ 29,000	\$ 2,000
	15138	Scum Pump Station Condition Assessment	\$ 50,000	\$ 51,000	\$ 15,000	\$ 15,000	\$ 19,000	\$ 2,000
	15139	Buried Utility Master Plan	\$ 75,000	\$ 76,000	\$ 22,000	\$ 23,000	\$ 29,000	\$ 2,000
	3542-000	South Section Embankment Protection	\$ 105,000	\$ 105,000	\$ 31,000	\$ 31,000	\$ 40,000	\$ 3,000
	3544-000	Aeration Upgrade Construction - Part I	\$ 2,352,000	\$ 2,352,000	\$ 688,000	\$ 702,000	\$ 892,000	\$ 70,000
	3545-000	Facility Improvements Construction Part II	\$ 4,665,000	\$ 4,665,000	\$ 1,365,000	\$ 1,392,000	\$ 1,768,000	\$ 139,000
	4503-000	Site Storage Evaluation	\$ 50,000	\$ 50,000	\$ 15,000	\$ 15,000	\$ 19,000	\$ 1,000
		Small Cap Liquids	\$ 569,000	\$ 569,000	\$ 166,000	\$ 170,000	\$ 216,000	\$ 17,000
		Small Cap AWT	\$ 65,000	\$ 65,000	\$ 19,000	\$ 19,000	\$ 25,000	\$ 2,000
	TOTALS	\$ 8,005,000	\$ 8,009,000	\$ 2,343,000	\$ 2,391,000	\$ 3,036,000	\$ 239,000	

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 3 (21/22)								
	15103	Auxiliary Blower and Maintenance Building Roofs	\$ 157,000	\$ 165,000	\$ 48,000	\$ 49,000	\$ 63,000	\$ 5,000
	15137	Headworks Condition Assessment	\$ 95,000	\$ 100,000	\$ 29,000	\$ 30,000	\$ 38,000	\$ 3,000
	15138	Spatial Utilization Analysis	\$ 75,000	\$ 79,000	\$ 23,000	\$ 24,000	\$ 30,000	\$ 2,000
	15140	Aeration Upgrade Construction - Part II	\$ 2,864,000	\$ 3,014,000	\$ 882,000	\$ 900,000	\$ 1,143,000	\$ 90,000
	15818	Contact Basin Gate	\$ 221,000	\$ 232,000	\$ 68,000	\$ 69,000	\$ 88,000	\$ 7,000
	3543-000	Export Sludge Pipeline Replacement at RTP	\$ 335,000	\$ 353,000	\$ 103,000	\$ 105,000	\$ 134,000	\$ 11,000
		Small Cap Liquids	\$ 569,000	\$ 587,000	\$ 172,000	\$ 175,000	\$ 223,000	\$ 18,000
		Small Cap AWT	\$ 65,000	\$ 67,000	\$ -	\$ 67,000	\$ -	\$ -
	TOTALS	\$ 4,380,000	\$ 4,597,000	\$ 1,325,000	\$ 1,419,000	\$ 1,717,000	\$ 135,000	

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 4 (22/23)								
	15102	Odor Control Scrubber/Foul Air System Reconstruction	\$ 329,000	\$ 367,000	\$ 107,000	\$ 110,000	\$ 139,000	\$ 11,000
	15108	Scum Pump Station and Wet Well	\$ 268,000	\$ 299,000	\$ 87,000	\$ 89,000	\$ 113,000	\$ 9,000
	15125	Vehicle Storage Building Mezzanine Upgrades	\$ 59,000	\$ 65,000	\$ 19,000	\$ 20,000	\$ 25,000	\$ 2,000
	15143	RAS/WAS Pump Station Condition Assessment	\$ 75,000	\$ 84,000	\$ 24,000	\$ 25,000	\$ 32,000	\$ 2,000
		Small Cap Liquids	\$ 569,000	\$ 606,000	\$ 177,000	\$ 181,000	\$ 230,000	\$ 18,000
		Small Cap AWT	\$ 65,000	\$ 69,000	\$ -	\$ 69,000	\$ -	\$ -
		TOTALS	\$ 1,365,000	\$ 1,490,000	\$ 416,000	\$ 493,000	\$ 539,000	\$ 42,000

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 5 (23/24)								
	15102	Odor Control Scrubber/Foul Air System Reconstruction	\$ 1,448,000	\$ 1,653,000	\$ 483,000	\$ 493,000	\$ 627,000	\$ 49,000
	15105	Headworks Screen Drum Replacement	\$ 630,000	\$ 719,000	\$ 210,000	\$ 215,000	\$ 273,000	\$ 21,000
	15119	Maintenance Building Upgrade	\$ 646,000	\$ 737,000	\$ 216,000	\$ 220,000	\$ 280,000	\$ 22,000
	15144	Standby Power Condition Assessment	\$ 65,000	\$ 74,000	\$ 22,000	\$ 22,000	\$ 28,000	\$ 2,000
		Small Cap Liquids	\$ 569,000	\$ 625,000	\$ 183,000	\$ 187,000	\$ 237,000	\$ 19,000
		Small Cap AWT	\$ 65,000	\$ 71,000	\$ -	\$ 71,000	\$ -	\$ -
		TOTALS	\$ 3,423,000	\$ 3,881,000	\$ 1,114,000	\$ 1,209,000	\$ 1,444,000	\$ 114,000

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 6 (24/25)								
	15102	Odor Control Scrubber/Foul Air System Reconstruction	\$ 1,448,000	\$ 1,670,000	\$ 489,000	\$ 499,000	\$ 633,000	\$ 50,000
	15147	Pavement and Surface Drainage Master Plan	\$ 75,000	\$ 87,000	\$ 25,000	\$ 26,000	\$ 33,000	\$ 3,000
	15713	North Section Embankment Protection	\$ 929,000	\$ 1,072,000	\$ 314,000	\$ 320,000	\$ 406,000	\$ 32,000
	15813	AWT Building Modifications	\$ 218,000	\$ 252,000	\$ -	\$ 252,000	\$ -	\$ -
		Small Cap Liquids	\$ 569,000	\$ 645,000	\$ 189,000	\$ 193,000	\$ 245,000	\$ 19,000
		Small Cap AWT	\$ 65,000	\$ 74,000	\$ -	\$ 74,000	\$ -	\$ -
		TOTALS	\$ 3,304,000	\$ 3,800,000	\$ 1,016,000	\$ 1,363,000	\$ 1,317,000	\$ 104,000

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 7 (25/26)								
	15101	Grit Handling Upgrade	\$ 795,000	\$ 954,000	\$ 279,000	\$ 285,000	\$ 362,000	\$ 28,000
	15106	DAF Polymer and DAF Control Building Upgrade	\$ 403,000	\$ 483,000	\$ 141,000	\$ 144,000	\$ 183,000	\$ 14,000
	15132	Channel Lining	\$ 840,000	\$ 1,008,000	\$ 295,000	\$ 301,000	\$ 382,000	\$ 30,000
	15148	Instrumentation Master Plan	\$ 75,000	\$ 90,000	\$ 26,000	\$ 27,000	\$ 34,000	\$ 3,000
		Small Cap Liquids	\$ 569,000	\$ 666,000	\$ 195,000	\$ 199,000	\$ 253,000	\$ 20,000
		Small Cap AWT	\$ 65,000	\$ 76,000	\$ -	\$ 76,000	\$ -	\$ -
		TOTALS	\$ 2,746,000	\$ 3,277,000	\$ 936,000	\$ 1,031,000	\$ 1,213,000	\$ 96,000

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 8 (26/27)								
	15126	Personnel Building Modification	\$ 305,000	\$ 375,000	\$ 110,000	\$ 112,000	\$ 142,000	\$ 11,000
	15133	Operations Building Rehab	\$ 932,000	\$ 1,147,000	\$ 335,000	\$ 342,000	\$ 435,000	\$ 34,000
	15145	Export Sludge System Condition Assessment	\$ 85,000	\$ 105,000	\$ 31,000	\$ 31,000	\$ 40,000	\$ 3,000
	15714	Aliso - Sulfur Creek Confluence Protection	\$ 647,000	\$ 796,000	\$ 233,000	\$ 238,000	\$ 302,000	\$ 24,000
	15815	Effluent Equalization Basin Valve Replacement - Common (AWT)	\$ 810,000	\$ 997,000	\$ -	\$ 997,000	\$ -	\$ -
	15817	AWT Instrumentation	\$ 453,000	\$ 558,000	\$ -	\$ 558,000	\$ -	\$ -
		Small Cap Liquids	\$ 569,000	\$ 687,000	\$ 201,000	\$ 205,000	\$ 261,000	\$ 21,000
		Small Cap AWT	\$ 65,000	\$ 79,000	\$ -	\$ 79,000	\$ -	\$ -
	TOTALS	\$ 3,865,000	\$ 4,744,000	\$ 910,000	\$ 2,562,000	\$ 1,179,000	\$ 93,000	

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 9 (27/28)								
	15115	RAS and WAS Pump Station	\$ 189,000	\$ 247,000	\$ 72,000	\$ 74,000	\$ 93,000	\$ 7,000
	15122	West Corridor Piping Reconstruction	\$ 1,651,000	\$ 2,158,000	\$ 631,000	\$ 644,000	\$ 818,000	\$ 64,000
	15123	Piping Between RAS/WAS PS and AWT	\$ 106,000	\$ 138,000	\$ 40,000	\$ 41,000	\$ 52,000	\$ 4,000
		Small Cap Liquids	\$ 569,000	\$ 709,000	\$ 208,000	\$ 212,000	\$ 269,000	\$ 21,000
		Small Cap AWT	\$ 65,000	\$ 81,000	\$ -	\$ 81,000	\$ -	\$ -
		TOTALS	\$ 2,579,000	\$ 3,333,000	\$ 951,000	\$ 1,052,000	\$ 1,233,000	\$ 97,000

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 10 (28/29)								
	15110	Potable Water System Relocation	\$ 592,000	\$ 778,000	\$ 228,000	\$ 232,000	\$ 295,000	\$ 23,000
	15115	RAS and WAS Pump Station	\$ 1,037,000	\$ 1,365,000	\$ 399,000	\$ 407,000	\$ 517,000	\$ 41,000
	15121	Auxiliary Blower Bldg Upgrade	\$ 691,000	\$ 909,000	\$ 266,000	\$ 271,000	\$ 345,000	\$ 27,000
	15124	Central Corridor Piping	\$ 1,691,000	\$ 2,226,000	\$ 651,000	\$ 664,000	\$ 844,000	\$ 66,000
	15146	Primary Sedimentation System Condition Assessment	\$ 65,000	\$ 86,000	\$ 25,000	\$ 26,000	\$ 32,000	\$ 3,000
		Small Cap Liquids	\$ 569,000	\$ 732,000	\$ 214,000	\$ 219,000	\$ 278,000	\$ 22,000
		Small Cap AWT	\$ 65,000	\$ 84,000	\$ -	\$ 84,000	\$ -	\$ -
		TOTALS	\$ 4,710,000	\$ 6,179,000	\$ 1,783,000	\$ 1,903,000	\$ 2,311,000	\$ 182,000

Table F.5 - Regional Treatment Plant Capital Improvement Plan

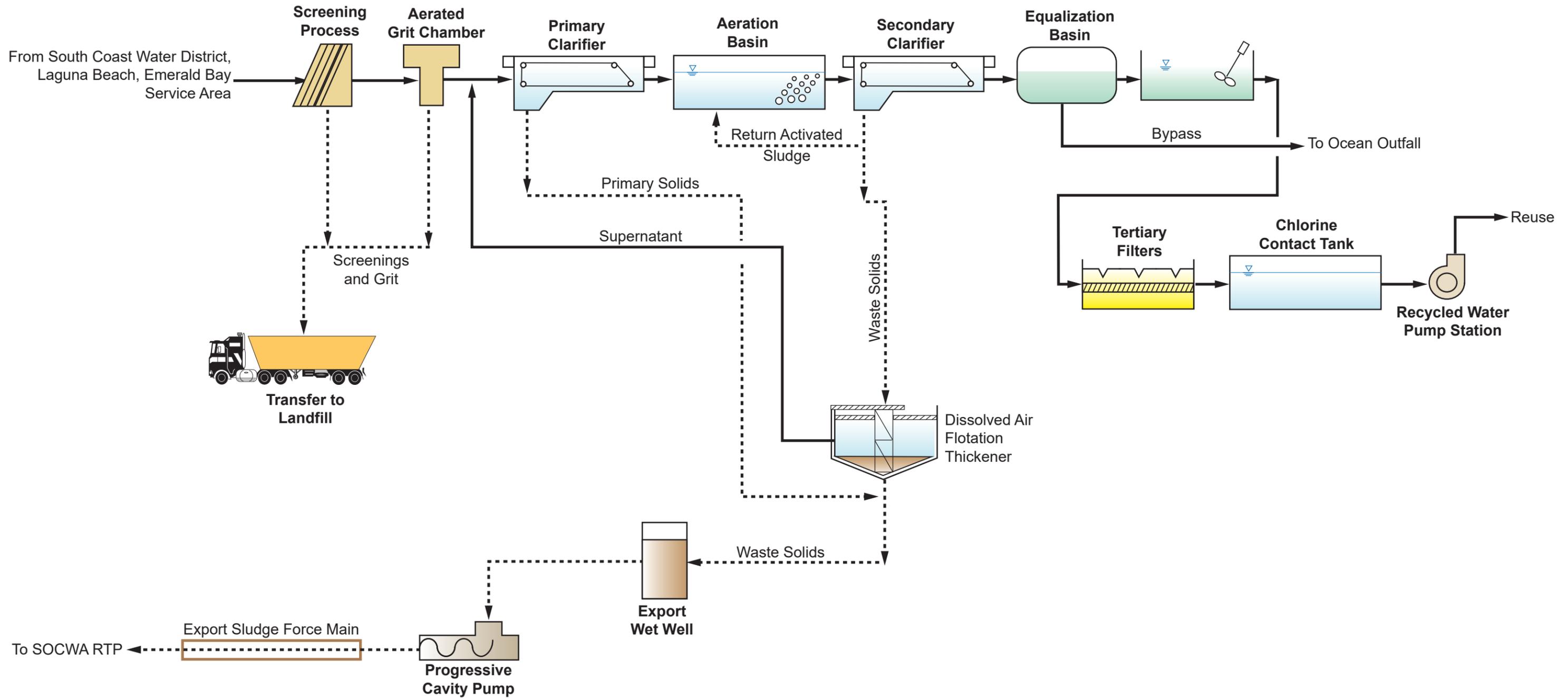
Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 11 ('29/'30)								
	15113	Pave Road System	\$ 132,000	\$ 183,000	\$ 54,000	\$ 55,000	\$ 69,000	\$ 5,000
	15115	RAS and WAS Pump Station	\$ 1,037,000	\$ 1,441,000	\$ 421,000	\$ 430,000	\$ 546,000	\$ 43,000
	15116	Primary Sludge Pump System Design	\$ 682,000	\$ 947,000	\$ 277,000	\$ 283,000	\$ 359,000	\$ 28,000
	15127	Headworks Valve Replacement	\$ 343,000	\$ 476,000	\$ 139,000	\$ 142,000	\$ 181,000	\$ 14,000
	15150	Screening Washer/Compactor System	\$ 413,000	\$ 573,000	\$ 168,000	\$ 171,000	\$ 217,000	\$ 17,000
	15812	AWT Filter Valve Upgrade	\$ 541,000	\$ 752,000	\$ -	\$ 752,000	\$ -	\$ -
	15819	AWT Support Equipment	\$ 759,000	\$ 1,054,000	\$ -	\$ 1,054,000	\$ -	\$ -
	15821	AWT Buried Piping	\$ 1,011,000	\$ 1,404,000	\$ -	\$ 1,404,000	\$ -	\$ -
		Small Cap Liquids	\$ 569,000	\$ 755,000	\$ 221,000	\$ 226,000	\$ 286,000	\$ 23,000
		Small Cap AWT	\$ 65,000	\$ 86,000	\$ -	\$ 86,000	\$ -	\$ -
		TOTALS	\$ 5,550,000	\$ 7,672,000	\$ 1,280,000	\$ 4,602,000	\$ 1,659,000	\$ 131,000
YEAR 12 ('30/'31)								
	15104	DAF System Rehabilitation	\$ 1,300,000	\$ 1,827,000	\$ 535,000	\$ 546,000	\$ 693,000	\$ 55,000
	15117	SCADA System Reconstruction	\$ 147,000	\$ 206,000	\$ 60,000	\$ 62,000	\$ 78,000	\$ 6,000
	15129	Standby Power Reconstruction	\$ 179,000	\$ 251,000	\$ 74,000	\$ 75,000	\$ 95,000	\$ 8,000
		Small Cap Liquids	\$ 569,000	\$ 780,000	\$ 228,000	\$ 233,000	\$ 296,000	\$ 23,000
		Small Cap AWT	\$ 65,000	\$ 89,000	\$ -	\$ 89,000	\$ -	\$ -
		TOTALS	\$ 2,260,000	\$ 3,154,000	\$ 897,000	\$ 1,004,000	\$ 1,162,000	\$ 91,000

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 13 ('31/'32)								
	15111	Non-Potable Water System Relocation	\$ 333,000	\$ 508,000	\$ 149,000	\$ 152,000	\$ 193,000	\$ 15,000
	15117	SCADA System Reconstruction	\$ 1,150,000	\$ 1,756,000	\$ 514,000	\$ 524,000	\$ 666,000	\$ 52,000
	15128	Existing Export Sludge PS Upgrade	\$ 836,000	\$ 1,276,000	\$ 373,000	\$ 381,000	\$ 484,000	\$ 38,000
	15129	Standby Power Reconstruction	\$ 559,000	\$ 853,000	\$ 250,000	\$ 255,000	\$ 324,000	\$ 25,000
		Small Cap Liquids	\$ 569,000	\$ 805,000	\$ 235,000	\$ 240,000	\$ 305,000	\$ 24,000
		Small Cap AWT	\$ 65,000	\$ 92,000	\$ -	\$ 92,000	\$ -	\$ -
		TOTALS	\$ 3,512,000	\$ 5,290,000	\$ 1,521,000	\$ 1,644,000	\$ 1,971,000	\$ 155,000
YEAR 14 ('32/'33)								
	15112	West Primary Sedimentation System Upgrade	\$ 1,032,000	\$ 1,631,000	\$ 477,000	\$ 487,000	\$ 618,000	\$ 49,000
	15129	Standby Power Reconstruction	\$ 559,000	\$ 884,000	\$ 259,000	\$ 264,000	\$ 335,000	\$ 26,000
		Small Cap Liquids	\$ 569,000	\$ 830,000	\$ 243,000	\$ 248,000	\$ 315,000	\$ 25,000
		Small Cap AWT	\$ 65,000	\$ 95,000	\$ -	\$ 95,000	\$ -	\$ -
		TOTALS	\$ 2,225,000	\$ 3,441,000	\$ 979,000	\$ 1,094,000	\$ 1,268,000	\$ 100,000

Table F.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD
YEAR 15 ('33/'34)								
	15114	East Primary Sedimentation Upgrade	\$ 677,000	\$ 1,079,000	\$ 316,000	\$ 322,000	\$ 409,000	\$ 32,000
	15118	Aeration Basin Gates	\$ 1,499,000	\$ 2,388,000	\$ 699,000	\$ 713,000	\$ 905,000	\$ 71,000
	15120	RAS Hypo Pumps	\$ 98,000	\$ 155,000	\$ 45,000	\$ 46,000	\$ 59,000	\$ 5,000
	15131	Headworks Miscellaneous Upgrades	\$ 505,000	\$ 805,000	\$ 235,000	\$ 240,000	\$ 305,000	\$ 24,000
	15134	Perimeter Fence Replacement	\$ 857,000	\$ 1,365,000	\$ 399,000	\$ 408,000	\$ 518,000	\$ 41,000
	15135	Blower Building Roof	\$ 106,000	\$ 169,000	\$ 49,000	\$ 50,000	\$ 64,000	\$ 5,000
	15136	Export Sludge Pumps	\$ 847,000	\$ 1,349,000	\$ 395,000	\$ 403,000	\$ 511,000	\$ 40,000
	15816	AWT Hypo Pumps	\$ 261,000	\$ 415,000	\$ -	\$ 415,000	\$ -	\$ -
		Small Cap Liquids	\$ 569,000	\$ 857,000	\$ 251,000	\$ 256,000	\$ 325,000	\$ 26,000
		Small Cap AWT	\$ 65,000	\$ 98,000	\$ -	\$ 98,000	\$ -	\$ -
	TOTALS	\$ 5,484,000	\$ 8,680,000	\$ 2,389,000	\$ 2,951,000	\$ 3,096,000	\$ 244,000	



Legend	
—	Liquid
.....	Solids

Figure F.1
CTP Process Flow Diagram



Figure F.2
Coastal Treatment Plant Site



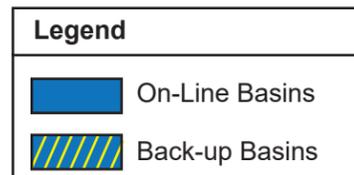
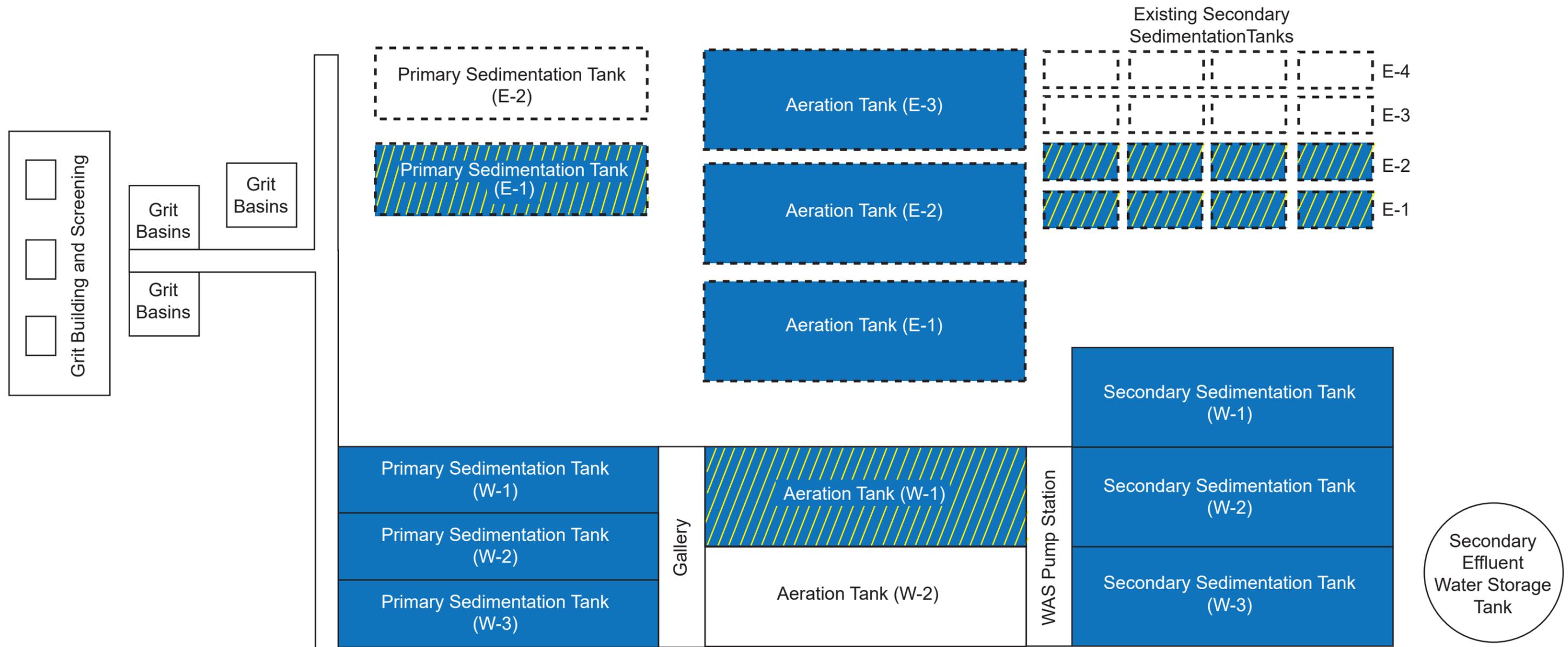
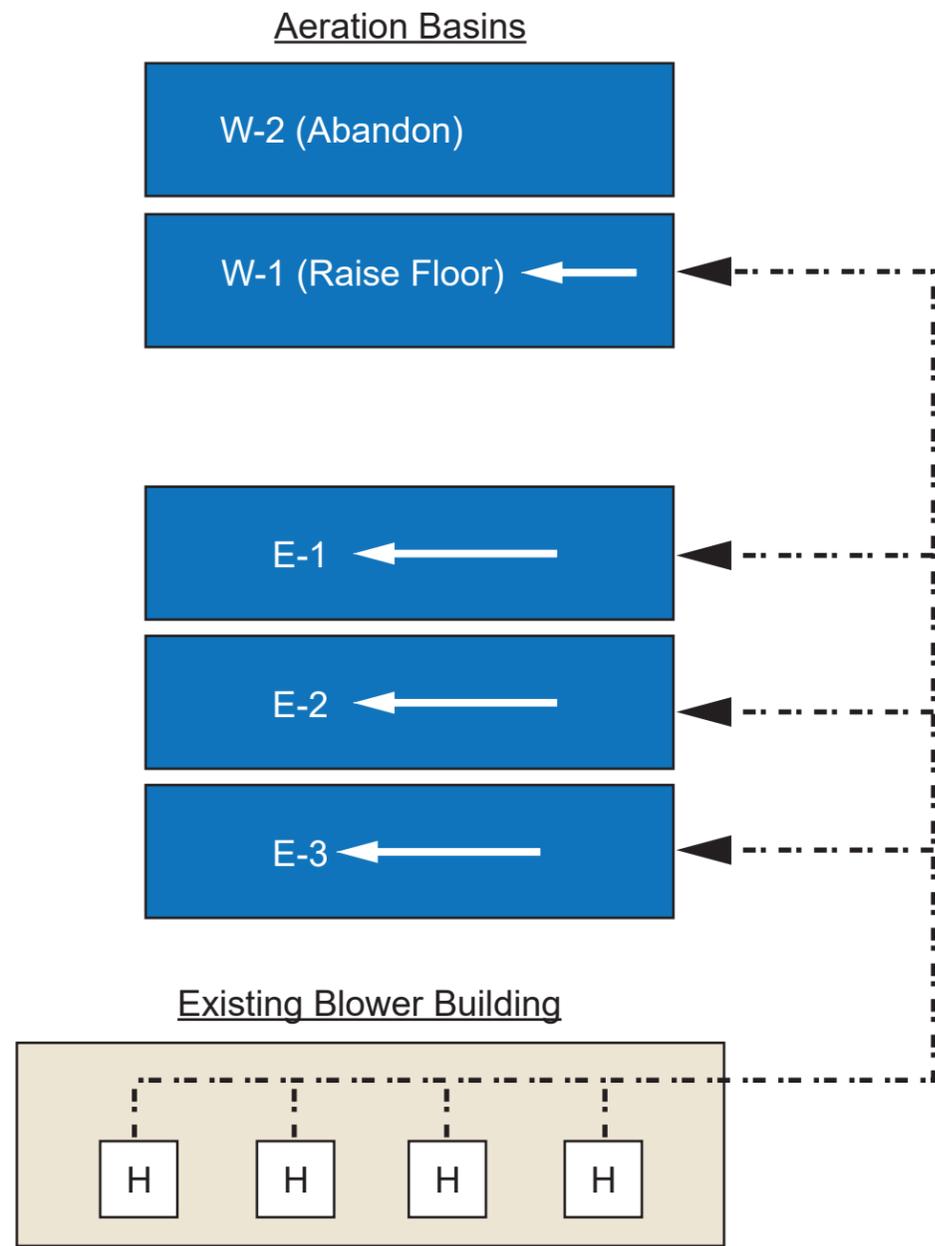
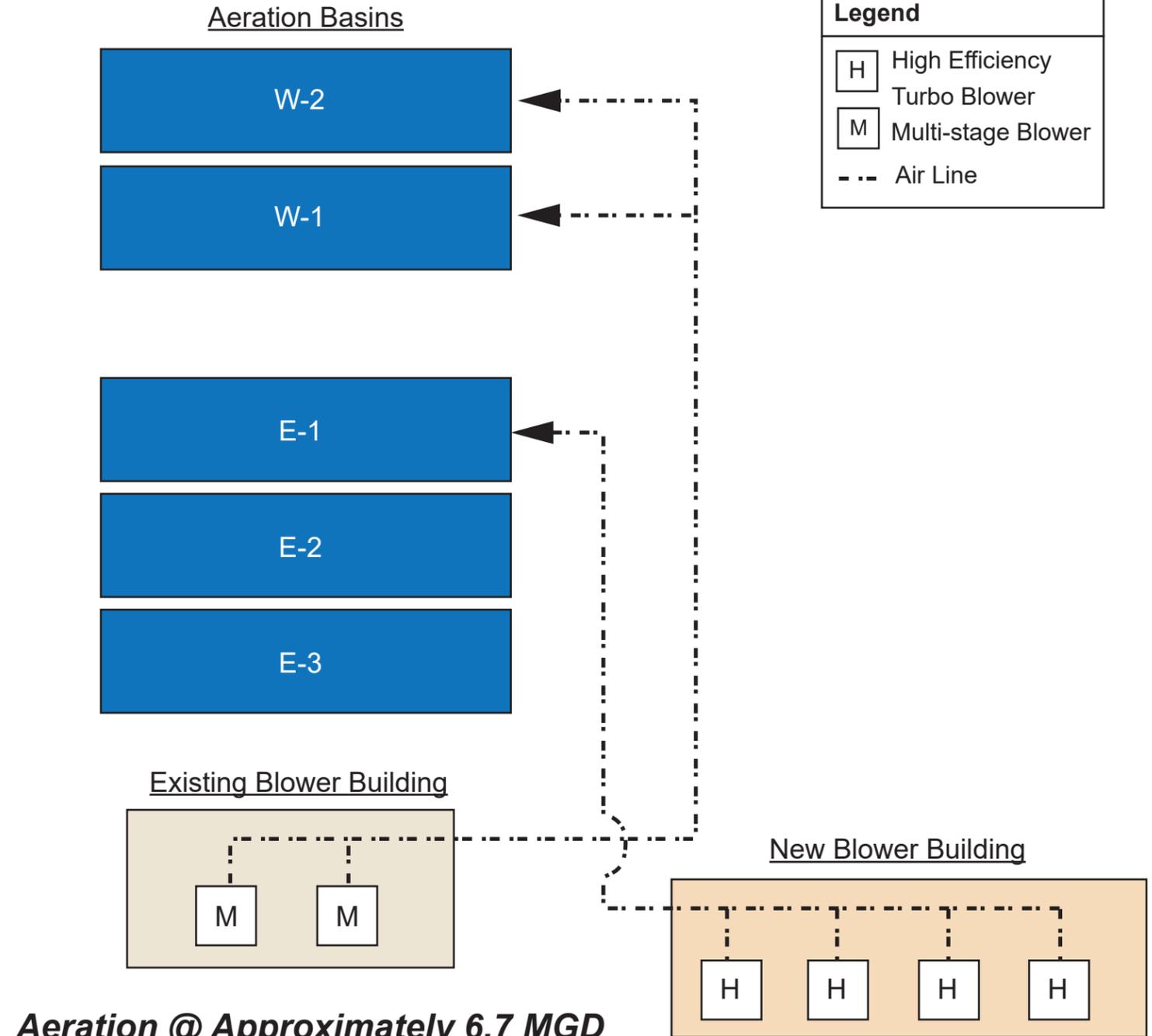


Figure F.3
Basin Utilization at 4 MGD



Aeration @ Approximately 4.0 MGD



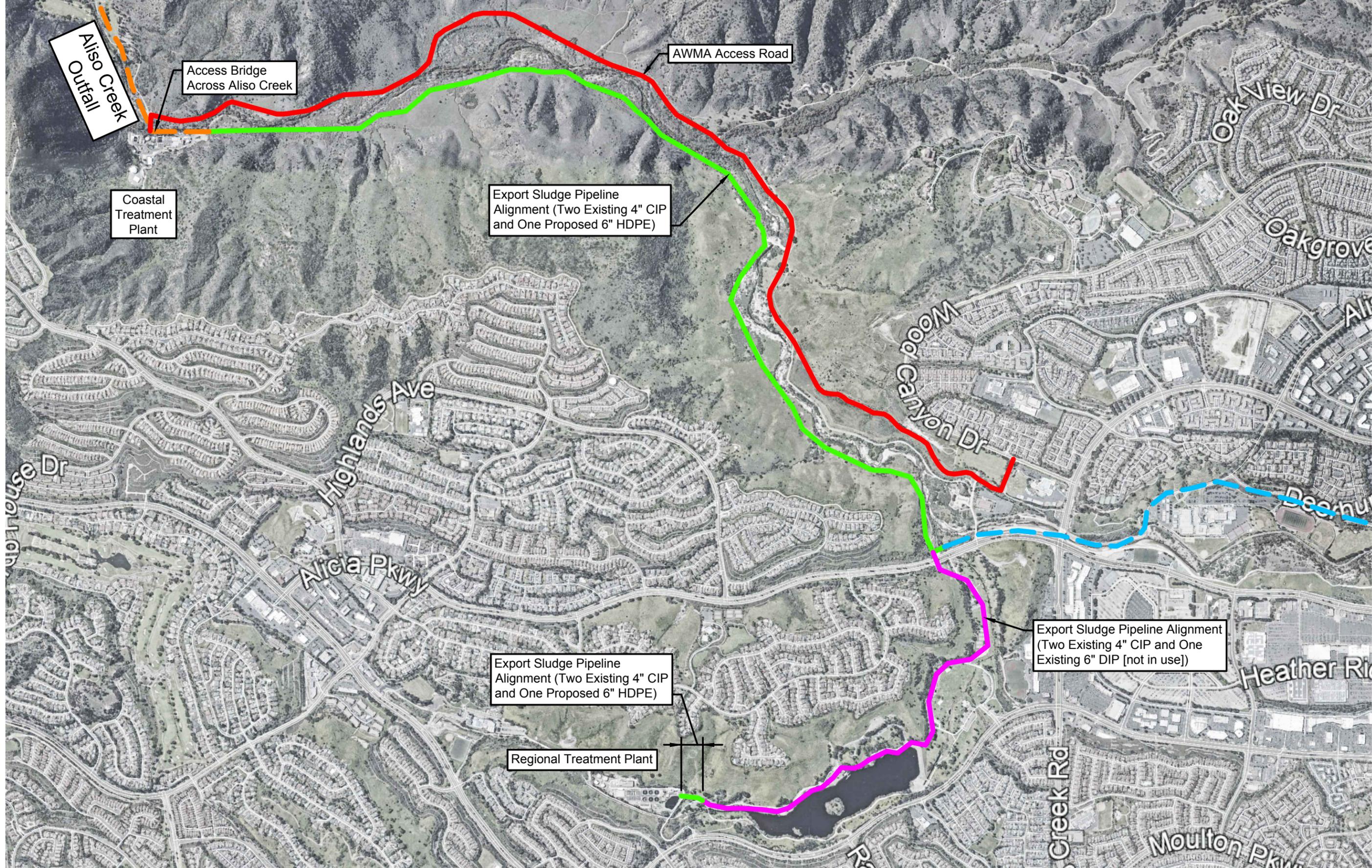
Aeration @ Approximately 6.7 MGD

Legend	
H	High Efficiency Turbo Blower
M	Multi-stage Blower
- - -	Air Line

Figure F.4
Aeration System Options



Figure F.5
 Potential Facility Modifications
 for Future Title 22 Reclamation
 Scenario



Prepared by:

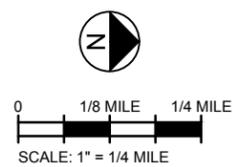


Figure F.6
 Coastal Treatment Plant Export
 Pipeline and AWMA Access Road

Appendix G
Coastal Treatment Plant Project Descriptions

Capital Improvement Program – Project Description

Project No.: 3542-000
Project Name: South Section Embankment Project
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '20/'21
Project Status: Conceptual Analysis/Short Term Planning

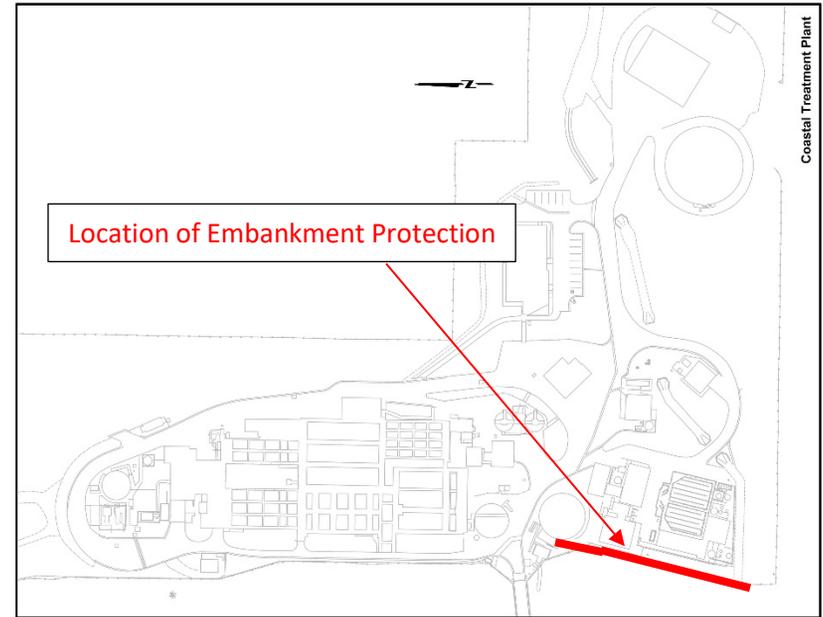
Project Description: Project involves (1) installation of gabion project along between access bridge and southwest corner of plant site; (2) installation of rip-rap apron below storm channel, (3) repair of cracking in storm channel; and (4) replacement of damaged sections of fencing.

Project Need: Southwest side of the treatment plant vulnerable to erosion damage during wet weather events along Aliso Creek. Some damage occurred during storm event of January 2017.

Key Issues: Improvements defined by conceptual analysis by TetraTech in April 2016 and February 2017. Resource agencies rejected this site as a candidate for emergency work in spring, 2017.

Estimated Project Amount (in 2019 \$):

Permitting:	\$ 60,241
Design:	\$ 45,180
Construction:	\$ 301,204
Construction Support:	\$ 75,300
Total Budget:	\$ 481,925



Capital Improvement Program – Project Description

Project No.: 3543-000
Project Name: Export Sludge Line Replacement at Regional Treatment Plant
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '21/'22
Project Status: Short Term Planning

Project Description: The currently designed Export Sludge System project replace the pipelines up to the Regional Treatment Plant site boundary. The proposed project will replace the piping on the Regional Plant site from the boundary to the Sludge Equalization Tanks.

Project Need: This project is based on the poor condition of the existing pipelines.

Key Issues: The routing of the new pipeline on the Regional Treatment Plant site is pending the completion of the Lee & Ro underground piping study.

Estimated Project Amount (in 2019 \$):

Conceptual Study:	\$ 12,883
Design:	\$ 26,766
Construction:	\$ 256,655
<u>Construction Support:</u>	<u>\$ 38,649</u>
Total Budget:	\$ 334,953

Capital Improvement Program – Project Description

Project No.: 3544-000
Project Name: Aeration System
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '20/'21 and '21/'22
Project Status: Short Term Planning



Project Description: The project includes replacing the existing panel diffusers with disc diffusers and appurtenances, raising the floor in Aeration Basin W-1, replace the aeration blowers with four multistage blowers with VFDs in the existing building.

Project Need: This project is based on the need to upgrade the existing system due to capacity, automation and membrane nearing end of useful life.

Key Issues: Keeping the system running during the project implementation

Estimated Project Amount (in 2019 \$):

Design:	\$ 453,549
Construction:	\$ 4,533,488
<u>Construction Support:</u>	<u>\$ 680,324</u>
Total Budget:	\$ 5,669,359

Capital Improvement Program – Project Description

Project No.: 15101
Project Name: Grit Handling Upgrade
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '25/'26
Project Status: Long Term Planning
Project Description: Replacement of grit pumps and grit classifiers in Headworks Building.



Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: A nominal amount has been set aside for additional mechanical work (e.g. piping and valves). Additional work needed to determine needed improvement to the surrounding system including structural, mechanical and electrical.

Estimated Project Amount (in 2019 \$):
Design: \$ 64,884
Construction: \$648,837
Construction Support: \$ 81,105
Total Budget: \$794,825

Capital Improvement Program – Project Description

Project No.: 15102
Project Name: Odor Control Scrubber and Foul Air System Reconstruction
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '22/'23 through '24/'25
Project Status: Short Term Planning

Project Description: The project includes the replacement of the odor control scrubber, foul air ducting and ancillary fans.



Project Need: Both the concrete pad and the foul air ducting are deteriorating. Foul air fans are nearing the end of their useful lives.

Key Issues: The DHK evaluation of the scrubber was based on replacement in place. Alternative locations need to be considered to minimize the unit downtime. The proposed project also includes the replacement of the physical scrubber although the fiberglass vessel is in relatively good condition. The current cost is based on reusing the existing chemical storage. This should also be evaluated in further detail.

Estimated Project Amount (in 2019 \$):

Conceptual Study:	\$ 65,799
Design:	\$ 263,196
Construction:	\$ 2,631,961
<u>Construction Support:</u>	<u>\$ 263,196</u>
Total Budget:	\$ 3,224,152

Capital Improvement Program – Project Description

Project No.: 15103
Project Name: Auxiliary Blower and Maintenance Building Roofs
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '21/'22
Project Status: Short Term Planning

Project Description: Reconstruction of Headworks, Auxiliary Blower, Chlorine and DAF Building Roofs.

Project Need: All of these building roofs are over 35 years old. Project has been identified based on exceedance of life of key components.

Key Issues: Design needed to reflect different types of roofs.

Estimated Project Amount (in 2019 \$):
Design: \$ 18,848
Construction: \$125,652
Construction Support: \$ 12,566
Total Budget: \$157,065



Capital Improvement Program – Project Description

Project No.: 15104
Project Name: Dissolved Air Flotation (DAF) System Rehabilitation
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '30/'31
Project Status: Long Term Planning

Project Description: Rehabilitation includes DAF structural, compressor and piping, dissolution tank, Thicken Activated Waste (TWAS) pumps, recirculation pumps, drain pump, DAF piping, DAF flow meter, TWAS flow meter and electrical. Collectors should not require replacement; however, collectors will be recoated.



Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Much of the existing system was installed in 2006. Current operating conditions appear good. The need for this project should be reevaluated in the future. A scheme for construction sequence will be needed to maintain one DAF operational at all time.

Estimated Project Amount (in 2019 \$):

Design:	\$ 56,533
Construction:	\$1,130,659
<u>Construction Support:</u>	<u>\$ 113,066</u>
Total Budget:	\$1,300,258

Capital Improvement Program – Project Description

Project No.: 15105
Project Name: Headworks Rotary Screen Drum Replacement
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '23/'24
Project Status: Short Term Planning

Project Description: The project includes the replacement of the drums and the level sensors in the Headworks rotary screens.

Project Need: Three new rotary screens were installed in 2011. The screen drum is expected to last for ten years.



Key Issues: Both equipment and structures deteriorate more rapidly in the headworks than in any other part of the treatment. The areas and systems around the rotary screens should be evaluated before the project to refine both scope and cost. Work on the rotary screens should not be performed during the wet weather portion of the year.

Estimated Project Amount (in 2019 \$):

Design:	\$ 50,414
Construction:	\$ 504,141
<u>Construction Support:</u>	<u>\$ 75,621</u>
Total Budget:	\$ 630,176

Capital Improvement Program – Project Description

Project No.: 15106
Project Name: Dissolved Air Flotation (DAF) Polymer System and Building Upgrade
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '25/'26
Project Status: Long Term Planning



Project Description: Upgrades include DAF polymer storage tank and mixer, metering and transfer pumps, piping and valves, building doors, mechanical and electrical system.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: The existing DAF polymer system has not been used in over 10 years as the Operations staff has maintained a dilute thickened waste activated sludge (TWAS) due to concerns regarding Export Sludge piping system. The need for this project should be reevaluated after the new Export Sludge pipeline is completed.

Estimated Project Amount (in 2019 \$):

Design:	\$ 32,198
Construction:	\$ 321,977
<u>Construction Support:</u>	<u>\$ 48,297</u>
Total Budget:	\$ 402,472

Capital Improvement Program – Project Description

Project No.: 15108
Project Name: Scum Pump Station and Wetwell
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '22/'23
Project Status: Short Term Planning

Project Description: Rehabilitation includes scum wetwell, scum pump, mechanical, electrical and miscellaneous repairs.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Evaluation needed to more clearly define the scope of this project. Keeping the existing scum pump station running during the repair.

Estimated Project Amount (in 2019 \$):
Design: \$ 21,435
Construction: \$ 214,350
Construction Support: \$ 32,152
Total Budget: \$ 267,937



Capital Improvement Program – Project Description

Project No.: 15110
Project Name: Potable Water Pump Station Relocation
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '28/'29
Project Status: Long Term Planning

Project Description: The project involves the replacement and relocation of the potable water pump station including the air-gap and hydropneumatics tanks.



Project Need: This project involves the replacement of the potable water pump station based on the exceedance of anticipated life. An additional goal is to relocate the system further away from the Aliso Creek boundary.

Key Issues: The amount of potable water required for the facility will need to be reconsidered. Evaluation of the site for relocation of the pump station is needed.

Estimated Project Amount (in 2019 \$):

Conceptual Study	\$ 22,750
Design:	\$ 45,500
Construction:	\$ 455,000
<u>Construction Support:</u>	<u>\$ 68,250</u>
Total Budget:	\$ 591,500

Capital Improvement Program – Project Description

Project No.: 15111
Project Name: Non-Potable Water Pump Station Reconstruction
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '31/'32
Project Status: Long Term Planning

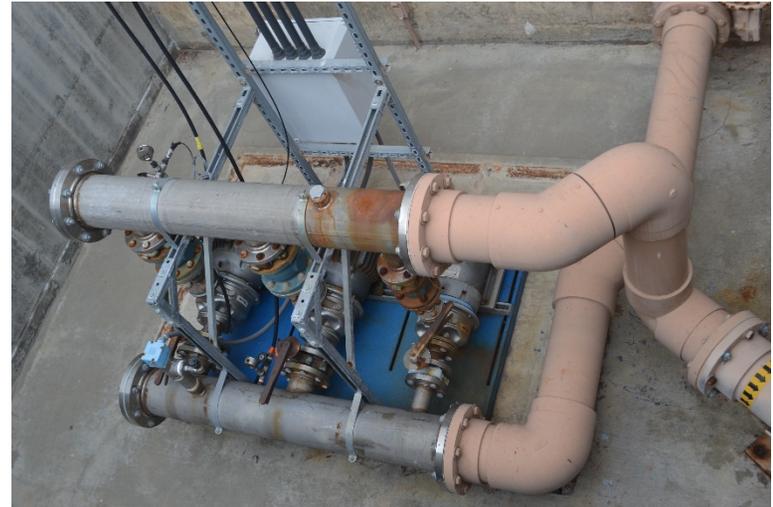
Project Description: The project involves the replacement of the non-potable water pump skid.

Project Need: This project involves the replacement of the pump skid system based on the exceedance of anticipated life.

Key Issues: The amount of non-potable water required for the facility will need to be considered prior to embarking on this project.

Estimated Project Amount (in 2019 \$):

Design	\$ 13,000
Design:	\$ 20,800
Construction:	\$ 260,000
<u>Construction Support:</u>	<u>\$ 39,000</u>
Total Budget:	\$ 332,800



Capital Improvement Program – Project Description

Project No.: 15112
Project Name: West Primary Sedimentation System Upgrade
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '32/'33
Project Status: Long Term Planning

Project Description: Upgrade includes primary clarifier sludge collector (chain and flight), scum collector and drive, weir and electrical.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Key Issues: Rehabilitation project has been completed in 2012. The need for this project should be reevaluated in the future. Replacement timeframe needs to be coordinated to rely on operating East primary sedimentation basins only.

Estimated Project Amount (in 2019 \$):
Design: \$ 84,217
Construction: \$ 842,171
Construction Support: \$ 105,217
Total Budget: \$ 1,031,659



Capital Improvement Program – Project Description

Project No.: 15113
Project Name: Pave Road System
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '29/'30
Project Status: Long Term Planning

Project Description: Project includes asphalt pavement throughout the plant.



Project Need: Coastal Treatment Plant has been the subject to many localized repairs and overlay projects over the past 30 years. This project is a comprehensive reconstruction based on exceedance of life.

Key Issues: Project should be coordinated with buried piping replacement projects to avoid tearing up new pavement system directly after completion. Need to perform the work in sections to keep the plant accessible. The cost estimate is based on a 2003 analysis by TetraTech; this evaluation needs to be updated.

Estimated Project Amount (in 2019 \$):

Condition Assessment:	\$	9,750
Design:	\$	9,750
Construction:	\$	97,500
<u>Construction Support:</u>	<u>\$</u>	<u>14,625</u>
Total Budget:	\$	131,625

Capital Improvement Program – Project Description

Project No.: 15114
Project Name: East Primary Sedimentation System Upgrade
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '33/'34
Project Status: Long Term Planning

Project Description: Upgrade includes primary clarifier sludge collector (chain and flight), scum collector and drive, weir and electrical.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Rehabilitation project has been recently completed. The need for this project should be reevaluated in the future. Replacement timeframe needs to be coordinated to rely on operating West primary sedimentation basins only.

Estimated Project Amount (in 2019 \$):

Design:	\$ 55,278
Construction:	\$ 552,776
<u>Construction Support:</u>	<u>\$ 69,097</u>
Total Budget:	\$ 677,151



Capital Improvement Program – Project Description

Project No.: 15115
Project Name: RAS and WAS Pump Station
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '27/'28 through '29/'30
Project Status: Long Term Planning

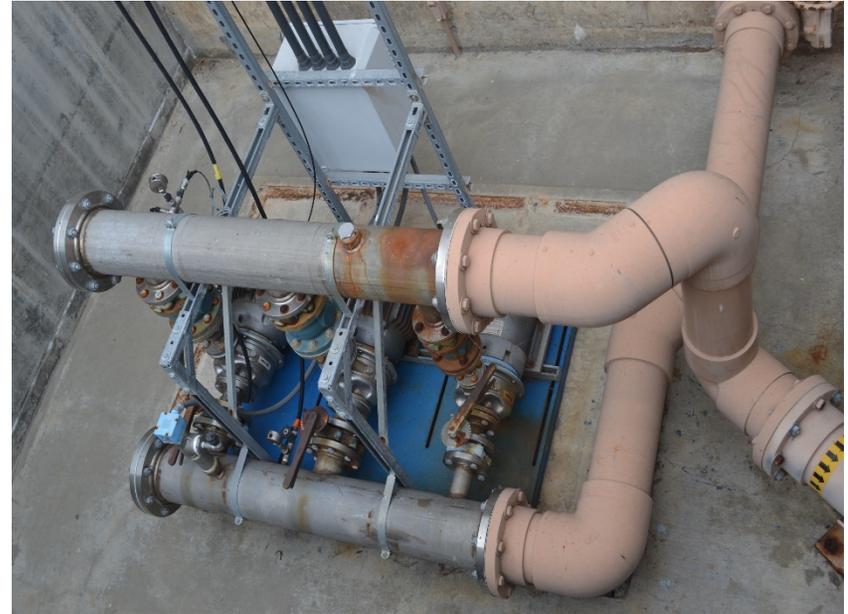
Project Description: Reconstruction of RAS and WAS pumping systems including pumps, valves and piping. Project also includes replacement of doors and monorail crane inside the RAS/WAS Pump Station.

Project Need: The RAS and WAS pumping systems have undergone limited rehabilitation over the past 10 years. A comprehensive reconstruction will be needed based on exceedance of life of key components.

Key Issues: Sequence work to maintain the existing RAS and WAS pumping systems in operations during the replacement.

Estimated Project Amount (in 2019 \$):

Design:	\$ 188,520
Construction:	\$1,885,200
<u>Construction Support:</u>	<u>\$ 188,520</u>
Total Budget:	\$2,262,240



Capital Improvement Program – Project Description

Project No.: 15116
Project Name: Primary Sludge Pump System Design
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '29/'30
Project Status: Long Term Planning

Project Description: Project includes demolition, East and West Primary Sludge pumps and piping, valves and actuators, flow meters, power and controls.



Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Both the East and West Primary Sludge Pump Stations have been reconstructed within the past 10 years. The need for this project should be evaluated further in the future. Need to sequence the work to keep the plant operational.

Estimated Project Amount (in 2019 \$):

Design:	\$ 55,656
Construction:	\$ 543,719
<u>Construction Support:</u>	<u>\$ 69,570</u>
Total Budget:	\$ 681,789

Capital Improvement Program – Project Description

Project No.: 15117
Project Name: SCADA System Reconstruction
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '30/'31 and '31/'32
Project Status: Long Term Planning



Project Description: Project involves installation of seven new programmable logic controllers (PLC's) and cabinets. Project also includes the installation of new fiber optic cable through existing the existing conduit as well as the installation of new fiber optic patch panels.

Project Need: The existing SCADA system was installed in 2004. The system utilizes Allen Bradley ControlLogix and CompactLogix PLC's. The replacement of the system is based on reaching a period of time when these units are no longer supported by the manufacturer. The replacement of the fiber optic system is based on reaching data transfer capacity of the existing system.

Key Issues: This project will require a future condition assessment to determine the scope and need for the proposed work.

Estimated Project Amount (in 2019 \$):

Condition Assessment:	\$ 48,938
Preliminary Design:	\$ 48,938
Design:	\$ 97,875
Construction:	\$ 978,749
Construction Support:	\$ 122,344
Total Budget:	\$ 1,296,844

Capital Improvement Program – Project Description

Project No.: 15118
Project Name: Aeration Basin Gates
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '33/'34
Project Status: Long Term Planning

Project Description: Each of the five aeration basins has two influent and two effluent aluminum gates. These gates are manually operated. The gates were installed in 2003 and remain in good condition. The need and timing for this project will be reevaluated in the future. Project includes replacement of west influent and effluent gates, and east influent and effluent gates.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Study may be needed to determine if using the gates for flow splitting control is necessary.

Estimated Project Amount (in 2019 \$):
Design: \$ 120,770
Construction: \$1,257,700
Construction Support: \$ 120,770
Total Budget: \$1,499,240



Capital Improvement Program – Project Description

Project No.: 15119
Project Name: Maintenance Building
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '23/'24
Project Status: Short Term Planning

Project Description: Project includes new benchwork, monorail system, HVAC and plumbing, doors and frames, windows, electrical, removal and replacement of roof.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Evaluation needed to determine true utilization of building. Need to find a temporary location for maintenance activities and storage during the improvement.

Estimated Project Amount (in 2019 \$):

Condition Assessment:	\$ 47,838
Conceptual Study	\$ 47,838
Design:	\$ 47,838
Construction:	\$ 430,548
<u>Construction Support:</u>	<u>\$ 71,757</u>
Total Budget:	\$ 645,819



Capital Improvement Program – Project Description

Project No.: 15120
Project Name: RAS Hypochlorite Pumps
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '33/'34
Project Status: Long Term Planning

Project Description: Project includes removal of existing RAS hypochlorite pumps and installation of new RAS hypochlorite pumps.

Project Need: New chemical feed pumps have been recently installed. The experience at SOCWA facilities is that a Sodium Hypochlorite pump has a life of approximately 15 years.

Key Issues: Chemical feed pump technology is evolving, the type of pump for replacement should be reviewed in the future. The goal of the replacement is to keep the AWT running during the replacement.

Estimated Project Amount (in 2019 \$):

Design:	\$ 7,800
Construction:	\$ 78,000
<u>Construction Support:</u>	<u>\$ 11,700</u>
Total Budget:	\$ 97,500



Capital Improvement Program – Project Description

Project No.: 15121
Project Name: Auxiliary Blower Building Upgrade
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '28/'29
Project Status: Long Term Planning

Project Description: The project involves the replacement of architectural hardware in the Auxiliary Blower Building. Project also involves replacement of compressors and blowers within the building.

Project Need: This project is based on the replacement of assets that have exceeded their useful lives.

Key Issues: Air requirements and energy efficiency need to be reevaluated for blower and compressors.

Estimated Project Amount (in 2019 \$):

Conceptual Study:	\$	51,171
Design:	\$	51,171
Construction:	\$	511,706
<u>Construction Support:</u>	<u>\$</u>	<u>76,756</u>
Total Budget:	\$	690,804



Capital Improvement Program – Project Description

Project No.: 15122
Project Name: West Corridor Piping Reconstruction
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '27/'28
Project Status: Long Term Planning

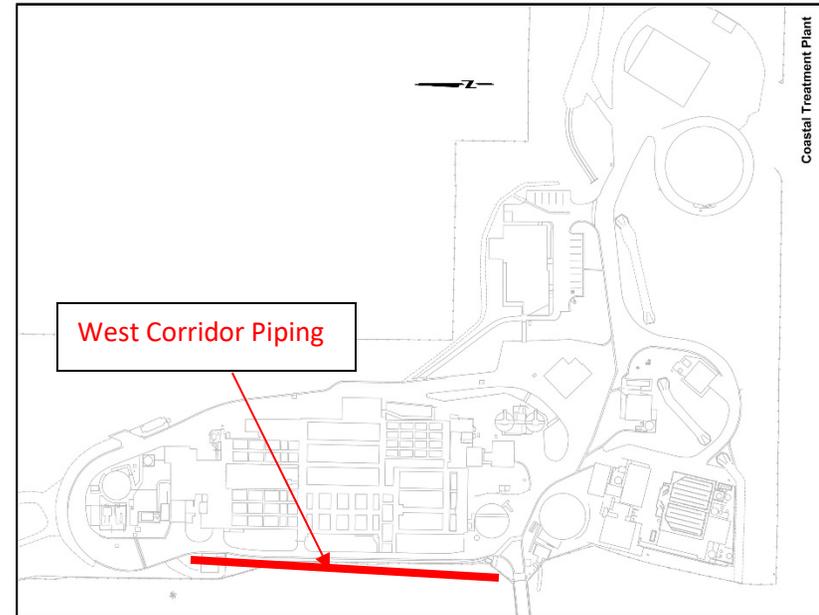
Project Description: Project includes replacement of the 8-inch drain, 20-inch force main and 6-inch non-potable water pipes.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Use existing trench or new trench for the pipe, and if temporary piping is needed during the replacement.

Estimated Project Amount (in 2019 \$):

Conceptual Design:	\$ 126,966
Design:	\$ 126,966
Construction:	\$ 1,269,654
<u>Construction Support:</u>	<u>\$ 126,966</u>
Total Budget:	\$ 1,650,552



Capital Improvement Program – Project Description

Project No.: 15123
Project Name: Piping between DAF and Export Sludge Equalization Basin
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '27/'28
Project Status: Long Term Planning

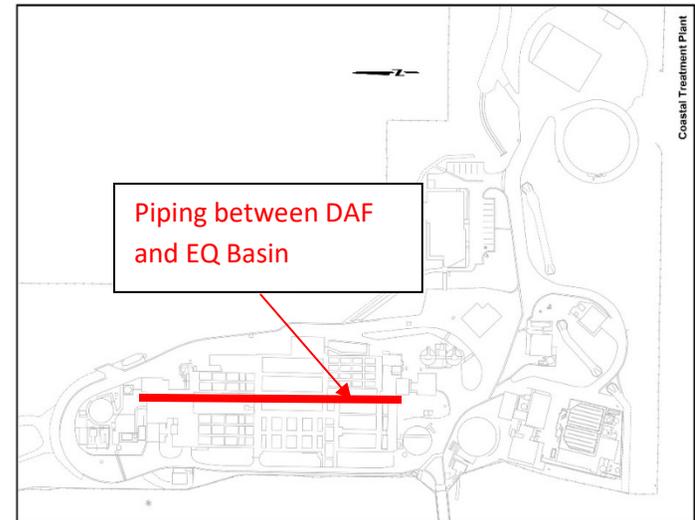
Project Description: Project includes replacement of the 6-inch primary sludge pipe and 4-inch WAS pipe.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Use existing trench or new trench for the pipe, and if temporary piping is needed during the replacement.

Estimated Project Amount (in 2019 \$):

Conceptual Design:	\$	7,819
Design:	\$	7,819
Construction:	\$	78,190
<u>Construction Support:</u>	<u>\$</u>	<u>11,729</u>
Total Budget:	\$	105,557



Capital Improvement Program – Project Description

Project No.: 15124
Project Name: Central Corridor Piping
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '28/'29
Project Status: Long Term Planning

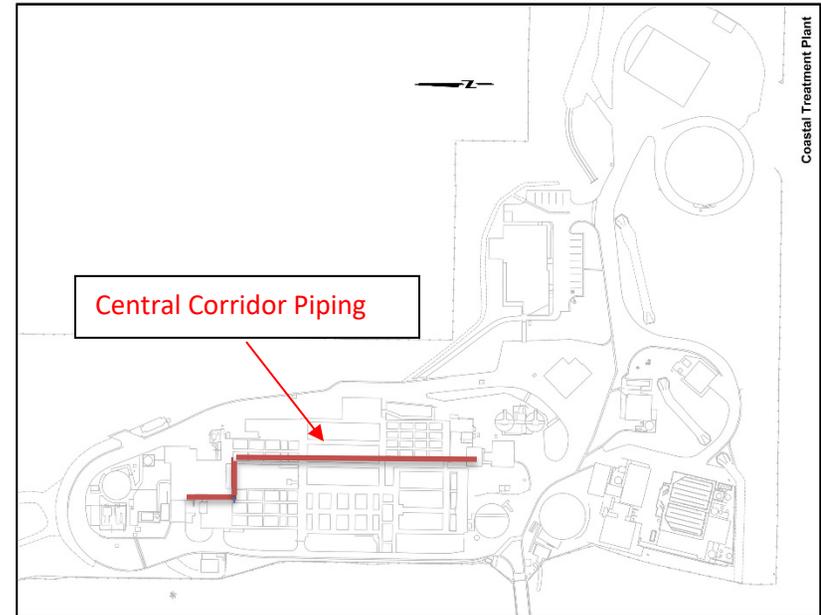
Project Description: Project includes replacement of low pressure air, drains, MLSS, scum, primary sludge, RAS and WAS piping from DAF to Headworks in the middle of the plant.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Use existing trench or new trench for the pipe, and if temporary piping is needed during the replacement to keep the plant running.

Estimated Project Amount (in 2019 \$):

Conceptual Design:	\$ 67,655
Design:	\$ 135,310
Construction:	\$ 1,353,097
<u>Construction Support:</u>	<u>\$ 135,310</u>
Total Budget:	\$ 1,691,372



Capital Improvement Program – Project Description

Project No.: 15125
Project Name: Vehicle Storage Building Rehabilitation
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '22/'23
Project Status: Short Term Planning

Project Description: Project includes upgrading to the mezzanine system inside the building.

Project Need: Wooden mezzanine constructed by Plant staff in 1990s does not meet building code.

Key Issues: Discussion with staff to determine if building still meets current needs.

Estimated Project Amount (in 2019 \$):

Design:	\$ 4,686
Construction:	\$ 46,859
<u>Construction Support:</u>	<u>\$ 7,029</u>
Total Budget:	\$ 58,573



Capital Improvement Program – Project Description

Project No.: 15126
Project Name: Personnel Building Modification
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '26/'27
Project Status: Long Term Planning

Project Description: Project includes removal of existing roof, replacement of roof, windows and doors.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Project needed to evaluate demolition of building and relocation of functions to Operations Building.



Estimated Project Amount (in 2019 \$):

Conceptual Design:	\$	22,553
Design:	\$	22,553
Construction:	\$	225,530
<u>Construction Support:</u>	<u>\$</u>	<u>33,829</u>
Total Budget:	\$	304,465

Capital Improvement Program – Project Description

Project No.: 15127
Project Name: Headworks Valve Replacement
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '29/'30
Project Status: Long Term Planning

Project Description: Project includes replacement of plug valves, effluent valves, bypass valves and primary sludge valves.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Need detailed bypass plan to ensure isolations and flow diversions.

Estimated Project Amount (in 2019 \$):

Design:	\$ 27,420
Construction:	\$ 274,205
<u>Construction Support:</u>	<u>\$ 41,130</u>
Total Budget:	\$ 342,755



Capital Improvement Program – Project Description

Project No.: 15128
Project Name: Existing Export Sludge Pump Station Rehabilitation
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '31/'32
Project Status: Long Term Planning

Project Description: The project involves the replacement of the two original Export Sludge Pumps along with the ancillary equipment. The project also involves the replacement of the architectural hardware for the pump room.



Project Need: This project involves the replacement of asset which have exceeded their anticipated lives.

Key Issues: This system currently serves as the back-up to the new Export Sludge Pump Station and Equalization Basin. An analysis is needed to show whether the added reliability provided by the existing pump station merits a project for rehabilitation.

Estimated Project Amount (in 2019 \$):

Design:	\$ 68,251
Construction:	\$ 682,513
<u>Construction Support:</u>	<u>\$ 85,314</u>
Total Budget:	\$ 836,078

Capital Improvement Program – Project Description

Project No.: 15129
Project Name: Standby Power System Reconstruction
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '30/'31 through '32/'33
Project Status: Long Term Planning

Project Description: The project involves the replacement of the standby power engine generator and diesel storage tank.

Project Need: This project involves the replacement of assets that are beyond their anticipated lives.

Key Issues: The power load to be served by the standby power generator needs to be reevaluated. Code impacts should also be considered. Construction sequencing will be a key issue to make sure that the plant has a continuous source of standby power.

Estimated Project Amount (in 2019 \$):

Conceptual Study:	\$ 97,876
Design:	\$ 97,875
Construction:	\$ 978,750
<u>Construction Support:</u>	<u>\$ 122,344</u>
Total Budget:	\$ 1,296,844



Capital Improvement Program – Project Description

Project No.: 15131
Project Name: Headworks Building Miscellaneous Improvements
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '33/'34
Project Status: Long Term Planning



Project Description: The project primarily involves the replacement of architectural components of the Headworks Building including doors, window, and roll-up doors. The project also involves the replacement of the inflow meters that were installed in 2009.

Project Need: This project is based on the exceedance of the anticipated life of the components involved in this project.

Key Issues: Conceptual analysis should include a condition assessment to verify the need for each of the project components.

Estimated Project Amount (in 2019 \$):

Conceptual Study:	\$ 19,435
Design:	\$ 38,870
Construction:	\$ 388,700
<u>Construction Support:</u>	<u>\$ 58,305</u>
Total Budget:	\$ 505,310

Capital Improvement Program – Project Description

Project No.: 15132
Project Name: Channel Lining
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '25/'26
Project Status: Long Term Planning

Project Description: The project involves the relining of the the overflow channel, the primary influent and effluent channels.

Project Need: This project is based both on the exceedance of the anticipated life of the lining and the observed condition of the lining systems.

Key Issues: An approach to construction sequencing needs to be developed to minimize the project impact on plant operations.

Estimated Project Amount (in 2019 \$):

Condition Assessment:	\$	53,492
Design:	\$	33,433
Construction:	\$	668,655
<u>Construction Support:</u>	<u>\$</u>	<u>83,582</u>
Total Budget:	\$	839,162



Capital Improvement Program – Project Description

Project No.: 15133
Project Name: Operations Building Rehabilitation
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '26/'27
Project Status: Long Term Planning

Project Description: The project involves the replacement of architectural hardware at the Operations Building. The project involves the remodeling of the laboratory into office space.

Project Need: The proposed project is driven both by the expected life of the building components and the need to modify space utilization.

Key Issues: An evaluation of the utilization of both the Personnel Building and Operations Building is needed in order to implement this project.

Estimated Project Amount (in 2019 \$):

Conceptual Study:	\$	36,530
Design:	\$	73,060
Construction:	\$	730,600
<u>Construction Support:</u>	<u>\$</u>	<u>91,325</u>
Total Budget:	\$	931,515



Capital Improvement Program – Project Description

Project No.: 15134
Project Name: Perimeter Fence Replacement
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '33/'34
Project Status: Long Term Planning

Project Description: The project involves the replacement of the perimeter fence around the entirety of the treatment plant.



Project Need: This project has been included in the Ten Year Plan based on the expected life of the fence.

Key Issues: Conceptual analysis needed due to the difficulty in access some of the areas where the perimeter fence has been installed. This project should be coordinated with OC Parks.

Estimated Project Amount (in 2019 \$):

Conceptual Study:	\$ 35,709
Design:	\$ 35,709
Construction:	\$ 749,894
<u>Construction Support:</u>	<u>\$ 35,709</u>
Total Budget:	\$ 857,021

Capital Improvement Program – Project Description

Project No.: 15135
Project Name: Blower Building Roof
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '33/'34
Project Status: Long Term Planning

Project Description: Project includes removal of the existing blower building roof and installation of new roof.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Note that the existing roof and skylights are showing no signs of deterioration. Condition of roof should be evaluated after completion of the aeration upgrade as part of the Facility Improvements Project.



Estimated Project Amount (in 2019 \$):

Design:	\$	12,237
Construction:	\$	81,582
<u>Construction Support:</u>	<u>\$</u>	<u>12,237</u>
Total Budget:	\$	106,056

Capital Improvement Program – Project Description

Project No.: 15136
Project Name: Export Sludge Pumps
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '33/'34
Project Status: Long Term Planning

Project Description: Project includes removal of the existing pumps, installation of Export Sludge mixing pump and Export Sludge pumps, and modifications to the power and controls.

Project Need:
Project has been identified based on exceedance of life of key components.

Key Issues: The Export Sludge Equalization system was constructed in 2013. A second Export Sludge pump will be added in 2017. The need for this project should be evaluated in the future. Limited shutdown windows for replacement of pumps and electrical modifications.

Estimated Project Amount (in 2019 \$):

Design:	\$ 69,113
Construction:	\$ 691,129
<u>Construction Support:</u>	<u>\$ 86,391</u>
Total Budget:	\$ 846,633



Capital Improvement Program – Project Description

Project No.: 15137
Project Name: Foul Air System Condition Assessment
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '20/'21
Project Status: Short Term Planning

Project Description: Project includes condition assessment of the odor scrubber, fans and ducts, and the condition of the slab.

Project Need:
Project has been identified based on exceedance of life of key components.

Key Issues: The foul air system was installed in 2001, therefore approaching nominal useful life of 20 years.

Estimated Project Amount (in 2019 \$):
Condition Assessment: \$ 75,000
Total Budget: \$ 75,000

Capital Improvement Program – Project Description

Project No.: 15138
Project Name: Scum Pump Station Condition Assessment
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '20/'21
Project Status: Short Term Planning

Project Description: Project includes condition assessment of the scum pump station including the mechanical, electrical and instrumentation, and safety access around the pumps.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: The scum wet well, mechanical and electrical were installed in 1983, the pumps were installed in 2001, which might exceed the nominal useful life.

Estimated Project Amount (in 2019 \$):

Condition Assessment:	\$ 50,000
Total Budget:	\$ 50,000

Capital Improvement Program – Project Description

Project No.: 15139
Project Name: Buried Utility Master Plan
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '20/'21
Project Status: Short Term Planning

Project Description: Project includes developing a master plan including a map to show all the buried utility. The master plan would help to prioritize the improvements and identify design packages.

Project Need:
Project has been identified based on exceedance of life of key components.

Key Issues: Prior to investing large capital funding in underground piping replacement, a buried utility master plan should be developed.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 75,000
Total Budget: \$ 75,000

Capital Improvement Program – Project Description

Project No.: 15141
Project Name: Headworks Condition Assessment
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '21/'22
Project Status: Short Term Planning

Project Description: Project includes condition assessment of the Headworks system including the screens, unloading facility and classifiers.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: The headworks system installed in 1982, therefore might approach the nominal useful life.

Estimated Project Amount (in 2019 \$):

Condition Assessment:	\$	95,000
Total Budget:	\$	95,000

Capital Improvement Program – Project Description

Project No.: 15142
Project Name: Spatial Utilization Analysis
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '21/'22
Project Status: Short Term Planning

Project Description: Project includes conceptual study of the spatial utilization

Project Need: Project has been identified based on potential to utilize the space at CTP more efficiently

Key Issues: Prior to renovation of the Operations Building, a spatial utilization study would help to identify the needs for improvements.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 75,000
Total Budget: \$ 75,000

Capital Improvement Program – Project Description

Project No.: 15143
Project Name: RAS/WAS Pump Station Condition Assessment
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '22/'23
Project Status: Short Term Planning

Project Description: Project includes condition assessment of the RAS/WAS Pump Station

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: The RAS/WAS Pump Station was constructed in 1983, mechanical, electrical and structural components might be reaching the nominal useful life.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 75,000
Total Budget: \$ 75,000

Capital Improvement Program – Project Description

Project No.: 15144
Project Name: Standby Power Condition Assessment
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '23/'24
Project Status: Short Term Planning

Project Description: Project includes condition assessment of the standby power system including load sizing, load shedding and on-site fuel storage.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: The standby power system was installed in 1982, mechanical, electrical and structural components might be reaching the nominal useful life.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 65,000
Total Budget: \$ 65,000

Capital Improvement Program – Project Description

Project No.: 15145
Project Name: Export Sludge System Condition Assessment
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '26/'27
Project Status: Long Term Planning

Project Description: Project includes condition assessment of the Export Sludge System including the Export Sludge pumps, grinders and the Export Sludge Equalization Basin.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: The Export Sludge System was installed in 2012, and components might exceed the nominal useful life.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 85,000
Total Budget: \$ 85,000

Capital Improvement Program – Project Description

Project No.: 15146
Project Name: Primary Sedimentation System Condition Assessment
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '28/'29
Project Status: Long Term Planning

Project Description: Project includes condition assessment of the primary sedimentation system including covers, launders, sludge collection system and coating.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: The primary sedimentation system was installed in 2012, and components might exceed the nominal useful life.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 65,000
Total Budget: \$ 65,000

Capital Improvement Program – Project Description

Project No.: 15147
Project Name: Pavement and Surface Drainage Master Plan
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '24/'25
Project Status: LongTerm Planning

Project Description: Project includes conceptual study of the pavement and surface drainage system.

Project Need: Project has been identified based on the need to correct localized drainage issues.

Key Issues: Localized drainage issues should be correct to allow proper drainage during storm events.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 75,000
Total Budget: \$ 75,000

Capital Improvement Program – Project Description

Project No.: 15148
Project Name: Instrumentation Master Plan
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '25/'26
Project Status: Long Term Planning

Project Description: Project includes conceptual study of the instrumentation system including assessments of the PLC, PLC cabinets and PLC technology.

Project Need: Project has been identified based on the need to implement newer technology and potential for cost and energy savings on the instrumentation system.

Key Issues: Aging PLC, cabinets and instruments.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 75,000
Total Budget: \$ 75,000

Capital Improvement Program – Project Description

Project No.: 15149
Project Name: Site Storage Evaluation
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '20/'21
Project Status: Short Term Planning

Project Description: Project includes conceptual study of the site storage evaluation to identify if the current storage meets the function and capacity.

Project Need: Project has been identified to determine if the current storage meets the Operation's needs.

Key Issues: With all the project implementations, site storage functions might change or expand.

Estimated Project Amount (in 2019 \$):
Conceptual Study: \$ 50,000
Total Budget: \$ 50,000

Capital Improvement Program – Project Description

Project No.: 15150
Project Name: Washer/Compactor System
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '29/'30
Project Status: Long Term Planning



Project Description: Project includes installation of a washer/compactor system at the Headworks Building.

Project Need: Project has been identified based on providing operation an easier and cleaner way to handle the sludge.

Key Issues: Keeping the existing system running while installing the new system. In addition, space could be a potential issue.

Estimated Project Amount (in 2019 \$):

Design:	\$ 33,680
Construction:	\$ 336,804
Construction Support:	\$ 42,100
Total Budget:	\$ 412,585

Capital Improvement Program – Project Description

Project No.: 15713
Project Name: North Section Embankment Project
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '24/'25
Project Status: Long Term Planning

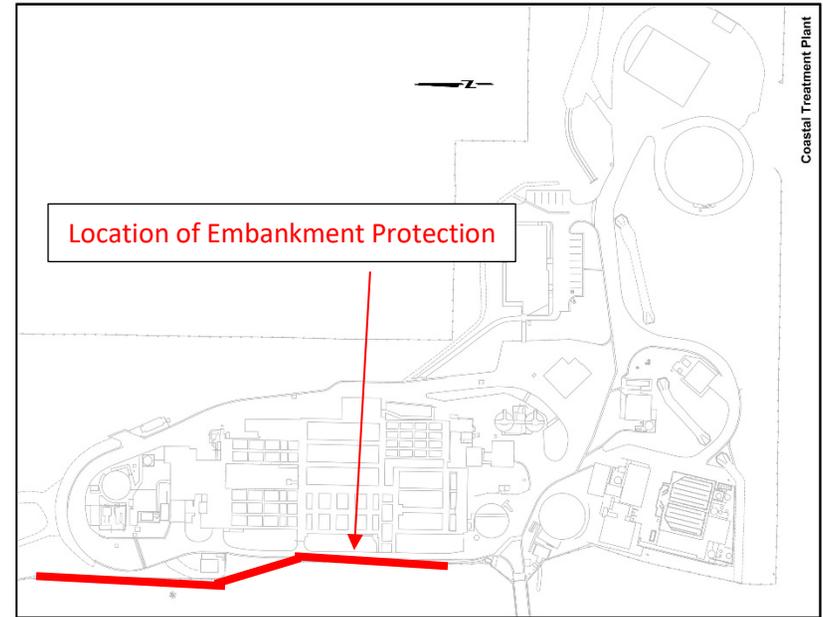
Project Description: Project involves installation of gabions for select sections between the north property line of the plant and the access bridge.

Project Need: The completion of the County's arrundo removal project in 2014 revealed the very sharp drop in the embankment slope from the west plant access road to Aliso Creek. This area has not been subject to the same degree of erosion as the area to the south of the access bridge. However, the area remains vulnerable to future erosion.

Key Issues: This project requires further evaluation regarding both need and scope. The cost estimate for the proposed project was based on extrapolation of the TetraTech work for the south section embankment.

Estimated Project Amount (in 2019 \$):

Permitting	\$ 97,780
Design:	\$ 65,187
Construction:	\$ 651,869
<u>Construction Support:</u>	<u>\$ 114,077</u>
Total Budget:	\$ 928,913



Capital Improvement Program – Project Description

Project No.: 15714
Project Name: Aliso Sulfur Creek Confluence Protection
Facility: Coastal Treatment Plant
Cost Center: PC 15
Anticipated Fiscal Year: '26/'27
Project Status: Long Term Planning

Project Description: Project involves protection of existing channel geometry against erosion by providing milder invert slope, reducing flow velocity, and combination of fill and riprap along banks to stabilize the confluence of Sulphur and Aliso Creeks.

Project Need: The steep existing banks appeared to lack stability and are likely to be subjected to slope failure if no remediation or improvement is provided. Stabilization is needed in order to protect the existing banks and overbank facilities including roadway, underground utilities, and culturally sensitive area against potential future erosion and bank failure.

Key Issues: This project requires further evaluation regarding both need and scope. The cost estimate for the proposed project was based on extrapolation of the TetraTech conceptual study for the stabilization of confluence of Sulphur and Aliso Creeks.

Note that the cost below represents 50% of the project cost; the remaining 50% would be allocated to Project Committee 21 Reach E.

Estimated Project Amount (in 2019 \$):

Permitting	\$ 138,582
Design:	\$ 92,388
Construction:	\$ 923,882
<u>Construction Support:</u>	<u>\$ 138,582</u>
Total Budget:	\$ 1,293,434



Capital Improvement Program – Project Description

Project No.: 15812
Project Name: AWT Filter Upgrade
Facility: Coastal Treatment Plant
Cost Center: PC 15 AWT
Anticipated Fiscal Year: '29/'30
Project Status: Long Term Planning

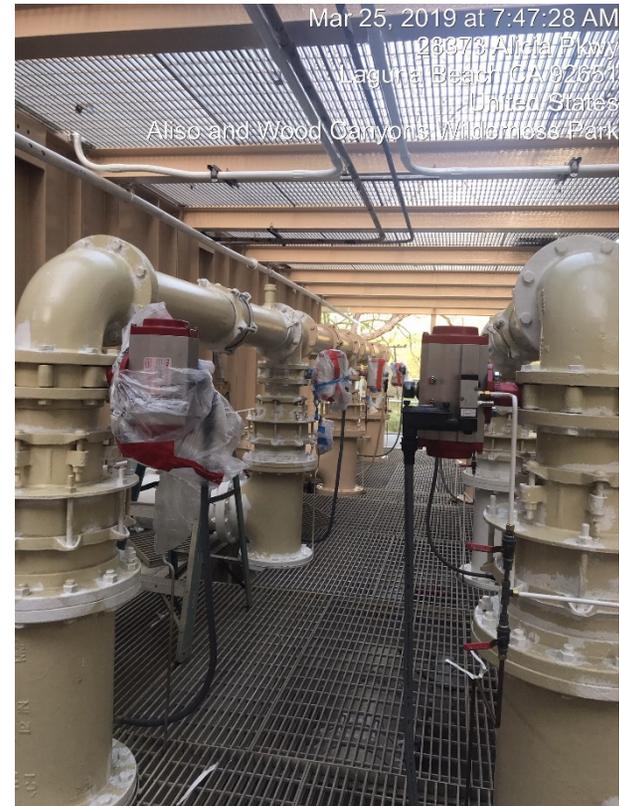
Project Description: Project includes replacement of the filter sand media and the filter valves (influent, effluent, backwash and backwash waste). Project also involves the repair and recoating of corrosion areas on the meta vessel if needed.

Project Need: The filters were last upgraded in 2019. The filter media is scheduled for replacement every 10 years.

Key Issues: The scheduling of the project needs to be arranged to minimize needed AWT production.

Estimated Project Amount (in 2019 \$):

Design:	\$ 43,307
Construction:	\$ 433,075
<u>Construction Support:</u>	<u>\$ 64,961</u>
Total Budget:	\$ 541,343



Capital Improvement Program – Project Description

Project No.: 15813
Project Name: AWT Building Modifications
Facility: Coastal Treatment Plant
Cost Center: PC 15 AWT
Anticipated Fiscal Year: '24/'25
Project Status: Long Term Planning

Project Description: Project includes removal of existing AWT building roof, door and frame replacement and AWT building roof replacement.

Project Need: Building doors have already shown the sign of deterioration. Project has been identified based on exceedance of life of key components.

Key Issues: The space utilization of the building should be considered before beginning this work. It may be desirable to expand the electrical room into the existing process room. Timing of project should be scheduled to minimize downtime of AWT operation.

Estimated Project Amount (in 2019 \$):
Design: \$ 17,470
Construction: \$ 174,703
Construction Support: \$ 26,205
Total Budget: \$ 218,378



Capital Improvement Program – Project Description

Project No.: 15815
Project Name: Effluent Equalization Basin Valve Replacement
Facility: Coastal Treatment Plant
Cost Center: PC 15 AWT
Anticipated Fiscal Year: '26/'27
Project Status: Long Term Planning

Project Description: This project would involve the replacement of three underground and one above ground valve that are used to isolate flow to and from the Effluent Equalization Basin.



Project Need: There is very little available documentation regarding the existing valves. Some of the valves date to the mid 1980's; some valves were installed at an earlier date. The as-built documentation is very poor.

Key Issues: This project would involve a complicated scheme to bypass effluent flow while the work is being performed. A conceptual analysis should be performed as early as possible to confirm scope and cost.

Estimated Project Amount (in 2019 \$):

Conceptual Study:	\$ 60,000
Design:	\$ 60,000
Construction:	\$ 681,000
<u>Construction Support:</u>	<u>\$ 90,000</u>
Total Budget:	\$ 810,000

Capital Improvement Program – Project Description

Project No.: 15816
Project Name: AWT Sodium Hypochlorite Pumps Replacement
Facility: Coastal Treatment Plant
Cost Center: PC 15 AWT
Anticipated Fiscal Year: '33/'34
Project Status: Long Term Planning



Project Description: Project includes removal of the existing AWT Hypochlorite pumps and install new Hypochlorite pumps.

Project Need: New chemical feed pumps have been recently installed. The experience at SOCWA facilities is that a Sodium Hypochlorite pump has a life of approximately 15 years.

Key Issues: Chemical feed pump technology is evolving, the type of pump for replacement should be reviewed in the future. The goal of the replacement is to keep the AWT running during the replacement.

Estimated Project Amount (in 2019 \$):

Design:	\$ 10,863
Construction:	\$ 217,249
<u>Construction Support:</u>	<u>\$ 32,588</u>
Total Budget:	\$ 260,700

Capital Improvement Program – Project Description

Project No.: 15817
Project Name: AWT Instrumentation
Facility: Coastal Treatment Plant
Cost Center: PC 15 AWT
Anticipated Fiscal Year: '26/'27
Project Status: Long Term Planning

Project Description: Project includes replacement of three chlorine residual analyzers, two turbidimeters and three level sensors associated with AWT system. The project also includes the replacement of the backwash control valve and meter.



Project Need: This project has been identified as the equipment will have reached the end of its' anticipated lives.

Key Issues: Water quality instrumentation has undergone significant evolutions in recent years. This equipment should be researched with the SOCWA Operations and Environmental Compliance Departments prior to finalizing the scope and cost for this project.

Estimated Project Amount (in 2019 \$):

Design:	\$ 18,886
Construction:	\$ 377,714
<u>Construction Support:</u>	<u>\$ 56,658</u>
Total Budget:	\$ 453,258

Capital Improvement Program – Project Description

Project No.: 15818
Project Name: Contact Basin Gates Replacement
Facility: Coastal Treatment Plant
Cost Center: PC 15 AWT
Anticipated Fiscal Year: '21/'22
Project Status: Short Term Planning

Project Description: Each contact basin has two sluice gates and two drain gates. Project includes replacement of the contact basins sluice gates and drain gates.

Project Need: Project has been identified based on exceedance of life of key components. The guiderails for the slide gates are showing signs of corrosion.

Key Issues: Construction work should be planned during winter months when one chlorine contact basin can be taken out of service at a time due to low AWT demand.

Estimated Project Amount (in 2019 \$):
Design: \$ 17,632
Construction: \$ 176,325
Construction Support: \$ 26,448
Total Budget: \$ 220,405



Capital Improvement Program – Project Description

Project No.: 15819
Project Name: AWT Support Equipment Replacement
Facility: Coastal Treatment Plant
Cost Center: PC 15 AWT
Anticipated Fiscal Year: '29/'30
Project Status: Long Term Planning



Project Description: Project includes removal of the existing AWT flocculators, installation of new flocculators, chem clean system, mechanical system, and chlorine mixers.

Project Need: Project has been identified based on exceedance of life of key components.

Key Issues: Note that Operations staff has not typically operated flocculators. This system is maintained to comply with the Operating permit. Timing of project should be scheduled to minimize downtime of AWT operation.

Estimated Project Amount (in 2019 \$):

Design:	\$ 60,691
Construction:	\$ 606,905
<u>Construction Support:</u>	<u>\$ 91,036</u>
Total Budget:	\$ 758,631

Capital Improvement Program – Project Description

Project No.: 15821
Project Name: AWT Buried Piping Replacement
Facility: Coastal Treatment Plant
Cost Center: PC 15 AWT
Anticipated Fiscal Year: '29/'30
Project Status: Long Term Planning

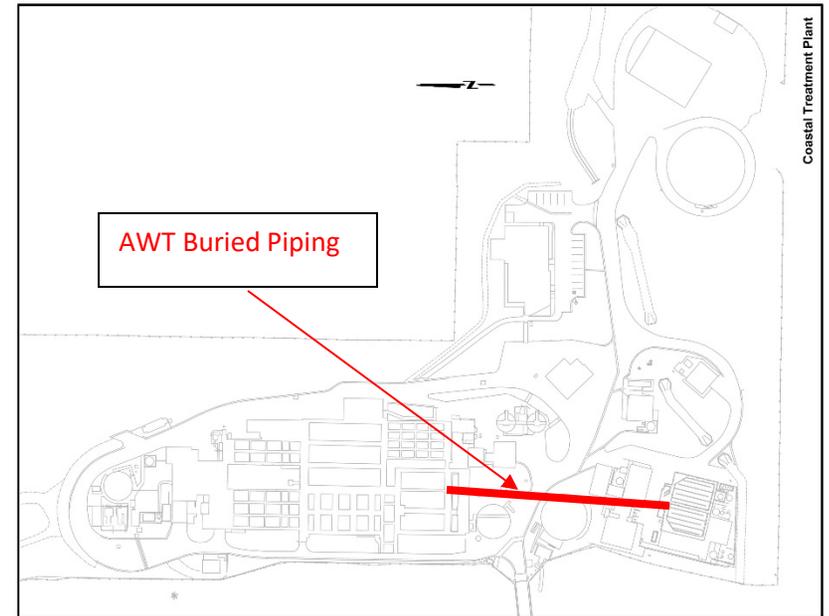
Project Description: Project includes site work and replacement of effluent, backwash waste, reclaimed, non-potable, filter supply, tertiary effluent and drain piping. Note that this project does not include replacement of the pipe from the recycled water pumps to the SCWD reclaimed water storage tank.

Project Need: No problems have been identified with the existing buried piping. The life of the key piping components will not be exceeded during the 15-year span of this edition of the Ten Year Plan. The replacement of piping has been included based on buried piping failure at other SOCWA facilities.

Key Issues: Identify pipe routing and sequencing to minimize AWT downtime.

Estimated Project Amount (in 2019 \$):

Design:	\$ 82,488
Construction:	\$ 824,856
<u>Construction Support:</u>	<u>\$ 103,130</u>
Total Budget:	\$ 1,010,474



Appendix H
Coastal Treatment Plant Proposed Project Cost Tables

Coastal Treatment Plant

Project Number 15101

Grit Handling Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Demolition of Existing Pump	1	LS	\$	-		\$	10,000	\$	10,000		
	Installation of Grit Pump	3	LS	\$	22,000	\$	66,000	25%	\$	16,500	\$	82,500
	Demolition of Existing Grit Classifier	1	LS	\$	-		\$	10,000		\$	10,000	
	Installation of Grit Classifier	3	LS	\$	60,000	\$	180,000	25%	\$	45,000	\$	225,000
	Misc. Piping and Valves	1	LS							\$	50,000	
										\$	377,500	

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 101,925

Shipping Rate

0% included

Sale Tax

8.00% \$ 19,680

Project Contingency@

30% \$ 149,732

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	648,837
Current Estimate	2019 Dollars	\$	648,837

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 64,884	0%	\$ -	\$ 64,884
Engr. During Construction	7.5%	\$ 48,663	0%	\$ -	\$ 48,663
Construction Mgt.	5.0%	\$ 32,442	0%	\$ -	\$ 32,442
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

\$ 81,105

Total Project Cost (Present Value in 2019 Dollars)

\$ 794,825

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15102

Odor Control System Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Odor Control System	1	LS	\$ 515,000	\$ 515,000	-	\$ 232,500	\$ 747,500
	Booster Fans and Ductwork	1	LS	\$ 425,750	\$ 425,750	-	\$ 195,375	\$ 621,125
	Supply Air System	1	LS	\$ 38,000	\$ 38,000	-	\$ 19,000	\$ 57,000
	Demolition of Structural Pad	1	LS	\$ -	\$ -	-	\$ -	\$ 20,000
	Temporary Odor Control System	1	LS	\$ -	\$ -	-	\$ -	\$ 75,000
	Structural Pad	1	LS	\$ 20,000	\$ 20,000	25%	\$ 5,000	\$ 25,000
	Coating of Structural Pad	1	LS	\$ 10,000	\$ 10,000	50%	\$ 5,000	\$ 15,000
	Power Supply	1	LS	\$ 15,000	\$ 15,000	50%	\$ 7,500	\$ 22,500
	Instrumentation Connection	1	LS	\$ 5,000	\$ 5,000	100%	\$ 5,000	\$ 10,000
				\$ -	\$ -		\$ -	\$ -

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%	\$ 430,144
Shipping Rate	0%	included
Sale Tax	8.00%	\$ 82,300
Project Contingency@	25%	\$ 526,392

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 2,631,961
Current Estimate	2019 Dollars	\$ 2,631,961

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 65,799	0%	\$ -	\$ 65,799
Design	10.0%	\$ 263,196	0%	\$ -	\$ 263,196
Engr. During Construction	5.0%	\$ 131,598	0%	\$ -	\$ 131,598
Construction Mgt.	5.0%	\$ 131,598	0%	\$ -	\$ 131,598
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)		\$ 3,224,152
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Notes:

1 Odor Control System, Booster Fans and Supply Air System Based on DHK Engineers evaluation (4/17)

Coastal Treatment Plant

Project Number 15103

Auxiliary Blower and Maint Building Roofs

Main Project Type

Key Dates

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Initial Estimate May-17
 Estimate Update Jul-19
 Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost¹

Remove Aux Blower Building Existing Roof System	1	LS				\$ 5,805	\$ 5,805
Hazardous Material Removal	1	LS				\$ 16,850	\$ 16,850
Original Blower Building Roof Replacement	1	LS	\$ 23,000	\$ 23,000	25%	\$ 5,750	\$ 28,750
Remove Maintenance Building Roof System	1	LS		\$ -		\$ 3,200	\$ 3,200
Hazardous Material Removal	1	LS		\$ -		\$ 12,700	\$ 12,700
Maintenance Building Roof Placement	1	LS	\$ 5,600	\$ 5,600	25%	\$ 1,400	\$ 7,000
Subtotal							\$ 74,305

Subtotal

General Conditions. Contractor Overhead and Profit,
 and Bonds and Insurance @

Shipping Rate	27%						\$ 20,062
Sale Tax	0%						included
Project Contingency@	8.00%						\$ 2,288
	30%						\$ 28,997

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ 125,652
Updated Estimate	2019 Dollars						\$ 125,652

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	15.0%	\$ 18,848	0%	\$ -	\$ 18,848
Engr. During Construction	5.0%	\$ 6,283	0%	\$ -	\$ 6,283
Construction Mgt.	5.0%	\$ 6,283	0%	\$ -	\$ 6,283
Total Project Cost (Present Value in 2019 Dollars)					\$ 157,065

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15104

DAF System Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	DAFT Structural ¹	1	LS	\$ 165,000	\$ 165,000	25%	\$ 41,250	\$ 206,250
	DAFT Collector Recoating ²	1	LS		\$ -		\$ -	\$ 150,000
	DAFT Compressor and Piping ¹	1	LS	\$ 11,000	\$ 11,000	25%	\$ 2,750	\$ 13,750
	DAFT Dissolution Tank ¹	1	LS	\$ 29,000	\$ 29,000	25%	\$ 7,250	\$ 36,250
	DAFT TWAS Pumps ¹	1	LS	\$ 35,000	\$ 34,000	25%	\$ 8,500	\$ 42,500
	DAFT Recirculation Pumps ¹	1	LS	\$ 52,500	\$ 52,500	25%	\$ 13,125	\$ 65,625
	DAFT Drain Pump ¹	1	LS	\$ 25,000	\$ 25,000	25%	\$ 6,250	\$ 31,250
	DAFT Piping	1	LS	\$ -	\$ -	0%	\$ -	\$ 75,000
	DAFT Flow Meter ¹	1	LS	\$ 9,500	\$ 9,500	25%	\$ 2,375	\$ 11,875
	TWAS Flow Meter ¹	1	LS	\$ 7,000	\$ 7,000	25%	\$ 1,750	\$ 8,750
	DAFT Electrical	1	LS	\$ -	\$ -	0%	\$ -	\$ 50,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$ 186,638
Shipping Rate	0%	included	
Sale Tax	8.00%		\$ 26,640
Project Contingency@	25%		\$ 226,132

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 1,130,659
Updated Estimate	2019 Dollars	\$ 1,130,659

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	5.0%	\$ 56,533	0%	\$ -	\$ 56,533
Engr. During Construction	5.0%	\$ 56,533	0%	\$ -	\$ 56,533
Construction Mgt.	5.0%	\$ 56,533	0%	\$ -	\$ 56,533
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 1,300,258

Notes:

- 1 Cost estimate provided by Hazen & Sawyer
- 2 Cost estimate based on recoating of DAF collector mechanisms at RTP in 2015.

Coastal Treatment Plant

Project Number 15105

Headworks Rotary Screen Drum Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Drum Replacement ¹	3	EA	\$ 58,236	\$ 174,708	25%	\$ 43,677	\$ 218,385
	Miscellaneous Piping /Valves	1	LS	\$ 25,000	\$ 25,000	25%	\$ 6,250	\$ 31,250
	Miscellaneous Structural Rep.	1	LS	\$ 5,000	\$ 5,000	100%	\$ 5,000	\$ 10,000
	Miscellaneous Electrical	1	LS	\$ 10,000	\$ 10,000	25%	\$ 2,500	\$ 12,500
	Level Instrumentation	3	EA	\$ 5,000	\$ 15,000	25%	\$ 3,750	\$ 18,750
					\$ 229,708			

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ 78,539
Shipping Rate	0%					included	
Sale Tax	8.00%						\$ 18,377
Project Contingency@	30%						\$ 116,340

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ 504,141
Current Estimate	2019 Dollars						\$ 504,141

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 50,414	0%	\$ -	\$ 50,414
Engr. During Construction	10.0%	\$ 50,414	0%	\$ -	\$ 50,414
Construction Mgt.	5.0%	\$ 25,207	0%	\$ -	\$ 25,207
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)					\$ 630,176
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Notes:

1 Drum replacement cost based on estimate provided by the Coombs Hopkins Company

Coastal Treatment Plant

Project Number 15106

DAF Polymer System & DAF Bldg Repair

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19
 Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	DAFT Polymer Storage Tank and Mixer	1	LS	\$ 30,000	\$ 30,000	25%	\$ 7,500	\$ 37,500
	DAFT Polymer Metering and Transfer Pump	1	LS	\$ 10,000	\$ 10,000	25%	\$ 2,500	\$ 12,500
	DAFT Polymer Piping and Valves	1	LS	\$ -	\$ -	0%	\$ -	\$ 75,000
	DAF Polymer Bldg Doors (3)	1	LS	-	-	-	-	\$ 30,000
	DAF Polymer Bldg Mechanical	1	LS	-	-	-	-	\$ 30,000
	DAFT Polymer Electrical	1	LS	\$ -	\$ -	0%	\$ -	\$ 7,500
Subtotal								\$ 192,500

General Conditions. Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 51,975

Shipping Rate

0% included

Sale Tax

8.00% \$ 3,200

Project Contingency@

30% \$ 74,303

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 321,978
Updated Estimate	2019 Dollars	\$ 321,978

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 32,198	0%	\$ -	\$ 32,198
Engr. During Construction	10.0%	\$ 32,198	0%	\$ -	\$ 32,198
Construction Mgt.	5.0%	\$ 16,099	0%	\$ -	\$ 16,099
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 402,472

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15108

Scum Pump Station and Wetwell

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Scum Wetwell	1	LS	\$ 22,000	\$ 22,000	25%	\$ 5,500	\$ 27,500
	Scum Pump	1	LS	\$ 15,000	\$ 15,000	25%	\$ 3,750	\$ 18,750
	Scum Mechanical	1	LS	\$ 21,000	\$ 21,000	25%	\$ 5,250	\$ 26,250
	Scum Electrical	1	LS	\$ 2,800	\$ 2,800	25%	\$ 700	\$ 3,500
	Miscellaneous Repair	1	LS		\$ -		\$ -	\$ 50,000

Subtotal

General Conditions. Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 34,020

Shipping Rate

0% included

Sale Tax

8.00% \$ 4,864

Project Contingency@

30% \$ 49,465

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 214,349
Updated Estimate	2019 Dollars	\$ 214,349

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 21,435	0%	\$ -	\$ 21,435
Engr. During Construction	10.0%	\$ 21,435	0%	\$ -	\$ 21,435
Construction Mgt.	5.0%	\$ 10,717	0%	\$ -	\$ 10,717
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 267,937

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15110

Potable Water Pump Station

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate	May-17
Estimate Update	Jul-19
Const. Year	
Prepared By	BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Potable PS Relocated	1	LS	-	-	-	-	\$ 350,000
					\$ -		\$ -	\$ -
Subtotal								\$ 350,000

General Conditions, Contractor Overhead and Profit,
and Bonds and Insurance @

0% included

Shipping Rate

0% included

Sale Tax

0% included

Project Contingency@

30% \$ 105,000.00

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 455,000.00
Current Estimate	2019 Dollars	\$ 455,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 22,750	0%	\$ -	\$ 22,750
Design	10.0%	\$ 45,500	0%	\$ -	\$ 45,500
Engr. During Construction	10.0%	\$ 45,500	0%	\$ -	\$ 45,500
Construction Mgt.	5.0%	\$ 22,750	0%	\$ -	\$ 22,750
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 591,500

Notes:

1 Cost Estimate Developed by TetraTech

Coastal Treatment Plant

Project Number 15111

Non-Potable Water Pump Station

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19
 Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Non-Potable PS	1	LS	-	-	-	-	\$ 200,000
					\$ -		\$ -	\$ -
Subtotal								\$ 200,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @ 0% included
 Shipping Rate 0% included
 Sale Tax 0% included
 Project Contingency@ 30% 60,000

Total Main Project Cost (Year of Estimate or Estimate Update)		
Original Estimate	2019 Dollars	260,000
Current Estimate	2019 Dollars	\$ 260,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 13,000	0%	\$ -	\$ 13,000
Design	8.0%	\$ 20,800	0%	\$ -	\$ 20,800
Engr. During Construction	10.0%	\$ 26,000	0%	\$ -	\$ 26,000
Construction Mgt.	5.0%	\$ 13,000	0%	\$ -	\$ 13,000
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 332,800

Notes:

1 Cost Estimate Developed by TetraTech

Coastal Treatment Plant

Project Number 15112

West Primary Sedimentation System Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹	Primary Clarifier Sludge Collector (Chain and Flight)	1	LS	\$ 200,000	\$ 200,000	25%	\$ 50,000 \$ 250,000
	Primary Clarifier Scum Collector and Drive	1	LS	\$ 140,000	\$ 140,000	25%	\$ 35,000 \$ 175,000
	Primary Clarifier Weir	1	LS	\$ 41,000	\$ 41,000	25%	\$ 10,250 \$ 51,250
	Primary Clarifier Electrical	1	LS	\$ 7,500	\$ 7,500	25%	\$ 1,875 \$ 9,375
Subtotal							\$ 485,625
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @				27%			\$ 131,119
Shipping Rate				0%		included	
Sale Tax				8.00%			\$ 31,080
Project Contingency@				30%			\$ 194,347
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 842,171
Current Estimate	2019 Dollars						\$ 842,171

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 84,217	0%	\$ -	\$ 84,217
Engr. During Construction	7.5%	\$ 63,163	0%	\$ -	\$ 63,163
Construction Mgt.	5.0%	\$ 42,109	0%	\$ -	\$ 42,109
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 1,031,659

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15113

Pave Road System

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹	Asphalt Pavement	1	LS	\$	-	\$	- \$ 75,000
Subtotal							\$ 75,000
General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @		27%					included
Shipping Rate		0%					included
Sale Tax		8.00%					\$ -
Project Contingency@		30%					\$ 22,500
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 97,500
Current Estimate	2019 Dollars						\$ 97,500

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	10.0%	\$ 9,750	0%	\$ -	\$ 9,750
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 9,750	0%	\$ -	\$ 9,750
Engr. During Construction	10.0%	\$ 9,750	0%	\$ -	\$ 9,750
Construction Mgt.	5.0%	\$ 4,875	0%	\$ -	\$ 4,875
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 131,625

Notes:

1 Cost estimate derived from 2003 Study by TetraTech.

Coastal Treatment Plant

Project Number 15114

East Primary Sedimentation System Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹	1	LS	\$ 130,000	\$ 130,000	25%	\$ 32,500	\$ 162,500
	1	LS	\$ 92,000	\$ 92,000	25%	\$ 23,000	\$ 115,000
	1	LS	\$ 28,000	\$ 28,000	25%	\$ 7,000	\$ 35,000
	1	LS	\$ 5,000	\$ 5,000	25%	\$ 1,250	\$ 6,250
Subtotal							\$ 318,750
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 86,063
Shipping Rate		0%				included	
Sale Tax		8.00%					\$ 20,400
Project Contingency@		30%					\$ 127,564
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 552,776
Current Estimate	2019 Dollars						\$ 552,776

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 55,278	0%	\$ -	\$ 55,278
Engr. During Construction	7.5%	\$ 41,458	0%	\$ -	\$ 41,458
Construction Mgt.	5.0%	\$ 27,639	0%	\$ -	\$ 27,639
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 677,151

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15115

RAS and WAS Pump Stations

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19
 Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Construction of RAS Pump Station ¹	1	LS					\$ 800,000
Replacement of Doors (2) ²	1	LS					\$ 21,000
Replacement of Monorail Crane	1	LS					\$ 50,000
Construction of WAS Pump Station ¹	1	LS					\$ 700,000
Subtotal							\$ 1,571,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%						\$ -
Shipping Rate	0%						included
Sale Tax	8.00%						\$ -
Project Contingency@	20%						\$ 314,200

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ 1,885,200
Current Estimate	2019 Dollars						\$ 1,885,200

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 188,520	0%	\$ -	\$ 188,520
Engr. During Construction	5.0%	\$ 94,260	0%	\$ -	\$ 94,260
Construction Mgt.	5.0%	\$ 94,260	0%	\$ -	\$ 94,260
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 2,262,240

Notes:

- 1 Cost estimate provided by Tetra Tech
- 2 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15116

Primary Sludge Pump System Design

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Demolition of Existing System	1	LS	\$	-	25%	\$	30,000	\$	30,000
	East Primary Sludge Pump and Piping	1	LS	\$ 67,000	\$ 67,000	25%	\$	16,750	\$	83,750
	East Primary Sludge Removal Valve and Actuator	1	LS	\$ 72,000	\$ 72,000	25%	\$	18,000	\$	90,000
	East Primary Sludge Flow Meter	1	LS	\$ 7,000	\$ 7,000	25%	\$	1,750	\$	8,750
	West Primary Sludge Pump and Piping	1	LS	\$ 68,000	\$ 68,000	25%	\$	17,000	\$	85,000
	West Primary Sludge Removal Valve and Actuator	1	LS	\$ 50,000	\$ 50,000	25%	\$	12,500	\$	62,500
	West Primary Sludge Flow Meter	1	LS	\$ 9,500	\$ 9,500	25%	\$	2,375	\$	11,875
	Pumps Power and Controls	1	LS	\$ 45,000	\$ 45,000	25%	\$	11,250	\$	56,250
Subtotal									\$	428,125

General Conditions. Contractor Overhead and Profit,

and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

0.00% \$ -

Project Contingency@

30% \$ 128,438

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	556,563
Current Estimate	2019 Dollars	\$	556,563

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 55,656	0%	\$ -	\$ 55,656
Engr. During Construction	7.5%	\$ 41,742	0%	\$ -	\$ 41,742
Construction Mgt.	5.0%	\$ 27,828	0%	\$ -	\$ 27,828
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 681,789

Notes:

1 Cost estimate came from CTP Primary Treatment Upgrade Phase I Bids (2009)

Coastal Treatment Plant

Project Number 15117

SCADA System Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	PLC's ¹	7	EA	-	-	-	-	\$ 630,000
	Fiber Optic System ²	1	LS	-	-	-	-	\$ 95,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%							\$ -
Shipping Rate	0%							included
Sale Tax	8.00%							\$ -
Project Contingency@	35%							\$ 253,750

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 978,750
Current Estimate	2019 Dollars							\$ 978,750

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	5.0%	\$ 48,938	0%	\$ -	\$ 48,938
Conceptual Study	5.0%	\$ 48,938	0%	\$ -	\$ 48,938
Design	10.0%	\$ 97,875	0%	\$ -	\$ 97,875
Engr. During Construction	7.5%	\$ 73,406	0%	\$ -	\$ 73,406
Construction Mgt.	5.0%	\$ 48,938	0%	\$ -	\$ 48,938
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 20197 Dollars)					\$ 1,296,844

Notes:

- 1 Replacement of seven PLC's and cabinets. Costs based on cost of new PLCs and cabinets for the JBLTP Package A/C Facility Improvement Project.
- 2 Includes replacement of fiber optic and fiber optic patch panels; assumes use of existing conduit.
- 3 High contingency based on uncertainties including location of new panels and demolition of existing panels.

Coastal Treatment Plant

Project Number 15118

Aeration Tank Gates

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	West Influent Gate	4	EA	\$ 28,000	\$ 112,000	40%	\$ 44,800	\$ 156,800
	West Effluent Gate	4	EA	\$ 24,000	\$ 96,000	40%	\$ 38,400	\$ 134,400
	East Influent/Effluent Gate	12	EA	\$ 26,000	\$ 312,000	40%	\$ 124,800	\$ 436,800

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 728,000
Shipping Rate	0%							\$ 196,560
Sale Tax	8.00%							included
Project Contingency@	25%							\$ 41,600
								\$ 241,540

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 1,207,700
Current Estimate	2019 Dollars							\$ 1,207,700

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 120,770	0%	\$ -	\$ 120,770
Engr. During Construction	5.0%	\$ 60,385	0%	\$ -	\$ 60,385
Construction Mgt.	5.0%	\$ 60,385	0%	\$ -	\$ 60,385
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)					\$ 1,449,240
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Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15119

Maintenance Building

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
New Benchwork	1	LS	\$	-		\$	60,000
Monorail System	1	LS	\$	-		\$	75,000
HVAC/Plumbing	1	LS	\$	-		\$	30,000
Replace Doors and Frames (3) ¹	1	LS	\$	-		\$	30,000
Replace Windows (2) ¹	1	LS	\$	-		\$	22,000
Electrical	1	LS	\$	-		\$	35,000
Remove Maintenance Shop Roof ¹	1	LS	\$	-		\$ 5,805	\$ 5,805
Hazardous Material Removal ¹	1	LS	\$	-		\$ 16,850	\$ 16,850
Maintenance Shop Roof Replacement ¹	1	LS	\$ 11,500	\$ 11,500	25%	\$ 2,875	\$ 14,375
Subtotal							\$ 289,030
General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 78,038
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 920
Project Contingency@		30%					\$ 110,396
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 478,385
Current Estimate	2019 Dollars						\$ 478,385

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	10.0%	\$ 47,838	0%	\$ -	\$ 47,838
Design	10.0%	\$ 47,838	0%	\$ -	\$ 47,838
Engr. During Construction	10.0%	\$ 47,838	0%	\$ -	\$ 47,838
Construction Mgt.	5.0%	\$ 23,919	0%	\$ -	\$ 23,919
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2017 Dollars)					\$ 645,819

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15120

RAS Hypochlorite Pumps

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹							
Remove existing RAS Hypochlorite Pumps	1	LS	\$ -	\$ -		\$ 10,000	\$ 10,000
Install new RAS Hypochlorite pumps	2	LS	\$ 20,000	\$ 40,000	25%	\$ 10,000	\$ 50,000
Subtotal							\$ 60,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @			0%				\$ -
Shipping Rate			0%				included
Sale Tax			0.00%				\$ -
Project Contingency@			30%				\$ 18,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 78,000
Current Estimate	2019 Dollars						\$ 78,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 7,800	0%	\$ -	\$ 7,800
Engr. During Construction	10.0%	\$ 7,800	0%	\$ -	\$ 7,800
Construction Mgt.	5.0%	\$ 3,900	0%	\$ -	\$ 3,900
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 97,500

Notes:

1 Cost estimate based on bids from CTP Miscellaneous Improvements 2015

Coastal Treatment Plant

Project Number 15121

Auxilliary Blower Building Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19
 Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Replace Sound Louver ¹	1	LS		\$ -			\$ 28,500
Replace Blowers	2	EA	\$ 30,000	\$ 60,000	50%	\$ 15,000	\$ 75,000
Replace Compressors	2	EA	\$ 20,000	\$ 40,000	50%	\$ 10,000	\$ 50,000
Replace Doors and Frames (5) ¹	1	LS		\$ -			\$ 52,000
Replace Windows (1) ¹	1	LS		\$ -			\$ 11,000
Electrical	1	LS		\$ -			\$ 35,000
Mechanical Upgrade	1	LS	-	-	-	-	\$ 30,000

Subtotal

General Conditions, Contractor Overhead and Profit,
and Bonds and Insurance @

27% \$ 76,005

Shipping Rate

0% included

Sale Tax

8.00% \$ 8,000

Project Contingency@

40% \$ 146,202

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 511,707
Current Estimate	2019 Dollars	\$ 511,707

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	10.0%	\$ 51,171	0%	\$ -	\$ 51,171
Design	10.0%	\$ 51,171	0%	\$ -	\$ 51,171
Engr. During Construction	10.0%	\$ 51,171	0%	\$ -	\$ 51,171
Construction Mgt.	5.0%	\$ 25,585	0%	\$ -	\$ 25,585
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 690,804

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant 15122
 Project Number

West Corridor Piping Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	May-17
Estimate Update	Jul-19
Prepared By	RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Site Work	1	LS	\$	-	\$	64,158	\$	64,158
	8-Inch Drain	1	LS	\$	32,500	\$	32,500	25%	\$ 8,125 \$ 40,625
	Site Work	1	LS			\$	206,746		\$ 206,746
	20-Inch FM	1	LS	\$	222,000	\$	222,000	25%	\$ 55,500 \$ 277,500
	Site Work	1	LS			\$	136,951		\$ 136,951
	6-Inch NPW	1	LS	\$	44,000	\$	44,000	25%	\$ 11,000 \$ 55,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$	210,865
Shipping Rate	0%								included
Sale Tax	8.00%							\$	23,880
Project Contingency@	25%							\$	253,931

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	1,269,656
Current Estimate	2019 Dollars	\$	1,269,656

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	10.0%	\$ 126,966	0%	\$ -	\$ 126,966
Design	10.0%	\$ 126,966	0%	\$ -	\$ 126,966
Engr. During Construction	5.0%	\$ 63,483	0%	\$ -	\$ 63,483
Construction Mgt.	5.0%	\$ 63,483	0%	\$ -	\$ 63,483
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)	\$ 1,650,552
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Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15123

Piping between RAS/WAS Pump Station to AWT

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost¹

Site Work	1	LS					\$ 11,758	\$ 11,758
6-Inch Primary Sludge	1	LS	\$ 6,500	\$ 6,500	25%	\$ 1,625	\$ 8,125	\$ 8,125
Site Work	1	LS				\$ 13,180	\$ 13,180	\$ 13,180
4-inch WAS	1	LS	\$ 8,000	\$ 8,000	25%	\$ 2,000	\$ 10,000	\$ 10,000
Subtotal							\$ 43,063	\$ 43,063

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 11,627

Shipping Rate

0% included

Sale Tax

8.00% \$ 1,160

Project Contingency@

40% \$ 22,340

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 78,190
Current Estimate	2019 Dollars	\$ 78,190

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	10.0%	\$ 7,819	0%	\$ -	\$ 7,819
Design	10.0%	\$ 7,819	0%	\$ -	\$ 7,819
Engr. During Construction	10.0%	\$ 7,819	0%	\$ -	\$ 7,819
Construction Mgt.	5.0%	\$ 3,910	0%	\$ -	\$ 3,910
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 105,557

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15124

Piping from DAF to Headworks in the Middle of the Plant

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost¹

Site Work	1	LS					\$ 59,094	\$ 59,094
6-Inch LLP Air	1	LS	\$ 46,500	\$ 46,500	25%	\$ 11,625	\$ 11,625	\$ 58,125
Site Work	1	LS		\$ -		\$ 115,301	\$ 115,301	\$ 115,301
6-Inch Drain	1	LS	\$ 40,700	\$ 40,700	25%	\$ 10,175	\$ 10,175	\$ 50,875
Site Work	1	LS				\$ 3,225	\$ 3,225	\$ 3,225
3-Inch Drain	1	LS	\$ 2,100	\$ 2,100	25%	\$ 525	\$ 525	\$ 2,625
Site Work	1	LS				\$ 26,430	\$ 26,430	\$ 26,430
6-Inch MLSS	1	LS	\$ 12,800	\$ 12,800	25%	\$ 3,200	\$ 3,200	\$ 16,000
Site Work	1	LS				\$ 25,362	\$ 25,362	\$ 25,362
4-Inch Scum	1	LS	\$ 11,000	\$ 11,000	25%	\$ 2,750	\$ 2,750	\$ 13,750
Site Work	1	LS				\$ 26,397	\$ 26,397	\$ 26,397
6-Inch Scum	1	LS	\$ 12,000	\$ 12,000	25%	\$ 3,000	\$ 3,000	\$ 15,000
Site Work	1	LS				\$ 66,116	\$ 66,116	\$ 66,116
4-Inch Primary Sludge	1	LS	\$ 16,500	\$ 16,500	25%	\$ 4,125	\$ 4,125	\$ 20,625
Site Work	1	LS				\$ 49,705	\$ 49,705	\$ 49,705
4-Inch Drain	1	LS	\$ 10,000	\$ 10,000	25%	\$ 2,500	\$ 2,500	\$ 12,500
Site Work	1	LS				\$ 1,096	\$ 1,096	\$ 1,096
4-Inch Sludge	1	LS	\$ 3,100	\$ 3,100	25%	\$ 775	\$ 775	\$ 3,875
Site Work	1	LS				\$ 12,357	\$ 12,357	\$ 12,357
6-Inch Primary Sludge	1	LS	\$ 6,500	\$ 6,500	25%	\$ 1,625	\$ 1,625	\$ 8,125
Site Work	1	LS		\$ -		\$ 52,274	\$ 52,274	\$ 52,274
10-inch RAS	1	LS	\$ 18,500	\$ 18,500	25%	\$ 4,625	\$ 4,625	\$ 23,125
Site Work	1	LS				\$ 28,189	\$ 28,189	\$ 28,189
8-inch RAS	1	LS	\$ 2,100	\$ 2,100	25%	\$ 525	\$ 525	\$ 2,625
Site Work	1	LS				\$ 28,913	\$ 28,913	\$ 28,913
16-inch RAS	1	LS	\$ 26,500	\$ 26,500	25%	\$ 6,625	\$ 6,625	\$ 33,125
Site Work	1	LS				\$ 8,186	\$ 8,186	\$ 8,186
12-inch RAS	1	LS	\$ 40,000	\$ 40,000	25%	\$ 10,000	\$ 10,000	\$ 50,000
Site Work	1	LS				\$ 13,180	\$ 13,180	\$ 13,180
4-inch WAS	1	LS	\$ 8,000	\$ 8,000	25%	\$ 2,000	\$ 2,000	\$ 10,000
Subtotal								\$ 836,200

Subtotal

General Conditions, Contractor Overhead and Profit,

and Bonds and Insurance @

27%

\$ 225,774

Shipping Rate

0%

included

Sale Tax

8.00%

\$ 20,504

Project Contingency@

25%

\$ 270,620

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 1,353,098
Current Estimate	2019 Dollars	\$ 1,353,098

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 67,655	0%	\$ -	\$ 67,655
Design	10.0%	\$ 135,310	0%	\$ -	\$ 135,310
Engr. During Construction	5.0%	\$ 67,655	0%	\$ -	\$ 67,655
Construction Mgt.	5.0%	\$ 67,655	0%	\$ -	\$ 67,655
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 1,691,372

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15125

Vehicle Storage Building Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Demolition and Dismantling	1	LS		\$	-		\$	10,000	\$	10,000	
	Structural System Installation	1	LS	\$	8,000	\$	8,000	25%	\$	2,000	\$	10,000
	Guardrail	1	LS	\$	6,000	\$	6,000	25%	\$	1,500	\$	7,500

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 7,425

Shipping Rate

0% included

Sale Tax

8.00% \$ 1,120

Project Contingency@

30% \$ 10,814

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	46,859
Current Estimate	2019 Dollars	\$	46,859

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 4,686	0%	\$ -	\$ 4,686
Engr. During Construction	10.0%	\$ 4,686	0%	\$ -	\$ 4,686
Construction Mgt.	5.0%	\$ 2,343	0%	\$ -	\$ 2,343
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 58,573

Notes:

1 Cost estimate provided by AECOM

Coastal Treatment Plant

Project Number 15126

Personnel Building Modification

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹							
Remove Existing Roof	1	LS	\$	-		\$ 5,805	\$ 5,805
Hazardous Material Removal	1	LS				\$ 16,850	\$ 16,850
Personnel Building Roof Installation	1	LS	\$ 19,000	\$ 19,000	25%	\$ 4,750	\$ 23,750
Replace Doors (8)	1	LS					\$ 67,000
Replace Windows (2)	1	LS					\$ 22,000
Subtotal							\$ 135,405
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 36,559
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 1,520
Project Contingency@		30%					\$ 52,045
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 225,530
Current Estimate	2019 Dollars						\$ 225,530

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	10.0%	\$ 22,553	0%	\$ -	\$ 22,553
Design	10.0%	\$ 22,553	0%	\$ -	\$ 22,553
Engr. During Construction	10.0%	\$ 22,553	0%	\$ -	\$ 22,553
Construction Mgt.	5.0%	\$ 11,276	0%	\$ -	\$ 11,276
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 304,465

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15127

Headworks Valve Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	12" Inlet Valve from SCWD FM	1	EA	\$ 5,000	\$ 5,000	20%	\$ 1,000	\$ 6,000
	12" Inlet Valve from CLB FM	1	EA	\$ 5,000	\$ 5,000	20%	\$ 1,000	\$ 6,000
	4" Downstairs Plug Valve	12	EA	\$ 1,000	\$ 12,000	20%	\$ 2,400	\$ 14,400
	24" Effluent Valve	3	EA	\$ 25,000	\$ 75,000	20%	\$ 15,000	\$ 90,000
	16" FM Bypass Valve	1	EA	\$ 7,500	\$ 7,500	20%	\$ 1,500	\$ 9,000
	4" Upstairs Plug Valve	3	EA	\$ 1,000	\$ 3,000	20%	\$ 600	\$ 3,600
	E. Primary Sludge 6" Valve	14	EA	\$ 1,500	\$ 21,000	20%	\$ 4,200	\$ 25,200
	W. Primary Sludge 6" Valve	2	EA	\$ 1,500	\$ 3,000	20%	\$ 600	\$ 3,600
Subtotal								\$ 157,800

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 42,606

Shipping Rate

0% included

Sale Tax

8.00% \$ 10,520

Project Contingency@

30% \$ 63,278

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 274,204
Current Estimate	2019 Dollars	\$ 274,204

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 27,420	0%	\$ -	\$ 27,420
Engr. During Construction	10.0%	\$ 27,420	0%	\$ -	\$ 27,420
Construction Mgt.	5.0%	\$ 13,710	0%	\$ -	\$ 13,710
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars) \$ 342,755

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15128

Original Export Sludge PS Rehab

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Replace Monorail and Hoist	1	LS	\$ -				\$ 50,000
Replace Pumps	2	EA	\$ 45,000	\$ 90,000	50%	\$ 22,500	\$ 112,500
Replace Chopper Pump	1	EA	\$ 35,000	\$ 35,000	50%	\$ 17,500	\$ 52,500
Replace Grinder	1	EA	\$ 40,000	\$ 40,000	50%	\$ 20,000	\$ 60,000
Replace Doors and Frames (1) ¹	1	LS	\$ -				\$ 9,000
Replace Roll-up Door ¹	1	LS	\$ -				\$ 24,000
Electrical	1	LS	\$ -				\$ 45,000
Mechanical Upgrade	1	LS	-	-	-	-	\$ 50,000
Subtotal							\$ 403,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 108,810
Shipping Rate		0%				included	
Sale Tax		8.00%					\$ 13,200
Project Contingency@		30%					\$ 157,503
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 682,513
Current Estimate	2019 Dollars						\$ 682,513

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 68,251	0%	\$ -	\$ 68,251
Engr. During Construction	7.5%	\$ 51,188	0%	\$ -	\$ 51,188
Construction Mgt.	5.0%	\$ 34,126	0%	\$ -	\$ 34,126
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 836,078

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15129

Standby Power Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Emergency Generator & Support ¹	1	LS	\$ 320,000	\$ 320,000	-	\$ 184,000	\$ 504,000
	Replace Doors (5) ³	1	LS	-	-	-	-	\$ 48,000
	Replace Window (1) ³	1	LS	-	-	-	-	\$ 11,000
	Replace Accoustic Louvers (2) ³	1	LS	-	-	-	-	\$ 56,000
	Upgrade Mechanical System	1	LS	-	-	-	-	\$ 30,000
	Upgrade Electrical System	1	LS	-	-	-	-	\$ 35,000
	Temporary Power Supply System	1	LS	\$ 30,000	\$ 30,000	50%	\$ 15,000	\$ 45,000
					\$ 350,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$ 196,830
Shipping Rate	0%	included	
Sale Tax	8.00%		\$ 28,000
Project Contingency@	25%		\$ 238,458

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 1,192,288
Current Estimate	2019 Dollars	\$ 1,192,288

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 59,614	0%	\$ -	\$ 59,614
Design	10.0%	\$ 119,229	0%	\$ -	\$ 119,229
Engr. During Construction	5.0%	\$ 59,614	0%	\$ -	\$ 59,614
Construction Mgt.	5.0%	\$ 59,614	0%	\$ -	\$ 59,614
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars) \$ 1,490,359

Notes:

- 1 Emergency Generator and Diesel Tank on DHK Engineers evaluation (4/17)
- 2 Assume AST (installed in 2009) are adequate.
- 3 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15131

Headworks Building Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Replacement of Flow Meters (2)	1	LS	-	-	-	-	\$ 95,000
	Replace Door (6)	1	LS	-	-	-	-	\$ 54,000
	Replace Window (5)	1	LS	-	-	-	-	\$ 60,000
	Replace Roll Up Doors (1)	1	LS	-	-	-	-	\$ 30,000
	Upgrade Mechanical System	1	LS	-	-	-	-	\$ 30,000
	Upgrade Electrical System	1	LS	-	-	-	-	\$ 30,000

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	0%							\$ -
Shipping Rate	0%							included
Sale Tax	8.00%							\$ -
Project Contingency@	30%							\$ 89,700

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 388,700
Current Estimate	2019 Dollars							\$ 388,700

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 19,435	0%	\$ -	\$ 19,435
Design	10.0%	\$ 38,870	0%	\$ -	\$ 38,870
Engr. During Construction	10.0%	\$ 38,870	0%	\$ -	\$ 38,870
Construction Mgt.	5.0%	\$ 19,435	0%	\$ -	\$ 19,435
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2017 Dollars)					\$ 505,310
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Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15132

Channel Lining

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	Overflow Channel Lining	1	LS	-	-	-	-	\$ 30,000
	Bypass Pumping	1	LS	-	-	-	-	\$ 225,000
	Primary Influent Channel Lining	1	LS	-	-	-	-	\$ 60,000
	Primary Effluent Channel Lining	1	LS					\$ 90,000
Subtotal								\$ 405,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 109,350
Shipping Rate	0%							included
Sale Tax	8.00%							\$ -
Project Contingency@	30%							\$ 154,305

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$ 668,655
Current Estimate	2019 Dollars							\$ 668,655

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	8.0%	\$ 53,492	0%	\$ -	\$ 53,492
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	5.0%	\$ 33,433	0%	\$ -	\$ 33,433
Engr. During Construction	7.5%	\$ 50,149	0%	\$ -	\$ 50,149
Construction Mgt.	5.0%	\$ 33,433	0%	\$ -	\$ 33,433
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 839,162

Notes:

1 Based On Unit Factors Provided by Sancon

Coastal Treatment Plant

Project Number 15133

Administration Building Rehab

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolish Laboratory	1	LS	-	-	-	-	\$ 80,000
	Replace Doors (18) ¹	1	LS	-	-	-	-	\$ 166,000
	Replace Window (16) ¹	1	LS	-	-	-	-	\$ 176,000
	Remodel Lab to Office Space	1	LS	-	-	-	-	\$ 75,000
	Upgrade Mechanical System	1	LS	-	-	-	-	\$ 30,000
	Upgrade Electrical System	1	LS	-	-	-	-	\$ 35,000
Subtotal								\$ 562,000

General Conditions. Contractor Overhead and Profit,
 and Bonds and Insurance @

	0%	\$ -
Shipping Rate	0%	included
Sale Tax	8.00%	\$ -
Project Contingency@	30%	\$ 168,600

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 730,600
Current Estimate	2019 Dollars	\$ 730,600

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 36,530	0%	\$ -	\$ 36,530
Design	10.0%	\$ 73,060	0%	\$ -	\$ 73,060
Engr. During Construction	7.5%	\$ 54,795	0%	\$ -	\$ 54,795
Construction Mgt.	5.0%	\$ 36,530	0%	\$ -	\$ 36,530
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 931,515

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15134

Perimeter Fence Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate	May-17
Estimate Update	Jul-19
Prepared By	BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Perimeter Fence Replacement	1	LS	-	-	-	-	\$ 489,000
Subtotal								\$ 489,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @				27%				\$ 132,030
Shipping Rate				0%			included	
Sale Tax				8.00%				\$ -
Project Contingency@				15%				\$ 93,155

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 714,185
Current Estimate	2019 Dollars	\$ 714,185

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 35,709	0%	\$ -	\$ 35,709
Design	5.0%	\$ 35,709	0%	\$ -	\$ 35,709
Engr. During Construction	5.0%	\$ 35,709	0%	\$ -	\$ 35,709
Construction Mgt.	5.0%	\$ 35,709	0%	\$ -	\$ 35,709
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 857,021

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15135

Blower Building Roof

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹							
Remove New Blower Building Roof	1	LS	\$	-		\$ 5,400	\$ 5,400
Hazardous Material Removal	1	LS	\$	-		\$ 16,850	\$ 16,850
Blower Building Roof Placement	1	LS	\$ 18,000	\$ 18,000	25%	\$ 4,500	\$ 22,500
Subtotal							\$ 44,750
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 12,083
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 1,440
Project Contingency@		40%					\$ 23,309
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 81,582
Current Estimate	2019 Dollars						\$ 81,582

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	15.0%	\$ 12,237	0%	\$ -	\$ 12,237
Engr. During Construction	10.0%	\$ 8,158	0%	\$ -	\$ 8,158
Construction Mgt.	5.0%	\$ 4,079	0%	\$ -	\$ 4,079
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 106,056

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15136

Export Sludge Mixing and Sludge Pumps

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	Demolition of Existing Pumps	1	LS	\$	-	25%	\$ 30,000	\$ 30,000
	Installation of Export Sludge Mixing Pumps	2	EA	\$ 70,000	\$ 140,000			\$ 140,000
	Installation of Export Sludge Pumps	2	EA	\$ 85,000	\$ 170,000		\$ -	\$ 170,000
	Pumps Power and Controls	1	LS	\$ 45,000	\$ 45,000	25%	\$ 11,250	\$ 56,250

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$	106,988
Shipping Rate	0%							included
Sale Tax	8.00%						\$	28,400
Project Contingency@	30%						\$	159,491

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	691,129
Current Estimate	2019 Dollars						\$	691,129

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 69,113	0%	\$ -	\$ 69,113
Engr. During Construction	7.5%	\$ 51,835	0%	\$ -	\$ 51,835
Construction Mgt.	5.0%	\$ 34,556	0%	\$ -	\$ 34,556
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)

\$ 846,633

Notes:

- 1 Cost estimate came from Coastal Treatment Plant Export Equalization Basin and Miscellaneous Improvements 2017 Bids

Coastal Treatment Plant

Project Number 15137

Foul Air System Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%	\$	-
Shipping Rate	0%		included
Sale Tax	8.00%	\$	-
Project Contingency@	30%	\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)		
Original Estimate	2019 Dollars	\$ -
Current Estimate	2019 Dollars	\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ 75,000
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ -	0%	\$ -	
Engr. During Construction	7.5%	\$ -	0%	\$ -	
Construction Mgt.	5.0%	\$ -	0%	\$ -	
Total Project Contingency	0.0%	\$ -	0%	\$ -	
Total Project Cost (Present Value in 2019 Dollars)					\$ 75,000

Notes:

Coastal Treatment Plant

Project Number 15138

Scum Pump Station Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

\$ -
 \$ -
 \$ -
 \$ -
 \$ -
 \$ -

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27%

\$ -

Shipping Rate

0%

included

Sale Tax

8.00%

\$ -

Project Contingency@

25%

\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate 2019 Dollars \$ -
 Current Estimate 2019 Dollars \$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ 50,000
Conceptual Study	2.5%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	5.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 50,000

Notes:

Coastal Treatment Plant

Project Number 15139

Buried Utility Master Plan

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19
 Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost							\$	-
							\$	-
							\$	-
							\$	-
							\$	-
							\$	-
Subtotal							\$	-
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$	-
Shipping Rate		0%					included	
Sale Tax		8.00%					\$	-
Project Contingency@		30%					\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	-
Updated Estimate	2019 Dollars						\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ 75,000
Design	15.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	5.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -
Total Project Contingency ⁵	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 75,000

Coastal Treatment Plant

Project Number 3544-000

Aeration System with Multistage Blowers with VFDs

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jan-19
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹	Raising the Floor of Aeration Basin W-1	1	LS	\$	-		\$ 572,000
	Diffusers, Droplegs and Valves	1	LS	\$	-		\$ 505,000
	Aeration Blowers (Multistage with VFDs)	1	LS	\$	-		\$ 705,000
	Aeration Piping, Valves and Actuators	1	LS	-	-	-	\$ 278,000
	Sitework, Demolition and Electrical	1	LS	\$	-	\$	\$ 797,000
Subtotal							\$ 2,857,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 771,390
Shipping Rate		0%					included
Sale Tax		8.00%					\$ -
Project Contingency@		25%					\$ 907,098
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 4,535,488
Current Estimate	2019 Dollars						\$ 4,535,488

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 453,549	0%	\$ -	\$ 453,549
Engr. During Construction	7.5%	\$ 340,162	0%	\$ -	\$ 340,162
Construction Mgt.	7.5%	\$ 340,162	0%	\$ -	\$ 340,162
Total Project Cost (Present Value in 2019 Dollars)					\$ 5,669,359

Notes:

1 Cost estimate provided by Hazen & Sawyer

Construction in FY 20/21	\$2,352,057.00
Construction in FY 21/22	\$2,863,753.63
	\$5,215,810.63

Coastal Treatment Plant

Project Number 15141

Headworks Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost							\$	-
							\$	-
							\$	-
							\$	-
							\$	-
							\$	-
							\$	-
Subtotal							\$	-
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$	-
Shipping Rate		0%						included
Sale Tax		8.00%					\$	-
Project Contingency@		25%					\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	-
Updated Estimate	2019 Dollars						\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ 95,000
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	5.0%	\$ -	0%	\$ -	
Engr. During Construction	5.0%	\$ -	0%	\$ -	
Construction Mgt.	5.0%	\$ -	0%	\$ -	
Total Project Contingency	0.0%	\$ -	0%	\$ -	

Total Project Cost (Present Value in 2019 Dollars) \$ 95,000

Notes:

Coastal Treatment Plant

Project Number 15142

Spatial Utilization Analysis

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost							\$ -
							\$ -
							\$ -
							\$ -
							\$ -

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ -
Shipping Rate	0%						included
Sale Tax	8.00%						\$ -
Project Contingency@	30%						\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ -
Current Estimate	2019 Dollars						\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ 75,000
Design	10.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	10.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 75,000

Notes:

Coastal Treatment Plant

Project Number 15143

RAS/WAS Pump Station Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost							\$ -
							\$ -

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

	27%						\$ -
Shipping Rate	0%						included
Sale Tax	8.00%						\$ -
Project Contingency@	30%						\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ -
Updated Estimate	2019 Dollars						\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ 75,000
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ -	0%	\$ -	
Engr. During Construction	10.0%	\$ -	0%	\$ -	
Construction Mgt.	5.0%	\$ -	0%	\$ -	
Total Project Contingency	0.0%	\$ -	0%	\$ -	
Total Project Cost (Present Value in 2019 Dollars)					\$ 75,000

Notes:

Coastal Treatment Plant

Project Number 15144

Standby Power Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
			\$	-		\$	-

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%					\$	-
Shipping Rate	0%					included	
Sale Tax	8.00%					\$	-
Project Contingency@	30%					\$	-

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars					\$	-
Current Estimate	2019 Dollars					\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	10.0%	\$ -	0%	\$ -	\$ 65,000
Conceptual Study	5.0%	\$ -	0%	\$ -	
Design	7.5%	\$ -	0%	\$ -	
Engr. During Construction	7.5%	\$ -	0%	\$ -	
Construction Mgt.	5.0%	\$ -	0%	\$ -	
Total Project Contingency	0.0%	\$ -	0%	\$ -	
Total Project Cost (Present Value in 2019 Dollars)					\$ 65,000

Coastal Treatment Plant

Project Number 15145

Export Sludge System Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost							\$ -
							\$ -
							\$ -
							\$ -

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ -
Shipping Rate	0%						included
Sale Tax	8.00%						\$ -
Project Contingency@	30%						\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$ -
Updated Estimate	2019 Dollars						\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ 85,000
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ -	0%	\$ -	
Engr. During Construction	10.0%	\$ -	0%	\$ -	
Construction Mgt.	5.0%	\$ -	0%	\$ -	
Total Project Contingency	0.0%	\$ -	0%	\$ -	
Total Project Cost (Present Value in 2019 Dollars)					\$ 85,000

Notes:

Coastal Treatment Plant

Project Number 15147

Pavement and Surface Drainage Master Plan

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate	Jul-19
Estimate Update	Jul-19
Const. Year	
Prepared By	BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

-	-	-	-	-	-	-
---	---	---	---	---	---	---

\$	-	\$	-	\$	-
----	---	----	---	----	---

Subtotal

General Conditions, Contractor Overhead and Profit,
and Bonds and Insurance @

0% included

Shipping Rate

0% included

Sale Tax

0% included

Project Contingency@

30% \$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	-
Current Estimate	2019 Dollars	\$	-

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ -	0%	\$ -	\$ 75,000
Design	10.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	10.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 75,000

Notes:

Coastal Treatment Plant

Project Number 15148

Instrumentation Master Plan

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	1	LS	-	-	-	-	-	-
				\$ -			\$ -	\$ -

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%						included	
Shipping Rate	0%						included	
Sale Tax	0%						included	
Project Contingency@	30%							0

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							0
Current Estimate	2019 Dollars						\$ -	

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ -	0%	\$ -	\$ 75,000
Design	8.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	10.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 75,000

Notes:

1 Cost Estimate Developed by TetraTech

Coastal Treatment Plant

Project Number 15149

Site Storage Evaluation

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

\$ -
 \$ -
 \$ -
 \$ -
 \$ -

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27%

\$ -

Shipping Rate

0%

included

Sale Tax

8.00%

\$ -

Project Contingency@

30%

\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate 2019 Dollars

\$ -

Current Estimate 2019 Dollars

\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ 50,000
Design	10.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	7.5%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 50,000

Notes:

Coastal Treatment Plant

Project Number 15150

Screening Washer/Compactor System

Main Project Type

New Facility	X
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	

Key Dates

Initial Estimate Jul-19
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Washer/Compactor	1	LS	\$	-		\$	100,000
	Conveyor	1	LS	\$	-	\$	-	\$ 83,000
	Electrical	1	LS	\$	-			\$ 21,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$	55,080
Shipping Rate	0%							included
Sale Tax	8.00%						\$	-
Project Contingency@	30%						\$	77,724

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars						\$	336,804
Current Estimate	2019 Dollars						\$	336,804

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 33,680	0%	\$ -	\$ 33,680
Engr. During Construction	7.5%	\$ 25,260	0%	\$ -	\$ 25,260
Construction Mgt.	5.0%	\$ 16,840	0%	\$ -	\$ 16,840
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2019 Dollars)					\$	412,585
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Notes:

- 1 Cost estimate provided by CH2MHill from the Facility Plan

Coastal Treatment Plant

Project Number 3543-000

Export Sludge Line Replacement at RTP

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate Apr-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Export Sludge Line HDPE	2400	LF	\$ 25	\$ 60,000	-	\$ 48,000	\$ 108,000
	Plug Valves	4	EA	\$ 2,500	\$ 10,000	-	\$ 6,000	\$ 16,000
	Export Sludge Line Improvements	1	LS	\$ 8,000	\$ 8,000	-	\$ 8,000	\$ 16,000
Subtotal								\$ 140,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 37,800

Shipping Rate

0% included

Sale Tax

8.00% \$ 6,240

Project Contingency@

40% \$ 73,616

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 257,656
Current Estimate	2019 Dollars	\$ 257,656

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 12,883	0%	\$ -	\$ 12,883
Design	10.0%	\$ 25,766	0%	\$ -	\$ 25,766
Engr. During Construction	10.0%	\$ 25,766	0%	\$ -	\$ 25,766
Construction Mgt.	5.0%	\$ 12,883	0%	\$ -	\$ 12,883
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 334,953

Notes:

1 Costs from Lee & Ro Draft Technical Memo on Underground Piping Reconstruction at the Regional Treatment Plant

Coastal Treatment Plant

Project Number 3542-000

South Section Embankment Protection

Main Project Type

New Facility	X
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

 Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	Gabion Protection System ¹	1	LS	-	-	-	-	\$ 112,040
	Protection at Storm Channel ²	1	LS	-	-	-	-	\$ 103,105
					\$ -		\$ -	\$ -
Subtotal								\$ 215,145

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

Shipping Rate

Sale Tax

Project Contingency@

0%	included
0%	included
0%	included
40%	\$ 86,058

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 301,203.00
Current Estimate	2019 Dollars	\$ 301,203

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	20.0%	\$ 60,241	0%	\$ -	\$ 60,241
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	15.0%	\$ 45,180	0%	\$ -	\$ 45,180
Engr. During Construction	10.0%	\$ 30,120	0%	\$ -	\$ 30,120
Construction Mgt.	15.0%	\$ 45,180	0%	\$ -	\$ 45,180
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 481,925

Notes:

- 1 Based on Alternative 2 "Aliso Creek at SOCWA CTP Erosion Risk Reduction Measures and Alternative Development Memorandum" April 2016 by TetraTech.
- 2 Based on Site East 3 "Aliso Creek Storm Repairs" February 2017 by TetraTech.
- 3 Based on a 165 foot length to be protected in addition to area at storm channel discharge point.

Coastal Treatment Plant

Project Number 15713

North Section Embankment Protection

Main Project Type

New Facility	X
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	Gabion Protection System	1	LS	-	-	-	-	\$	434,579
					\$	-		\$	-
Subtotal								\$	434,579

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% included

Shipping Rate

0% included

Sale Tax

0% included

Project Contingency@

50% \$ 217,290

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	651,869
Current Estimate	2019 Dollars	\$	651,869

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	15.0%	\$ 97,780	0%	\$ -	\$ 97,780
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 65,187	0%	\$ -	\$ 65,187
Engr. During Construction	7.5%	\$ 48,890	0%	\$ -	\$ 48,890
Construction Mgt.	10.0%	\$ 65,187	0%	\$ -	\$ 65,187
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 928,913

Notes:

- 1 Based on Alternative 2 "Aliso Creek at SOCWA CTP Erosion Risk Reduction Measures and Alternative Development Memorandum" April 2016 by TetraTech.
- 2 Protection based on use of gabions.
- 3 Based on a 640 foot length to be protected
- 4 Shown as a ratio of 640 feet to 165 feet (165 feet being basis for protection south embankment in reference in Note 1).

Coastal Treatment Plant

Project Number 15714

Aliso and Sulfur Creek Confluence Proection

Main Project Type

New Facility	X
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	Drop Structure	1	LS	-	-	-	-	\$	323,656
	Bank Protection (North Bank)	1	LS	-	-	-	-	\$	50,960
	Bank Protection (South Bank)	1	LS	-	-	-	-	\$	187,260
	Storm Drain Modifications	1	LS	-	-	-	-	\$	39,800
	Surface Runoff Remediation	1	LS	-	-	-	-	\$	14,245

\$ - \$ - \$ -

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% included

Shipping Rate

0% included

Sale Tax

0% included

Project Contingency@

50% \$ 307,961

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	923,882
Current Estimate	2019 Dollars	\$	923,882

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	15.0%	\$ 138,582	0%	\$ -	\$ 138,582
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 92,388	0%	\$ -	\$ 92,388
Engr. During Construction	5.0%	\$ 46,194	0%	\$ -	\$ 46,194
Construction Mgt.	10.0%	\$ 92,388	0%	\$ -	\$ 92,388
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 1,293,434

Notes:

- 1 Based on Alternative 3 "Stabilization of Confluence of Sulphur and Aliso Creeks Conceptual Alternatives Report October 2012 by TetraTech.
- 2 To be split evenly between Project Committee 15 and 21.
- 3 Assume AST (installed in 2009) are adequate.

Coastal Treatment Plant

Project Number 15812

AWT Filter Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Filter Valves ¹	1	LS	\$ 32,160	\$ 32,160	100%	\$ 32,160	\$ 64,320
	Media Replacement	1	LS	\$ 30,000	\$ 30,000	100%	\$ 30,000	\$ 60,000
	Coating Repair	1	LS	-	-	-	-	\$ 95,000
	Fabric Shade	1	EA	\$ 25,000	\$ 25,000	50%	\$ 12,500	\$ 37,500
					\$ -		\$ -	\$ -
Subtotal								\$ 256,820

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 69,341

Shipping Rate

0% included

Sale Tax

8.00% \$ 6,973

Project Contingency@

30% \$ 99,940

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 433,074
Current Estimate	2019 Dollars	\$ 433,074

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 43,307	0%	\$ -	\$ 43,307
Engr. During Construction	10.0%	\$ 43,307	0%	\$ -	\$ 43,307
Construction Mgt.	5.0%	\$ 21,654	0%	\$ -	\$ 21,654
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 541,343

Notes:

- 1 Evoqua Letter Proposal for Valve Replacement

Coastal Treatment Plant

Project Number 15813

AWT Building Roof

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Remove Existing AWT Building Roof	1	LS	\$	-	\$	5,400	\$	5,400			
	Hazardous Material Removal	1	LS	\$	-	\$	16,850	\$	16,850			
	Door and Frame Replacement	1	LS	-	-	-	-	\$	55,000			
	AWT Building Roof Placement	1	LS	\$	16,000	\$	16,000	25%	\$	4,000	\$	20,000
Subtotal									\$	97,250		

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 26,258

Shipping Rate

0% included

Sale Tax

8.00% \$ 1,280

Project Contingency@

40% \$ 49,915

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$	174,703
Current Estimate	2019 Dollars	\$	174,703

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 17,470	0%	\$ -	\$ 17,470
Engr. During Construction	10.0%	\$ 17,470	0%	\$ -	\$ 17,470
Construction Mgt.	5.0%	\$ 8,735	0%	\$ -	\$ 8,735
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 218,378

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15815

Equalization Basin Valve Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	X

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹	Buried 36" Valves (2) and Piping	1	LS	-	-	-	\$ 360,000
	Buried 24" Valves (2) and Piping	1	LS	-	-	-	\$ 120,000
				\$	-	\$	-
Subtotal							\$ 480,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		0%					\$ -
Shipping Rate		0%				included	
Sale Tax		8.00%					\$ -
Project Contingency@		25%					\$ 120,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 600,000
Current Estimate	2019 Dollars						\$ 600,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	10.0%	\$ 60,000	0%	\$ -	\$ 60,000
Design	10.0%	\$ 60,000	0%	\$ -	\$ 60,000
Engr. During Construction	10.0%	\$ 60,000	0%	\$ -	\$ 60,000
Construction Mgt.	5.0%	\$ 30,000	0%	\$ -	\$ 30,000
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 810,000

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15816

AWT Hypochlorite Pumps

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ¹							
Remove existing AWT Hypochlorite Pumps	1	LS	\$	-		\$ 10,000	\$ 10,000
Install new AWT Hypochlorite pumps	3	LS	\$ 50,000	\$ 150,000	25%	\$ 37,500	\$ 187,500
Subtotal							\$ 197,500
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @			0%				\$ -
Shipping Rate			0%				included
Sale Tax			0.00%				\$ -
Project Contingency@			10%				\$ 19,750
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 217,250
Current Estimate	2019 Dollars						\$ 217,250

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	5.0%	\$ 10,863	0%	\$ -	\$ 10,863
Engr. During Construction	10.0%	\$ 21,725	0%	\$ -	\$ 21,725
Construction Mgt.	5.0%	\$ 10,863	0%	\$ -	\$ 10,863
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 260,700

Notes:

1 Cost estimate based on bids from CTP Miscellaneous Improvements 2015

Coastal Treatment Plant

Project Number 15817

AWT Instrumentation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Turbidimeters (2) ¹	1	LS	-	-	-	-	\$	40,000
	Miscellaneous Piping /Valves	1	LS	\$ 15,000	\$ 15,000	25%	\$ 3,750	\$	18,750
	Chlorine Residual Analyzers (3) ¹	1	LS	-	-	-	-	\$	60,000
	Backwash Control Meter and Valve	1	LS	-	-	-	-	\$	50,000
	Level Instrumentation	9	EA	\$ 5,000	\$ 45,000	25%	\$ 11,250	\$	56,250
					\$ -		\$ -	\$	-

Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$	60,750
Shipping Rate	0%							included	
Sale Tax	8.00%							\$	4,800
Project Contingency@	30%							\$	87,165

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars							\$	377,715
Current Estimate	2019 Dollars							\$	377,715

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	5.0%	\$ 18,886	0%	\$ -	\$ 18,886
Engr. During Construction	10.0%	\$ 37,772	0%	\$ -	\$ 37,772
Construction Mgt.	5.0%	\$ 18,886	0%	\$ -	\$ 18,886
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2017 Dollars)					\$ 453,258

Notes:

1 Cost Based on Bids for the Regional Treatment Plant Miscellaneous Improvements 2016 Project.

Coastal Treatment Plant

Project Number 15818

Chlorine Contact Tank Gates

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19
 Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	CCT Sluice Gate	2	EA	\$ 23,500	\$ 42,000	40%	\$ 16,800	\$ 58,800
	CCT Drain Gate	2	EA	\$ 17,500	\$ 31,000	40%	\$ 12,400	\$ 43,400
Subtotal								\$ 102,200
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @				27%				\$ 27,594
Shipping Rate				0%				included
Sale Tax				8.00%				\$ 5,840
Project Contingency@				30%				\$ 40,690

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 176,324
Current Estimate	2019 Dollars	\$ 176,324

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 17,632	0%	\$ -	\$ 17,632
Engr. During Construction	10.0%	\$ 17,632	0%	\$ -	\$ 17,632
Construction Mgt.	5.0%	\$ 8,816	0%	\$ -	\$ 8,816
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 220,405

Notes:

1 Cost estimate provided by Hazen & Sawyer

Coastal Treatment Plant

Project Number 15819

AWT Support Equipment

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Remove existing AWT Flocculators	1	LS				\$ 10,000	\$ 10,000
Install new Flocculators ¹	2	EA	\$ 50,000	\$ 100,000	25%	\$ 25,000	\$ 125,000
Replace Chem Clean System	1	LS	-	-	-	-	\$ 50,000
Replace Mechanical Systems	1	LS	-	-	-	-	\$ 35,000
Remove existing AWT Chlorine Mixers	1	LS		\$ -		\$ 10,000	\$ 10,000
Install new Chlorine Mixers ¹	2	EA	\$ 50,000	\$ 100,000	25%	\$ 25,000	\$ 125,000
Subtotal				\$ 200,000			\$ 355,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 95,850
Shipping Rate		0%					included
Sale Tax		8.00%					\$ 16,000
Project Contingency@		30%					\$ 140,055
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2019 Dollars						\$ 606,905
Current Estimate	2019 Dollars						\$ 606,905

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 60,691	0%	\$ -	\$ 60,691
Engr. During Construction	10.0%	\$ 60,691	0%	\$ -	\$ 60,691
Construction Mgt.	5.0%	\$ 30,345	0%	\$ -	\$ 30,345
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 758,631

Notes:

1 Cost estimate based on bids from CTP Miscellaneous Improvements 2015

Coastal Treatment Plant

Project Number 15821

Piping from AWPS to Filters and Surge Tank to DPS

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate May-17
 Estimate Update Jul-19

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost¹

Site Work	1	LS					\$ 12,357	\$ 12,357
14-Inch Effluent	1	LS	\$ 12,000	\$ 12,000	25%	\$ 3,000	\$ 15,000	\$ 15,000
Site Work	1	LS				\$ 4,300	\$ 4,300	\$ 4,300
20-Inch Effluent	1	LS	\$ 6,500	\$ 6,500	25%	\$ 1,625	\$ 8,125	\$ 8,125
Site Work	1	LS				\$ 11,473	\$ 11,473	\$ 11,473
14-Inch Backwash Waste	1	LS	\$ 12,000	\$ 12,000	25%	\$ 3,000	\$ 15,000	\$ 15,000
Site Work	1	LS				\$ 11,100	\$ 11,100	\$ 11,100
12-Inch Backwash Waste	1	LS	\$ 10,000	\$ 10,000	25%	\$ 2,500	\$ 12,500	\$ 12,500
Site Work	1	LS				\$ 33,254	\$ 33,254	\$ 33,254
12-Inch Reclaimed	1	LS	\$ 27,000	\$ 27,000	25%	\$ 6,750	\$ 33,750	\$ 33,750
Site Work	1	LS				\$ 16,250	\$ 16,250	\$ 16,250
4-Inch PW	1	LS	\$ 4,800	\$ 4,800	25%	\$ 1,200	\$ 6,000	\$ 6,000
Site Work	1	LS				\$ 39,671	\$ 39,671	\$ 39,671
4-Inch NPW	1	LS	\$ 21,000	\$ 21,000	25%	\$ 5,250	\$ 26,250	\$ 26,250
Site Work	1	LS				\$ 33,336	\$ 33,336	\$ 33,336
12-Inch Filter Supply	1	LS	\$ 26,000	\$ 26,000	25%	\$ 6,500	\$ 32,500	\$ 32,500
Site Work	1	LS				\$ 23,938	\$ 23,938	\$ 23,938
12-Inch Tertiary Effluent	1	LS	\$ 21,500	\$ 21,500	25%	\$ 5,375	\$ 26,875	\$ 26,875
Site Work	1	LS				\$ 25,000	\$ 25,000	\$ 25,000
6-inch NPW	1	LS	\$ 8,800	\$ 8,800	25%		\$ 8,800	\$ 8,800
Site Work	1	LS				\$ 10,000	\$ 10,000	\$ 10,000
6-inch Drain	1	LS	\$ 5,000	\$ 5,000	25%		\$ 5,000	\$ 5,000
Site Work	1	LS				\$ 60,000	\$ 60,000	\$ 60,000
8-inch Drain	1	LS	\$ 30,000	\$ 30,000	25%	\$ 7,500	\$ 37,500	\$ 37,500
Subtotal							\$ 507,979	\$ 507,979

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 137,154

Shipping Rate

0% included

Sale Tax

8.00% \$ 14,768

Project Contingency@

25% \$ 164,975

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2019 Dollars	\$ 824,877
Current Estimate	2019 Dollars	\$ 824,877

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 82,488	0%	\$ -	\$ 82,488
Engr. During Construction	7.5%	\$ 61,866	0%	\$ -	\$ 61,866
Construction Mgt.	5.0%	\$ 41,244	0%	\$ -	\$ 41,244
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2019 Dollars)					\$ 1,010,474

Notes:

1 Cost estimate provided by Hazen & Sawyer

Appendix I
Regional Treatment Plant Ten Year Plan

BACKGROUND

The Regional Treatment Plant is a conventional activated sludge treatment plant with a secondary treatment design capacity of 12 mgd. The main wastewater treatment processes are screening, aerated grit removal, primary sedimentation, activated sludge aeration and secondary sedimentation. A schematic of the Regional Treatment Plant (RTP) process flow diagram is presented in Figure I.1.

A portion of secondary treated effluent is reclaimed on the site and pumped into the Moulton Niguel Water District reclaimed water system for distribution for irrigation use. Each of the reclamation, or advanced wastewater treatment (AWT), facilities consists of chemical addition, coagulation (with mechanical mixing), filtration and chlorine disinfection. The remaining portion of the secondary effluent is discharged through the Aliso Creek Ocean Outfall.

The RTP treats solids produced at the plant, thickened solids trucked from the El Toro Water Reclamation Plant, and thickened solids pumped from the Coastal Treatment Plant. Solids treatment at the Regional Treatment Plant consists of dissolved air flotation thickening of the RTP waste activated sludge, anaerobic digestion and centrifuge dewatering. Dewatered solids are removed from the facility by a private contractor for composting or land application. Screenings and grit are transported by a private contractor to a sanitary landfill.

FACILITY HISTORY

The Regional Treatment Plant was constructed in the early 1980's and began operation in 1983. The original construction project included the liquid stream portion of the plant, the thickeners, the digesters, the effluent equalization pond and the Energy Recovery Building. The Energy Recovery Building included the cogeneration equipment as well as belt filter presses for dewatering. Key subsequent projects at the plant included the following:

- 1989: The first AWT facilities were expanded (this facility is known as AWT No. 1) to a current capacity of 2.4 mgd.
- 1992: The anaerobic digester covers were fixed at a set level.
- 1994: New Odor Control Scrubber No. 1 installed.
- 1998: New Odor Control Scrubber No. 2 installed.
- 1997: Original cogeneration engines replaced to meet AQMD rules.
- 1998: Solids handling expansion included the construction of a truck loading bay adjoining the Energy Recovery Building and the replacement of the belt filter presses with centrifuges.
- 1996: Construction of AWT No.2 (with a current capacity of 9.0 mgd) along with an underground reclaimed water storage tank.

- 2003: New Odor Control Scrubber No.3 installed.
- 2004: Rehabilitation of aeration system completed.
- 2005: Upgrade of SCADA system completed.
- 2008: Reconstruction of the DAF collector mechanisms, TWAS and WAS pumping systems.
- 2011: Rehabilitation of plant headworks including reconstruction of Headworks Building roof completed.
- 2012: Failure of the two influent sewage force mains with subsequent repair.
- 2012: Reconstruction of Administration Building Roof completed.
- 2016: Recoating work in secondary sedimentation basins and anaerobic digesters completed.
- 2018: The replacement of the cogeneration system to comply with amended AQMD Rule 1110.2 was completed.

FACILITY OWNERSHIP

The Regional Treatment Plant is owned and operated by SOCWA on behalf of five member agencies:

- El Toro Water District
- Emerald Bay Service District
- City of Laguna Beach
- Moulton Niguel Water District

- South Coast Water District

The collective group within SOCWA that owns capacity in the Regional Treatment Plant is called Project Committee 17. The percentage of ownership held by each of the agencies is shown in Table I.1.

Table I.1
Current Percent Ownership at the Regional Treatment Plant

	% Liquids	% Common	% Solids
El Toro Water District	0.00%	10.26%	20.41%
Emerald Bay Service District	0.00%	0.33%	0.59%
City of Laguna Beach	0.00%	6.27%	11.22%
Moulton Niguel Water District	100.00%	78.13%	58.82%
South Coast Water District	0.00%	5.01%	8.96%
Total	100.00%	100.00%	100.00%

The Moulton Niguel Water District (MNWD) owns the whole capacity of the AWT in addition to the liquid stream for the plant.

PLANT UTILIZATION

Table I.2 shows the average annual influent flows into the Regional Treatment Plant over the past ten years.

Table I.2
Regional Treatment Plant Utilization

Year	Average Annual Daily Influent Flow (mgd)	Peak Month Average Daily Influent Flow (mgd)	Average Annual Daily Recycled Water Production (mgd)	Peak Month Average Daily Recycled Water Production (mgd)
2018	7.54	7.95	5.16	7.07
2017	7.78	8.78	5.09	6.95
2016	7.60	8.06	5.05	7.19
2015	7.85	8.25	5.81	7.56
2014	8.32	8.78	6.58	8.16
2013	8.77	9.13	6.00	7.85
2012	9.07	9.30	5.50	7.87
2011	9.32	9.82	5.04	8.03
2010	9.22	11.14	5.35	8.04
2009	9.44	9.78	6.30	8.51

All raw sewage flowing into the RTP originates from within the MNWD. Influent flow has steadily decreased over the past ten years. This is a function of MNWD’s effective water conservation program. The six-year California drought from 2012 to 2017 was one of the drivers for reduced flows. There has not appeared to a significant rebound in influent flows over the past two years. The MNWD is in the process of updating its Wastewater Master Plan. One of the options that may be considered is the transfer of raw sewage flows from other tributary basins to the RTP. However, the existing raw sewage flow at the RTP is expected to continue into the near future.

The operation of the RTP has effectively handled the reduced flows. This is due in

part to the flexibility at the RTP to remove basins from operation to handle reduced flows. The turn-down ratio of the single stage blower at RTP has aided the aeration system in handling the lower plant flow rates.

The 2013 Facility Plan for the Regional Treatment Plant included a brief evaluation of the ability of the RTP to handle the flow from the CTP (in the event that the latter facility would be abandoned). The assessment contemplated the conversion to an MBR process to allow the recycling of the imported CTP flows. The concept was not recommended for additional development due to the following issues:

- The need for a raw sewage force main from the CTP to the RTP.
- The potential for increased odors at the RTP.
- Limitations on the configuration of the existing RTP Headworks.
- Concerns about wet weather events at the RTP.

The existing flow utilization has some impact on the Ten Year Plan. No need for expanded facilities has been identified. The lower level of plant utilization means that basins will be cycled on or off at a comparatively high rate. The accelerated wetting/drying cycles will have a tendency to accelerate corrosion. The impact of this cycle should be monitored through ongoing condition assessments. The short-term upgrade of the aeration system should also address the needed turn-down ratios.

WET WEATHER EVENTS

The intensity of peak wet weather events over the past ten years has increased. SOCWA facilities have experienced significant winter storm events in 2010, 2017, and 2019. The ratio of peak flow to average daily flow during a ten-year period during these events has ranged between 4:1 to 5:1 (the accuracy of these estimates are limited by the plant flow metering capability) over a three hour period. The January 22, 2017, storm event resulted in an overflow of the Secondary Effluent Equalization Pond.

The design of the effluent handling system depends on a combination of the 33-inch effluent pipeline and the tertiary treatment/pumping system. The capacity of the gravity effluent pipeline is limited to approximately 19 mgd with the tertiary treatment/pumping system to convey the remaining flows. However, during a long-term series of storms the transmission capability of the tertiary treatment/pumping system becomes limited by available storage in the MNWD reclaimed water system. Large storm events can also create treatment problems within the RTP that can limit the capacity of the RTP tertiary treatment system. The MNWD is currently evaluating potential projects to increase the transmission capacity of the plant effluent system.

The current version of the Ten Year Plan includes relatively few improvements related to the handling of the peak wet weather flow events at the RTP. The general approach of SOCWA and its member agencies is to evaluate ways of limiting storm flows within the member agency collection systems. When those

options have been exhausted there will be additional planning to determine in-plant improvements to handle storm events. However, the overall impact of the storm flows is to indicate the need to maintain the overall facility capacity at the Regional Treatment Plant.

PROJECT COMMITTEE 17 AGREEMENT

The fifty year term of the Project Committee 17 agreement expires in 2029. That expiration date falls within the fifteen-year planning span used in this document. The Regional Treatment Plant is unique in that the liquids capacity has only one owner, the MNWD. Therefore, the project agreement is not seen as having a significant impact on capital expenditures at the treatment plant. However, the expiration could have a more significant impact on Commons and Solids capacity shared among the five participating member agencies. The Project Committee 15 members could determine to construct solids facilities at the Coastal Plant; the El Toro Water District (ETWD) could investigate alternative options for the handling of its solids. These potential actions would tend to cause a delay to Common and Solids improvements at the RTP. However, the currently proposed Ten Year Plan is based on asset replacement based on expected life. A series of condition assessments are planned over the next ten years to verify the need for various replacement projects. The goal is asset replacement to avoid increased risk of failure that might impact facility operations.

EXISTING RECYCLED WATER PRODUCTION

The original construction of the Regional Treatment Plant in 1983 included a tertiary treatment system with sand filtration and chlorine disinfection referred to as Advanced Wastewater Treatment Facility (AWT) No. 1. This facility was expanded in 1989. The applied water pumps for this system draw water from the Secondary Effluent Equalization Pond. AWT No. 1 has not been operated since the early 2000's.

AWT No. 2 was constructed in 1998. The facility includes two applied water pumps (delivering secondary effluent), six sand filters (complete with rapid mix and flocculation systems), and a chlorine contact basin. The chlorine contact basin was configured for a future conversion to ultraviolet radiation disinfection. The six filters have a rated loading capacity of 9.5 mgd (based on the Title 22 filter loading rate of 5.0 gpm/sq.ft. with one filter out of service) and a maximum production rate of 9 mgd.

A 2005 study ("Tertiary Filter Evaluation", Carollo Engineers) identified a modified operating approach that would allow the maximum production rate to increase from 9.0 mgd to 11.0 mgd. This increased production rate was based on the following two actions:

- Modifying the control sequence to maintain a loading of 5.0 gpm/sq.ft. when all six filters are in operation.
- Increasing the water depth in the chlorine contact basin from 15.6 feet to 17.1 feet.

The modifications were not implemented at the Regional Treatment Plant due to the decreasing levels of influent flow.

The AWT capacity at the Regional Treatment Plant is completely owned by the MNWD.

FUTURE AWT PLANNING

Water reclamation at the Regional Treatment Plant is unique compared to the other two SOCWA treatment facilities. The effluent at the Regional Treatment Plant is fully utilized by the MNWD for used in the recycled water system for turf irrigation. Therefore, there are no plans at the RTP to either expand or modify the treatment process for AWT No. 2. This scenario might change if the MNWD elects to shift sewage flows from other parts of its collection system to the Regional Treatment Plant. This is not addressed in the current Ten Year Plan.

SOCWA's capital improvement planning for the AWT is focused on the preservation of the existing assets. SOCWA has used Earl Gehringer, an original technician with the Evoqua (the supplier of the package filtration equipment at the RTP) to perform a site investigation of the filters every couple of years. This inspection was last completed in November 2016. The evaluation indicated that the filtration system remained in good condition. The inspections indicated that with upgrades the filtration structure should remain in service for another fifteen years. The current capital improvement budget includes a project for the upgrade of the AWT No. 2 filters. The Ten Year Plan

includes limited additional rehabilitation for the filter system over the next 15 years.

There is currently no plan for conversion of the disinfection system from chlorination (with sodium hypochlorite) to ultraviolet radiation.

The MNWD is currently reviewing potential changes to their recycled water system. The potential outcomes of this study have not been addressed in this Ten Year Plan.

CURRENT BIOSOLIDS HANDLING

Primary sludge and thickened waste activate sludge from the Regional Treatment Plant are combined with trucked sludge from the El Toro Water District Reclamation Facility and pumped sludge from the Coastal Treatment Plant in one of two sludge equalization tanks. The mixed sludge is then digested anaerobically and dewatered by any of the four centrifuges. The centrifuges typically produce a biosolids cake that is 23% to 26% solids concentration. The centrifuges are located on the second story of the Energy Recovery Building. The dewatered solids are then conveyed directed to one of two elevated hoppers. These hoppers can then discharge to a single truck bay on the building's first floor. A hauling truck trailer can hold approximately 25 wet tons of sludge. Two truckloads are typically hauled from the Regional Treatment Plant each day.

The dewatered cake solids at the Regional Treatment Plant can be stored within the sludge hoppers. However, each hopper can only hold approximately twenty tons of cake. This is equivalent to approximately

one day of solids storage. This plant has also used available volume within the digesters during disruptions of the dewatering operation as a means of solids storage. These digesters can hold approximately two to three days of sludge storage.

Dewatered biosolids are trucked to one of the following systems/locations:

- Synagro South Kern County Composting Facility.
- Synagro Nursery Products Composting Facility (located near Adelanto).
- County of Orange Prima Deshecha Landfill.

Table I.3 presents the solids generation at the Regional Plant based on flow source and on type of disposal. The wet tons of generated biosolids has remained roughly the same over a five-year period.

SOLIDS ASSET PLANNING

The current version of the Ten Year Plan focuses on the asset replacement aspect of the solids management system and dewatering. The four anaerobic digesters at the RTP were all constructed and placed into operation in 1983. The system was modified in the early 1990's when the floating covers on the digesters were fixed into stationary levels. SOCWA has recently completed a program of cleaning and recoating the internal concrete walls (only those portions of the walls exposed due to the rising and falling liquid levels in the digesters) and the internal portion

of the metallic domes. The recoating of the digesters was intended to extend the life of the system by at least another ten years. The projected project is then to replace the covers and the digester mixing systems. Ancillary projects will include the replacement of the digester heating systems, the digested sludge pumps and the associated piping systems.

The solids dewatering system at the Regional Treatment Plant was reconstructed in 1998 (the original belt filter presses were replaced with centrifuges). A recent condition assessment completed by Carollo Engineers indicated that the main components of the dewatering system should be replaced in five to ten years. However, the procurement of replacement parts for the dewatering centrifuges has been an ongoing issue for the Operations staff.

ALTERNATIVE BIOSOLIDS HANDLING OPTIONS

SOCWA has done past evaluations of alternative methods of handling biosolids. SOCWA has developed conceptual plans for the implementation of heat drying at both the J. B. Latham and the Regional Treatment Plants. SOCWA also investigated participation in the Irvine Ranch Water District (IRWD) Michelson Water Reclamation Plant Heat Drying Facility in 2010. SOCWA has not adopted these approaches due to higher unit costs for handling.

SOCWA issued Requests for Proposals (RFPs) in the spring of 2019 for the evaluation of innovative biosolids technologies. This action is being taken

for the following reasons:

- **Potential Biosolids Land Ban.** This ban has been a regulatory discussion point for over ten years. A future potential ban remains uncertain; however, its impact should be considered as the diversion of biosolids to the composting market may exceed the current market demand.
- **Deferral of Capital Investments.** Significant capital investments are expected at the Regional Treatment Plant in the next ten years to reconstruct the digestion and dewatering systems. A portion of these costs may be avoided through the use of an innovative biosolids handling technology.
- **Neighborhood Impacts.** Biosolids hauling has an impact on the surroundings in terms of both odors and noise. A technology that would significantly reduce hauling may aid SOCWA staff in its relationship with the residential area surrounding the treatment plant.
- **Facility Reliability.** The RTP only has the equivalent of 1 to 1-1/2 days of storage of dewatered solids. This becomes problematic if a problem arises with services with one of the contracted haulers.

Six innovative biosolids technology proposals were received. These proposals will be reviewed by a technical advisory committee through the summer and early fall of 2019. This process may have an impact on a future version of the Ten Year Plan; however, the current

version of the plan does not reflect the implementation of an innovative biosolids technology.

SOCWA ASSETS AT RTP

The original listing of SOCWA assets was prepared by Tetra Tech in 2005 as part of an Asset Management Study. This listing provided a comprehensive list of mechanical items and systems. SOCWA has expanded the list with structural, structural appurtenances, electrical and instrumentation components, site facilities and buried piping. The list was also amended to include structures and equipment associated with new projects. The current asset list for the Regional Treatment Plant includes over 430 items. The SOCWA asset listing is maintained in an Excel spreadsheet. Table I.4 presents a listing of SOCWA assets at the Regional Treatment Plant. Each listing includes a year of installation, an expected life and a replacement (or rehabilitation year).

There has been a significant level in capital investment in the replacement and rehabilitation of systems at the Regional Treatment Plant over the past 20 years. Some systems and devices are recently reconstructed and not projected for replacement within the 15-year span of the draft Ten Year Plan. Examples of these systems include the following:

- Standby Power Generator and Associated Automatic Transfer Switches
- Emergency Interstage Pumps (the trailer mounted Godwin Pumps)
- Plant Switchgear

- 480 Volt Conductors Between Switchgear and Motor Control Centers D, E, and F
- Co-Generation Engine
- Digester Gas Treatment System

The Ten Year Plan for the Regional Treatment Plant also does not contemplate the reconstruction of major concrete structures. The anticipated life of concrete structures in a wastewater environment is 50 years. The majority of concrete structures were completed in 1983 which would indicate an anticipated end of life in 2033. However, visual inspections of concrete structure have only identified superficial deficiencies. No projects have been identified for the replacement of major structures.

The Access Bridge into the Regional Treatment Plant bears special attention as this is currently the only method of access into the treatment plant. A recent evaluation of the bridge only identified minor improvements. These improvements were addressed in a 2017 project.

Projects that were completed during the past 20 years may require additional rehabilitation during the fifteen-year span of the proposed Capital Improvement Plan. This is due to the anticipated life span of some assets. These projects tend to appear in the latter part of the fifteen-year span. These projects include the following:

- Replacement of the preliminary treatment systems in the Headworks Building.
- Rehabilitation of the primary treat-

ment sludge collectors and basin covers.

- Reconstruction of the Administration Building roof.
- Replacement of AWT No.2 filter media (given the ten year cycle for doing this work this project occurs twice within the fifteen year span of the Capital Improvement Plan).

CONDITION ASSESSMENTS

The level of uncertainty of some long term rehabilitation projects at the RTP reflects the importance of condition assessments through the course of the Ten Year Plan cycle. SOCWA began a program of contracting condition assessments in 2016. The assessments conducted thus far include the following:

- Influent Junction Structure
- Access Road Bridge
- Energy Building HVAC System
- Plant Outdoor Lighting System
- Electrical System Manholes
- Solids Dewatering System
- AWT No. 2 Filtration System

A condition assessment of the Secondary Effluent Equalization Pond and the associated slide gates is scheduled for the spring of 2020.

Additional condition assessments are included through the Ten Year Plan. In general, a condition assessment for a major system is scheduled two to five years prior to the scheduled date for the rehabilitation project.

KEY ISSUES

Various issues have a significant impact on both the projects and the project costs for the Regional Treatment Plant capital improvement program. Some of these issues are addressed below.

Property Perimeter

There are a number of projects in the plan that address the perimeter of the property. One of the most significant projects relates to a recent Tetra Tech condition assessment of the storm channels along the north and west side of the treatment plant. This assessment identified structural deficiencies; the correction of these deficiencies involves a significant cost.

Another potentially significant site project involves a study to address the stability of the hillside on the west side of the treatment plant. It is not certain whether this issue will require a significant capital investment.

Structures – Seismic

Only one structure at the Regional Treatment Plant has been subject to a detailed evaluation of seismic safety: the Energy Management Building. A study performed in 1998 identified needed improvements. These improvements were completed in 2000. There are cracks appearing in the Energy Building. These are not major cracks but they do merit evaluation. Project 17330 will include a structural evaluation of the building.

There are no other seismic evaluations or improvements included in the Ten Year Plan.

Buried Piping

Buried infrastructure has been an important issue at the RTP due to the history of piping failures. Lee & Ro completed the development of a plan for the reconstruction of the buried piping in 2018. This plan identified a cost of reconstruction of over \$4 million. The approach taken in the current plan was to prioritize the replacement of three piping systems that had been the most prone to failure:

- Digester Gas (currently budgeted)
- Hot Water Supply and Return
- 2W, 3W Low Pressure, and 3W High Pressure Piping

These projects have all been scheduled in the first three years of the proposed Capital Improvement Plan.

A separate piping project that does not appear in this volume – the replacement of the Export Sludge piping on the Regional Treatment Plant – is identified in the draft plan for Project Committee 15 (the Coastal Treatment Plant).

The Moulton Niguel Water District recently completed a design for the rehabilitation of the sewer piping that enters the treatment plant from the south property line. The Ten Year Plan will need to be updated when the estimate and schedule for that project are identified.

There are currently no plans for upgrades

to the secondary effluent piping on the plant site. A plan needs to be developed to provide a condition assessment for this system.

Dewatering System

The single most expensive capital improvement plan identified is the reconstruction of the Dewatering System. This proposed project has a cost of over \$7 million. This project resulted from a Carollo Engineers condition assessment that asserted a remaining life of 5 to 10 years for the centrifuges (as well as the conveyors). This is supported by increasing frequency of maintenance projects on the centrifuges. This project has been placed in Year 6 of the draft Ten Year Plan. Further investigation is needed to determine if the correct approach is to replace the centrifuges with like equipment.

The reconstruction of the dewatering system may also be impacted by the outcome of the Innovative Biosolids Technology investigation.

Actual Life Versus “Book” Life

There are a series of projects identified in Years 6 through 15 of the proposed plan that have been the subject of rehabilitation or reconstruction projects within the past 20 years. A few of these systems include the following:

- Headworks Bar Screens
- Primary Sedimentation Covers and Sludge Collectors
- Secondary Sedimentation Sludge Collectors

- Polymer and Sodium Hypochlorite Chemical Feed Systems
- Dissolved Air Flotation Thickener Sludge Collectors
- Thickened Waste Activate Sludge Pumps
- Digester Domes

These systems are included in the later years of the draft Ten Year Plan where they exceed the identified “book” lives. However, it has been SOCWA’s experience that these systems have an actual life that exceeds “book” life. These systems should undergo future condition assessments to verify the need for a project.

timing has been built around either the life of the longest asset or the asset that was deemed to be the most vulnerable. The timing of projects does not typically coincide with the effective useful life. The intent of the current edition of the Ten Year Plan was to address the replacement of all assets that exceed their life within the 15 year span of the evaluation. However, projects within the Ten Year Plan have been prioritized according to the current understanding of the asset condition as well as the critical nature of that asset.

TEN YEAR PLAN PROJECTS

Table I.5 summarizes the proposed capital improvement projects and costs for the Regional Treatment Plant. This table identifies projects in the fiscal year that they would be added to the SOCWA capital improvement budget. Descriptions of each of the projects in Table I.5 are provided in Appendix J. Tables showing the derivation of project costs are shown in Appendix K. The values in Table I.5 do not include project administration costs. These values are added to the annual costs in Chapter 8 of the main Ten Year Plan report.

The projects identified in Table I.5 largely focus on the replacement of assets as they reach the end of their useful life. Different components within an area or process may have varied expected lives. The project

TABLE I.4
REGIONAL TREATMENT PLANT ASSET LISTING

Item No.	System /Location	Asset Description	Installation Year	Nominal Useful Life (Years)	Nominal Replacement Year
1	Preliminary Treatment	Manhole A	1983	50	2033
2	Preliminary Treatment	Manhole B	1983	50	2033
3	Preliminary Treatment	Manhole C	1983	50	2033
4	Preliminary Treatment	Vault (MHC)	1983	50	2033
5	Preliminary Treatment	Manhole 5	1983	50	2033
6	Preliminary Treatment	Manhole 1	1983	50	2033
7	Preliminary Treatment	Manhole 2	1983	50	2033
8	Preliminary Treatment	Manhole 3	1983	50	2033
9	Preliminary Treatment	Manhole 3A	1983	50	2033
10	Preliminary Treatment	Manhole 4	1983	50	2033
11	Preliminary Treatment	Bypass Vault (MH4)	1983	50	2033
12	Preliminary Treatment	Headworks Building Structure	1983	50	2033
13	Preliminary Treatment	Headworks Building Architectural Hardware	1983	35	2018
14	Preliminary Treatment	Headworks Building Roof	2009	25	2034
15	Preliminary Treatment	Headworks Building Electrical	2009	30	2039
16	Preliminary Treatment	MCC-A	1983	30	2013
17	Preliminary Treatment	Headworks Building Mechanical	1983	30	2013
18	Preliminary Treatment	Headworks Building Bin Floor Sump Pump	2009	25	2034
19	Preliminary Treatment	Headworks Bldg Gas Detection	2009	20	2029
20	Preliminary Treatment	Headworks Building Supply Fan	1983	30	2013
21	Preliminary Treatment	Headworks Gates	2009	30	2039
22	Preliminary Treatment	Influent Structure Gates	2017	30	2047
23	Preliminary Treatment	Influent Junction Structure	1983	50	2033
24	Preliminary Treatment	Influent Structure Drainage Drywell	1983	50	2033
25	Preliminary Treatment	Influent Structure Drainage Pump	1983	20	2003
26	Preliminary Treatment	Bar Screen	2009	20	2029
27	Preliminary Treatment	Screenings Compactor	2009	15	2024
28	Preliminary Treatment	Screenings Conveyor	2009	20	2029
29	Preliminary Treatment	Grit Classifier	2009	20	2029
30	Preliminary Treatment	Aerated Grit Removal Tank Structures	1983	50	2033
31	Preliminary Treatment	Aerated Grit Removal Tank Covers	1995	25	2020
32	Preliminary Treatment	Aerated Grit Removal Tank Mechanical	1983	25	2008
33	Primary Treatment	Primary Sedimentation Basin Structural	1983	50	2033
34	Primary Treatment	Primary Sedimentation Basin Covers	1994	25	2019
35	Primary Treatment	Primary Sedimentation Sludge Collectors	2007	20	2027
36	Primary Treatment	Primary Sedimentation Cross Collectors	1995	20	2015
37	Primary Treatment	Primary Sedimentation Scum Collectors	1983	20	2003
38	Primary Treatment	Primary Tank Level Controller	2007	20	2027
39	Primary Treatment	Level Indicator: Primary Tank Level	1983	20	2003
40	Primary Treatment	Scum Trough Bubbler Panel	2002	20	2022
41	Primary Treatment	Primary Sedimentation Scum Pumps	1983	25	2008
42	Primary Treatment	Primary Sedimentation Submerged Effluent Collectors	1983	30	2013
43	Primary Treatment	Primary Sedimentation Basin Electrical	1983	30	2013
44	Primary Treatment	Primary Gallery Structure	1983	50	2033
45		Primary Gallery Architectural Hardware	1983	50	2033
46	Primary Treatment	Primary Gallery Mechanical	1983	30	2013
47	Primary Treatment	Primary Gallery Roof Fan	1983	20	2003
48	Primary Treatment	Primary Gallery Air Handling Unit	1983	20	2003
49	Primary Treatment	Primary Gallery Sump Pump	1987	20	2007
50	Primary Treatment	Primary Gallery Tank Drainage Pump	2013	20	2033
51	Primary Treatment	Primary Gallery Electrical	1983	25	2008
52	Primary Treatment	Primary Sludge Pumps	2011	20	2031
53	Primary Treatment	Primary Sludge Flowmeter	2003	20	2023
54	Primary Treatment	Grit Pumps	1983	20	2003
55	Interstage Pump Station	Interstage Structural	1983	50	2033
56	Interstage Pump Station	Interstage Pumps - Size 1	1983	25	2008
57	Interstage Pump Station	Interstage Pumps - Size 2	1983	25	2008
58	Interstage Pump Station	Interstage Pump Station Piping and Valves	1983	30	2013
59	Interstage Pump Station	Interstage Pump Station Electrical	2006	25	2031
60	Interstage Pump Station	Interstage Pump Station Emergency MCC	2011	30	2041
61	Interstage Pump Station	Emergency Interstage Pumps	2011	30	2041
62	Interstage Pump Station	Emergency Interstage Pump Station Piping and Valves	2011	35	2046
63	Interstage Pump Station	Emergency Interstage Electrical	2011	30	2041
64	Interstage Pump Station	MCC-H	2017	20	2037
65	Secondary Treatment	Aeration Basin Structure	1983	50	2033
66	Secondary Treatment	Aeration Basin Handrails		40	40
67	Secondary Treatment	Aeration Basin Air Piping	2003	40	2043
68	Secondary Treatment	Aeration Air Flow Meters	2003	20	2023
69	Secondary Treatment	Aeration Dissolved Oxygen Meters	2003	20	2023
70	Secondary Treatment	Aeration Control Valves	2003	20	2023
71	Secondary Treatment	Pneumatic Actuator -Aeration Control Valves	2003	20	2023
72	Secondary Treatment	Aeration Air Diffusion System	2003	20	2023
73	Secondary Treatment	Aeration Basin Influent Gates	1983	20	2003

74	Secondary Treatment	Aeration Basin Effluent Weirs	1983	30	2013
75	Secondary Treatment	Aeration Basin Mechanical	1983	30	2013
76	Secondary Treatment	Aeration Basin Electrical	2003	35	2038
77	Secondary Treatment	Blower Building	2003	50	2053
78	Secondary Treatment	Blower Building Roof	2003	25	2028
79	Secondary Treatment	Blower Building Architectural Hardware	2003	35	2038
80	Secondary Treatment	Single Stage Blower	2003	30	2033
81	Secondary Treatment	Multistage Blowers	2003	30	2033
82	Secondary Treatment	Aeration Building Air Compressor	2003	20	2023
83	Secondary Treatment	Blower Building Aeration Control Valves	2003	25	2028
84	Secondary Treatment	Electric Actuator (Blower Bldg Aeration Valve)	2003	20	2023
85	Secondary Treatment	Pneumatic Actuator (Blower Bldg Aeration Control Valve)	2003	20	2023
86	Secondary Treatment	Blower Building Aeration Butterfly Valves	2003	25	2028
87	Secondary Treatment	Blower Building Aeration Check Valves	2003	25	2028
88	Secondary Treatment	Blower Building Aeration Piping	2003	40	2043
89	Secondary Treatment	Aeration Data Recorder	2003	20	2023
90	Secondary Treatment	Pressure Transmitter: Aeration	2003	20	2023
91	Secondary Treatment	Blower Building Mechanical	2003	25	2028
92	Secondary Treatment	Blower Building Electrical	2003	35	2038
93	Secondary Treatment	MCC-30310	2003	30	2033
94	Secondary Treatment	MCC-B	2017	30	2047
95	Secondary Treatment	Secondary Sedimentation Basin Structures	1983	50	2033
96	Secondary Treatment	Secondary Sedimentation Basin Sludge Collectors	1983	25	2008
97	Secondary Treatment	Secondary Sedimentation Bridges	1983	40	2023
98	Secondary Treatment	Secondary Sedimentation Basin Effluent Weirs	1983	15	1998
99	Secondary Treatment	Secondary Sedimentation Drop Gates	1983	30	2013
100	Secondary Treatment	Secondary Sedimentation Basin Mechanical	1983	20	2003
101	Secondary Treatment	Secondary Sedimentation Basin Electrical	1983	25	2008
102	Secondary Treatment	RAS Pump Station Structures	1983	50	2033
103	Secondary Treatment	RAS Pumps	1983	20	2003
104	Secondary Treatment	RAS Pump Station Mechanical	1983	30	2013
105	Secondary Treatment	RAS Pump Station Electrical	1983	25	2008
106	Secondary Treatment	RAS Pump Flow Meters	1983	20	2003
107	Secondary Treatment	RAS Pump Valves	1983	20	2003
108	Secondary Treatment	Secondary Scum Pumps	1983	25	2008
109	Secondary Treatment	Secondary Scum Mechanical	1983	20	2003
110	Secondary Treatment	Secondary Scum Electrical	1983	25	2008
111	Secondary Treatment	WAS Pumps	2008	20	2028
112	Secondary Treatment	WAS Flow Meters	2008	20	2028
113	Secondary Treatment	WAS Pumping Mechanical	2008	20	2028
114	Secondary Treatment	WAS Pumping Electrical	2008	25	2033
115	Secondary Treatment	Drain Gates	1983	30	2013
116	Ferric Chloride System	Ferric Chloride Storage Tanks	2007	30	2037
117	Ferric Chloride System	Ferric Chloride Metering Pumps	2002	15	2017
118	Ferric Chloride System	Ferric Chloride Containment System	1988	20	2008
119	Ferric Chloride System	Ferric Chloride Mechanical	1988	25	2013
120	Ferric Chloride System	Ferric Chloride Electrical	1988	30	2018
121	Chlorine System	Chlorine Building	1983	50	2033
122	Chlorine System	Chlorine Building Roof	2014	25	2039
123	Chlorine System	Chlorine Building Architectural Hardware	1983	50	2033
124	Chlorine System	Chlorine Bldg Air Handling Unit & Fans	1983	20	2003
125	Chlorine System	Chlorine Building-2 W Pumps	1983	15	1998
126	Chlorine System	Chlorine Crane	1983	20	2003
127	Chlorine System	Air Break Tank	1983	20	2003
128	Chlorine System	Process Water CCT Flash Mixer	1983	15	1998
129	Chlorine System	Water Champ - AWT No. 1 & AWT No. 2	2004	15	2019
130	Chlorine System	Chlorine Building Electrical	1983	25	2008
131	Chlorine System	MCC-E	1983	20	2003
132	NaOCl System	AWT NaOCl Containment Area	2016	50	2066
133	NaOCl System	AWT NaOCl Containment Area Architectural Hardware	2016	30	2046
134	NaOCl System	AWT NaOCl Bulk Storage Tanks	2016	30	2046
135	NaOCl System	AWT NaOCl Bulk Storage Tank Level Measurement Primary Elements	2016	20	2036
136	NaOCl System	AWT NaOCl Pumps	2016	15	2031
137	NaOCl System	AWT NaOCl Mechanical	2016	15	2031
138	NaOCl System	AWT NaOCl Electrical	2016	30	2046
139	NaOCl System	PW NaOCl Containment	2016	50	2066
140	NaOCl System	PW NaOCl Storage Tank	2016	30	2046
141	NaOCl System	PW NaOCl Tank Level Measurement Primary Element	2016	20	2036
142	NaOCl System	PW NaOCl Pumps	2016	15	2031
143	NaOCl System	PW NaOCl Mechanical	2016	15	2031
144	NaOCl System	PW NaOCl Electrical	2016	30	2046
145	NaOCl System	RAS NaOCl Containment	1983	50	2033
146	NaOCl System	RAS NaOCl Pumps	2016	15	2031
147	NaOCl System	RAS NaOCl Mechanical	2016	15	2031
148	NaOCl System	RAS NaOCl Electrical	2016	30	2046
149	Advanced Treatment/AWT No.1	Chlorine Contact Basin Structure	1988	50	2038
150	Advanced Treatment/AWT No.1	CCT Gate - Drain	1983	25	2008
151	Advanced Treatment/AWT No.1	CCT Gate - Size 1	1983	25	2008
152	Advanced Treatment/AWT No.1	CCT Gate - Size 2	1983	25	2008
153	Advanced Treatment/AWT No.1	AWT No.1 Applied Water Pumps - Type 1	1989	20	2009
154	Advanced Treatment/AWT No.1	AWT No.1 Applied Water Pumps-Type 2	1989	20	2009

155	Advanced Treatment/AWT No.1	AWT No. 1 Applied Water Pump Valves	1997	20	2017
156	Advanced Treatment/AWT No.1	AWT No. 1 Applied Water Flowmeter	1987	15	2002
157	Advanced Treatment/AWT No.1	AWT No.1 RWR Pumps-Size 1	1989	20	2009
158	Advanced Treatment/AWT No.1	AWT No.1 RWR Pumps-Size 2	1989	20	2009
159	Advanced Treatment/AWT No.1	AWT No.1 RWR Pumps-Size 3	1989	20	2009
160	Advanced Treatment/AWT No.1	AWT No. 1 Reclaim Water Flowmeter	2005	15	2020
161	Advanced Treatment/AWT No.1	AWT No.1 Back Wash Pump	1989	15	2004
162	Advanced Treatment/AWT No.1	AWT No.1 Flocculators	1988	15	2003
163	Advanced Treatment/AWT No.1	AWT No.1 Filters	1988	15	2003
164	Advanced Treatment/AWT No.1	AWT No.1 Chem Clean System	1989	15	2004
165	Advanced Treatment/AWT No.1	AWT No.1 Turbidity Analyzer	2002	20	2022
166	Advanced Treatment/AWT No.1	Level Indicator: Mudwell Level	2004	20	2024
167	Advanced Treatment/AWT No.1	Data Recorder: RAS Effluent & AWT No. 1	2001	15	2016
168	Advanced Treatment/AWT No.1	AWT No.1 Mechanical	1988	20	2008
169	Advanced Treatment/AWT No.1	AWT No. 1 Butterfly Valves	1987	20	2007
170	Advanced Treatment/AWT No.1	AWT No. 1 Pneumatic Actuators	1987	20	2007
171	Advanced Treatment/AWT No.1	AWT No.1 Electrical	1988	25	2013
172	Advanced Treatment/AWT No.1	MSC-I	1988	20	2008
173	Advanced Treatment/AWT No.1	MCC-J	1988	20	2008
174	Advanced Treatment/AWT No.1	CCT 1 Gates	1997	30	2027
175	Advanced Treatment/AWT No.1	CCT3 Gates	1989	30	2019
176	Advanced Treatment/AWT No.2	Chlorine Contact Basin Structure	1997	50	2047
177	Advanced Treatment/AWT No.2	Chlorine Contact Basin Covers	1997	30	2027
178	Advanced Treatment/AWT No.2	AWT Building	1997	50	2047
179		AWT Building Roof	1997	25	2022
180		AWT Building Architectural Hardware	1997	35	2032
181	Advanced Treatment/AWT No.2	AWT Building Mechanical	1997	20	2017
182	Advanced Treatment/AWT No.2	AWT Building Electrical	1997	35	2032
183	Advanced Treatment/AWT No.2	MSC-2	1997	30	2027
184	Advanced Treatment/AWT No.2	MCC-K	1997	30	2027
185	Advanced Treatment/AWT No.2	MCC-L	1997	30	2027
186	Advanced Treatment/AWT No.2	AWT No.2 Applied Water Pumps	1997	20	2017
187	Advanced Treatment/AWT No.2	AWT No. 2 Waste Backwash Pump	1997	25	2022
188	Advanced Treatment/AWT No.2	AWT No. 2 Flash Mixer	1997	20	2017
189	Advanced Treatment/AWT No.2	AWT No.2 Flocculators	1997	20	2017
190	Advanced Treatment/AWT No.2	Filter Structure	1997	50	2047
191	Advanced Treatment/AWT No.2	AWT No.2 Filters	1997	50	2047
192	Advanced Treatment/AWT No.2	Alum Storage Tanks	1997	30	2027
193	Advanced Treatment/AWT No.2	Alum Feeders	1997	15	2012
194	Advanced Treatment/AWT No.2	Alum Containment Area	1997	35	2032
195	Advanced Treatment/AWT No.2	AWT No.2 Chem Clean System	1997	15	2012
196	Advanced Treatment/AWT No.2	AWT No.2 Turbidity Analyzer	2017	20	2037
197	Advanced Treatment/AWT No.2	Data Recorder: Turbidity, Residual & AWT 2 Applied Flow	2003	15	2018
198	Advanced Treatment/AWT No.2	Data Recorder: AWT No. 2	2000	15	2015
199	Advanced Treatment/AWT No.2	Level Indicator: Mudwell Level	2003	20	2023
200	Advanced Treatment/AWT No.2	Chlorine Residual Controller	2016	20	2036
201	Advanced Treatment/AWT No.2	Res. Level Controller	1997	20	2017

202	Advanced Treatment/AWT No.2	Panel Level Controller	2000	20	2020
203	Advanced Treatment/AWT No.2	AWT No. 2 Backwash Flow Meter	1994	20	2014
204	Advanced Treatment/AWT No.2	AWT No. 2 Applied Flow Meter	1999	20	2019
205	Advanced Treatment/AWT No.2	AWT No.2 Mechanical	1997	20	2017
206	Advanced Treatment/AWT No.2	AWT No. 2 Butterfly Valves	1997	20	2017
207	Advanced Treatment/AWT No.2	AWT No. 2 Pneumatic Actuators	1997	20	2017
208	Advanced Treatment/AWT No.2	AWT No. 2 Backwash Pressure Reducing Valve	2003	30	2033
209	Advanced Treatment/AWT No.2	AWT No. 2 CCT Gates - Size 1	1997	30	2027
210	Advanced Treatment/AWT No.2	AWT No. 2 CCT Gates - Size 2	1997	30	2027
211	Advanced Treatment/AWT No.2	AWT No. 2 CCT Gates - Size 3	1997	30	2027
212	Advanced Treatment/AWT No.2	Storm Water Pump	1997	25	2022
213	Advanced Treatment/AWT No.2	Storm Runoff Pump	1997	25	2022
214	Advanced Treatment/AWT No.2	CCT Feed Pump	1983	25	2008
215	Advanced Treatment/AWT No.2	AWT No. 2 Low Pressure Blower	1997	30	2027
216	Advanced Treatment/AWT No.2	AWT No. 2 Surge Tank Air Compressor	1997	20	2017
217	Advanced Treatment/AWT No.2	AWT No. 2 High Pressure Air Compressor	1997	20	2017
218	Advanced Treatment/AWT No.2	AWT No. 2 Air Dryer	1997	20	2017
219	Effluent Management	Effluent Equalization Basin	1997	35	2032
220	Effluent Management	Level Indicator: Effluent Equalization Basin (Pond)	1997	20	2017
221	Effluent Management	Effluent Junction Structure	1983	50	2033
222	Effluent Management	Final Effluent Weir Flowmeter	2005	20	2025
223	Effluent Management	Effluent Meter Manhole	1983	50	2033
224	Effluent Management	Effluent Meter No.1	1983	20	2003
225	Effluent Management	Backflow Preventer	1992	35	2027
226	Effluent Management	Level Indicator: Storm Water Pump station	1983	20	2003
227	Administration	Administration Building	1983	50	2033
228	Administration	Administration Building Roof	2010	25	2035
229	Administration	Administration Building Architectural Hardware	1983	35	2018
230	Administration	Administration Building Mech.	2011	20	2031
231	Administration	Administration Building Elect.	1983	35	2018
232	Administration	MCC-F	1983	30	2013
233	Administration	Laboratory Benchwork	2003	30	2033
234	Administration	Laboratory Equipment	1983	20	2003
235	Solids	Energy Building Structural	1983	50	2033
236	Solids	Energy Building Structural - Addition	1996	50	2046
237	Solids	Energy Building Roof	1983	25	2008
238	Solids	Energy Building Mechanical	1983	20	2003
239	Solids	Energy Bldg - Air Handling Units	1983	20	2003
240	Solids	Energy Building Electrical	1983	25	2008
241	Solids	MSG-1	2017	30	2047
242	Solids	MCC-C	1983	30	2013
243	Solids	MCC-G	1983	30	2013
244	Solids	Polyme Booster Water System	2007	15	2022
245	Solids	Bulk Polymer Storage Tanks	1983	25	2008
246	Solids	Bulk Polymer Storage Containment	1983	30	2013
247	Solids	Bulk Polymer Transfer Pumps	1983	15	1998
248	Liquids	Polymer Day Tanks	1983	30	2013
249	Liquids	Level Indicator: Polymer Tank #1	1999	20	2019
250	Liquids	Polymer Mixers	1983	20	2003
251	Liquids	Polymer Metering Pumps- DAF	1983	15	1998
252	Liquids	Mannich Polymer Piping and Valving	1983	25	2008
253	Solids	Emulsion Polymer Feeders	2011	15	2026
254	Solids	Emulsion Polymer Piping and Valving	2011	25	2036
255	Solids	Polymer Mixing Pumps	1997	15	2012
256	Solids	Polymer Mechanical	1983	20	2003
257	Solids	Polymer Electrical	2011	25	2036
258	Liquids	DAF Structures	1983	50	2033
259	Liquids	DAF Covers	1998	25	2023
260	Liquids	DAF Collectors	2007	30	2037
261	Liquids	DAF Compressors	2002	20	2022
262	Liquids	DAF Dissolution Tanks	1983	25	2008
263	Liquids	TWAS Pumps	2007	20	2027
264	Liquids	TWAS Flowmeter	2002	20	2022
265	Liquids	DAF Mechanical	1983	20	2003
266	Liquids	DAF Electrical	2007	25	2032
267	Solids	Sludge Flow Meters	1983	20	2003
268	Solids	Sludge Equalization Tanks	1983	50	2033
269	Solids	Level Control: SET Tanks	2007	20	2027
270	Solids	Equalized Sludge Circulation Pumps	1983	25	2008
271	Solids	Equalized Sludge Pumps	2010	20	2030
272	Solids	Equalized Sludge Mechanical	1987	25	2012
273	Solids	Equalization Dry Pit Structure	1983	50	2033
274	Solids	Equalization Dry Pit Structure Handrail	1983	40	2023
275	Solids	Equalization Dry Pit Structure Architectural Hardware	1983	50	2033
276	Solids	Equalized Sludge Flow Meter	2002	20	2022
277	Solids	Equalized Sludge Grinder	1986	20	2006

278	Solids	Equalized Sludge Electrical	1983	25	2008
279	Solids	Solids Building	1983	50	2033
280	Solids	Solids Building Roof	1983	25	2008
281	Solids	Solids Building Architectural Hardware	1983	50	2033
282	Solids	Solids Building Mechanical	1983	30	2013
283	Solids	Solids Building Electrical	1983	25	2008
284	Solids	MCC-D	1983	20	2003
285	Solids	Digester Structures	1983	50	2033
286	Solids	Digester Architectural Hardware	1983	50	2033
287	Solids	Digester Hand rails	1983	40	2023
288	Solids	Level Indicator: Digester Tank	2004	20	2024
289	Solids	Digester Domes	1983	30	2013
290	Solids	Digester Gas Circulation/Mixing System	2002	20	2022
291	Solids	Digester Sludge Circulation Pumps	2001	25	2026
292	Solids	Digester Bldg - YMCA Pump	1991	25	2016
293	Solids	Digester Heat Loops	1983	20	2003
294	Solids	Digester Hot Water Valves	1983	20	2003
295	Solids	Pneumatic Actuators - Digester Hot Water Valves	1983	20	2003
296	Solids	Digester Mechanical	1983	20	2003
297	Solids	Digester Electrical	1983	25	2008
298	Solids	Digester Bldg Gas Detection	1979	20	1999
299	Solids	Gas Management Building (Digester Building)	1983	50	2033
300	Solids	Gas Management Building Roof	1983	25	2008
301	Solids	Gas Management Building Architectural Hardware	1983	50	2033
302	Solids	Gas Management Building Mechanical	1983	20	2003
303	Solids	Gas Management Building Electrical	1983	25	2008
304	Solids	Digested Sludge Pumps	1997	20	2017
305	Solids	Digested Sludge Flow Meters	1997	20	2017
306	Solids	Centrifuges	1998	30	2028
307	Solids	MCC-M	1999	20	2019
308	Solids	DP-1	1999	20	2019
309	Solids	Conveyors - Type 1	1998	20	2018
310	Solids	Conveyors - Type 2	1998	20	2018
311	Solids	Conveyors - Type 3	1998	20	2018
312	Solids	Conveyors - Type 4	1998	20	2018
313	Solids	Sludge Hoppers	1998	40	2038
314	Solids	Hopper Room Crane	1998	30	2028
315	Solids	Dewatering System Platform and Stairways	1998	40	2038
316	Solids	Dewatering Roof Roll Up Door	1983	35	2018
317	Solids	Dewatering System Mechanical	1998	20	2018
318	Solids	Dewatering System Gates	1998	20	2018
319	Solids	Pneumatic Actuators	1998	20	2018
320	Solids	Dewatering System Electrical	1998	25	2023
321	Solids	Truck Loads Cells	1998	40	2038
322	Solids	El Toro Truck Station Sludge Flowmeter	1994	20	2014
323	Solids	Dewatering Room Crane	1998	20	2018
324	Odor Control	Odor Control Scrubber No.1	1997	20	2017
325	Odor Control	Scrubber No. 1 Chemical Tanks	1997	30	2027
326	Odor Control	Odor Control Scrubber No.1 Ducting & Supply Fan	1997	20	2017
327	Odor Control	Odor Control Scrubber No.1 Electrical	1997	20	2017
328	Odor Control	Odor Control Scrubber No.2	1999	20	2019
329	Odor Control	Odor Control Scrubber No.2 Containment Area	1999	50	2049
330	Odor Control	Scrubber No. 2 Chemical Tanks	1999	30	2029
331	Odor Control	Odor Control Scrubber No.2 Ducting & Supply Fan	1999	20	2019
332	Odor Control	Odor Control Scrubber No.2 Electrical	1999	20	2019
333	Odor Control	Odor Control Scrubber No.3	2002	20	2022
334	Odor Control	Scrubber No. 3 Chemical Tanks	2002	30	2032
335	Odor Control	Odor Control Scrubber No.3 Ducting & Supply Fan	2002	20	2022
336	Odor Control	Odor Control Scrubber No.3 Electrical	2002	20	2022
337	Odor Control	ORT Recirculation Pump	1983	25	2008
338	Odor Control	ORT Transfer Fan from Solids Dewatering - Size 1	1998	30	2028
339	Odor Control	ORT Transfer Fan from Solids Dewatering - Size 2	1998	30	2028
340	Odor Control	ORT Transfer Fan from Solids Dewatering - Size 3	1998	30	2028
341	Odor Control	ORT Transfer Fan from Solids Dewatering - Size 4	1983	30	2013
342	Odor Control	ORT Transfer Fan from DAF	1992	30	2022
343	Odor Control	ORT Transfer Fan from Influent Structure	1983	30	2013
344	Odor Control	ORT Supply Fan - Size 1	1983	20	2003
345	Odor Control	ORT Supply Fan - Size 2	1983	20	2003
346	Plant Heat Loop	Plant Heat Loop Pumps	1983	25	2008
347	Plant Heat Loop	Plant Heat Loops	1983	20	2003
348	Plant Heat Loop	Waste Heat Loop Control Valve	1983	35	2018
349	Plant Heat Loop	Pneumatic Actuator -Waste Heat Loop Control Valve	1983	20	2003
350	Energy	Digester Gas Conditioning System	2017	20	2037
351	Energy	DGCS - Carbon Vessels	2017	30	2047
352	Energy	DGCS - H2S Vessels	2017	30	2047
353	Energy	Engine Generator Unit	2017	20	2037
354	Energy	Cogen Hot Water Pump	2017	20	2037
355	Energy	Heat Exchange Package Units	2004	20	2024
356	Energy	Sludge Heat Exchanger	1983	30	2013
357	Energy	Waste Gas Burner	1983	20	2003
358	Energy	Gas Control Valves	2017	20	2037
359	Energy	Pneumatic Actuator - Gas Control Valves	1983	20	2003
360	Energy	Generator Room Crane	1983	30	2013
361	Energy	Boiler	2016	25	2041
362	Energy	Boiler Hot Water Pump	2017	20	2037
363	Energy	Air Compressor Equipment	1983	20	2003
364	Energy	Instrument Air System	1983	20	2003
365	Energy	Service Air System	2013	20	2033
366	Energy	Clean Lube Oil Transfer Pump	1983	15	1998
367	Energy	Waste Lube Oil Transfer Pump	1983	15	1998
368	Energy	Waste HEX Cooling Water Pumps	1983	25	2008
369	Energy	Cogen Waste/Cube OK Tank	1995	30	2025
370	Energy	Engine Room Exhaust Fan - Size 1	1983	20	2003

371	Energy	Engine Room Exhaust Fan - Size 2	1983	30	2013
372	Energy	Ventilation Room Air Handling Unit	1983	20	2003
373	Energy	Ventilation Room- Blower Room Exhaust Fan	1983	30	2013
374	Energy	Ventilation Room - Transfer Fan	1983	30	2013
375	Energy	Generator Room Supply Fan	1983	30	2013
376	Plant Water	3WLP Pumps	1983	20	2003
377	Plant Water	3WLP Auto Screen	1983		1983
378	Plant Water	3WLP Flow Meter	2003	20	2023
379	Plant Water	Pressure Transmitter: 3 WLP	1983	20	2003
380	Plant Water	3WLP Waste flow Control Valve	2002	35	2037
381	Plant Water	Pneumatic Actuator - 3WLP Waste flow Control Valve	2002	20	2022
382	Plant Water	3WHP Pumps	1983	25	2008
383	Plant Water	3WHP Auto Screen	1983		1983
384	Plant Water	3WHP Flow Meter	1983	20	2003
385	Maintenance Shop	Bench Work	1983	30	2013
386	Maintenance Shop	Roll Up Door	2008	35	2043
387	Maintenance Shop	Crane	1983	40	2023
388	Maintenance Shop	Equipment	1983	25	2008
389	Maintenance Shop	Electrical	1983	20	2003
390	Underground Piping	Heat Reservoir Return	1983	30	2013
391	Underground Piping	Heat Reservoir Supply	1983	30	2013
392	Underground Piping	Natural Gas	1983	30	2013
393	Underground Piping	3W High pressure	1983	30	2013
394	Underground Piping	2W	1983	30	2013
395	Underground Piping	Waste Activated Sludge	1983	30	2013
396	Underground Piping	Process Drainage	1983	30	2013
397	Underground Piping	Thickened Waste Activated Sludge	1983	30	2013
398	Underground Piping	Pumped Sludge	1983	30	2013
399	Underground Piping	Gas Circulation	1983	30	2013
400	Underground Piping	Circulation Sludge	1983	30	2013
401	Underground Piping	Tank Drain	1983	30	2013
402	Underground Piping	Low Pressure Sludge Gas	1983	30	2013
403	Underground Piping	Primary Scum	1983	30	2013
404	Underground Piping	Primary Effluent	1983	30	2013
405	Underground Piping	Underground Electrical: Cable	1983	25	2008
406	Underground Piping	Underground Electrical: Conduit	1983	50	2033
407	Underground Piping	Underground Electrical: Manholes	1983	25	2008
408	VFD's	Interstage Pump Station VFD's	2006	15	2021
409	VFD's	RAS Pump VFD's	2002	15	2017
410	VFD's	WAS Pump VFD's	2009	15	2024
411	VFD's	Digested Sludge Pump VFD's	2010	15	2025
412	VFD's	Centrifuge VFD's	1998	15	2013
413	VFD's	AWT No.1 VFD's	1989	15	2004
414	VFD's	AWT No.2 VFD'	1998	15	2013
415	Instrumentation	PLC ACP	1995	15	2010
416	Instrumentation	PLC E	1995	15	2010
417	Instrumentation	PLC AWT-1	1995	15	2010
418	Instrumentation	PLC Aeration	2004	15	2019
419	Instrumentation	PLC Centrifuge 1	2012	30	2042
420	Instrumentation	PLC Centrifuge 2	2012	30	2042
421	Instrumentation	PLC Centrifuge 3	2012	30	2042
422	Instrumentation	PLC Centrifuge 4	2012	30	2042
423	Instrumentation	PLC ECP	2004	15	2019
424	Instrumentation	PLC SCP	2004	15	2019
425	Instrumentation	PLC AWT-2	2004	15	2019
426	Instrumentation	PLC Interstage Pumps		15	15
427	Instrumentation	PLC Emergency Interstage Pumps		15	15
428	Instrumentation	PLC NaOCl	2016	15	2031
429	Storage Building	Storage Building	1997	20	2017
430	Site	Pavement	1983	40	2023
431	Site	Gate No.1	2005	40	2045
432	Site	Gate No.2	2017	40	2057
433	Site	Access Bridge	1983	50	2033
434	Site	Perimeter Fencing	1983	40	2023
435	Site	Storm Channel - North and East	1983	50	2033
436	Site	Storm Channel - East Central	1983	50	2033
437	Site	Storm Channels - East South	1983	50	2033
438	Site	Storm Drain Inlet No.1	1998	40	2038
439	Site	Storm Drain Inlet No.2	1998	40	2038

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 1 ('19/'20)									
	3701-000	Secondary Electrical System Rerouting	\$ 702,000	\$ 702,000	\$ 702,000	\$ -	\$ -	\$ -	\$ -
	3702-000	Waste Activated Sludge VFD Control Panel	\$ 242,000	\$ 242,000	\$ 242,000	\$ -	\$ -	\$ -	\$ -
	3741-000	Southwest Influent Sewer and MH Repair Design	\$ 71,000	\$ 71,000	\$ 71,000	\$ -	\$ -	\$ -	\$ -
	3742-000	Aeration System Upgrade	\$ 1,007,000	\$ 1,007,000	\$ 1,007,000	\$ -	\$ -	\$ -	\$ -
	3743-000	Aeration Gate Replacement	\$ 435,000	\$ 435,000	\$ 435,000	\$ -	\$ -	\$ -	\$ -
	3749-000	Phase I Solids Piping Upgrade	\$ 179,000	\$ 179,000	\$ 105,000	\$ 16,000	\$ 20,000	\$ 1,000	\$ 37,000
	3751-000	Energy Building Roof and Breezeway	\$ 168,000	\$ 168,000	\$ 99,000	\$ 15,000	\$ 19,000	\$ 1,000	\$ 34,000
	3753-000	Aeration Diffuser Upgrade	\$ 807,000	\$ 807,000	\$ 807,000	\$ -	\$ -	\$ -	\$ -
	3755-000	SE Sewer Rehabilitation	\$ 572,000	\$ 572,000	\$ 572,000	\$ -	\$ -	\$ -	\$ -
	3756-000	Secondary Clarifier Safety Repairs	\$ 77,000	\$ 77,000	\$ 77,000	\$ -	\$ -	\$ -	\$ -
	3757-000	Miscellaneous Safety Imps - Liquids	\$ 142,000	\$ 142,000	\$ 142,000	\$ -	\$ -	\$ -	\$ -
	3758-000	AWT No. 2 Reconstruction	\$ 1,263,000	\$ 1,263,000	\$ 1,263,000	\$ -	\$ -	\$ -	\$ -
	3759-000	AWT No. 2 Electrical Upgrades	\$ 177,000	\$ 177,000	\$ 177,000	\$ -	\$ -	\$ -	\$ -

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 1 Cont.									
('19/'20)									
	3761-000	External lighting Upgrade	\$ 90,000	\$ 90,000	\$ 70,000	\$ 5,000	\$ 6,000	\$ -	\$ 9,000
	3766-000	AWT Hypochlorite Tanks Shade	\$ 284,000	\$ 284,000	\$ 284,000	\$ -	\$ -	\$ -	\$ -
	3769-000	Trailer Drain Line	\$ 56,000	\$ 56,000	\$ 44,000	\$ 3,000	\$ 3,000	\$ -	\$ 6,000
	3771-000	Miscellaneous Safety Imps - Solids	\$ 142,000	\$ 142,000	\$ 83,000	\$ 13,000	\$ 16,000	\$ 1,000	\$ 29,000
	3772-000	Hot Water Piping Reconstruction	\$ 625,000	\$ 625,000	\$ 368,000	\$ 56,000	\$ 70,000	\$ 4,000	\$ 128,000
	3773-000	Cogeneration System Modifications	\$ 640,000	\$ 640,000	\$ 376,000	\$ 57,000	\$ 72,000	\$ 4,000	\$ 131,000
	3784-000	Replace DAF (Mannich) Polymer System	\$ 76,000	\$ 76,000	\$ 76,000	\$ -	\$ -	\$ -	\$ -
	3785-000	Replace DAF Dissolution Tank System and Compressors	\$ 101,000	\$ 101,000	\$ 101,000	\$ -	\$ -	\$ -	\$ -
	3786-000	Primary Gallery Mechanical and Electrical Upgrade	\$ 521,000	\$ 521,000	\$ 521,000	\$ -	\$ -	\$ -	\$ -
	4703-000	Laboratory Reconstruction Evaluation	\$ 71,000	\$ 71,000	\$ 55,000	\$ 4,000	\$ 4,000	\$ -	\$ 7,000
	4704-000	Evaluate Plant and Storm Water Drainage System	\$ 91,000	\$ 91,000	\$ 71,000	\$ 5,000	\$ 6,000	\$ -	\$ 9,000
		Small Cap Liquids	\$ 316,000	\$ 316,000	\$ 316,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 220,000	\$ 220,000	\$ 129,000	\$ 20,000	\$ 25,000	\$ 1,000	\$ 45,000
		Small Cap Common	\$ 165,000	\$ 165,000	\$ 129,000	\$ 8,000	\$ 10,000	\$ 1,000	\$ 17,000
		Small Cap AWT	\$ 35,000	\$ 35,000	\$ 35,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 9,275,000	\$ 9,275,000	\$ 8,359,000	\$ 201,000	\$ 251,000	\$ 13,000	\$ 451,000

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD	
YEAR 2 (2021)										
	17087	Odor Control Chemical Tank	\$ 270,000	\$ 275,000	\$ 275,000	\$ -	\$ -	\$ -	\$ -	
	17088	Primary Sedimentation Condition Assessment	\$ 65,000	\$ 66,000	\$ 66,000	\$ -	\$ -	\$ -	\$ -	
	17093	AWT #2 Rehab 2021	\$ 1,439,000	\$ 1,439,000	\$ 1,439,000	\$ -	\$ -	\$ -	\$ -	
	37001-000	MCC A, C, G, H Replacement (Solids)	\$ 203,000	\$ 203,000	\$ 119,000	\$ 18,000	\$ 23,000	\$ 1,000	\$ 41,000	
	37002-000	West Slope Protection	\$ 184,000	\$ 184,000	\$ 144,000	\$ 9,000	\$ 12,000	\$ 1,000	\$ 19,000	
	37003-000	Admin Building Door & Window Repair	\$ 133,000	\$ 133,000	\$ 104,000	\$ 7,000	\$ 8,000	\$ -	\$ 14,000	
	3774-000	MCC A, C, G, H Replacement (Liquids)	\$ 457,000	\$ 457,000	\$ 457,000	\$ -	\$ -	\$ -	\$ -	
	3775-000	Aeration Basin Handrail Upgrade	\$ 154,000	\$ 154,000	\$ 154,000	\$ -	\$ -	\$ -	\$ -	
	3776-000	Effluent Pond Gate Replacement	\$ 528,000	\$ 528,000	\$ 528,000	\$ -	\$ -	\$ -	\$ -	
	3777-000	Site Lighting Upgrade - Liquids	\$ 647,000	\$ 647,000	\$ 647,000	\$ -	\$ -	\$ -	\$ -	
	3778-000	Site Lighting Upgrade - Common	\$ 450,000	\$ 450,000	\$ 352,000	\$ 23,000	\$ 28,000	\$ 1,000	\$ 46,000	
	3779-000	MCC A, C, G, H Replacement (Common)	\$ 289,000	\$ 289,000	\$ 226,000	\$ 14,000	\$ 18,000	\$ 1,000	\$ 30,000	
	4701-000	Interstage Pump Station Condition Assessment	\$ 52,000	\$ 52,000	\$ 52,000	\$ -	\$ -	\$ -	\$ -	
	4702-000	Site Storage Evaluation	\$ 81,000	\$ 81,000	\$ 64,000	\$ 4,000	\$ 5,000	\$ -	\$ 8,000	
			Small Cap Liquids	\$ 326,000	\$ 326,000	\$ 326,000	\$ -	\$ -	\$ -	\$ -
			Small Cap Solids	\$ 227,000	\$ 227,000	\$ 134,000	\$ 20,000	\$ 25,000	\$ 1,000	\$ 46,000
			Small Cap Common	\$ 170,000	\$ 170,000	\$ 133,000	\$ 9,000	\$ 11,000	\$ 1,000	\$ 17,000
			Small Cap AWT	\$ 36,000	\$ 36,000	\$ 36,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 5,712,000	\$ 5,719,000	\$ 5,256,000	\$ 104,000	\$ 130,000	\$ 7,000	\$ 222,000	

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 3 (21/22)									
	17057	Aeration Single Stage Blower Replacement	\$ 1,763,000	\$ 1,855,000	\$ 1,855,000	\$ -	\$ -	\$ -	\$ -
	17061	Mixed Liquor Channel Condition Assessment	\$ 270,000	\$ 284,000	\$ 284,000	\$ -	\$ -	\$ -	\$ -
	17082	Secondary Effluent Conveyance Evaluation	\$ 50,000	\$ 53,000	\$ 53,000	\$ -	\$ -	\$ -	\$ -
	17083	Grit Handling Evaluation	\$ 60,000	\$ 63,000	\$ 63,000	\$ -	\$ -	\$ -	\$ -
	17084	Mannich Polymer Shade	\$ 195,000	\$ 205,000	\$ 205,000	\$ -	\$ -	\$ -	\$ -
	17086	Aeration Basin Upgrade	\$ 3,090,000	\$ 3,252,000	\$ 3,252,000	\$ -	\$ -	\$ -	\$ -
	17330	Energy Building Seismic Analysis	\$ 80,000	\$ 84,000	\$ 66,000	\$ 4,000	\$ 5,000	\$ -	\$ 9,000
	17333	SCADA System Upgrade Project/1st Phase	\$ 368,000	\$ 387,000	\$ 302,000	\$ 19,000	\$ 24,000	\$ 1,000	\$ 40,000
	17338	West Side Storm Channel Reconstruction - Phase II	\$ 68,000	\$ 72,000	\$ 56,000	\$ 4,000	\$ 4,000	\$ -	\$ 7,000
	17346	Buried Water Pipe Reconstruction	\$ 1,545,000	\$ 1,626,000	\$ 1,270,000	\$ 81,000	\$ 102,000	\$ 5,000	\$ 167,000
	17354	Energy Building Condition Assessment	\$ 60,000	\$ 63,000	\$ 49,000	\$ 3,000	\$ 4,000	\$ -	\$ 6,000
	17536	Flare Replacement Project	\$ 2,709,000	\$ 2,851,000	\$ 1,677,000	\$ 255,000	\$ 320,000	\$ 17,000	\$ 582,000
	17541	Emulsion Tank Cover	\$ 195,000	\$ 205,000	\$ 121,000	\$ 18,000	\$ 23,000	\$ 1,000	\$ 42,000
		Small Cap Liquids	\$ 326,000	\$ 337,000	\$ 337,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 234,000	\$ 138,000	\$ 21,000	\$ 26,000	\$ 1,000	\$ 48,000
		Small Cap Common	\$ 170,000	\$ 176,000	\$ 137,000	\$ 9,000	\$ 11,000	\$ 1,000	\$ 18,000
	Small Cap AWT	\$ 36,000	\$ 37,000	\$ 37,000	\$ -	\$ -	\$ -	\$ -	
	TOTALS	\$ 11,212,000	\$ 11,784,000	\$ 9,902,000	\$ 415,000	\$ 520,000	\$ 27,000	\$ 919,000	

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 4 (22/23)									
	17060	Secondary Scum Pump Station Reconstruction	\$ 578,000	\$ 646,000	\$ 646,000	\$ -	\$ -	\$ -	\$ -
	17081	Primary Sedimentation Collectors and Gates	\$ 904,000	\$ 1,009,000	\$ 1,009,000	\$ -	\$ -	\$ -	\$ -
	17090	RAS System Condition Assessment	\$ 50,000	\$ 56,000	\$ 56,000	\$ -	\$ -	\$ -	\$ -
	17342	Electrical Box Reconstruction/Phase I	\$ 1,602,000	\$ 1,788,000	\$ 1,397,000	\$ 90,000	\$ 112,000	\$ 6,000	\$ 183,000
	17356	Instrumentation Plan	\$ 90,000	\$ 100,000	\$ 78,000	\$ 5,000	\$ 6,000	\$ -	\$ 10,000
	17542	Solids Area Overhaul Plan	\$ 90,000	\$ 100,000	\$ 59,000	\$ 9,000	\$ 11,000	\$ 1,000	\$ 21,000
	17543	Digester System Condition Assessment	\$ 85,000	\$ 95,000	\$ 56,000	\$ 8,000	\$ 11,000	\$ 1,000	\$ 19,000
		Small Cap Liquids	\$ 326,000	\$ 347,000	\$ 347,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 242,000	\$ 142,000	\$ 22,000	\$ 27,000	\$ 1,000	\$ 49,000
		Small Cap Common	\$ 170,000	\$ 181,000	\$ 142,000	\$ 9,000	\$ 11,000	\$ 1,000	\$ 19,000
		Small Cap AWT	\$ 36,000	\$ 38,000	\$ 38,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 4,159,000	\$ 4,603,000	\$ 3,970,000	\$ 143,000	\$ 179,000	\$ 9,000	\$ 302,000

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 5 ('23/'24)									
	17074	WAS Pump VFD Panel Reconstruction	\$ 144,000	\$ 164,000	\$ 164,000	\$ -	\$ -	\$ -	\$ -
	17091	Secondary Sedimentation Condition Assessment	\$ 60,000	\$ 69,000	\$ 69,000	\$ -	\$ -	\$ -	\$ -
	17329	Laboratory Reconstruction	\$ 1,042,000	\$ 1,192,000	\$ 932,000	\$ 60,000	\$ 75,000	\$ 4,000	\$ 122,000
	17331	Energy Building Repair and Rehabilitation	\$ 1,646,000	\$ 1,882,000	\$ 1,471,000	\$ 94,000	\$ 118,000	\$ 6,000	\$ 193,000
	17332	Maintenance Shop Rehabilitation	\$ 316,000	\$ 361,000	\$ 282,000	\$ 18,000	\$ 23,000	\$ 1,000	\$ 37,000
	17337	West Side Storm Channel Reconstruction - Phase I	\$ 999,000	\$ 1,143,000	\$ 893,000	\$ 57,000	\$ 72,000	\$ 4,000	\$ 117,000
	17345	Energy Building HVAC Upgrade	\$ 473,000	\$ 541,000	\$ 423,000	\$ 27,000	\$ 34,000	\$ 2,000	\$ 56,000
	17348	Secondary Access Road	\$ 319,000	\$ 364,000	\$ 285,000	\$ 18,000	\$ 23,000	\$ 1,000	\$ 37,000
	17357	MCC D, E, & F Condition Assessment	\$ 45,000	\$ 51,000	\$ 40,000	\$ 3,000	\$ 3,000	\$ -	\$ 5,000
	17538	Digested and Eq Sludge Pump VFD Replacement	\$ 287,000	\$ 328,000	\$ 193,000	\$ 29,000	\$ 37,000	\$ 2,000	\$ 67,000
		Small Cap Liquids	\$ 326,000	\$ 358,000	\$ 358,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 250,000	\$ 147,000	\$ 22,000	\$ 28,000	\$ 1,000	\$ 51,000
		Small Cap Common	\$ 170,000	\$ 187,000	\$ 146,000	\$ 9,000	\$ 12,000	\$ 1,000	\$ 19,000
		Small Cap AWT	\$ 36,000	\$ 40,000	\$ 40,000	\$ -	\$ -	\$ -	\$ -
	TOTALS	\$ 6,090,000	\$ 6,931,000	\$ 5,442,000	\$ 339,000	\$ 424,000	\$ 22,000	\$ 705,000	

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 6 ('24/'25)									
	17055	Primary Gallery Upgrade Phase II	\$ 1,289,000	\$ 1,487,000	\$ 1,487,000	\$ -	\$ -	\$ -	\$ -
	17080	Primary Scum Skimmer	\$ 1,453,000	\$ 1,676,000	\$ 1,676,000	\$ -	\$ -	\$ -	\$ -
	17525	Solids Building Structural Rehabilitation	\$ 306,000	\$ 352,000	\$ 207,000	\$ 32,000	\$ 40,000	\$ 2,000	\$ 72,000
	17526	MCC D Replacement	\$ 520,000	\$ 600,000	\$ 353,000	\$ 54,000	\$ 67,000	\$ 4,000	\$ 122,000
	17528	Heating System Reconstruction	\$ 1,778,000	\$ 2,052,000	\$ 1,207,000	\$ 184,000	\$ 230,000	\$ 12,000	\$ 419,000
	17529	Digester Gas Management Building Rehabilitation	\$ 372,000	\$ 429,000	\$ 253,000	\$ 38,000	\$ 48,000	\$ 3,000	\$ 88,000
	17532	Dewatering System Reconstruction	\$ 7,154,000	\$ 8,254,000	\$ 4,855,000	\$ 740,000	\$ 926,000	\$ 49,000	\$ 1,685,000
	17533	Solids Conveyor Replacement	\$ 3,810,000	\$ 4,396,000	\$ 2,586,000	\$ 394,000	\$ 493,000	\$ 26,000	\$ 897,000
		Small Cap Liquids	\$ 326,000	\$ 370,000	\$ 370,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 258,000	\$ 151,000	\$ 23,000	\$ 29,000	\$ 2,000	\$ 53,000
		Small Cap Common	\$ 170,000	\$ 193,000	\$ 151,000	\$ 10,000	\$ 12,000	\$ 1,000	\$ 20,000
		Small Cap AWT	\$ 36,000	\$ 41,000	\$ 41,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 17,440,000	\$ 20,108,000	\$ 13,336,000	\$ 1,474,000	\$ 1,846,000	\$ 97,000	\$ 3,355,000

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 7 (25/26)									
	17052	Odor Control Scrubber No.1 Replacement	\$ 5,878,000	\$ 7,052,000	\$ 7,052,000	\$ -	\$ -	\$ -	\$ -
	17089	Headworks Condition Assessment	\$ 50,000	\$ 60,000	\$ 60,000	\$ -	\$ -	\$ -	\$ -
	17320	Plant Drainage Pump Station Reconstruction	\$ 603,000	\$ 723,000	\$ 565,000	\$ 36,000	\$ 45,000	\$ 2,000	\$ 74,000
	17323	PW Hypochlorite Pump and Instrument Replacement	\$ 161,000	\$ 194,000	\$ 151,000	\$ 10,000	\$ 12,000	\$ 1,000	\$ 20,000
	17349	Underground Piping Reconstruction Area A	\$ 560,000	\$ 671,000	\$ 525,000	\$ 34,000	\$ 42,000	\$ 2,000	\$ 69,000
	17350	Underground Piping Reconstruction Area B	\$ 1,848,000	\$ 2,218,000	\$ 1,733,000	\$ 111,000	\$ 139,000	\$ 7,000	\$ 228,000
	17355	Pavement and Surface Drainage Master Plan	\$ 90,000	\$ 108,000	\$ 84,000	\$ 5,000	\$ 7,000	\$ -	\$ 11,000
	17534	Storage and Truck loading Rehabilitation	\$ 788,000	\$ 945,000	\$ 556,000	\$ 85,000	\$ 106,000	\$ 6,000	\$ 193,000
	17720	AWT Hypochlorite Pump and Instrument	\$ 206,000	\$ 248,000	\$ 248,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Liquids	\$ 326,000	\$ 382,000	\$ 382,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 266,000	\$ 156,000	\$ 24,000	\$ 30,000	\$ 2,000	\$ 54,000
		Small Cap Common	\$ 170,000	\$ 199,000	\$ 156,000	\$ 10,000	\$ 12,000	\$ 1,000	\$ 20,000
		Small Cap AWT	\$ 36,000	\$ 42,000	\$ 42,000	\$ -	\$ -	\$ -	\$ -
	TOTALS	\$ 10,943,000	\$ 13,108,000	\$ 11,710,000	\$ 315,000	\$ 394,000	\$ 21,000	\$ 669,000	

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 8 (26/27)									
	17056	Interstage Pump Station Reconstruction	\$ 2,567,000	\$ 3,158,000	\$ 3,158,000	\$ -	\$ -	\$ -	\$ -
	17062	Mixed Liquor Channel Rehabilitation	\$ 719,000	\$ 885,000	\$ 885,000	\$ -	\$ -	\$ -	\$ -
	17071	Odor Control Scrubber No.2 Replacement	\$ 2,928,000	\$ 3,601,000	\$ 3,601,000	\$ -	\$ -	\$ -	\$ -
	17079	MCC E Replacement	\$ 354,000	\$ 436,000	\$ 436,000	\$ -	\$ -	\$ -	\$ -
	17092	DAF System Condition Assessment	\$ 60,000	\$ 74,000	\$ 74,000	\$ -	\$ -	\$ -	\$ -
	17325	Process Water Contact Basin Gate and Valve Replacement	\$ 247,000	\$ 304,000	\$ 238,000	\$ 15,000	\$ 19,000	\$ 1,000	\$ 31,000
	17327	MCC F Replacement	\$ 448,000	\$ 551,000	\$ 430,000	\$ 28,000	\$ 35,000	\$ 2,000	\$ 56,000
	17340	Plant Water Pump Screen Replacement	\$ 214,000	\$ 263,000	\$ 206,000	\$ 13,000	\$ 17,000	\$ 1,000	\$ 27,000
	17341	Lube Oil Tank Replacement	\$ 105,000	\$ 130,000	\$ 101,000	\$ 6,000	\$ 8,000	\$ -	\$ 13,000
	17347	Electrical Box Reconstruction/Phase II	\$ 2,210,000	\$ 2,719,000	\$ 2,124,000	\$ 136,000	\$ 170,000	\$ 9,000	\$ 279,000
	17721	AWT No.2 Contact Basin Upgrades	\$ 243,000	\$ 299,000	\$ 299,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Liquids	\$ 326,000	\$ 394,000	\$ 394,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 274,000	\$ 161,000	\$ 25,000	\$ 31,000	\$ 2,000	\$ 56,000
		Small Cap Common	\$ 170,000	\$ 206,000	\$ 161,000	\$ 10,000	\$ 13,000	\$ 1,000	\$ 21,000
	Small Cap AWT	\$ 36,000	\$ 44,000	\$ 44,000	\$ -	\$ -	\$ -	\$ -	
	TOTALS	\$ 10,855,000	\$ 13,335,000	\$ 12,310,000	\$ 234,000	\$ 292,000	\$ 15,000	\$ 484,000	

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 9 (27/28)									
	17053	Headworks Process Equipment Replacement	\$ 2,896,000	\$ 3,787,000	\$ 3,787,000	\$ -	\$ -	\$ -	\$ -
	17064	RAS Hypochlorite Pump and Instrument Replacement	\$ 161,000	\$ 211,000	\$ 211,000	\$ -	\$ -	\$ -	\$ -
	17066	Replace Effluent Flow Meter Weir and Level Transmitter	\$ 94,000	\$ 122,000	\$ 122,000	\$ -	\$ -	\$ -	\$ -
	17068	TWAS System Reconstruction	\$ 346,000	\$ 453,000	\$ 453,000	\$ -	\$ -	\$ -	\$ -
	17322	Plant Water Pumping System Reconstruction	\$ 548,000	\$ 717,000	\$ 560,000	\$ 36,000	\$ 45,000	\$ 2,000	\$ 74,000
	17523	Sludge Equalization System Mechanical and Electrical Rehabilitation	\$ 1,810,000	\$ 2,366,000	\$ 1,392,000	\$ 212,000	\$ 265,000	\$ 14,000	\$ 483,000
		Small Cap Liquids	\$ 326,000	\$ 407,000	\$ 407,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 283,000	\$ 166,000	\$ 25,000	\$ 32,000	\$ 2,000	\$ 58,000
		Small Cap Common	\$ 170,000	\$ 212,000	\$ 166,000	\$ 11,000	\$ 13,000	\$ 1,000	\$ 22,000
		Small Cap AWT	\$ 36,000	\$ 45,000	\$ 45,000	\$ -	\$ -	\$ -	\$ -
	TOTALS	\$ 6,615,000	\$ 8,603,000	\$ 7,309,000	\$ 284,000	\$ 356,000	\$ 19,000	\$ 636,000	

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 10 (28/29)									
	17059	RAS Pump Station Reconstruction	\$ 2,884,000	\$ 3,796,000	\$ 3,796,000	\$ -	\$ -	\$ -	\$ -
	17321	Chlorine Building Rehabilitation	\$ 229,000	\$ 302,000	\$ 236,000	\$ 15,000	\$ 19,000	\$ 1,000	\$ 31,000
	17334	Storage Building Project	\$ 899,000	\$ 1,184,000	\$ 925,000	\$ 59,000	\$ 74,000	\$ 4,000	\$ 121,000
	17335	Site Pavement Reconstruction	\$ 1,007,000	\$ 1,325,000	\$ 1,035,000	\$ 66,000	\$ 83,000	\$ 4,000	\$ 136,000
	17351	Underground Piping Reconstruction Area C	\$ 525,000	\$ 691,000	\$ 540,000	\$ 35,000	\$ 43,000	\$ 2,000	\$ 71,000
	17352	Underground Piping Reconstruction Area D	\$ 291,000	\$ 383,000	\$ 299,000	\$ 19,000	\$ 24,000	\$ 1,000	\$ 39,000
	17722	AWT Control Building Structural, Mechanical and Electrical Upgrade	\$ 500,000	\$ 658,000	\$ 658,000	\$ -	\$ -	\$ -	\$ -
	17723	AWT No.2 Applied Water Pump System	\$ 212,000	\$ 279,000	\$ 279,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Liquids	\$ 326,000	\$ 420,000	\$ 420,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 292,000	\$ 172,000	\$ 26,000	\$ 33,000	\$ 2,000	\$ 60,000
		Small Cap Common	\$ 170,000	\$ 219,000	\$ 171,000	\$ 11,000	\$ 14,000	\$ 1,000	\$ 22,000
		Small Cap AWT	\$ 36,000	\$ 46,000	\$ 46,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 7,308,000	\$ 9,595,000	\$ 8,577,000	\$ 232,000	\$ 290,000	\$ 15,000	\$ 481,000

Table I.5 - Regional Treatment Plant Capital Improvement Plan

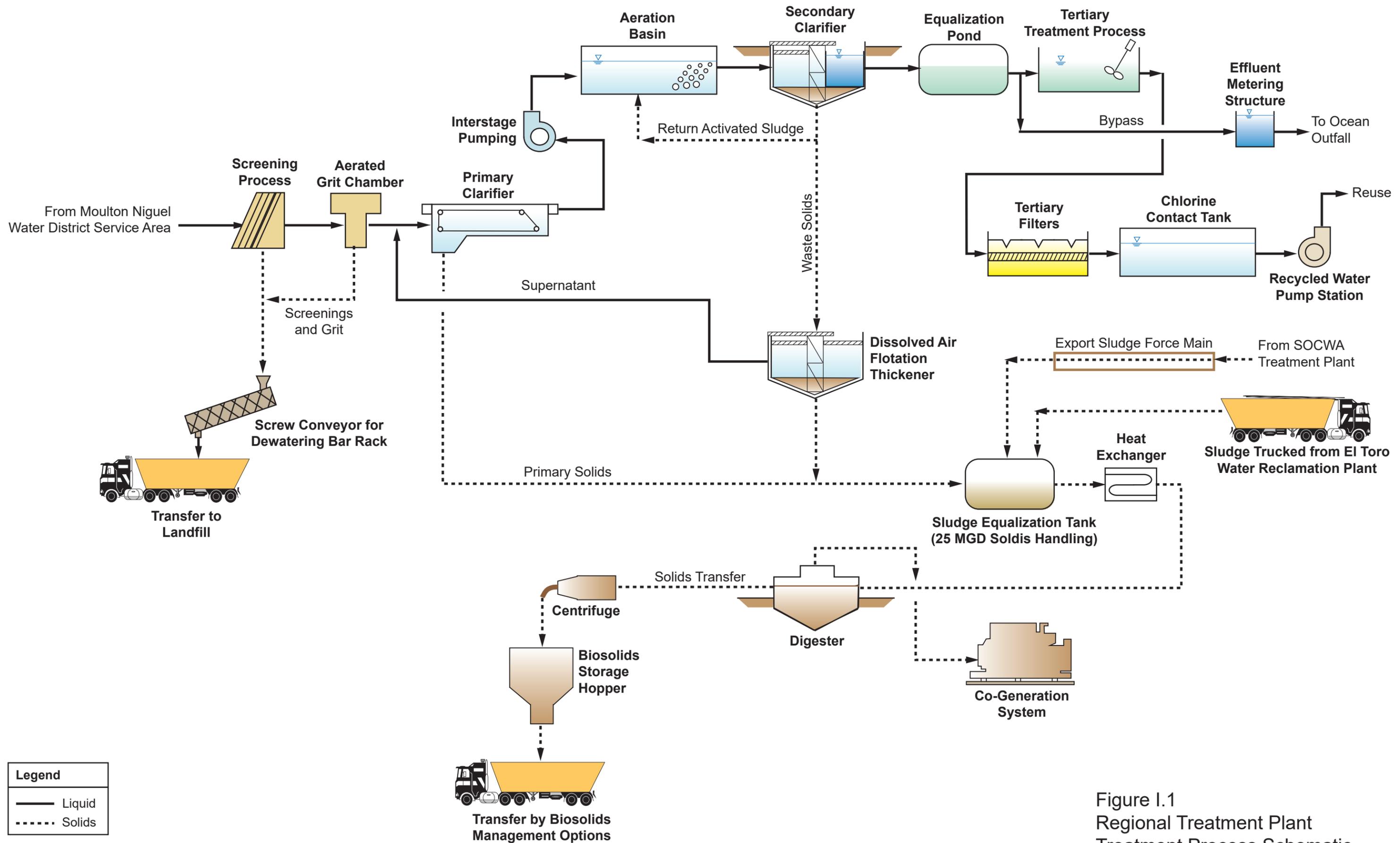
Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 11 ('29/'30)									
	17058	Secondary Sedimentation Basin Reconstruction	\$ 4,080,000	\$ 5,668,000	\$ 5,668,000	\$ -	\$ -	\$ -	\$ -
	17522	Emulsion Polymer Feed System Replacement	\$ 317,000	\$ 441,000	\$ 259,000	\$ 39,000	\$ 49,000	\$ 3,000	\$ 90,000
		Small Cap Liquids	\$ 326,000	\$ 433,000	\$ 433,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 301,000	\$ 177,000	\$ 27,000	\$ 34,000	\$ 2,000	\$ 62,000
		Small Cap Common	\$ 170,000	\$ 226,000	\$ 177,000	\$ 11,000	\$ 14,000	\$ 1,000	\$ 23,000
		Small Cap AWT	\$ 36,000	\$ 48,000	\$ 48,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 5,156,000	\$ 7,117,000	\$ 6,762,000	\$ 78,000	\$ 97,000	\$ 5,000	\$ 175,000
YEAR 12 ('30/'31)									
	17067	DAF Collector Recoating and Cover Replacement	\$ 786,000	\$ 1,105,000	\$ 1,105,000	\$ -	\$ -	\$ -	\$ -
	17520	Ferric Chloride System Reconstruction	\$ 764,000	\$ 1,073,000	\$ 631,000	\$ 96,000	\$ 120,000	\$ 6,000	\$ 219,000
	17527	Anaerobic Digester System Reconstruction	\$ 12,408,000	\$ 17,438,000	\$ 10,257,000	\$ 1,562,000	\$ 1,957,000	\$ 103,000	\$ 3,559,000
	17530	Digested Sludge Pump System Reconstruction	\$ 545,000	\$ 766,000	\$ 451,000	\$ 69,000	\$ 86,000	\$ 5,000	\$ 156,000
	17535	Odor Control Scrubber No.3 Replacement	\$ 1,559,000	\$ 2,191,000	\$ 1,289,000	\$ 196,000	\$ 246,000	\$ 13,000	\$ 447,000
		Small Cap Liquids	\$ 326,000	\$ 447,000	\$ 447,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 311,000	\$ 183,000	\$ 28,000	\$ 35,000	\$ 2,000	\$ 63,000
		Small Cap Common	\$ 170,000	\$ 233,000	\$ 182,000	\$ 12,000	\$ 15,000	\$ 1,000	\$ 24,000
		Small Cap AWT	\$ 36,000	\$ 49,000	\$ 49,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 16,822,000	\$ 23,615,000	\$ 14,595,000	\$ 1,963,000	\$ 2,458,000	\$ 129,000	\$ 4,469,000

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 13 ('31/'32)									
	17075	Polymer Storage Tank - Mannich Replacement	\$ 252,000	\$ 385,000	\$ 385,000	\$ -	\$ -	\$ -	\$ -
	17521	Bulk Polymer Storage and Transfer System Reconstruction	\$ 294,000	\$ 449,000	\$ 264,000	\$ 40,000	\$ 50,000	\$ 3,000	\$ 92,000
	17531	MCC M Replacement	\$ 491,000	\$ 750,000	\$ 441,000	\$ 67,000	\$ 84,000	\$ 4,000	\$ 153,000
	17727	MCC L Replacement	\$ 436,000	\$ 666,000	\$ 666,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Liquids	\$ 326,000	\$ 461,000	\$ 461,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 321,000	\$ 189,000	\$ 29,000	\$ 36,000	\$ 2,000	\$ 66,000
		Small Cap Common	\$ 170,000	\$ 241,000	\$ 188,000	\$ 12,000	\$ 15,000	\$ 1,000	\$ 25,000
		Small Cap AWT	\$ 36,000	\$ 51,000	\$ 51,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 2,232,000	\$ 3,324,000	\$ 2,646,000	\$ 148,000	\$ 186,000	\$ 10,000	\$ 335,000
YEAR 14 ('32/'33)									
	17054	Primary Sedimentation Basin Upgrade	\$ 1,692,000	\$ 2,675,000	\$ 2,675,000	\$ -	\$ -	\$ -	\$ -
	17063	WAS Pump Station Reconstruction	\$ 469,000	\$ 741,000	\$ 741,000	\$ -	\$ -	\$ -	\$ -
	17072	Grit Management Facility	\$ 1,781,000	\$ 2,817,000	\$ 2,817,000	\$ -	\$ -	\$ -	\$ -
	17078	MCC 30310 Replacement	\$ 466,000	\$ 737,000	\$ 737,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Liquids	\$ 326,000	\$ 476,000	\$ 476,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 331,000	\$ 195,000	\$ 30,000	\$ 37,000	\$ 2,000	\$ 68,000
		Small Cap Common	\$ 170,000	\$ 248,000	\$ 194,000	\$ 12,000	\$ 16,000	\$ 1,000	\$ 25,000
		Small Cap AWT	\$ 36,000	\$ 53,000	\$ 53,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 5,168,000	\$ 8,079,000	\$ 7,888,000	\$ 42,000	\$ 53,000	\$ 3,000	\$ 93,000

Table I.5 - Regional Treatment Plant Capital Improvement Plan

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD	Project cost (adjusted) CLB	Project cost (adjusted) EBSD	Project cost (adjusted) ETWD
YEAR 15 (‘33/‘34)									
	17336	Perimeter Fence Replacement	\$ 334,000	\$ 532,000	\$ 416,000	\$ 27,000	\$ 33,000	\$ 2,000	\$ 55,000
	17353	SCADA System Upgrade Project/2nd Phase	\$ 2,025,000	\$ 3,226,000	\$ 2,520,000	\$ 162,000	\$ 202,000	\$ 11,000	\$ 331,000
	17725	AWT SCADA System Upgrade	\$ 147,000	\$ 234,000	\$ 234,000	\$ -	\$ -	\$ -	\$ -
	17726	AWT No.2 Filter Sand Replacement and Underdrain Rehabilitation	\$ 358,000	\$ 571,000	\$ 571,000	\$ -	\$ -	\$ -	\$ -
	17728	AWT WQ Instrumentation Replacement	\$ 135,000	\$ 214,000	\$ 214,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Liquids	\$ 326,000	\$ 491,000	\$ 491,000	\$ -	\$ -	\$ -	\$ -
		Small Cap Solids	\$ 227,000	\$ 342,000	\$ 201,000	\$ 31,000	\$ 38,000	\$ 2,000	\$ 70,000
		Small Cap Common	\$ 170,000	\$ 256,000	\$ 200,000	\$ 13,000	\$ 16,000	\$ 1,000	\$ 26,000
		Small Cap AWT	\$ 36,000	\$ 54,000	\$ 54,000	\$ -	\$ -	\$ -	\$ -
		TOTALS	\$ 3,758,000	\$ 5,920,000	\$ 4,902,000	\$ 232,000	\$ 290,000	\$ 15,000	\$ 482,000



Legend	
—	Liquid
.....	Solids

Figure I.1
 Regional Treatment Plant
 Treatment Process Schematic

Appendix J
Regional Treatment Plant Project Descriptions

Capital Improvement Program – Project Description

Project No.: 17051
Project Name: MCC A, C, G, and H Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2021
Project Status: Short Term Planning



Project Description: The project includes the replacement of the Motor Control Centers ‘A’, ‘C’, ‘G’, and ‘H’ in the Energy Building.

Project Need: The original motor control centers date to the original plant construction in 1983. Deficiencies in the units were noted in the electrical coordination study performed for the Cogeneration and Switchgear Upgrade.

Key Issues: The replacement of the motor control centers will need to address other near future projects such as the replacement of the odor control systems.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	825,000
Construction Support:	\$	124,000
Total Budget:	\$	949,000

Capital Improvement Program – Project Description

Project No.: 17052
Project Name: Odor Control Scrubber No.1 Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2026
Project Status: Long Term Planning

Project Description: The project includes the replacement of the existing chemical scrubber with a new biotower and chemical scrubber combination for Odor Control System No.1. The new system will be located on the west side of the Primary Sedimentation Basins in the approximate location of the existing prefabricated metal storage building.



Project Need: The existing scrubber system was installed in 1995. With the periodic replacement of fans, recirculation pumps, and chemical feed pumps the system remains functional. The fiberglass unit itself remains in good condition as the system nears 25 years in operation.

Key Issues: The odor control system proposed in the DHK evaluation in 2017 is a robust system meant to achieve BACT. This system is also proposed to provide greater redundancy for maintenance shutdowns. However, the proposed system is both more complex and more expensive than a simple replacement of the existing system. The proposed relocation to the current storage building location will require the development of a new storage approach.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	120,000
Design:	\$	480,000
Construction:	\$	4,798,000
Construction Support:	\$	480,000
Total Budget:	\$	5,878,000

Capital Improvement Program – Project Description

Project No.: 17053
Project Name: Headworks Process Equipment Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2028
Project Status: Long Term Planning

Project Description: This project includes the replacement of three bar screens, two conveyors, two screenings compressors, and two grit classifiers. The work also includes the replacement of push button stations and system alarms.



Project Need: The bars screens were originally installed in 1998 and then refurbished in 2010. The remaining process equipment was replaced in 2010. The process equipment is expected to have a 20 year life.

Key Issues: The Headworks underwent a major reconstruction in 2010 including the replacement of the roof, HVAC ducting and lighting as well as rehabilitation of the bar screen channels. A condition assessment should prior to the budgeting of this project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 60,000
Conceptual Study:	\$ 0
Design:	\$ 181,000
Construction:	\$ 2,413,000
Construction Support:	\$ 241,000
Total Budget:	\$ 2,896,000

Capital Improvement Program – Project Description

Project No.: 17054
Project Name: Primary Sedimentation Basin Upgrade
Facility: Regional Treatment Plant
Cost Center: PC 17 (Common)
Anticipated Fiscal Year: 2033
Project Status: Long Term Planning

Project Description: Project includes the rehabilitation of the six primary sedimentation basins including replacement of the chain and flight sludge collectors and the aluminum basin covers.

Project Need: The chain and flight collectors were replaced in 2011 and are expected to have a 20 year life. The aluminum covers were installed in the 1990's and remain in condition. The cross collectors were removed from the operation in the 1990's. The scum collectors are to be replaced in a separate project.

Key Issues: The estimated cost for the project does not include concrete repair or liner replacement. The primary sedimentation system should undergo a detailed condition assessment in approximately 5 years.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 35,000
Conceptual Study:	\$ 0
Design:	\$ 141,000
Construction:	\$ 1,410,000
Construction Support:	\$ 141,000
Total Budget:	\$ 1,727,000



Capital Improvement Program – Project Description

Project No.: 17055
Project Name: Primary Gallery Upgrade Phase II
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning



Project Description: This project includes the replacement of the three helical scum skimmers, scum boxes, sludge pumps, grit pumps, and associated piping. The project includes replacement of piping, valves and power supply connections.

Project Need: The helical skimmers have been rebuilt several times by SOCWA maintenance and are past their useful life. This replacement project has been identified based on the expected 20 year life of the scum skimmers, scum boxes, and associated piping.

Key Issues:

Estimated Project Amount (in 2018 \$):		
Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	33,000
Construction:	\$	1,092,000
Construction Support:	\$	164,000
Total Budget:	\$	1,289,000

Capital Improvement Program – Project Description

Project No.: 17056
Project Name: Interstage Pump Station Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning

Project Description: This project includes the replacement of the five interstage syphon pumps. The project includes replacement of piping, valves, VFDs, and power supply connections.

Project Need: The five pumps were essentially installed when the plant was initially brought online. The pumps have been maintained and serviced to keep them in operation but the style of pump is no longer available. A viable replacement for the interstage pumps is needed as they are past their useful life.

Key Issues: Part of the pump is encased on concrete and a new pumping system may be difficult to install without modifications to the concrete structure. In addition, the power requirements for different style pumps may be increased from the current style and therefore power consumption should be included in the cost analysis.



Estimated Project Amount (in 2018 \$):
Condition Assessment: \$ 0
Conceptual Study: \$ 0
Design: \$ 205,000
Construction: \$ 2,054,000
Construction Support: \$ 308,000
Total Budget: \$ 2,567,000

Capital Improvement Program – Project Description

Project No.: 17057
Project Name: Secondary Aeration Phase II
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: This project includes the replacement of the Turblex blower with two Aerzen Blowers similar to what is now installed at the JB Latham Treatment Plant.

Project Need: Although the blower has not reached the end of its expected 30-year life (installed in 2003), the manufacturer is no longer supporting this model and parts are becoming increasingly difficult to find.

Key Issues: The blower building is limited in space. An initial conceptual design by Lee and Ro has placed the two blowers near each other while allowing access to all areas. If further analysis finds that this conceptual design cannot be used, modifications to the building may need to be made increasing the cost of the project significantly.

Estimated Project Amount (in 2018 \$):		
Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	147,000
Construction:	\$	1,469,000
Construction Support:	\$	147,000
Total Budget:	\$	1,763,000

Capital Improvement Program – Project Description

Project No.: 17058
Project Name: Secondary Sedimentation Basin Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2030
Project Status: Long Term Planning

Project Description: Project includes the replacement retrofit of all mechanical equipment within the secondary clarifiers.

Project Need: The coating of all metallic equipment in the secondary clarifiers was completed in 2015. It was assumed that this would extend the equipment life by approximately 10 years.

Key Issues: The cost estimate is based on the replacement of the mechanical equipment with steel collectors; additional evaluation is needed if the stainless-steel units are to be considered. The process of isolating the clarifiers should be considered before replacing the stop gate structures.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	174,000
Construction:	\$	3,472,000
Construction Support:	\$	434,000
Total Budget:	\$	4,080,000



Capital Improvement Program – Project Description

Project No.: 17059
Project Name: RAS Pump Station Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2029
Project Status: Long Term Planning

Project Description: This project includes the replacement of the ten RAS pumps, ten VFDs, six slide gates/frames, and associated piping and electrical.



Project Need: The pumps were originally installed in 1983 and this replacement project has been identified based on the expected 20-year life of the pumps.

Key Issues: The RAS system is comprised of four separate stations that service six basins with ten pumps. The separated locations and complexity of connections between the stations may increase some design and construction costs.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	240,000
Construction:	\$	2,403,000
Construction Support:	\$	240,000
Total Budget:	\$	2,884,000

Capital Improvement Program – Project Description

Project No.: 17060
Project Name: Secondary Scum Pump Station Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning

Project Description: This project includes the replacement of the ten RAS pumps, ten VFDs, six slide gates/frames, and associated piping and electrical.

Project Need: The pumps and gates were originally installed in 1983 and this replacement project has been identified based on the expected 20-year life of the pumps and the gates are beyond their expected 30-year life.

Key Issues: The RAS system is comprised of four separate stations that service six basins with ten pumps. The separated locations and complexity of connections between the stations and basins may increase some design and construction costs.



Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	48,000
Construction:	\$	482,000
Construction Support:	\$	48,000
Total Budget:	\$	578,000

Capital Improvement Program – Project Description

Project No.: 17061
Project Name: Mixed Liquor Channel Condition Assessment
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: The project involves a condition assessment of the Mixed Liquor Channel from the Aeration Basins to the Secondary Sedimentation Basins.

Project Need: The channel has not been removed from service for inspection and cleaning since the original construction in 1983. There is no fixed method for bypassing the channel.

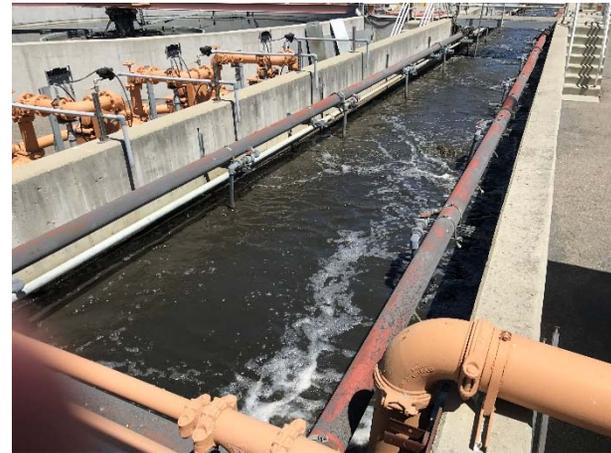
Key Issues: A portion of the channel was removed from service in 2008 for the installation of new suction connections for the waste activated sludge pumps. This work highlighted the challenges of installing bulkheads in the Mixed Liquor Channel due to the presence of agitation air piping along the bottom of the channel.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	270,000
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	270,000

Capital Improvement Program – Project Description

Project No.: 17062
Project Name: Mixed Liquor Channel Rehabilitation
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning



Project Description: The project includes the rehabilitation of the Mixed Liquor Channel from the Aeration Basins to the Secondary Sedimentation Basins including reconstruction of the agitation air system and repair of the concrete surfaces.

Project Need: The channel has not been removed from service for inspection and cleaning since the original construction in 1983. There is no fixed method for bypassing the channel.

Key Issues: This work is to be preceded by the condition assessment work in Project 17061.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	46,000
Construction:	\$	612,000
Construction Support:	\$	61,000
Total Budget:	\$	719,000

Capital Improvement Program – Project Description

Project No.: 17063
Project Name: WAS Pump Station Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2033
Project Status: Long Term Planning

Project Description: This project includes the replacement of the four Waste Activated Sludge Pumps along with the associated above ground piping, valves and flow meters. The project also includes the replacement of the associated variable frequency drives (although the replacement of the cabinets is addressed in another project).



Project Need: The existing WAS system was constructed in 2008. Based on estimated 20 year life for sludge pumps this system would be scheduled for replacement in approximately 2020. It is possible that the life of the existing system will extend beyond the life of the current Ten Year Plan.

Key Issues: The condition of the system should be assessed in approximately 5 years to determine the need for reconstruction. The process requirements should be compared with the quantity of WAS required at that time.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	30,000
Construction:	\$	399,000
Construction Support:	\$	40,000
Total Budget:	\$	469,000

Capital Improvement Program – Project Description

Project No.: 17064

Project Name: RAS Hypochlorite Pump and Instrumentation Replacement

Facility: Regional Treatment Plant

Cost Center: PC 17

Anticipated Fiscal Year: 2028

Project Status: Long Term Planning

Project Description: Project includes removal of existing RAS hypochlorite pumps and installation of new RAS hypochlorite pumps and instrumentation

Project Need: New chemical pumps were installed in 2015. The experience at SOCWA facilities is that a chemical pump has a life of approximately 15 years.

Key Issues: Chemical feed pump technology is evolving, the type of pump for replacement should be reviewed in the future.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	13,000
Construction:	\$	135,000
Construction Support:	\$	13,000
Total Budget:	\$	161,000



Capital Improvement Program – Project Description

Project No.: 17066
Project Name: Effluent Flow Meter Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 (Liquids)
Anticipated Fiscal Year: 2028
Project Status: Long Term Planning

Project Description: Project includes the replacement of the contraction plate, weir, sonic level/flow meter and the composite sampler at the effluent junction box.

Project Need: The original project for the effluent flow meter was installed in 2004. Components for the system including the sonic level/flow meter and the composite sampler may be replaced on an as-needed basis. The contraction plate and weir within the effluent structure should be replaced after approximately 25 years.

Key Issues: The development of the original project in 2004 identified a low technology, low cost project to provide a needed effluent flow meter. A conceptual study should be performed to consider long term options for effluent flow metering. A condition assessment should also be performed to evaluate the conditions within the Effluent Junction Box. This cost estimate is based on the assumption that the conduit and wiring to the Effluent Junction Box can be reused.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	6,000
Conceptual Study:	\$	18,000
Design:	\$	6,000
Construction:	\$	59,000
Construction Support:	\$	6,000
Total Budget:	\$	94,000



Capital Improvement Program – Project Description

Project No.: 17068
Project Name: TWAS System Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 (Liquids)
Anticipated Fiscal Year: 2030
Project Status: Long Term Planning

Project Description: Project includes the replacement of the three thickened waste activated sludge (TWAS) pumps, the associated piping and valves and a variable frequency drives (VFD) for each individual pump.



Project Need: The existing TWAS pumping system was installed in 2008. The proposed replacement project is based on the expected 20-year life of the sludge pumps.

Key Issues: The VFD's are located in Motor Control Center (MCC) "C". The VFD's should not be replaced prior to the replacement of MCC "C". The underground piping from the TWAS pump discharge to the Sludge Equalization Tanks (SET's) is addressed in a separate reconstruction project. The piping from the TWAS pump suction to the DAF structure has not been addressed in the current version of the Ten Year Plan.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	29,000
Construction:	\$	289,000
Construction Support:	\$	29,000
Total Budget:	\$	346,000

Capital Improvement Program – Project Description

Project No.: 17072
Project Name: Grit Management Facility
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2033
Project Status: Short Term Planning

Project Description: This project involves the construction of a new Grit Handling Building to be constructed adjacent to the existing Headworks Building. The building would include new grit classifiers located above grit bins. The floor level of the building would match the approximate grade of the access road. A new screenings compactor would include a long discharge tube to access the new bins.



Project Need: The proposed project would eliminate the double handling of screenings and grit.

Key Issues: Key Issues: This project will be preceded by Project 17083 Grit Handling Evaluation which will do the conceptual design for the new grit handling facility.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	142,000
Construction:	\$	1,425,000
Construction Support:	\$	214,000
Total Budget:	\$	1,781,000

Capital Improvement Program – Project Description

Project No.: 17074
Project Name: WAS Pump VFD Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning

Project Description: This project includes the replacement of the four Waste Activated Sludge Pump variable frequency drives.

Project Need: The existing WAS variable frequency drives were installed in 2008. This project is included in the Ten Year Plan based on exceedance of expected life.

Key Issues: The existing cabinets remain in good condition; the proposed project includes only the replacement of the cabinet doors.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	12,000
Construction:	\$	120,000
Construction Support:	\$	12,000
Total Budget:	\$	144,000



Capital Improvement Program – Project Description

Project No.: 17075
Project Name: Mannich Polymer Storage System Upgrade Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2032
Project Status: Long Term Planning

Project Description: Project includes the replacement of the bulk mannich polymer storage tank, the transfer pump, and the associated piping.



Project Need: The fiberglass storage tank was replaced in 2011. The pump and piping system is in poor condition; the Operations staff has been replacing components on as-needed basis.

Key Issues: The concrete containment area remains in good condition and does not appear to require replacement. This project is separated from the proposed shade construction (Project 17084).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	21,000
Construction:	\$	210,000
Construction Support:	\$	21,000
Total Budget:	\$	252,000

Capital Improvement Program – Project Description

Project No.: 17078
Project Name: MCC 30310 Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 (Liquids)
Anticipated Fiscal Year: 2033
Project Status: Long Term Planning

Project Description: Project includes the replacement of Motor Control Center '30310' in the Blower Building.

Project Need: MCC '30310' was installed in 2003. Project is included in Ten Year Plan based on anticipated 30 year life of motor control center.

Key Issues: The scheduling of this project may be impacted by Project 17057 relative to the replacement of the single stage blower.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 9,000
Conceptual Study:	\$ 0
Design:	\$ 37,000
Construction:	\$ 373,000
Construction Support:	\$ 47,000
Total Budget:	\$ 466,000



Capital Improvement Program – Project Description

Project No.: 17071
Project Name: Odor Control Scrubber No.2 Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning



Project Description: The project includes the replacement of the existing chemical scrubber with a new chemical scrubber and carbon scrubber combination for Odor Control System No.2. The new system will be located on the west side of the Aeration Basins in the current location of the grassy knoll.

Project Need: The existing scrubber system was installed in 1998. With the periodic replacement of fans, recirculation pumps, and chemical feed pumps the system remains functional. The fiberglass unit itself remains in good condition as the system has reached 20 years in operation.

Key Issues: The odor control system proposed in the DHK evaluation in 2017 is a robust system meant to achieve BACT. This system is also proposed to provide greater redundancy for maintenance shutdowns. However, the proposed system is both more complex and more expensive than a simple replacement of the existing system.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	60,000
Design:	\$	239,000
Construction:	\$	2,390,000
Construction Support:	\$	239,000
Total Budget:	\$	2,928,000

Capital Improvement Program – Project Description

Project No.: 17080
Project Name: Primary Scum Skimmer Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning

Project Description: Project includes the rehabilitation of the six primary helical scum skimmers and the three associated scum troughs. Associated electrical controls and piping are included.

Project Need: The scum skimmers have been maintained past their expected useful life of 20 years and are currently run in manual mode because of the failure of the electronic controls. The skimmers and troughs were installed in 1983.

Key Issues: The estimated cost for the project does not include concrete repair.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	37,000
Construction:	\$	1,231,000
Construction Support:	\$	185,000
Total Budget:	\$	1,453,000



Capital Improvement Program – Project Description

Project No.: 17081
Project Name: Primary Sedimentation Collectors and Gates Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning

Project Description: Project includes the replacement of the influent drop gates, the effluent drop gates, and the effluent collector pipes in the six primary sedimentation basins.



Project Need: The drop gates and the effluent collectors are all as originally constructed in 1983.

Key Issues: The estimated cost is based on the replacement of the existing drop gates with new drop gates. The plant operations staff have requested that the drop gates be replaced with slide gates. The technical and cost impacts of this request should be analyzed prior to the project design.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	18,000
Design:	\$	74,000
Construction:	\$	738,000
Construction Support:	\$	74,000
Total Budget:	\$	904,000

Capital Improvement Program – Project Description

Project No.: 17082
Project Name: Secondary Effluent Conveyance
Evaluation Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: Evaluation of secondary effluent conveyance capacity through the piping system between the Regional Treatment Plant and the Effluent Transmission Main. Study shall also consider ability of system to store effluent during wet weather events. Study to develop alternative to enhance effluent conveyance and storage capacity.

Project Need: Recent winter storm events have exceeded capacity of secondary effluent system narrowly avoiding overflow of the Secondary Effluent Equalization Pond.

Key Issues: Project requires coordination with Moulton Niguel Water District (in terms of ability of reclaimed water system to handle flow) and OC Parks (if additional conveyance through the Laguna Niguel Regional Park is to be considered). It may be appropriate to perform this study in conjunction with an analysis of the sources of wet weather influent flow.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	50,000
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	50,000

Capital Improvement Program – Project Description

Project No.: 17083
Project Name: Grit Handling Evaluation
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: This project is to evaluate the construction of a new Grit Handling Building to be constructed adjacent to the existing Headworks Building. The building would include new grit classifiers located above grit bins. The floor level of the building would match the approximate grade of the access road. A new screenings compactor would include a long discharge tube to access the new bins. The odor control system would need to be extended to handle the foul air from the new Grit Handling Building.

Project Need: The proposed project would eliminate the double handling of screenings and grit.

Key Issues: Study would include both an economic and reliability of evaluation to determine the relative merit of the project. A separate project (17072) includes the design and construction of the proposed facility.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	60,000
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	60,000

Capital Improvement Program – Project Description

Project No.: 17084
Project Name: Mannich Polymer Tank Shade
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning

Project Description: Project includes the installation of a removable fabric cover over the mannich polymer bulk storage tank.

Project Need: This project is based on a request by the SOCWA Operations Department as a means of decreasing the degradation of the mannich polymer in storage.

Key Issues: The estimated construction cost for this project is based on the cost of the aluminum cover installed over the sodium hypochlorite storage tank at the Latham Plant in 2007. An evaluation should be done in Fiscal Year 2018/2019 (as part of the Miscellaneous Engineering budget) to verify the technical approach and cost for the fabric covers. This project should be done in conjunction with the covering of the emulsion polymer storage tank (see Project 17541).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	16,000
Construction:	\$	163,000
Construction Support:	\$	16,000
Total Budget:	\$	195,000



Capital Improvement Program – Project Description

Project No.: 17086
Project Name: Aeration Control Valves, Gates, and Flow Meter Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: This project includes replacing all influent, effluent, RAS feed, and step-feed gates on the six aeration basins. It also includes as the final (third) phase of aeration upgrades the replacement of the air flow control valves, air flow meters, and dissolved oxygen meters and controllers for all six basins.

Project Need: The gates were originally installed in 1983 and have been repaired and maintained past their expected useful life of 20 years. The aeration control valves, air flow meters, DO meters and DO controllers are near the end of their expected useful life and will also provide increased control and efficiency along with the Phase I and Phase II new diffusers and blowers.

Key Issues: Because of the aeration feed system, bulkheading and bypassing will be required for this project and in some locations may be difficult. The project costs could be significantly increased depending on how much bypass pumping will be required during the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	247,000
Construction:	\$	2,472,000
Construction Support:	\$	371,000
Total Budget:	\$	3,090,000

Capital Improvement Program – Project Description

Project No.: 17320
Project Name: Plant Drainage Pump Station Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2026
Project Status: Long Term Planning

Project Description: This project includes the reconstruction of the Drainage Pump Station including the construction of a shade over the facility.



Project Need: The Drainage Pump Station remains largely as constructed in 1983. Piping and valves show signs of corrosion. Shade need to reduce the amount of debris that falls in pump drywell.

Key Issues: The review of the storm water and drainage systems (Project 17326) should be completed prior to starting this project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	48,000
Construction:	\$	482,000
Construction Support:	\$	72,000
Total Budget:	\$	603,000

Capital Improvement Program – Project Description

Project No.: 17321
Project Name: Chlorine Building Rehabilitation Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2029
Project Status: Long Term Planning

Project Description: This project includes the replacement of architectural hardware on the existing building.

Project Need: Most of the architectural hardware dates to the original plant construction.

Key Issues: An internal condition assessment should be performed for this building prior to budgeting.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	19,000
Construction:	\$	187,000
Construction Support:	\$	23,000
Total Budget:	\$	229,000



Capital Improvement Program – Project Description

Project No.: 17322
Project Name: Plant Water Pumping System Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2028
Project Status: Long Term Planning

Project Description: This project includes the replacement of three 3W High Pressure pumps, three 3W Low Pressure pumps, two 2W pumps and the air gap system.



Project Need: The process water system has not undergone a comprehensive reconstruction since its original construction.

Key Issues: A condition assessment should be conducted at least two years prior to the budgeting of this project. Assessment should include reevaluation of water demands and pump sizing.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 11,000
Conceptual Study:	\$ 0
Design:	\$ 45,000
Construction:	\$ 448,000
Construction Support:	\$ 45,000
Total Budget:	\$ 548,000

Capital Improvement Program – Project Description

Project No.: 17323

Project Name: Non-Potable Hypochlorite Pump and Instrumentation Replacement

Facility: Regional Treatment Plant

Cost Center: PC 17 Common

Anticipated Fiscal Year: 2026

Project Status: Long Term Planning

Project Description: Project includes removal of existing Non-Potable hypochlorite pumps and installation of new Non-Potable hypochlorite pumps and instrumentation

Project Need: New chemical pumps were installed in 2015. The experience at SOCWA facilities is that a chemical pump has a life of approximately 15 years.

Key Issues: Chemical feed pump technology is evolving, the type of pump for replacement should be reviewed in the future.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	13,000
Construction:	\$	135,000
Construction Support:	\$	13,000
Total Budget:	\$	161,000



Capital Improvement Program – Project Description

Project No.: 17325
Project Name: Process Water Contact Basin Gate and Valve Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning

Project Description: This project includes the replacement of the four slide gates, modification of small piping systems, and rehabilitation of the concrete.



Project Need: The Process Water Contact Basins have remained largely unmodified since the original construction in 1983.

Key Issues: This work should be preceded by a condition assessment at least two years prior to the budgeting of the work.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 5,000
Conceptual Study:	\$ 0
Design:	\$ 20,000
Construction:	\$ 202,000
Construction Support:	\$ 20,000
Total Budget:	\$ 247,000

Capital Improvement Program – Project Description

Project No.: 17327
Project Name: MCC F Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning
Project Description: Project includes the replacement of Motor Control Center 'F'.



Project Need: Motor Control Center 'F' was installed in 1983; the unit has exceeded its anticipated life.

Key Issues: The conduit and conductors between MCC 'F' and its associated loads will largely be replaced as part of the Miscellaneous Improvements 2018 project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	37,000
Construction:	\$	365,000
Construction Support:	\$	46,000
Total Budget:	\$	448,000

Capital Improvement Program – Project Description

Project No.: 17329
Project Name: Laboratory Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning

Project Description: Project addresses the reconstruction of Regional Treatment Plant Laboratory.



Project Need: The Regional Treatment Plant laboratory has not been the subject of a major reconstruction project since the facility construction in 1983. Portions of the casework were replaced in 2005 with units relocated from Plant 3A (when that laboratory was demolished). The laboratory air conditioning system was rebuilt in 2011.

Key Issues: The cost estimate for the reconstruction of the laboratory is based on Option 4 for the reconstruction of the J. B. Latham Treatment Plant Laboratory Study published in 2010. The take-off for the Regional Plant laboratory and Option 4 are similar. However, a study specific to the Regional Plant should be undertaken in the near term. Project development will be based on project evaluation developed in Project 17343.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	87,000
Construction:	\$	869,000
Construction Support:	\$	87,000
Total Budget:	\$	1,042,000

Capital Improvement Program – Project Description

Project No.: 17330
Project Name: Energy Building Seismic Analysis and Structural Condition Assessment
Facility: Regional Treatment Plant
Cost Center: PC 17 Commons
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning

Project Description: This project entails a structural condition assessment and a seismic evaluation of the multi-story Energy Building.

Project Need: In 1999, the Energy Building underwent a seismic evaluation due to cracking noted in the building after the completion of the dewatering system expansion. Seismic improvements were completed in 2000. The current project is intended to update the seismic evaluation. The Energy Building, constructed in 1983, shows minor signs of deterioration. The purpose on the condition assessment is intended to provide a more detailed review of the building status.

Key Issues: The budget for the work is based on approximately 320 hours of engineering time. The estimate does not include provision for high level access or fall protection on the building roof.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	80,000
Conceptual Study:	\$	0
Design:	\$	0
Construction:	\$	0
Construction Support:	\$	0
Total Budget:	\$	80,000



Capital Improvement Program – Project Description

Project No.: 17331
Project Name: Energy Building Repair and Rehabilitation
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning
Project Description: Project includes the metal deck, concrete fill, and other roof elements located above the roof framing. Demolition and replacement of the HVAC mezzanine located along the building ridge above the Generator Room.

Project Need: The Energy Building was constructed in the early 1980s, and the life expectancy is 20 to 30 years. There are corrosion issues observed with the building roof frame and metal deck.

Key Issues: Temporary protection of equipment and temporary support electrical and mechanical items supported from the roof structure.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	134,000
Construction:	\$	1,344,000
Construction Support:	\$	168,000
Total Budget:	\$	1,646,000



Capital Improvement Program – Project Description

Project No.: 17332
Project Name: Maintenance Shop Rehabilitation
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: Project includes new benchwork, cabinetry, lighting and plumbing.

Project Need: The Regional Treatment Plant maintenance shop has not been the subject of a major reconstruction project since the facility construction in 1983.

Key Issues: Project should be coordinated with Project 17344 Site Storage Evaluation to determine if the existing maintenance shop will stay in its current location.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	6,000
Design:	\$	26,000
Construction:	\$	258,000
Construction Support:	\$	26,000
Total Budget:	\$	316,000

Capital Improvement Program – Project Description

Project No.: 17333
Project Name: SCADA System Upgrade – Phase I
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning
Project Description: Project includes the replacement of the last six old model PLC's.



Project Need: This project would complete the conversion of all of the PLC's at the Regional Treatment Plant to Allen Bradley ControlLogix/Compact Logix models.

Key Issues: Project cost estimate assumes that all cabinets for all six PLC's may be reused.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	31,000
Construction:	\$	307,000
Construction Support:	\$	31,000
Total Budget:	\$	368,000

Capital Improvement Program – Project Description

Project No.: 17334
Project Name: Storage Building Project
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2029
Project Status: Long Term Planning



Project Description: Project includes a new storage building that is 30 feet wide by 50 feet long. Split masonry block walls are approximately 25 foot high. The building has two roll up doors; one double leaf door, and two regular doors. The building would have a clay tile roof. The building is approximately located in the current position of AWT No.1.

Project Need: The Regional Treatment Plant has been chronically short of storage. This shortage will be exacerbated by the future removal of the prefabricated metal storage building adjacent to the primary sedimentation basins.

Key Issues: This project will be preceded by Project 17344 Site Storage Evaluation which will do the conceptual design for the new storage building.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	72,000
Construction:	\$	719,000
Construction Support:	\$	108,000
Total Budget:	\$	899,000

Capital Improvement Program – Project Description

Project No.: 17335
Project Name: Site Pavement Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2029
Project Status: Long Term Planning

Project Description: Project includes reconstruction of asphalt pavement throughout the plant including access road from bridge to LaPaz Road. Work includes sawcutting and removing AC pavement, installing new AC pavement (4 inches of AC over 8" AB) and AC overlay (1-1/2").



Project Need: Regional Treatment Plant has been the subject to many localized repairs and overlay projects over the past 30 years. This project is a comprehensive reconstruction based on exceedance of life.

Key Issues: Project should be coordinated with buried piping replacement projects to avoid tearing up new pavement system directly after completion. Need to perform the work in sections to keep the plant accessible. The cost estimate is based on a 2004 analysis by TetraTech; this evaluation needs to be updated. Note that this estimate does not address concrete pavement, curbs and gutters; nor does the estimate include manhole covers and box hatches.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 21,000
Conceptual Study:	\$ 0
Design:	\$ 43,000
Construction:	\$ 857,000
Construction Support:	\$ 86,000
Total Budget:	\$ 1,007,000

Capital Improvement Program – Project Description

Project No.: 17336
Project Name: Perimeter Fence Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2034
Project Status: Long Term Planning



Project Description: Project includes the replacement of 3,700 linear feet of chain link fencing along the perimeter of the treatment plant.

Project Need: Most of the fencing dates to the original 1983 construction of the facility. This project has been included in list based on anticipated age of pipe.

Key Issues: Areas of perimeter fencing on the west side of the plant are difficult to reach due to hillside slope. The cost estimate does not include temporary fencing during construction.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	28,000
Construction:	\$	284,000
Construction Support:	\$	21,000
Total Budget:	\$	334,000

Capital Improvement Program – Project Description

Project No.: 17337
Project Name: West Side Storm Channel Reconstruction Phase I
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: Project includes reconstruction of asphalt pavement throughout the plant including access road from bridge to LaPaz Road. Work includes sawcutting and removing AC pavement, installing new AC pavement (4 inches of AC over 8" AB) and AC overlay (1-1/2").

Project Need: Regional Treatment Plant has been the subject to many localized repairs and overlay projects over the past 30 years. This project is a comprehensive reconstruction based on exceedance of life.

Key Issues: Project should be coordinated with buried piping replacement projects to avoid tearing up new pavement system directly after completion. Need to perform the work in sections to keep the plant accessible. The cost estimate is based on a 2004 analysis by TetraTech; this evaluation needs to be updated. Note that this estimate does not address concrete pavement, curbs and gutters; nor does the estimate include manhole covers and box hatches.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	40,000
Design:	\$	80,000
Construction:	\$	799,000
Construction Support:	\$	80,000
Total Budget:	\$	999,000

Capital Improvement Program – Project Description

Project No.: 17338
Project Name: West Side Storm Channel Reconstruction Phase II
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning



Project Description: Project includes erosion repairs around the terrace drain system on the hillside on the west side of the treatment plant. Work also includes repairs to down drains between the main terrace drains connecting to the main storm channel.

Project Need: Repairs needed as identified in condition assessment prepared by TetraTech in 2018.

Key Issues: Project should not be performed until potential mitigation to hillside erosion has been addressed.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	10,000
Construction:	\$	50,000
Construction Support:	\$	8,000
Total Budget:	\$	68,000

Capital Improvement Program – Project Description

Project No.: 17340
Project Name: Plant Water Pump Screen Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning

Project Description: Project includes replacement of two auto strainers on the plant water piping system.



Project Need: The water strainers were installed in 1983 and are prone to clogging.

Key Issues: The installation of the drain pipe from the strainers to the sanitary sewer is located over a congested underground route.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	18,000
Construction:	\$	179,000
Construction Support:	\$	18,000
Total Budget:	\$	214,000

Capital Improvement Program – Project Description

Project No.: 17341
Project Name: Lube Oil Tank Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning



Project Description: Project includes replacement of combined lube oil/waste oil tank, access stair and platform, and piping between tank and Energy Building. Project also includes new level instrumentation to be connected to plant SCADA system.

Project Need: Existing double wall containment tank was installed in 1998. There are no known issues with the existing tank and piping system.

Key Issues: The cost estimate for the tank is based on an estimate developed for the diesel fuel storage tank at the Coastal Treatment Plant. A more specific quote should be obtained for the Regional Treatment Plant project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	4,000
Conceptual Study:	\$	0
Design:	\$	16,000
Construction:	\$	78,000
Construction Support:	\$	8,000
Total Budget:	\$	105,000

Capital Improvement Program – Project Description

Project No.: 17342
Project Name: Electrical Box Reconstruction Phase I
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2023
Project Status: Short Term Planning

Project Description: Project includes the replacement of four electrical manholes and four electrical hand holes.



Project Need: Project need was identified in "Condition Assessment and Evaluation of Electrical Manholes", February, 2015 by Lee & Ro.

Key Issues: Final design to identify how to perform work while maintaining necessary systems in operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	128,000
Construction:	\$	1,282,000
Construction Support:	\$	192,000
Total Budget:	\$	1,602,000

Capital Improvement Program – Project Description

Project No.: 17345
Project Name: Energy Building HVAC Upgrade
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning
Project Description: Project includes the reconstruction of the Energy Building HVAC system.



Project Need: Improvements identified in a condition assessment prepared by DHK Engineering.

Key Issues: The DHK evaluation was completed prior to the start-up of the new cogeneration system. The HVAC system should be modified to address any issues identified due to issues raised during the cogeneration project.

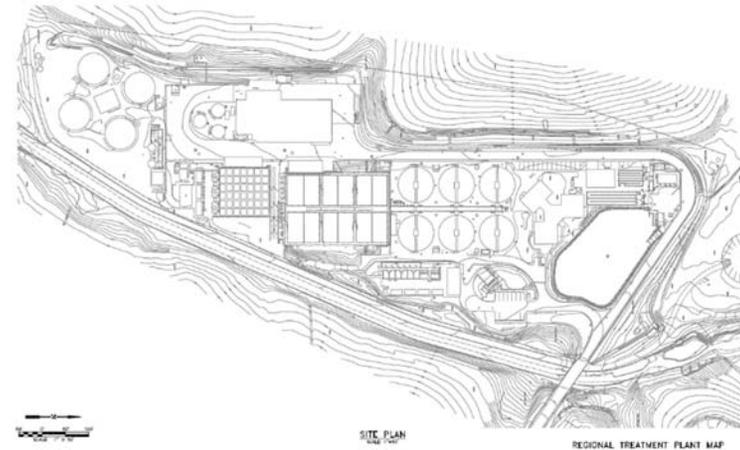
Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	39,000
Construction:	\$	394,000
Construction Support:	\$	39,000
Total Budget:	\$	473,000

Capital Improvement Program – Project Description

Project No.: 17346
Project Name: Buried Water Pipe Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning

Project Description: This project includes replacing underground water distribution piping for the 2-Water, 3-Water Low Pressure, and 3-Water High Pressure systems.



Project Need: The below grade piping at the facility is largely direct buried steel and ductile iron originally installed in 1983. Multiple significant failures have occurred in the RTP underground piping system accelerated by highly corrosive soils (CH2MHill 2013) especially near the vicinity of the Energy Building.

Key Issues: Much of the underground piping is buried under access roads at the facility and traffic flow will be a large part of the coordination of this project. In addition, key utilities may require temporary bypasses and other considerations to keep the facility operational during the project. The full extent of these impacts have not been reviewed and may have further cost implications to the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	129,000
Construction:	\$	1,287,000
Construction Support:	\$	129,000
Total Budget:	\$	1,545,000

Capital Improvement Program – Project Description

Project No.: 17347
Project Name: Electrical Box Reconstruction Phase II
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2027
Project Status: Long Term Planning

Project Description: Project includes the replacement of three electrical manholes.



Project Need: Project need was identified in "Condition Assessment and Evaluation of Electrical Manholes", February, 2015 by Lee & Ro.

Key Issues: Final design to identify how to perform work while maintaining necessary systems in operation.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	184,000
Construction:	\$	1,842,000
Construction Support:	\$	184,000
Total Budget:	\$	2,210,000

Capital Improvement Program – Project Description

Project No.: 17348
Project Name: Secondary Access Road
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning

Project Description: Project involves the construction of a secondary access road into the Laguna Niguel Regional Park.

Project Need: A secondary access route into the plant is proposed to improve facility reliability.

Key Issues: Coordination with OC Parks is necessary to obtain needed approval for access through the Laguna Niguel Regional Park. This project should be coordinated with Project 17337 as the secondary access route impacts the storm drain channel.

Estimated Project Amount (in 2018 \$):

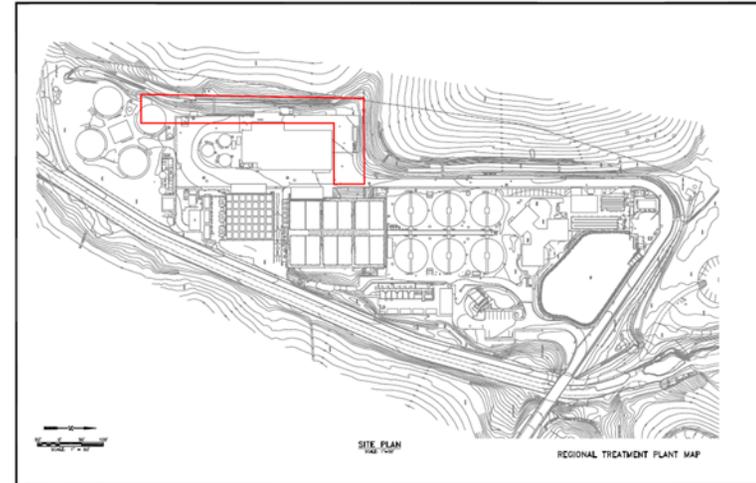
Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	7,000
Construction:	\$	283,000
Construction Support:	\$	28,000
Total Budget:	\$	319,000



Capital Improvement Program – Project Description

Project No.: 17349
Project Name: Underground Piping Phase I
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2026
Project Status: Long Term Planning

Project Description: This project includes replacing underground piping in the north and west portions around the Energy Building. Utilities included in this phase are the remaining portions of the Hot Water Supply and Return, Natural Gas, Low-pressure Sludge Gas, and Waste Activated Sludge.



Project Need: The below grade piping at the facility is largely direct buried steel and ductile iron originally installed in 1983. Multiple significant failures have occurred in the RTP underground piping system accelerated by highly corrosive soils (CH2MHill 2013) especially near the vicinity of the Energy Building.

Key Issues: Much of the underground piping is buried under access roads at the facility and traffic flow will be a large part of the coordination of this project. In addition, key utilities may require temporary bypasses and other considerations to keep the facility operational during the project. The full extent of these impacts have not been reviewed and may have further cost implications to the project.

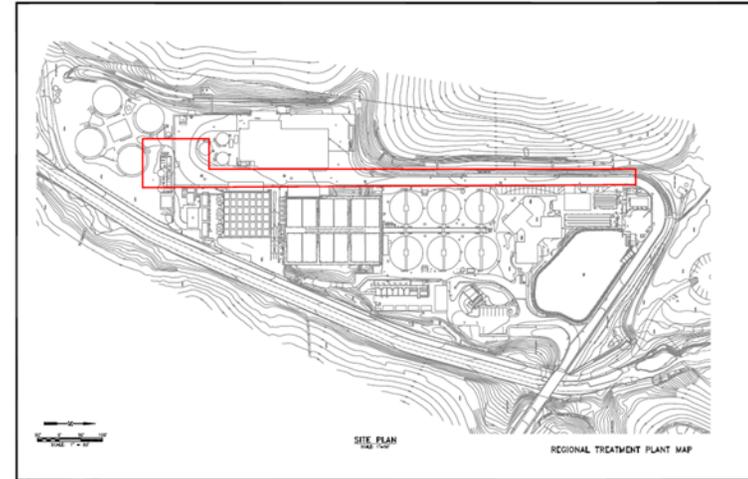
Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	45,000
Construction:	\$	448,000
Construction Support:	\$	67,000
Total Budget:	\$	560,000

Capital Improvement Program – Project Description

Project No.: 17350
Project Name: Underground Piping Phase II
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2026
Project Status: Long Term Planning

Project Description: This project includes replacing underground piping down the main north/south access road through the middle of the facility and solids transfer lines near the SET and DAFTS. Utilities included in this phase are the Natural Gas, Pumped Sludge, Digested Sludge, Thickened Waste Activated Sludge, Waste Activated Sludge, Primary Sludge, Primary Scum, Waste Activated Sludge, 2-Water, 3-Water Low Pressure, 3-Water High Pressure piping, and two spare lines.



Project Need: The below grade piping at the facility is largely direct buried steel and ductile iron originally installed in 1983. Multiple significant failures have occurred in the RTP underground piping system accelerated by highly corrosive soils (CH2MHill 2013) especially near the vicinity of the Energy Building.

Key Issues: Much of the underground piping is buried under access roads at the facility and traffic flow will be a large part of the coordination of this project. In addition, key utilities may require temporary bypasses and other considerations to keep the facility operational during the project. The full extent of these impacts have not been reviewed and may have further cost implications to the project with this phase likely having the greatest impact to plant traffic.

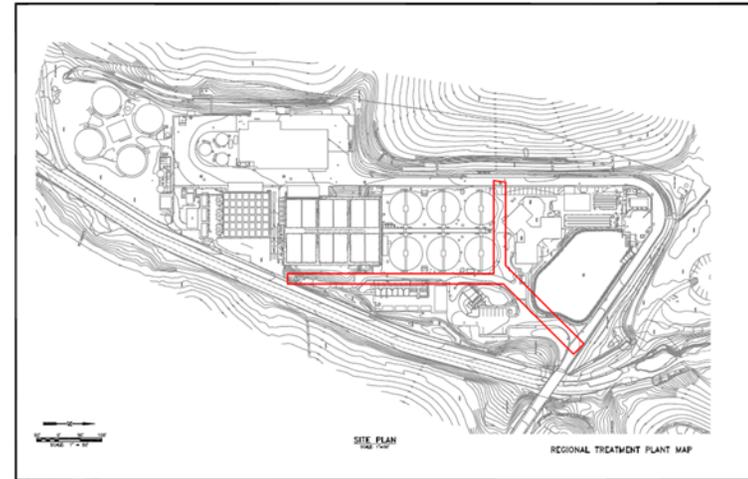
Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	148,000
Construction:	\$	1,479,000
Construction Support:	\$	222,000
Total Budget:	\$	1,848,000

Capital Improvement Program – Project Description

Project No.: 17351
Project Name: Underground Piping Phase III
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2029
Project Status: Long Term Planning

Project Description: This project includes replacing underground piping around the north and east sides of the secondary clarifiers and east of the Reclaimed Water Storage Basin. Utilities included in this phase are the Natural Gas, 2-Water, 3-Water Low Pressure, 3-Water High Pressure piping, and one spare line.



Project Need: The below grade piping at the facility is largely direct buried steel and ductile iron originally installed in 1983. Multiple significant failures have occurred in the RTP underground piping system accelerated by highly corrosive soils (CH2MHill 2013) especially near the vicinity of the Energy Building.

Key Issues: Much of the underground piping is buried under access roads at the facility and traffic flow will be a large part of the coordination of this project. In addition, key utilities may require temporary bypasses and other considerations to keep the facility operational during the project. The full extent of these impacts have not been reviewed and may have further cost implications to the project.

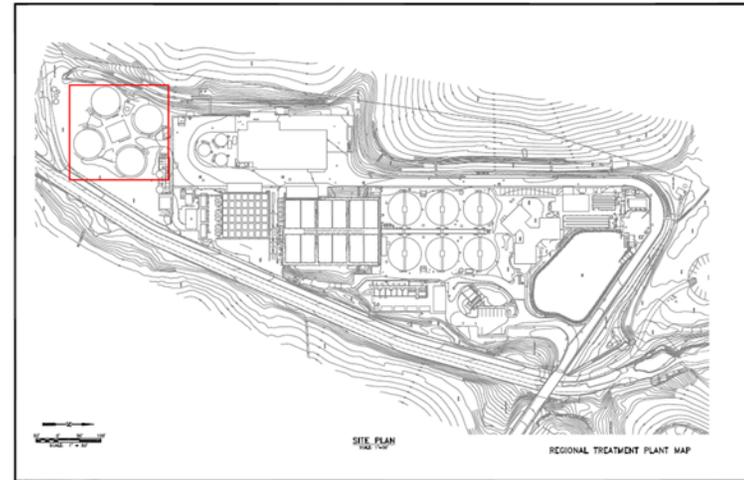
Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	42,000
Construction:	\$	420,000
Construction Support:	\$	63,000
Total Budget:	\$	525,000

Capital Improvement Program – Project Description

Project No.: 17352
Project Name: Underground Piping Phase IV
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2029
Project Status: Long Term Planning

Project Description: This project includes replacing underground piping around the digesters and Digester Control Building. Utilities included in this phase are the digester gas and natural gas lines.



Project Need: The below grade piping at the facility is largely direct buried steel and ductile iron originally installed in 1983. Multiple significant failures have occurred in the RTP underground piping system accelerated by highly corrosive soils (CH2MHill 2013) especially near the vicinity of the Energy Building.

Key Issues: Much of the underground piping is buried under access roads at the facility and traffic flow will be a large part of the coordination of this project. In addition, key utilities may require temporary bypasses and other considerations to keep the facility operational during the project. The full extent of these impacts have not been reviewed and may have further cost implications to the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	23,000
Construction:	\$	233,000
Construction Support:	\$	35,000
Total Budget:	\$	291,000

Capital Improvement Program – Project Description

Project No.: 17353
Project Name: SCADA System Upgrade – Phase II
Facility: Regional Treatment Plant
Cost Center: PC 17 Common
Anticipated Fiscal Year: 2034
Project Status: Long Term Planning

Project Description: Project includes the replacement of 16 PLC's and all fiber optic cable (assuming that the conduits can be reused).



Project Need: This project is based on the future obsolescence of the Allen Bradley ControlLogix and CompactLogix currently in use.

Key Issues: A condition assessment should be performed at least two years prior to the budgeting of the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 78,000
Conceptual Study:	\$ 0
Design:	\$ 156,000
Construction:	\$ 1,558,000
Construction Support:	\$ 234,000
Total Budget:	\$ 2,025,000

Capital Improvement Program – Project Description

Project No.: 17520
Project Name: Ferric Chloride System Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2031
Project Status: Long Term Planning

Project Description: Project includes the demolition of the existing system and containment area while a temporary system operates. New system is installed with three chemical feed pumps, storage tank, piping and valving, instrumentation, and power. New system includes PLC in a shaded cabinet.



Project Need: The fiberglass storage tank was replaced in 2009. The pump and piping system is in poor condition; the Operations staff has been replacing components on as-needed basis. The containment area concreted shows chipping and chemical staining but otherwise remains in good condition.

Key Issues: The ferric chloride system should undergo a condition assessment prior to budgeting a replacement project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 16,000
Conceptual Study:	\$ 0
Design:	\$ 62,000
Construction:	\$ 624,000
Construction Support:	\$ 62,000
Total Budget:	\$ 764,000

Capital Improvement Program – Project Description

Project No.: 17521
Project Name: Emulsion Polymer Storage System Upgrade
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2032
Project Status: Long Term Planning

Project Description: Project includes the replacement of the bulk emulsion polymer storage tank, the transfer pump, the mixing pump and the associated piping.



Project Need: The fiberglass storage tank was replaced in 2011. The pump and piping system is in poor condition; the Operations staff has been replacing components on as-needed basis.

Key Issues: The concrete containment area remains in good condition and does not appear to require replacement. This project is separated from the proposed shade construction (Project 17541).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	24,000
Construction:	\$	245,000
Construction Support:	\$	24,000
Total Budget:	\$	294,000

Capital Improvement Program – Project Description

Project No.: 17522
Project Name: Emulsion Polymer Feed System Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2030
Project Status: Long Term Planning



Project Description: This project includes the replacement of the four Emulsion Polymer Feeders that meter emulsion polymer to the centrifuges. The project includes replacement of piping, valves and power supply connections.

Project Need: Three of the original emulsion feeders were installed in 2006 in the outdoor polymer containment area. These feeders were refurbished and relocated inside the Energy Building (along with the installation of one new emulsion polymer feeder) as part of the Miscellaneous Improvements 2011 project. This replacement project has been identified based on the expected 15 year life of the emulsion feeders. However, further impetus for this project may result from the replacement of the solids dewatering equipment.

Key Issues: The Fluid Dynamics polymer feeders have worked effectively with the current emulsion polymer that has been procured by SOCWA. The effectiveness of the polymer activation – as well as the overall basis of design - should be reviewed prior to the budgeting for the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	20,000
Construction:	\$	270,000
Construction Support:	\$	27,000
Total Budget:	\$	317,000

Capital Improvement Program – Project Description

Project No.: 17523
Project Name: Sludge Equalization System Mechanical and Electrical Rehabilitation Project
Facility: Regional Treatment Plant
Cost Center: PC 17 Liquids
Anticipated Fiscal Year: 2028
Project Status: Long Term Planning

Project Description: This project includes the rehabilitation of the two sludge equalization tanks, reconfiguring the sludge transfer manifold, replacement of 48 valves, ten check valves, six sludge pumps, two circulation pumps, the replacement of one grinder and the addition of a second grinder.

Project Need: The Sludge Equalization Tanks have not been rehabilitated during their service life (installed in 1983). The two circulation pumps originally installed in 1983 have exceeded their expected life of 25 years. The piping and valve manifolds are also past their expected useful life and also need to be reconfigured to accommodate changes made to the facility.

Key Issues: A condition assessment should be performed at least two years before budgeting the project/

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	217,000
Construction:	\$	1,448,000
Construction Support:	\$	145,000
Total Budget:	\$	1,810,000



Capital Improvement Program – Project Description

Project No.: 17525
Project Name: Solids Building Rehabilitation
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning



Project Description: This project includes the replacement of architectural hardware and the reconstruction of the roof on the existing building.

Project Need: Most of the architectural hardware dates to the original plant construction.

Key Issues: A condition assessment should be performed for this building prior to budgeting.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 6,000
Conceptual Study:	\$ 0
Design:	\$ 24,000
Construction:	\$ 244,000
Construction Support:	\$ 31,000
Total Budget:	\$ 306,000

Capital Improvement Program – Project Description

Project No.: 17526
Project Name: MCC D Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning
Project Description: Project includes the replacement of Motor Control Center 'D'.

Project Need: Motor Control Center 'D' was installed in 1983; the unit has exceeded its anticipated life.

Key Issues: Modified power distribution may allow downsizing of the motor control center.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	42,000
Construction:	\$	425,000
Construction Support:	\$	53,000
Total Budget:	\$	520,000



Capital Improvement Program – Project Description

Project No.: 17527
Project Name: Anaerobic Digester System Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2031
Project Status: Long Term Planning



Project Description: This project includes replacing the domes on each digester, removing the gas mix system and replacing it with a chopper pump system, and rehabilitating the digesters and associated piping.

Project Need: The domes are original and were changed from floating domes to fix domes in 1992. The domes have an expected life of 30 years and are past their current expected useful life. Chopper pumps should provide more reliable mixing and mastication of rags in the digester system. The current gas mix system was installed in 1983 with the pumps replaced in 2002. The mix tubes and other components of the gas mix system have not been updated since 1983.

Key Issues: The plant cannot currently run with only two digesters online and the time to take one digester down (drain and clean) and start one up can be lengthy. It is likely that this project will span multiple years in order to reduce disruptions to plant operations.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	792,000
Construction:	\$	10,560,000
Construction Support:	\$	1,056,000
Total Budget:	\$	12,408,000

Capital Improvement Program – Project Description

Project No.: 17528
Project Name: Heating System Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning



Project Description: This project includes replacing the four heat exchangers originally installed in 1983, removing the gas mix system and replacing each of the four gas blowers with chopper recirculation pumps. In addition, the four hot water pumps and associated electrical will all updated as well.

Project Need: The digester heating system has not had any major updates outside of changes in the Energy Building since it was originally installed and all components are past their expected useful life. Updates will allow for more efficient energy use and control of digester temperatures.

Key Issues: The Digester Control Building (60) is rated as an NFPA 70 Class I Div I location and therefore all work done inside of this building requires appropriately rated equipment for demolition and construction. The new equipment installed must also be appropriately rated for an explosive environment. Costs for construction could be greatly increased due to the safety requirements for the work environment. There is also the opportunity to look at design changes to the building to de-rate it which could also increase design and construction costs.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	148,000
Construction:	\$	1,482,000
Construction Support:	\$	148,000
Total Budget:	\$	1,778,000

Capital Improvement Program – Project Description

Project No.: 17529
Project Name: Digester Gas Management Building Rehabilitation
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning



Project Description: This project includes the replacement of architectural hardware and the reconstruction of the roof on the existing building.

Project Need: Most of the architectural hardware dates to the original plant construction.

Key Issues: An internal condition assessment should be performed for this building prior to budgeting.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	7,000
Conceptual Study:	\$	0
Design:	\$	29,000
Construction:	\$	292,000
Construction Support:	\$	44,000
Total Budget:	\$	372,000

Capital Improvement Program – Project Description

Project No.: 17530
Project Name: Digested Sludge Pump System Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2031
Project Status: Longa Term Planning

Project Description: This project includes replacing the four digested sludge pumps and associated piping and electrical inside of the Digester Control Building that pump digested sludge to the centrifuges.



Project Need: The digested sludge pumps were replaced in 1997 and are beyond their expected useful life of 20 years.

Key Issues: The Digester Control Building (60) is rated as an NFPA 70 Class I Div I location and therefore all work done inside of this building requires appropriately rated equipment for demolition and construction. The new equipment installed must also be appropriately rated for an explosive environment. Costs for construction could be greatly increased due to the safety requirements for the work environment. There is also the opportunity to look at design changes to the building to de-rate it which could also increase design and construction costs.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	45,000
Construction:	\$	454,000
Construction Support:	\$	45,000
Total Budget:	\$	545,000

Capital Improvement Program – Project Description

Project No.: 17531
Project Name: MCC M Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2032
Project Status: Long Term Planning
Project Description: Project includes the replacement of Motor Control Center 'M'.



Project Need: MCC 'M' was installed in 1998. Project is included in Ten Year Plan based on anticipated 30 year life of motor control center.

Key Issues: The scheduling of this project may be impacted by Project 17532 relative to the replacement of the dewatering equipment.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	10,000
Design:	\$	39,000
Construction:	\$	393,000
Construction Support:	\$	49,000
Total Budget:	\$	491,000

Capital Improvement Program – Project Description

Project No.: 17532
Project Name: Dewatering System Reconstruction
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning



Project Description: This project includes replacing the four centrifuges, VFDs, control panels, odor control, polymer system, and various piping repairs inside the centrifuge room.

Project Need: The centrifuges were installed in 1998 and although they are performing well and still within their expected useful life of 30 years, the manufacturer has indicated that parts for these units will be discontinued and difficult to source within the next few years.

Key Issues: This project description is based on replacing the existing centrifuges with new centrifuges. A conceptual study would be needed if alternative dewatering technologies were to be evaluated.

Estimated Project Amount (in 2018 \$):		
Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	596,000
Construction:	\$	5,961,000
Construction Support:	\$	596,000
Total Budget:	\$	7,154,000

Capital Improvement Program – Project Description

Project No.: 17533
Project Name: Solids Conveyor Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2025
Project Status: Long Term Planning

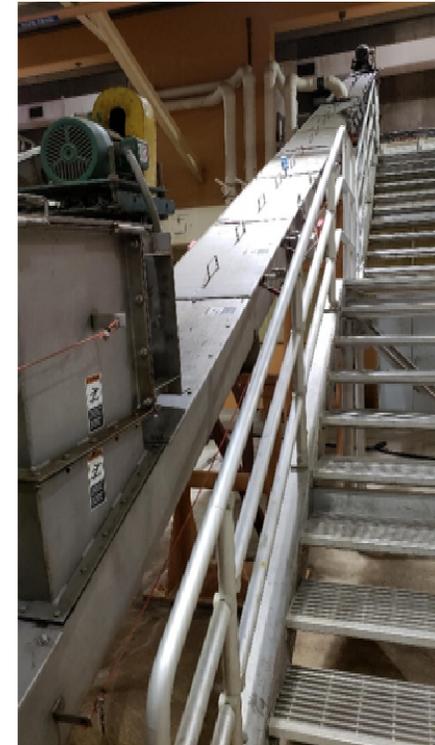
Project Description: This project includes replacing a total of five conveyors (two horizontal, two elevated, and one cross).

Project Need: The conveyors were installed in 1998 and are past their expected useful life of 20 years.

Key Issues: The current conveyors use shafted screw conveyors with each section of different length. SOCWA maintenance staff would prefer shaftless screw conveyors with similar length sections to allow for easier maintenance and portability between the conveyor sections.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	318,000
Construction:	\$	3,175,000
Construction Support:	\$	318,000
Total Budget:	\$	3,810,000



Capital Improvement Program – Project Description

Project No.: 17534
Project Name: Storage and Truck Loading Rehabilitation
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2026
Project Status: Long Term Planning



Project Description: This project includes recoating and repairing the two sludge hoppers, replacing the truck scale, and various improvements to the truck bay solids transfer equipment.

Project Need: The hoppers were installed in 1998 and are still within their expected useful life of 40 years. In order to keep them in service, the hoppers should be recoated and updated as needed. Similarly, the load cells were installed in 1998 and have an expected useful life of 40 years.

Key Issues: The latest condition assessment (2018 Carollo) rates the hoppers and load cells as being in good condition but some of the minor updates may be needed prior to rehabilitation of the hoppers and load cells.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	66,000
Construction:	\$	656,000
Construction Support:	\$	66,000
Total Budget:	\$	788,000

Capital Improvement Program – Project Description

Project No.: 17535
Project Name: Odor Control Scrubber No. 3 Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2031
Project Status: Long Term Planning

Project Description: Project includes the replacement of the odor control scrubber and the associated chemical feed systems.



Project Need: Original unit installed in 2003. Unit benefits from protection offered by overhead roof. Operation and Maintenance reports the unit as being in good condition.

Key Issues: Cost estimate based on chemical scrubber replacement cost developed for similar sized unit for the Coastal Treatment Plant. Unlike Odor Control Scrubbers No.1 and No.2 it is assumed that this system will continue to utilize only a wet chemical scrubber. This estimate does not address the cost of replacing ducting or fans.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 32,000
Conceptual Study:	\$ 0
Design:	\$ 127,000
Construction:	\$ 1,273,000
Construction Support:	\$ 127,000
Total Budget:	\$ 1,559,000

Capital Improvement Program – Project Description

Project No.: 17536
Project Name: Gas Flare Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning

Project Description: Project includes replacement of the digester gas flare system.



Project Need: The existing dual flare system was placed into operation in 1983. Various components of the flare system have been replaced in the intervening years. New AQMD regulations are anticipated in the next five years which will necessitate replacement of the flare.

Key Issues: The cost estimate for the replacement of the flare system is based on a 2013 evaluation by DHK Engineering. This evaluation did not identify a relocation site for the flare. This may have a significant impact on project cost.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	55,000
Design:	\$	221,000
Construction:	\$	2,211,000
Construction Support:	\$	221,000
Total Budget:	\$	2,709,000

Capital Improvement Program – Project Description

Project No.: 17538
Project Name: Digested and Equalized Sludge Pump VFD Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2024
Project Status: Short Term Planning



Project Description: This project includes the replacement of the four Equalized Sludge Pump variable frequency drives and the four Digested Sludge Pump variable frequency drives.

Project Need: The existing variable frequency drives have been replaced by the Operations staff between 2000 and 2010.

Key Issues: The existing cabinets remain in good condition; the proposed project includes only the replacement of the cabinet doors.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	24,000
Construction:	\$	239,000
Construction Support:	\$	24,000
Total Budget:	\$	287,000

Capital Improvement Program – Project Description

Project No.: 17541
Project Name: Emulsion Polymer Tanks Shade
Facility: Regional Treatment Plant
Cost Center: PC 17 Solids
Anticipated Fiscal Year: 2022
Project Status: Short Term Planning

Project Description: Project includes the installation of a removable fabric cover over the emulsion polymer bulk storage tank.



Project Need: This project is based on a request by the SOCWA Operations Department as a means of decreasing the degradation of the emulsion polymer in storage.

Key Issues: The estimated construction cost for this project is based on the cost of the aluminum cover installed over the sodium hypochlorite storage tank at the Latham Plant in 2007. An evaluation should be done in Fiscal Year 2018/2019 (as part of the Miscellaneous Engineering budget) to verify the technical approach and cost for the fabric covers. This project should be done in conjunction with the covering of the mannich polymer storage tank (see Project 17084).

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	16,000
Construction:	\$	163,000
Construction Support:	\$	16,000
Total Budget:	\$	195,000

Capital Improvement Program – Project Description

Project No.: 17720

Project Name: AWT Hypochlorite Pump and Instrumentation Replacement

Facility: Regional Treatment Plant

Cost Center: PC 17 AWT

Anticipated Fiscal Year: 2029

Project Status: Long Term Planning

Project Description: Project includes removal of existing AWT hypochlorite pumps and installation of new AWT hypochlorite pumps and instrumentation

Project Need: New chemical pumps were installed in 2015. The experience at SOCWA facilities is that a chemical pump has a life of approximately 15 years.

Key Issues: Chemical feed pump technology is evolving, the type of pump for replacement should be reviewed in the future.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	17,000
Construction:	\$	172,000
Construction Support:	\$	17,000
Total Budget:	\$	206,000



Capital Improvement Program – Project Description

Project No.: 17721
Project Name: AWT No.2 Contact Basin Upgrades
Facility: Regional Treatment Plant
Cost Center: PC 17 AWT
Anticipated Fiscal Year:
2027

Project Status: Long Term Planning

Project Description: Project includes the replacement of the sluice gates (inside the Control Building), the chemical clean system (inside the Control Building), the fiberglass covers over the contact basins, miscellaneous structural repairs.

Project Need: All systems date to the original construction in 1998.

Key Issues: A condition assessment should be performed at least two years prior to the budgeting of the project. The condition assessment should take in the full structure located below the filter complex.

Estimated Project Amount (in 2018 \$):

Condition Assessment:

\$ 26,000

Conceptual Study:

\$ 0

Design:

\$ 26,000

Construction:

\$ 173,000

Construction Support:



\$ 17,000

Total Budget:

\$ 243,000

Capital Improvement Program – Project Description

Project No.: 17722
Project Name: AWT Control Building Rehabilitation
Facility: Regional Treatment Plant
Cost Center: PC 17 AWT
Anticipated Fiscal Year: 2031
Project Status: Long Term Planning

Project Description: This project includes the replacement of architectural hardware and the reconstruction of the roof on the existing building.

Project Need: The roof and the architectural hardware are as installed in 1998.

Key Issues: A condition assessment should be performed for this building prior to budgeting.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 10,000
Conceptual Study:	\$ 0
Design:	\$ 40,000
Construction:	\$ 400,000
Construction Support:	\$ 50,000
Total Budget:	\$ 500,000



Capital Improvement Program – Project Description

Project No.: 17723
Project Name: AWT No. 2 Applied Water Pump System
Facility: Regional Treatment Plant
Cost Center: PC 17 AWT
Anticipated Fiscal Year: 2031
Project Status: Long Term Planning

Project Description: Project includes the replacement of the two AWT No.2 Applied Water Pumps and structural improvements to the pump bay.

Project Need: Applied Water Pumps were installed in 1998. Project is included in Ten Year Plan based on anticipated 30 year life of pumps.

Key Issues: Pump bay to be inspected during the draining of the Secondary Effluent Equalization Pond in the spring of 2019.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	18,000
Construction:	\$	177,000
Construction Support:	\$	18,000
Total Budget:	\$	212,000



Capital Improvement Program – Project Description

Project No.: 17725
Project Name: AWT SCADA System Upgrade
Facility: Regional Treatment Plant
Cost Center: PC 17 AWT
Anticipated Fiscal Year: 2034
Project Status: Long Term Planning

Project Description: Project includes the replacement of the cabinet and PLC inside the AWT Control Building.



Project Need: The AWT PLC was installed in 2003. This unit will have exceeded its anticipated life during the span of the current Ten Year Plan.

Key Issues: This project would be performed in conjunction with Project 17353 SCADA System Upgrade Phase II. A condition assessment should be conducted at least two years prior to budgeting the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	3,000
Conceptual Study:	\$	0
Design:	\$	12,000
Construction:	\$	120,000
Construction Support:	\$	12,000
Total Budget:	\$	147,000

Capital Improvement Program – Project Description

Project No.: 17726
Project Name: AWT No.2 Filter Sand Replacement and Underdrain Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 AWT
Anticipated Fiscal Year: 2034
Project Status: Long Term Planning

Project Description: Project includes the replacement of media and filter support mesh. An allowance is included for additional repairs on the filters.



Project Need: AWT No.2 will be the subject of a significant rehabilitation in the winter of 2019/2020. Media replacement should take place every 10 years. This provides the opportunity for the evaluation of the underdrain condition.

Key Issues: A condition assessment should be performed two years in advance of the anticipated budgeting of the project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 7,000
Conceptual Study:	\$ 0
Design:	\$ 29,000
Construction:	\$ 293,000
Construction Support:	\$ 29,000
Total Budget:	\$ 358,000

Capital Improvement Program – Project Description

Project No.: 17727
Project Name: MCC L Replacement
Facility: Regional Treatment Plant
Cost Center: PC 17 AWT
Anticipated Fiscal Year: 2032
Project Status: Long Term Planning
Project Description: Project includes the replacement of Motor Control Center 'L'.

Project Need: MCC 'L' was installed in 1998. Project is included in Ten Year Plan based on anticipated 30 year life of motor control center.

Key Issues: Arc Flash Study should be performed for unit.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$ 9,000
Conceptual Study:	\$ 0
Design:	\$ 35,000
Construction:	\$ 349,000
Construction Support:	\$ 44,000
Total Budget:	\$ 436,000



Capital Improvement Program – Project Description

Project No.: 17728
Project Name: AWT Water Quality Instrumentation Upgrade
Facility: Regional Treatment Plant
Cost Center: PC 17 AWT
Anticipated Fiscal Year: 2034
Project Status: Long Term Planning

Project Description: Project includes the replacement of two turbidimeters and two chlorine residual analyzers located in the AWT Control Building.



Project Need: The four water quality analyzers were replaced in 2016. This project is based on an estimated 15 year life for the devices.

Key Issues: Evaluation of both equipment condition and available technology should be considered prior to budgeting this project.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	6,000
Construction:	\$	117,000
Construction Support:	\$	12,000
Total Budget:	\$	135,000

Capital Improvement Program – Project Description

Project No.: 17729
Project Name: AWT Hypochlorite Storage Tank Shade
Facility: Regional Treatment Plant
Cost Center: PC 17 AWT
Anticipated Fiscal Year: 2020
Project Status: Short Term Planning



Project Description: Project includes the installation of a removable fabric cover over the sodium hypochlorite storage tanks.

Project Need: This project is based on a request by the SOCWA Operations Department as a means of decreasing the degradation of the sodium hypochlorite in storage.

Key Issues: The estimated construction cost for this project is based on the cost of the aluminum cover installed over the sodium hypochlorite storage tank at the Latham Plant in 2007. An evaluation should be done in Fiscal Year 2018/2019 (as part of the Miscellaneous Engineering budget) to verify the technical approach and cost for the fabric covers.

Estimated Project Amount (in 2018 \$):

Condition Assessment:	\$	0
Conceptual Study:	\$	0
Design:	\$	23,000
Construction:	\$	234,000
Construction Support:	\$	23,000
Total Budget:	\$	281,000

Appendix K
Regional Treatment Plant Project Cost Tables

Regional Treatment Plant

Project Number 17051

Motor Control Centers A, C, G and H Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Motor Control Center A ¹	1	Ea	\$ 127,248	\$ 127,248	40%	\$ 50,899	\$ 178,000
	Motor Control Center C ¹	1	Ea	\$ 63,624	\$ 63,624	40%	\$ 25,450	\$ 89,000
	Motor Control Center G ¹	1	Ea	\$ 52,056	\$ 52,056	40%	\$ 20,822	\$ 73,000
	Motor Control Center H ¹	1	Ea	\$ 52,056	\$ 52,056	40%	\$ 20,822	\$ 73,000
	Wiring	1	LS	-	-	-	-	\$ 43,000
	Demolition	1	LS	-	-	-	-	\$ 29,000
	Temporary Power Supply	1	LS	-	-	-	-	\$ 43,000
	Electrical Study	1	LS	-	-	-	-	\$ 24,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 112,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ 24,000
Project Contingency@	20%							\$ 138,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 825,000
Current Estimate	2018 Dollars							\$ 825,000

Project Phases Cost

		Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	5.0%	\$ 41,272	0%	\$ -	\$ 41,000
Construction Mgt.	10.0%	\$ 82,543	0%	\$ -	\$ 83,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 949,000

Notes:

1 Based on review with Maddox Electric.

Regional Treatment Plant

Project Number 17052

Odor Control Scrubber No.1 Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Biotower & Nutrient Storage ¹	1	LS	-	-	-	-	\$ 1,163,000
	Chemical Odor Scrubber ¹	1	LS	-	-	-	-	\$ 566,000
	Demo Storage Building ¹	1	LS	-	-	-	-	\$ 39,000
	Demo Existing Scrubber ¹	1	LS	-	-	-	-	\$ 62,000
	New Containment Structure ¹	1	LS	-	-	-	-	\$ 155,000
	Other Civil and Mech Imps ¹	1	LS	-	-	-	-	\$ 754,000
	Electrical and Inst ²	1	LS	-	-	-	-	\$ 411,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%	\$ 850,000
Shipping Rate	0%	included
Sale Tax	8.00%	\$ -
Project Contingency@	20%	\$ 800,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 4,798,000
Current Estimate	2018 Dollars	\$ 4,798,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 119,957	0%	\$ -	\$ 120,000
Design	10.0%	\$ 479,827	0%	\$ -	\$ 480,000
Engr. During Construction	5.0%	\$ 239,913	0%	\$ -	\$ 240,000
Construction Mgt.	5.0%	\$ 239,913	0%	\$ -	\$ 240,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 5,878,000

Notes:

- 1 Foul Air System Evaluation Regional Treatment Plant -DHK Engineers (4/18)
- 2 Electrical and instrumentation cost is taken as 15% of balance of construction costs

Regional Treatment Plant

Project Number 17053

Headworks Process Equipment Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Bar Screens ¹	3	Ea	\$ 225,000	\$ 675,000	25%	\$ 168,750	\$ 844,000
	Grit Classifiers ²	1	LS	-	-	-	-	\$ 150,000
	Screenings Compactors ¹	1	Ea	\$ 140,000	\$ 140,000	10%	\$ 14,000	\$ 154,000
	Conveyors ³	1	LS	-	-	-	-	\$ 190,000
	Power Supply Upgrade ³	1	LS	-	-	-	-	\$ 75,000
	Instrumentation Upgrade ³	1	LS	-	-	-	-	\$ 45,000
	Other ³	1	LS	-	-	-	-	\$ 230,000
					\$ 815,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%	\$ 269,000
Shipping Rate	0%	included
Sale Tax	8.00%	\$ 54,000
Project Contingency@	20%	\$ 402,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 2,413,000
Current Estimate	2018 Dollars	\$ 2,413,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 60,334	0%	\$ -	\$ 60,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 181,003	0%	\$ -	\$ 181,000
Engr. During Construction	5.0%	\$ 120,669	0%	\$ -	\$ 121,000
Construction Mgt.	5.0%	\$ 120,669	0%	\$ -	\$ 121,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 2,896,000

Notes:

- 1 Based on quotation provided by the Coombs Hopkins Company.
- 2 Based on prior replacement by SOCWA Operations Department.
- 3 Based on bids for the Regional Treatment Plant Headworks Upgrade from 2010

Regional Treatment Plant

Project Number 17054

Primary Sedimentation Basin Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 75,000
	Aluminum Basin Covers ¹	1	LS	-	-	-	-	\$ 500,000
	Chain and Flight Collectors ²	1	LS	-	-	-	-	\$ 525,000
	Spray Nozzles	1	LS	-	-	-	-	\$ 15,000
	Electrical	1	LS	-	-	-	-	\$ 60,000

\$ -

\$ 1,175,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

20% \$ 235,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,410,000
Current Estimate	2018 Dollars	\$ 1,410,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 35,250	0%	\$ -	\$ 35,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 141,000	0%	\$ -	\$ 141,000
Engr. During Construction	5.0%	\$ 70,500	0%	\$ -	\$ 71,000
Construction Mgt.	5.0%	\$ 70,500	0%	\$ -	\$ 71,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 1,727,000

Notes:

- 1 Based on a cost estimate provided by Hallsten.
- 2 Based on bids for RTP Clarifier Upgrade Phase I 2010.

Regional Treatment Plant

Project Number 17055

Primary Gallery Upgrade Phase II

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	EA	\$ -	\$ -	0%	\$ 75,000	\$ 75,000
Sludge Pumps	6	EA	\$ 10,000	\$ 60,000	200%	\$ 120,000	\$ 180,000
Grit Pumps	6	EA	\$ 10,000	\$ 60,000	300%	\$ 180,000	\$ 240,000
Replace Housekeeping Pads	5	EA	\$ 302	\$ 1,510	400%	\$ 6,040	\$ 8,000
Electrical	1	LS	\$ 100,000	\$ 100,000	50%	\$ 50,000	\$ 150,000
Programming	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ 190,000
Shipping Rate	0%					included	
Sale Tax	8.00%						\$ 18,000
Project Contingency@	20%						\$ 182,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$ 1,092,000
Current Estimate	2018 Dollars						\$ 1,092,000

Project Phases Cost	Rate ¹	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	3.0%	\$ 32,759	0%	\$ -	\$ -	\$ 33,000
Engr. During Construction	10.0%	\$ 109,195	0%	\$ -	\$ -	\$ 109,000
Construction Mgt.	5.0%	\$ 54,598	0%	\$ -	\$ -	\$ 55,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 1,289,000

Notes:

1 Equipment Cost estimate provided by Lee and Rc

Regional Treatment Plant

Project Number 17056

Interstage Pump Station Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	EA	\$ -	\$ -	0%	\$ 100,000	\$ 100,000
Replace Interstage Pumps	5	EA	\$ 100,000	\$ 500,000	50%	\$ 250,000	\$ 750,000
Install new VFD	5	EA	\$ 20,000	\$ 100,000	50%	\$ 50,000	\$ 150,000
Replace Housekeeping Pads	5	EA	\$ 1,000	\$ 5,000	400%	\$ 20,000	\$ 225,000
Electrical	1	LS	\$ 150,000	\$ 150,000	50%	\$ 75,000	\$ 225,000
Programming	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ 351,000
Shipping Rate	0%					included	
Sale Tax	8.00%						\$ 60,000
Project Contingency@	20%						\$ 342,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$ 2,054,000
Current Estimate	2018 Dollars						\$ 2,054,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	10.0%	\$ 205,368	0%	\$ -	\$ -	\$ 205,000
Engr. During Construction	10.0%	\$ 205,368	0%	\$ -	\$ -	\$ 205,000
Construction Mgt.	5.0%	\$ 102,684	0%	\$ -	\$ -	\$ 103,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 2,567,000

Notes:

1 Equipment Cost estimate provided by TetraTech

Regional Treatment Plant

Project Number 17057

Secondary Aeration Phase II - Blower Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	EA	\$ -	\$ -	0%	\$ 50,000	\$ 50,000
New Aerzen AT 400-0.8T	2	EA	\$ 200,000	\$ 400,000	50%	\$ 200,000	\$ 600,000
PLC	2	EA	\$ 20,000	\$ 40,000	150%	\$ 60,000	\$ 100,000
Electrical	1	LS	\$ 100,000	\$ 100,000	30%	\$ 30,000	\$ 130,000
Programming	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 251,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 43,000

Project Contingency@

20% \$ 245,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,469,000
Current Estimate	2018 Dollars	\$ 1,469,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 146,916	0%	\$ -	\$ -	\$ 147,000
Engr. During Construction	5.0%	\$ 73,458	0%	\$ -	\$ -	\$ 73,000
Construction Mgt.	5.0%	\$ 73,458	0%	\$ -	\$ -	\$ 73,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 1,763,000

Notes:

1 Equipment Cost estimate provided by MISCOWater

Regional Treatment Plant

Project Number 17058

Secondary Clarifier Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Collector Replacement ¹	6	Ea	\$ 180,000	\$ 1,080,000	20%	\$ 216,000	\$ 1,296,000
	Launder/Baffle Replacement ²	6	Ea	\$ 60,000	\$ 360,000	20%	\$ 72,000	\$ 432,000
	Drain Gate Replacement ³	6	Ea	\$ 10,000	\$ 60,000	25%	\$ 15,000	\$ 75,000
	Drop Gates	12	Ea	\$ 2,000	\$ 12,000	150%	\$ 18,000	\$ 30,000
	Coating ⁴	1	LS	-	-	-	-	\$ 350,000
					\$ 1,512,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%	\$ 589,000
Shipping Rate	0%	included
Sale Tax	8.00%	\$ 121,000
Project Contingency@	20%	\$ 579,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 3,472,000
Current Estimate	2018 Dollars	\$ 3,472,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	5.0%	\$ 173,602	0%	\$ -	\$ 174,000
Engr. During Construction	5.0%	\$ 173,602	0%	\$ -	\$ 174,000
Construction Mgt.	7.5%	\$ 260,403	0%	\$ -	\$ 260,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 4,080,000

Notes:

- 1 Based on quotation form Amir Soltaneih/Walker Process
- 2 Based on information provided by Rashi Gupta, Carollo Engineers
- 3 Based on a quotation from Jeremy Neill/Whipps
- 4 Based on bids for Miscellaneous Improvements 2014 Project.

Regional Treatment Plant

Project Number 17059

RAS Pump Station Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	EA	\$ -	\$ -	0%	\$ 75,000	\$ 75,000
New RAS Pumps	10	EA	\$ 35,000	\$ 350,000	40%	\$ 140,000	\$ 490,000
New Drop Gates	6	EA	\$ 40,000	\$ 240,000	50%	\$ 120,000	\$ 360,000
New VFD	10	EA	\$ 15,000	\$ 150,000	140%	\$ 210,000	\$ 360,000
Electrical	1	LS	\$ 125,000	\$ 125,000	50%	\$ 62,500	\$ 188,000
Programming	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000

Subtotal

\$ 1,523,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 411,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 69,000

Project Contingency@

20% \$ 401,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 2,403,000
Current Estimate	2018 Dollars	\$ 2,403,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	10.0%	\$ 240,333	0%	\$ -	\$ -	\$ 240,000
Engr. During Construction	5.0%	\$ 120,167	0%	\$ -	\$ -	\$ 120,000
Construction Mgt.	5.0%	\$ 120,167	0%	\$ -	\$ -	\$ 120,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 2,884,000

Notes:

1 Equipment Cost estimate provided by TetraTech

Regional Treatment Plant

Project Number 17060

Secondary Scum Pump Station Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	EA	\$ -	\$ -	0%	\$ 25,000	\$ 25,000
New Scum Pumps	2	EA	\$ 30,000	\$ 60,000	50%	\$ 30,000	\$ 90,000
New Scum Skimmer	1	EA	\$ 50,000	\$ 50,000	75%	\$ 37,500	\$ 88,000
Electrical	1	LS	\$ 40,000	\$ 40,000	50%	\$ 20,000	\$ 60,000
Programming	1	LS	\$ -	\$ -	0%	\$ 20,000	\$ 20,000
Subtotal							\$ 283,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 76,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 12,000

Project Contingency@

30% \$ 111,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 482,000
Current Estimate	2018 Dollars	\$ 482,000

Project Phases Cost	Rate ¹	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 48,201	0%	\$ -	\$ -	\$ 48,000
Engr. During Construction	5.0%	\$ 24,100	0%	\$ -	\$ -	\$ 24,000
Construction Mgt.	5.0%	\$ 24,100	0%	\$ -	\$ -	\$ 24,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 578,000

Notes:

1 Equipment Cost estimate provided by TetraTech

Regional Treatment Plant

Project Number 17061

Mixed Liquor Channel Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Condition Assessment	1	LS	-	-	-	-	\$ 30,000
	Bypass Pumping	1	LS	-	-	-	-	\$ 200,000
	Bulkhead Installation	1	LS	-	-	-	-	\$ 40,000
					\$ -			
Subtotal								\$ 270,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

0% \$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ -
Current Estimate	2018 Dollars	\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ 270,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	0.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	0.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -
Total Project Cost (Present Value in 2018 Dollars)					\$ 270,000

Notes:

Regional Treatment Plant

Project Number 17062

Mixed Liquor Channel Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Bypass Pumping	1	LS	-	-	-	-	\$ 350,000
	Bulkhead Installation	1	LS	-	-	-	-	\$ 60,000
	Channel Cleaning	1	LS	-	-	-	-	\$ 10,000
	Agitation Air Piping Reconst.	1	LS	-	-	-	-	\$ 40,000
	Concrete Repair	1	LS	-	-	-	-	\$ 50,000

\$ -

Subtotal

\$ 510,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

20% \$ 102,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 612,000
Current Estimate	2018 Dollars	\$ 612,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 45,900	0%	\$ -	\$ 46,000
Engr. During Construction	5.0%	\$ 30,600	0%	\$ -	\$ 31,000
Construction Mgt.	5.0%	\$ 30,600	0%	\$ -	\$ 31,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 719,000

Notes:

Regional Treatment Plant

Project Number 17063

Waste Activated Sludge (WAS) Pump Station Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	WAS Pump Reconstruction ^{1,2,3,4,5}	1	LS	-	-	-	-	\$ 333,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%	\$ -
Shipping Rate	0%	included
Sale Tax	8.00%	\$ -
Project Contingency@	20%	\$ 67,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 399,000
Current Estimate	2018 Dollars	\$ 399,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 29,925	0%	\$ -	\$ 30,000
Engr. During Construction	5.0%	\$ 19,950	0%	\$ -	\$ 20,000
Construction Mgt.	5.0%	\$ 19,950	0%	\$ -	\$ 20,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 469,000

Notes:

- 1 Based on the 2007 bids for the original reconstruction of the WAS pumping system
- 2 Work includes replacement of pumps, above ground piping and valves, flow meters, and VFD's (but not cabinets)
- 3 Work does not include modification to power feed, control wiring, or structural bases
- 4 Work does not include modification of suction lines connections
- 5 Work does not include replacement of underground pipelines to DAF thickener system

Regional Treatment Plant

Project Number 17064

RAS Sodium Hypochlorite Pumps and Instrument Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost ³							
Remove existing RAS Hypochlorite Pur	1	LS					\$ 10,000
Install new RAS Hypochlorite pumps	1	LS					\$ 48,000
Electrical and Instrumentation	1	LS					\$ 40,000
Other	1	LS					\$ 25,000
Subtotal							\$ 123,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		0%					\$ -
Shipping Rate		0%					included
Sale Tax		0.00%					\$ -
Project Contingency@		30%					\$ 12,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate	2018 Dollars						\$ 135,000
Current Estimate	2018 Dollars						\$ 135,000

Project Phases Cost	Rate ²	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 13,450	0%	\$ -	\$ -	\$ 13,000
Engr. During Construction	5.0%	\$ 6,725	0%	\$ -	\$ -	\$ 7,000
Construction Mgt.	5.0%	\$ 6,725	0%	\$ -	\$ -	\$ 7,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 161,000

Notes:

1 Cost estimate provided by RTP Sodium Hypochlorite 2014 Project Bid

Regional Treatment Plant

Project Number 17066

Effluent Flow Meter Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 5,000
	Metal Plate and Weir	1	LS	-	-	-	-	\$ 25,000
	Sonic Level/Flow Meter	1	LS	-	-	-	-	\$ 5,000
	Other Improvements	1	LS	-	-	-	-	\$ 10,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%							\$ -
Shipping Rate	0%							included
Sale Tax	8.00%							\$ -
Project Contingency@	30%							\$ 14,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 59,000
Current Estimate	2018 Dollars							\$ 59,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	10.0%	\$ 5,850	0%	\$ -	\$ 6,000
Conceptual Study	30.0%	\$ 17,550	0%	\$ -	\$ 18,000
Design	10.0%	\$ 5,850	0%	\$ -	\$ 6,000
Engr. During Construction	5.0%	\$ 2,925	0%	\$ -	\$ 3,000
Construction Mgt.	5.0%	\$ 2,925	0%	\$ -	\$ 3,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 94,000

Notes:

- 1 Based on bid for installation of effluent flow meter meter in 2004

Regional Treatment Plant

Project Number 17067

DAF Cover Replacement and Internal Recoating

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Concrete Recoating	Recoating ¹	1	LS	-	-	-	-	\$ 90,000
	Cover Replacement ^{2,3}		1	LS	-	-	-	-	\$ 225,000
	Metallic Surface Recoating ⁴		1	LS	-	-	-	-	\$ 180,000
	Level Measurement ¹		1	LS	-	-	-	-	\$ 15,000
	Other		1	LS	-	-	-	-	\$ 25,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%								\$ -
Shipping Rate	0%								included
Sale Tax	8.00%								\$ -
Project Contingency@	20%								\$ 107,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars								\$ 642,000
Current Estimate	2018 Dollars								\$ 642,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	5.0%	\$ 32,100	0%	\$ -	\$ 32,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 48,150	0%	\$ -	\$ 48,000
Engr. During Construction	5.0%	\$ 32,100	0%	\$ -	\$ 32,000
Construction Mgt.	5.0%	\$ 32,100	0%	\$ -	\$ 32,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 786,000

Notes:

- 1 Based on the 2007 bids for the original reconstruction of the DAF system
- 2 Based on a cost estimate provided by Hallsten.
- 3 Assumes that the support system for the covers can be reused
- 4 Based on bids for Miscellaneous Improvements 2014 Project.

Regional Treatment Plant

Project Number 17068

TWAS System Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 15,000
	TWAS Pumps ¹	1	LS	-	-	-	-	\$ 86,000
	Piping, Valves and Supports ¹	1	LS	-	-	-	-	\$ 45,000
	Variable Frequency Drives ¹	1	LS	-	-	-	-	\$ 26,000
	Other Improvements	1	LS	-	-	-	-	\$ 50,000

\$ -

\$ 222,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 67,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 289,000
Current Estimate	2018 Dollars	\$ 289,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 28,860	0%	\$ -	\$ 29,000
Engr. During Construction	5.0%	\$ 14,430	0%	\$ -	\$ 14,000
Construction Mgt.	5.0%	\$ 14,430	0%	\$ -	\$ 14,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 346,000

Notes:

1 Based on Bids from the 2007 RTP Waste Activated Sludge System Upgrade Project

Regional Treatment Plant

Project Number 17071

Odor Control Scrubber No.2 Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Carbon Scrubber ¹	1	LS	-	-	-	-	\$ 310,000
	Chemical Odor Scrubber ¹	1	LS	-	-	-	-	\$ 271,000
	Demolition ¹	1	LS	-	-	-	-	\$ 113,000
	New Containment Structure ¹	1	LS	-	-	-	-	\$ 310,000
	Other Civil and Mech Imps ¹	1	LS	-	-	-	-	\$ 564,000

\$ -

Subtotal \$ 1,568,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 423,000

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

20% \$ 398,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 2,390,000
Current Estimate	2018 Dollars	\$ 2,390,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 59,748	0%	\$ -	\$ 60,000
Design	10.0%	\$ 238,994	0%	\$ -	\$ 239,000
Engr. During Construction	5.0%	\$ 119,497	0%	\$ -	\$ 119,000
Construction Mgt.	5.0%	\$ 119,497	0%	\$ -	\$ 119,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 2,928,000

Notes:

1 Foul Air System Evaluation Regional Treatment Plant -DHK Engineers (4/18)

Regional Treatment Plant

Project Number 17072

New Grit Handling Facility

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 75,000
	Foundation	1	LS	-	-	-	-	\$ 30,000
	Site Modifications	1	LS	-	-	-	-	\$ 30,000
	Building ¹	1	LS	-	-	-	-	\$ 220,000
	Plumbing	1	LS	-	-	-	-	\$ 25,000
	Skylights	1	LS	-	-	-	-	\$ 15,000
	Grit Classifiers	1	LS	-	-	-	-	\$ 150,000
	Classifier Platform	1	LS	-	-	-	-	\$ 75,000
	Screenings Compactor & Tube	1	LS	-	-	-	-	\$ 190,000
	Electrical & Instrumentation	1	LS	-	-	-	-	\$ 125,000

\$ -

\$ 935,000

Subtotal

General Conditions. Contractor Overhead and Profit,

and Bonds and Insurance @

27% \$ 252,000

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

20% \$ 237,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,425,000
Current Estimate	2018 Dollars	\$ 1,425,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 142,494	0%	\$ -	\$ 142,000
Engr. During Construction	5.0%	\$ 71,247	0%	\$ -	\$ 71,000
Construction Mgt.	10.0%	\$ 142,494	0%	\$ -	\$ 142,000

Total Project Cost (Present Value in 2018 Dollars) \$ 1,781,000

Notes:

Regional Treatment Plant

Project Number 17074

WAS VFD Pump Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$	10,000
	VFD	1	LS	-	-	-	-	\$	50,000
	VFD Cabinet Door	1	LS	-	-	-	-	\$	12,000
	Electrical	1	LS	-	-	-	-	\$	20,000

\$ -

\$ 92,000

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 28,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	120,000
Current Estimate	2018 Dollars	\$	120,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 11,960	0%	\$ -	\$ 12,000
Engr. During Construction	5.0%	\$ 5,980	0%	\$ -	\$ 6,000
Construction Mgt.	5.0%	\$ 5,980	0%	\$ -	\$ 6,000

Total Project Cost (Present Value in 2018 Dollars) \$ 144,000

Notes:

Regional Treatment Plant

Project Number 17075

Mannich Polymer Bulk Polymer Storage Tank Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$	25,000
	Storage Tank ¹	1	Ea	\$ 50,000	\$ 50,000	25%	\$ 12,500	\$	63,000
	Transfer Pump	1	Ea	\$ 8,500	\$ 8,500	50%	\$ 4,250	\$	13,000
	Piping, Valves and Appurtenances	1	LS	-	-	-	-	\$	10,000
	Electrical and Instrumentation	1	LS	-	-	-	-	\$	30,000
	Temporary Chemical Supply	1	LS	-	-	-	-	\$	30,000
					\$ 58,500				

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%	\$	-
Shipping Rate	0%	included	
Sale Tax	8.00%	\$	5,000
Project Contingency@	20%	\$	35,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	210,000
Current Estimate	2018 Dollars	\$	210,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 20,992	0%	\$ -	\$ 21,000
Engr. During Construction	5.0%	\$ 10,496	0%	\$ -	\$ 10,000
Construction Mgt.	5.0%	\$ 10,496	0%	\$ -	\$ 10,000

Total Project Cost (Present Value in 2018 Dollars)		\$	252,000
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Notes:

1 Based on Crowley and Company quote dated 7/27/18.

Regional Treatment Plant

Project Number 17078

Motor Control Center 30310 Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Motor Control Center ¹	1	Ea	\$ 106,000	\$ 106,000	40%	\$ 42,400	\$ 148,000
	Wiring	1	LS	-	-	-	-	\$ 30,000
	Demolition	1	LS	-	-	-	-	\$ 15,000
	Temporary Power Supply	1	LS	-	-	-	-	\$ 25,000
	Electrical Study	1	LS	-	-	-	-	\$ 20,000
					\$ 106,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 40,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ 8,000
Project Contingency@	30%							\$ 86,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 373,000
Current Estimate	2018 Dollars							\$ 373,000

Project Phases Cost		Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 9,325.81	0%	\$ -	\$ 9,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 37,303	0%	\$ -	\$ 37,000
Engr. During Construction	5.0%	\$ 18,652	0%	\$ -	\$ 19,000
Construction Mgt.	7.5%	\$ 27,977	0%	\$ -	\$ 28,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 466,000

Notes:

1 Based on review with Maddox Electric

Regional Treatment Plant

Project Number 17079

Motor Control Center E Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Motor Control Center ¹	1	Ea	\$ 82,000	\$ 82,000	40%	\$ 32,800	\$ 115,000
	Wiring	1	LS	-	-	-	-	\$ 30,000
	Demolition	1	LS	-	-	-	-	\$ 15,000
	Temporary Power Supply	1	LS	-	-	-	-	\$ 25,000
					\$ 82,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 31,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ 7,000
Project Contingency@	30%							\$ 67,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 289,000
Current Estimate	2018 Dollars							\$ 289,000

Project Phases Cost

	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0% \$ -	\$ -
Conceptual Study	0.0%	\$ -	0% \$ -	\$ -
Design	10.0%	\$ 28,906	0% \$ -	\$ 29,000
Engr. During Construction	5.0%	\$ 14,453	0% \$ -	\$ 14,000
Construction Mgt.	7.5%	\$ 21,680	0% \$ -	\$ 22,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 354,000

Notes:

1 Based on review with Maddox Electric.

Regional Treatment Plant

Project Number 17080

Primary Scum Skimmer

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	EA	\$ -	\$ -	0%	\$ 75,000	\$ 75,000
Replace Helical Skimmers, Drive Mech	6	EA	\$ 60,000	\$ 360,000	50%	\$ 180,000	\$ 540,000
Replace Scum Troughs	3	EA	\$ 5,000	\$ 15,000	80%	\$ 12,000	\$ 27,000
Electrical	1	LS	\$ 75,000	\$ 75,000	50%	\$ 37,500	\$ 113,000
Programming	1	LS	\$ -	\$ -	0%	\$ 25,000	\$ 25,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 210,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 36,000

Project Contingency@

20% \$ 205,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,231,000
Current Estimate	2018 Dollars	\$ 1,231,000

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	3.0%	\$ 36,935	0%	\$ -	\$ -	\$ 37,000
Engr. During Construction	10.0%	\$ 123,116	0%	\$ -	\$ -	\$ 123,000
Construction Mgt.	5.0%	\$ 61,558	0%	\$ -	\$ -	\$ 62,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 1,453,000

Notes:

1 Equipment Cost estimate provided by Lee and Rc

Regional Treatment Plant

Project Number 17081

Primary Sedimentation Basin Collectors and Gates

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 75,000
	Drop Gates Inlet	1	LS	-	-	-	-	\$ 90,000
	Effluent Collector Pipes	1	LS	-	-	-	-	\$ 315,000
	Drop Gates Outlet	1	LS	-	-	-	-	\$ 135,000

\$ -

\$ 615,000

Subtotal

General Conditions, Contractor Overhead and Profit,
and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

20% \$ 123,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 738,000
Current Estimate	2018 Dollars	\$ 738,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 18,450	0%	\$ -	\$ 18,000
Design	10.0%	\$ 73,800	0%	\$ -	\$ 74,000
Engr. During Construction	5.0%	\$ 36,900	0%	\$ -	\$ 37,000
Construction Mgt.	5.0%	\$ 36,900	0%	\$ -	\$ 37,000

Total Project Cost (Present Value in 2018 Dollars) \$ 904,000

Notes:

Regional Treatment Plant

Project Number 17082

Secondary Effluent Conveyance Evaluation

Main Project Type

New Facility	
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	X

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	1	LS	-	-	-	-	\$ -
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Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ -
Shipping Rate	0%						included
Sale Tax	8.00%						\$ -
Project Contingency@	20%						\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$ -
Current Estimate	2018 Dollars						\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ 50,000
Design	0.0%	\$ -	0%	\$ -	\$ -
Engr. During Construction	0.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2018 Dollars) \$ 50,000

Notes:

Regional Treatment Plant

Project Number 17083

Grit Handling Evaluation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	1	LS	-	-	-	-	\$ -
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Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ -
Shipping Rate	0%						included
Sale Tax	8.00%						\$ -
Project Contingency@	20%						\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$ -
Current Estimate	2018 Dollars						\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ 60,000
Design	7.5%	\$ -	0%	\$ -	\$ -
Engr. During Construction	5.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2018 Dollars)					\$ 60,000
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Notes:

Regional Treatment Plant

Project Number 17084

Mannich Polumer Storage Tank Shade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Foundation	1	LS	-	-	-	-	\$	30,000
	Shade Structure	1	LS	-	-	-	-	\$	80,000
	Lighting	1	LS	-	-	-	-	\$	15,000
Subtotal								\$	125,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 38,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	163,000
Current Estimate	2018 Dollars	\$	163,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 16,250	0%	\$ -	\$ 16,000
Engr. During Construction	5.0%	\$ 8,125	0%	\$ -	\$ 8,000
Construction Mgt.	5.0%	\$ 8,125	0%	\$ -	\$ 8,000

Total Project Cost (Present Value in 2018 Dollars) \$ 195,000

Notes:

1 Based on construction cost of hypochlorite tank shade at J. B. Latham Treatment Plant

Regional Treatment Plant

Project Number 17086

Aeration Control Valve, Gates, and Flow Meter Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	100%	\$ 100,000	\$ 100,000
Gates (influent, effluent, RAS, & Drain)	42	EA	\$ 8,700	\$ 365,400	85%	\$ 310,000	\$ 675,000
Control Valves	24	EA	\$ 5,500	\$ 132,000	64%	\$ 84,000	\$ 216,000
Air Flow Meters	24	EA	\$ 3,700	\$ 88,800	74%	\$ 66,000	\$ 155,000
DO Meter	12	EA	\$ 3,000	\$ 36,000	50%	\$ 18,000	\$ 54,000
DO Controller	6	EA	\$ 2,500	\$ 15,000	68%	\$ 10,200	\$ 25,000
Electrical	1	LS	\$ 100,000	\$ 100,000	150%	\$ 150,000	\$ 250,000
Programming	1	LS	\$ -	\$ -	0%	\$ 100,000	\$ 100,000

Subtotal

\$ 1,575,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 425,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 59,000

Project Contingency@

20% \$ 412,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 2,472,000
Current Estimate	2018 Dollars	\$ 2,472,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	10.0%	\$ 247,168	0%	\$ -	\$ -	\$ 247,000
Engr. During Construction	10.0%	\$ 247,168	0%	\$ -	\$ -	\$ 247,000
Construction Mgt.	5.0%	\$ 123,584	0%	\$ -	\$ -	\$ 124,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 3,090,000

Notes:

- All Project costs provided by Lee and Rc

Regional Treatment Plant

Project Number 17320

Plant Drainage Pump Station Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	EA	\$ -	\$ -	0%	\$ 25,000	\$ 25,000
New Pumps	2	EA	\$ 30,000	\$ 60,000	50%	\$ 30,000	\$ 90,000
New Control Panel	1	EA	\$ 50,000	\$ 50,000	75%	\$ 37,500	\$ 88,000
Electrical	1	LS	\$ 40,000	\$ 40,000	50%	\$ 20,000	\$ 60,000
Programming	1	LS	\$ -	\$ -	0%	\$ 20,000	\$ 20,000
Subtotal							\$ 283,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 76,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 12,000

Project Contingency@

30% \$ 111,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 482,000
Current Estimate	2018 Dollars	\$ 482,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 48,201	0%	\$ -	\$ -	\$ 48,000
Engr. During Construction	10.0%	\$ 48,201	0%	\$ -	\$ -	\$ 48,000
Construction Mgt.	5.0%	\$ 24,100	0%	\$ -	\$ -	\$ 24,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 603,000

Notes:

1 Equipment Cost estimate provided by TetraTech

Regional Treatment Plant

Project Number 17321

Chlorine Building Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost¹

Replace Single Doors (4)	1	LS	\$	-	\$	34,000
Replace Double Doors (1)	1	LS	\$	-	\$	12,000
Replace Storage Door	1	LS	\$	-	\$	18,000
Replace Louvers (4)	1	LS	\$	-	\$	40,000
Replace Lighting and Power Receptacl	1	LS	\$	-	\$	40,000

Subtotal

\$ 144,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 43,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	187,000
Current Estimate	2018 Dollars	\$	187,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 18,720	0%	\$ -	\$ -	\$ 19,000
Engr. During Construction	5.0%	\$ 9,360	0%	\$ -	\$ -	\$ 9,000
Construction Mgt.	7.5%	\$ 14,040	0%	\$ -	\$ -	\$ 14,000

Total Project Cost (Present Value in 2018 Dollars) \$ 229,000

Notes:

1 Cost estimate provided by Hazen & Sawyer

Regional Treatment Plant

Project Number 17322

Plant Water Pumping System

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demolition	1	LS	\$ -	\$ -	0%	\$ -	\$ 35,000
3WHP Pumps	3	EA	\$ 12,000	\$ 36,000	50%	\$ 18,000	\$ 54,000
3WLP Pumps	3	EA	\$ 12,000	\$ 36,000	50%	\$ 18,000	\$ 54,000
2W Pumps	2	EA	\$ 7,500	\$ 15,000	30%	\$ 4,500	\$ 20,000
Water Gap System	1	LS	\$ -	\$ -	0%	\$ -	\$ 30,000
Piping and Valving	1	LS	\$ -	\$ -	0%	\$ -	\$ 40,000
Electrical and Instrumentation	1	LS	\$ -	\$ -	0%	\$ -	\$ 80,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$	34,000
Shipping Rate	0%		included	
Sale Tax	8.00%		\$	7,000
Project Contingency@	30%		\$	94,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	448,000
Current Estimate	2018 Dollars	\$	448,000

Project Phases Cost	Rate ²	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	2.5%	\$ 11,190.88	0%	\$ -	\$ -	\$ 11,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 44,764	0%	\$ -	\$ -	\$ 45,000
Engr. During Construction	5.0%	\$ 22,382	0%	\$ -	\$ -	\$ 22,000
Construction Mgt.	5.0%	\$ 22,382	0%	\$ -	\$ -	\$ 22,000

Total Project Cost (Present Value in 2018 Dollars)		\$	548,000
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Notes:

Regional Treatment Plant

Project Number 17323

Non-Potable Sodium Hypochlorite Pumps and Instrument Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Remove existing NPW Hypochlorite Pu	1	LS					\$	10,000
Install new NPW Hypochlorite pumps	1	LS					\$	48,000
Electrical and Instrumentation	1	LS					\$	40,000
Other	1	LS					\$	25,000

Subtotal

\$ 123,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

0.00% \$ -

Project Contingency@

30% \$ 12,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	135,000
Current Estimate	2018 Dollars	\$	135,000

Project Phases Cost		Rate ²	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA	Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
1.1.005 CS	Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
1.1.005 DS	Design	10.0%	\$ 13,450	0%	\$ -	\$ -	\$ 13,000
1.1.005 EDC	Engr. During Construction	5.0%	\$ 6,725	0%	\$ -	\$ -	\$ 7,000
1.1.005 CM	Construction Mgt.	5.0%	\$ 6,725	0%	\$ -	\$ -	\$ 7,000
Total Project Cost (Present Value in 2018 Dollars)							\$ 161,000

Notes:

1 Cost estimate provided by RTP Sodium Hypochlorite 2014 Project Bid

Regional Treatment Plant

Project Number 17325

Process Water Contact Basin Upgrades

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	CCT Sluice Gate ¹	2	EA	\$ 9,500	\$ 19,000	40%	\$ 7,600	\$ 27,000
	CCT Drain Gate ¹	2	EA	\$ 7,500	\$ 15,000	25%	\$ 3,750	\$ 19,000
	Concrete Rehabilitation	1	LS	-	-	-	-	\$ 50,000
	Piping Modifications	1	LS	-	-	-	-	\$ 20,000
	Electrical Modifications	1	LS	-	-	-	-	\$ 25,000

Subtotal

\$ 140,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 12,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 3,000

Project Contingency@

30% \$ 47,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 202,000
Current Estimate	2018 Dollars	\$ 202,000

Project Phases Cost

	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 5,048	0%	\$ -	\$ 5,000
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 20,191	0%	\$ -	\$ 20,000
Engr. During Construction	5.0%	\$ 10,095	0%	\$ -	\$ 10,000
Construction Mgt.	5.0%	\$ 10,095	0%	\$ -	\$ 10,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 247,000

Notes:

1 Based on quote by Whipps Gates.

Regional Treatment Plant

Project Number 17327

Motor Control Center F Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Motor Control Center ¹	1	Ea	\$ 100,000	\$ 100,000	40%	\$ 40,000	\$ 140,000
	Wiring	1	LS	-	-	-	-	\$ 30,000
	Demolition	1	LS	-	-	-	-	\$ 20,000
	Temporary Power Supply	1	LS	-	-	-	-	\$ 25,000

\$ -

Subtotal

\$ 215,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27%

\$ 58,000

Shipping Rate

0%

included

Sale Tax

8.00%

\$ 8,000

Project Contingency@

30%

\$ 84,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 365,000
Current Estimate	2018 Dollars	\$ 365,000

Project Phases Cost		Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 36,537	0%	\$ -	\$ 37,000
Engr. During Construction	5.0%	\$ 18,268	0%	\$ -	\$ 18,000
Construction Mgt.	7.5%	\$ 27,402	0%	\$ -	\$ 27,000
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2018 Dollars) \$ 448,000

Notes:

1 Based on review with Maddox Electric.

Regional Treatment Plant

Project Number 17329

Laboratory Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$	50,000
	Laboratory Casework ¹	1	LS	-	-	-	-	\$	80,000
	Plumbing ¹	1	LS	-	-	-	-	\$	114,000
	Laboratory Equipment ¹	1	LS	-	-	-	-	\$	80,000
	Flooring ¹	1	LS	-	-	-	-	\$	19,000
	Woodwork ¹	1	LS	-	-	-	-	\$	16,000
	Ceiling and Wall Repair ¹	1	LS	-	-	-	-	\$	24,000
	Coating ¹	1	LS	-	-	-	-	\$	22,000
	Electrical ¹	1	LS	-	-	-	-	\$	90,000
	Temporary Lab ²	1	LS	-	-	-	-	\$	75,000

\$ - \$ 570,000

Subtotal

General Conditions. Contractor Overhead and Profit,

and Bonds and Insurance @

27% \$ 154,000

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

20% \$ 145,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	869,000
Current Estimate	2018 Dollars	\$	869,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 86,868	0%	\$ -	\$ 87,000
Engr. During Construction	5.0%	\$ 43,434	0%	\$ -	\$ 43,000
Construction Mgt.	5.0%	\$ 43,434	0%	\$ -	\$ 43,000

Total Project Cost (Present Value in 2018 Dollars) \$ 1,042,000

Notes:

Regional Treatment Plant

Project Number 17330

Energy Building Seismic Analysis and Structural Condition Assessment

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	1	LS	-	-	-	-	\$ -
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Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ -
Shipping Rate	0%						included
Sale Tax	8.00%						\$ -
Project Contingency@	20%						\$ -

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$ -
Current Estimate	2018 Dollars						\$ -

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ 80,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ -	0%	\$ -	\$ -
Engr. During Construction	5.0%	\$ -	0%	\$ -	\$ -
Construction Mgt.	5.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2018 Dollars) \$ 80,000

Notes:

Regional Treatment Plant

Project Number 17331

Energy Building Repair and Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Energy Building Roof Reconstruction	1	LS	\$	-		\$	1,002,000
Diaphragm Collector Beam Retrofit	1	LS	\$	-	\$	-	\$ 9,000
Repair of Concrete Spalling at Bridge C	1	LS					\$ 20,000
Rehabilitation of Generator Room Me1	1	LS					\$ 33,000
Retrofit of Wall Piers at Solids Loading	1	LS					\$ 56,000
Subtotal							\$ 1,120,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

20% \$ 224,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	1,344,000
Current Estimate	2018 Dollars	\$	1,344,000

Project Phases Cost		Rate ²	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA	Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 CS	Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 DS	Design	10.0%	\$ 134,352	0%	\$ -	\$ -	\$ 134,000
1.1.005 EDC	Engr. During Construction	5.0%	\$ 67,176	0%	\$ -	\$ -	\$ 67,000
1.1.005 CM	Construction Mgt.	7.5%	\$ 100,764	0%	\$ -	\$ -	\$ 101,000
Total Project Cost (Present Value in 2018 Dollars)							\$ 1,646,000

Notes:

1 Cost estimate provided by CH2MHill Facility Plan

Regional Treatment Plant

Project Number 17332

Maintenance Shop Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 10,000
	Benchwork ¹	1	LS	-	-	-	-	\$ 80,000
	Plumbing ¹	1	LS	-	-	-	-	\$ 20,000
	Electrical ¹	1	LS	-	-	-	-	\$ 35,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 39,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ -
Project Contingency@	40%							\$ 74,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 258,000
Current Estimate	2018 Dollars							\$ 258,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 6,445	0%	\$ -	\$ 6,000
Design	10.0%	\$ 25,781	0%	\$ -	\$ 26,000
Engr. During Construction	5.0%	\$ 12,891	0%	\$ -	\$ 13,000
Construction Mgt.	5.0%	\$ 12,891	0%	\$ -	\$ 13,000

Total Project Cost (Present Value in 2018 Dollars)					\$ 316,000
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Notes:

Regional Treatment Plant

Project Number 17333

SCADA System Upgrade - Phase I

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Sep-18
 Estimate Update Sep-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	PLC's	6	EA	\$ 15,000	\$ 90,000	100%	\$ 90,000	\$ 180,000
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Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ 49,000
Shipping Rate	0%						included
Sale Tax	8.00%						\$ 7,000
Project Contingency@	30%						\$ 71,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 307,000
Current Estimate	2018 Dollars	\$ 307,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 30,654	0%	\$ -	\$ 31,000
Engr. During Construction	5.0%	\$ 15,327	0%	\$ -	\$ 15,000
Construction Mgt.	5.0%	\$ 15,327	0%	\$ -	\$ 15,000

Total Project Cost (Present Value in 2018 Dollars) \$ 368,000

Notes:

Regional Treatment Plant

Project Number 17334

New Storage Building

Main Project Type

New Facility	X
Facility Rehabilitation	
Major maintenance	
Asset Replacement	
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 10,000
	Foundation	1	LS	-	-	-	-	\$ 30,000
	Road Modifications/Parking	1	LS	-	-	-	-	\$ 30,000
	Building	1	LS	-	-	-	-	\$ 296,000
	Plumbing	1	LS	-	-	-	-	\$ 25,000
	Finishes	1	LS	-	-	-	-	\$ 30,000
	Skylights	1	LS	-	-	-	-	\$ 15,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 118,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ -
Project Contingency@	30%							\$ 166,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 719,000
Current Estimate	2018 Dollars							\$ 719,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 71,945	0%	\$ -	\$ 72,000
Engr. During Construction	5.0%	\$ 35,972	0%	\$ -	\$ 36,000
Construction Mgt.	10.0%	\$ 71,945	0%	\$ -	\$ 72,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 899,000

Notes:

- 1 Based on estimate by Hazen & Sawyer.

Regional Treatment Plant

Project Number 17335

Stie Pavement Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BEP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Asphalt Pavement	1	LS	\$	-	\$	-	\$	714,000
Subtotal								\$	714,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% included

Shipping Rate 0% included

Sale Tax 8.00% \$ -

Project Contingency@ 20% \$ 143,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	857,000
Current Estimate	2018 Dollars	\$	857,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 21,420	0%	\$ -	\$ 21,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	5.0%	\$ 42,840	0%	\$ -	\$ 43,000
Engr. During Construction	5.0%	\$ 42,840	0%	\$ -	\$ 43,000
Construction Mgt.	5.0%	\$ 42,840	0%	\$ -	\$ 43,000

Total Project Cost (Present Value in 2018 Dollars) \$ 1,007,000

Notes:

1 Cost estimate derived from 2004 Study by TetraTech.

Regional Treatment Plant

Project Number 17336

Perimeter Fence Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	Perimeter Fence Removal ¹	1	LS	-	-	-	-	\$ 59,000
	Perimeter Fence Replacement ²	1	LS	-	-	-	-	\$ 144,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 204,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ -
Project Contingency@	10%							\$ 26,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 284,000
Current Estimate	2018 Dollars							\$ 284,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 28,429	0%	\$ -	\$ 28,000
Engr. During Construction	2.5%	\$ 7,107	0%	\$ -	\$ 7,000
Construction Mgt.	5.0%	\$ 14,214	0%	\$ -	\$ 14,000
Total Project Contingency	0.0%	\$ -	0%	\$ -	\$ -

Total Project Cost (Present Value in 2018 Dollars)					\$ 334,000
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Notes:

- 1 Cost estimate provided by Hazen & Sawyer; \$16/lf of fence removal
- 2 Cost estimate provided by Hazen & Sawyer; \$39/lf of fence installation
- 3 Based on 3700 liner feet of perimeter fencing

Regional Treatment Plant

Project Number 17337

West Side Storm Channel Rehabilitation - Phase I

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Drainage Channel Replacement ¹	1	LS	-	-	-	-	\$	666,000
					\$	-		\$	-

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%								included
Shipping Rate	0%								included
Sale Tax	0%								included
Project Contingency@	20%							\$	133,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$	799,000
Current Estimate	2018 Dollars							\$	799,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	5.0%	\$ 39,960	0%	\$ -	\$ 40,000
Design	10.0%	\$ 79,920	0%	\$ -	\$ 80,000
Engr. During Construction	5.0%	\$ 39,960	0%	\$ -	\$ 40,000
Construction Mgt.	5.0%	\$ 39,960	0%	\$ -	\$ 40,000

Total Project Cost (Present Value in 2018 Dollars) \$ 999,000

Notes:

1 Based on "Structural Condition Assessment of the Existing Concrete Drainage Channel at the Regional Treatment Plant" December 2017 by TetraTech

Regional Treatment Plant

Project Number 17338

West Side Storm Channel Rehabilitation - Phase II

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Erosion Repair ¹	1	LS	-	-	-	-	\$	13,000
	Drain Repairs ¹	1	LS	-	-	-	-	\$	13,000
	Fiber Rolls ¹	1	LS	-	-	-	-	\$	10,000
					\$	-		\$	-
Subtotal								\$	36,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0%

included

Shipping Rate

0%

included

Sale Tax

0%

included

Project Contingency@

40%

\$ 14,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	50,000
Current Estimate	2018 Dollars	\$	50,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	20.0%	\$ 10,080	0%	\$ -	\$ 10,000
Engr. During Construction	10.0%	\$ 5,040	0%	\$ -	\$ 5,000
Construction Mgt.	5.0%	\$ 2,520	0%	\$ -	\$ 3,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 68,000

Notes:

1 Based on "'Terrace Drain Assessment At The Regional Treatment Plant" April 2018 by TetraTech

Regional Treatment Plant

Project Number 17340

Plant Water Pump Screen Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	6-inch Hellan DA Auto Strainer	1	Ea	\$ 12,500	\$ 12,500	100	\$ 12,500	\$ 25,000
	Wedge Wire Drum Scraper Brush	1	Ea	\$ 3,700	\$ 3,700	100	\$ 3,700	\$ 7,400
	8-inch Hellan DA Auto Strainer	1	Ea	\$ 14,000	\$ 14,000	100	\$ 14,000	\$ 28,000
	Wire Drum Scraper Brush	1	Ea	\$ 5,500	\$ 5,500	100	\$ 5,500	\$ 11,000
	Local Control Panel NEMA 4X Sst	1	Ea	\$ 6,500	\$ 6,500	100	\$ 6,500	\$ 13,000
	Demo of Existing Drain Piping	1	LS	-	-	-	-	\$ 3,000
	6-inch PVC Drain Piping	300	Ft	\$ 30	\$ 9,000	100	\$ 9,000	\$ 18,000
Subtotal				\$	51,200		\$ 51,200	\$ 105,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @			27%				\$	28,000
Shipping Rate			0%				included	
Sale Tax			8.00%				\$	4,000
Project Contingency@			30%				\$	41,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 179,000
Current Estimate	2018 Dollars	\$ 179,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 17,851	0%	\$ -	\$ 18,000
Engr. During Construction	5.0%	\$ 8,926	0%	\$ -	\$ 9,000
Construction Mgt.	5.0%	\$ 8,926	0%	\$ -	\$ 9,000

Total Project Cost (Present Value in 2018 Dollars) \$ 214,000

Notes:

Regional Treatment Plant

Project Number 17341

Lube Oil Tank Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Replacement of Tank ¹	1	LS	-	-	-	-	\$	20,000
	Replacement of Buried Piping	1	LS	-	-	-	-	\$	15,000
	Replace Access Platform	1	LS	-	-	-	-	\$	10,000
	Upgrade Instrumentation	1	LS	-	-	-	-	\$	15,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%							\$	-
Shipping Rate	0%							included	
Sale Tax	8.00%							\$	-
Project Contingency@	30%							\$	18,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$	78,000
Current Estimate	2018 Dollars							\$	78,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	5.0%	\$ 3,900	0%	\$ -	\$ 4,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	20.0%	\$ 15,600	0%	\$ -	\$ 16,000
Engr. During Construction	5.0%	\$ 3,900	0%	\$ -	\$ 4,000
Construction Mgt.	5.0%	\$ 3,900	0%	\$ -	\$ 4,000

Total Project Cost (Present Value in 2018 Dollars)					\$ 105,000
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Notes:

1 Based on "Coastal Treatment Plant Cost Estimate Odor Control & Emergency Generator Systems", DHK Engineering, April, 2017

Regional Treatment Plant

Project Number 17342

Electrical Box Reconstruction - Phase I

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate 8/1/118
 Estimate Update Oct-17

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Manhole and Handholds	1	LS	-	-	-	-	\$ 498,000
	Conductors	1	LS	-	-	-	-	\$ 570,000
					\$ -		\$ -	\$ -
Subtotal								\$ 1,068,000

General Conditions, Contractor Overhead and Profit,

and Bonds and Insurance @

0%

included

Shipping Rate

0%

included

Sale Tax

0%

included

Project Contingency@

20%

\$ 214,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,282,000
Current Estimate	2018 Dollars	\$ 1,282,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 128,160	0%	\$ -	\$ 128,000
Engr. During Construction	5.0%	\$ 64,080	0%	\$ -	\$ 64,000
Construction Mgt.	10.0%	\$ 128,160	0%	\$ -	\$ 128,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 1,602,000

Notes:

1 Based on "Condition Assessment and Evaluation of Electrical Manholes", February, 2015 by Lee & Ro

Regional Treatment Plant

Project Number 17345

Energy Building HVAC Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ³	HVAC Updates	1	LS	-	-	-	-	\$	303,000
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Subtotal

General Conditions. Contractor Overhead and Profit, and Bonds and Insurance @	27%	\$	82,000
Shipping Rate	0%		included
Sale Tax	0%		included
Project Contingency@	30%	\$	91,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	394,000
Current Estimate	2018 Dollars	\$	394,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Permitting	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 39,416	0%	\$ -	\$ 39,000
Engr. During Construction	5.0%	\$ 19,708	0%	\$ -	\$ 20,000
Construction Mgt.	5.0%	\$ 19,708	0%	\$ -	\$ 20,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 473,000

Notes:

Regional Treatment Plant

Project Number 17346

Burried Water Pipe Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 75,000	\$ 75,000
3WHP	3160	LF	\$ 53	\$ 167,480	75%	\$ 125,610	\$ 293,000
2W	920	LF	\$ 44	\$ 40,480	75%	\$ 30,360	\$ 71,000
3WLP	2140	LF	\$ 50	\$ 107,000	75%	\$ 80,250	\$ 187,000
WAS	400	LF	\$ 50	\$ 20,000	75%	\$ 15,000	\$ 35,000
Bypass Piping	1	LS	\$ 6,000	\$ 6,000	133%	\$ 7,980	\$ 14,000
Paving	1	LS	\$ 50,000	\$ 50,000	60%	\$ 30,000	\$ 80,000
Subtotal							\$ 755,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 204,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 31,000

Project Contingency@

30% \$ 297,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,287,000
Current Estimate	2018 Dollars	\$ 1,287,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	10.0%	\$ 128,743	0%	\$ -	\$ -	\$ 129,000
Engr. During Construction	5.0%	\$ 64,371	0%	\$ -	\$ -	\$ 64,000
Construction Mgt.	5.0%	\$ 64,371	0%	\$ -	\$ -	\$ 64,000

Total Project Cost (Present Value in 2018 Dollars) \$ 1,545,000

Notes:

1 All Project costs provided by Lee and Rc

Regional Treatment Plant

Project Number 17347

Electrical Box Reconstruction - Phase II

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Manhole and Handholds	1	LS	-	-	-	-	\$	280,000
	Conductors	1	LS	-	-	-	-	\$	1,255,000
					\$	-		\$	-
Subtotal								\$	1,535,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0%

included

Shipping Rate

0%

included

Sale Tax

0%

included

Project Contingency@

20%

\$ 307,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	1,842,000
Current Estimate	2018 Dollars	\$	1,842,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 184,200	0%	\$ -	\$ 184,000
Engr. During Construction	5.0%	\$ 92,100	0%	\$ -	\$ 92,000
Construction Mgt.	5.0%	\$ 92,100	0%	\$ -	\$ 92,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 2,210,000

Notes:

1 Based on "Condition Assessment and Evaluation of Electrical Manholes", February, 2015 by Lee & Ro

Regional Treatment Plant

Project Number 17348

Secondary Access Road

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Construction Water	1	LS	-	-	-	-	\$ 18,000
	Clearing & Miscellaneous Work	1	LS	-	-	-	-	\$ 1,700
	Dust Abatement	1	LS	-	-	-	-	\$ 4,850
	Pollution Control	1	LS	-	-	-	-	\$ 4,000
	Traffic Control	1	LS	-	-	-	-	\$ 5,000
	Dewatering/Channel Diversion	1	LS	-	-	-	-	\$ 6,000
	Erosion Control	1	LS	-	-	-	-	\$ 3,500
	Miscellaneous Work within Park	1	LS	-	-	-	-	\$ 4,850
	Remove Existing Traffic Barrier	1	LS	-	-	-	-	\$ 800
	Remove 19 Existing Trees	1	LS	-	-	-	-	\$ 900
	Emergency Access Road Imps	1	LS	-	-	-	-	\$ 9,500
					\$ -			\$ 112,400
Subtotal								\$ 172,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ 46,000
Shipping Rate	0%					included	
Sale Tax	8.00%						\$ -
Project Contingency@	30%						\$ 65,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 283,000
Current Estimate	2018 Dollars	\$ 283,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	2.5%	\$ 7,079	0%	\$ -	\$ 7,000
Engr. During Construction	5.0%	\$ 14,157	0%	\$ -	\$ 14,000
Construction Mgt.	5.0%	\$ 14,157	0%	\$ -	\$ 14,000

Total Project Cost (Present Value in 2018 Dollars)	\$ 319,000
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Notes

- 1 Based on Dudek preliminary design

Regional Treatment Plant

Project Number 17349

Underground Piping Reconstruction Area A

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Nov-17
Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 75,000	\$ 75,000
NG	750	LF	\$ 30	\$ 22,500	75%	\$ 16,875	\$ 39,000
LSG	140	LF	\$ 85	\$ 11,900	75%	\$ 8,925	\$ 21,000
WAS	400	LF	\$ 50	\$ 20,000	75%	\$ 15,000	\$ 35,000
Bypass Piping	1	LS	\$ 6,000	\$ 6,000	133%	\$ 7,980	\$ 14,000
Paving	1	LS	\$ 50,000	\$ 50,000	60%	\$ 30,000	\$ 80,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 71,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 9,000

Project Contingency@

30% \$ 103,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2017 Dollars	\$ 448,000
Current Estimate	2018 Dollars	\$ 448,000

Total Main Project Cost (CAMP Report Year)

Project Phases Cost		Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA	Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
1.1.005 CS	Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
1.1.005 DS	Design	10.0%	\$ 44,764	0%	\$ -	\$ -	\$ 45,000
1.1.005 EDC	Engr. During Construction	5.0%	\$ 22,382	0%	\$ -	\$ -	\$ 22,000
1.1.005 CM	Construction Mgt.	10.0%	\$ 44,764	0%	\$ -	\$ -	\$ 45,000
1.1.005 CY	Total Project Contingency ^d	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Total Project Cost (Present Value in 2018 Dollars)							\$ 560,000

Notes:

1 All Project costs provided by Lee and Rc

Regional Treatment Plant

Project Number 17350

Underground Piping Reconstruction Area B

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	100%	\$ 100,000	\$ 100,000
NG	400	LF	\$ 32	\$ 12,800	75%	\$ 9,600	\$ 22,000
Pumped Sludge	2400	LF	\$ 33	\$ 79,200	75%	\$ 59,400	\$ 139,000
DS	1500	LF	\$ 40	\$ 60,000	75%	\$ 45,000	\$ 105,000
TWAS	150	LF	\$ 49	\$ 7,350	75%	\$ 5,513	\$ 13,000
WAS	500	LF	\$ 35	\$ 17,500	75%	\$ 13,125	\$ 31,000
PS	120	LF	\$ 59	\$ 7,080	75%	\$ 5,310	\$ 12,000
PSC	150	LF	\$ 110	\$ 16,500	75%	\$ 12,375	\$ 29,000
Spare 6"	1200	LF	\$ 30	\$ 36,000	75%	\$ 27,000	\$ 63,000
Spare 10"	1200	LF	\$ 51	\$ 61,200	75%	\$ 45,900	\$ 107,000
Bypass Piping	1	LS	\$ 45,000	\$ 45,000	150%	\$ 67,500	\$ 113,000
Paving	1	LS	\$ 90,000	\$ 90,000	50%	\$ 45,000	\$ 135,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$ 234,000
Shipping Rate	0%	included	
Sale Tax	8.00%		\$ 35,000
Project Contingency@	30%		\$ 341,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,479,000
Current Estimate	2018 Dollars	\$ 1,479,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	10.0%	\$ 147,864	0%	\$ -	\$ -	\$ 148,000
Engr. During Construction	5.0%	\$ 73,932	0%	\$ -	\$ -	\$ 74,000
Construction Mgt.	10.0%	\$ 147,864	0%	\$ -	\$ -	\$ 148,000

Total I		\$ 1,848,000
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Notes:

- All Project costs provided by Lee and Ro

Regional Treatment Plant

Project Number 17351

Underground Piping Reconstruction Area C

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000
NG	500	LF	\$ 34	\$ 17,000	115%	\$ 19,550	\$ 37,000
Spare 8"	700	LF	\$ 50	\$ 35,000	75%	\$ 26,250	\$ 61,000
Bypass Piping	1	LS	\$ 15,000	\$ 15,000	167%	\$ 25,050	\$ 40,000
Paving	1	LS	\$ 40,000	\$ 40,000	50%	\$ 20,000	\$ 60,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$ 67,000
Shipping Rate	0%	included	
Sale Tax	8.00%		\$ 9,000
Project Contingency@	30%		\$ 97,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 420,000
Current Estimate	2018 Dollars	\$ 420,000

Project Phases Cost	Rate ¹	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
1.1.005 CS Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
1.1.005 DS Design	10.0%	\$ 42,033	0%	\$ -	\$ -	\$ 42,000
1.1.005 EDC Engr. During Construction	5.0%	\$ 21,016	0%	\$ -	\$ -	\$ 21,000
1.1.005 CM Construction Mgt.	10.0%	\$ 42,033	0%	\$ -	\$ -	\$ 42,000
1.1.005 CY Total Project Contingency ²	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Total Project Cost (Present Value in 2018 Dollars)						\$ 525,000

Notes:

1 All Project costs provided by Lee and Rc

Regional Treatment Plant

Project Number 17352

Underground Piping Reconstruction Area D

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	
Project Task Elements							
Total Construction Cost							
Demo	1	LS	\$ -	\$ -	0%	\$ 25,000	\$ 25,000
MSG	170	LF	\$ 80	\$ 13,600	130%	\$ 17,680	\$ 31,000
NG	400	LF	\$ 40	\$ 16,000	75%	\$ 12,000	\$ 28,000
Bypass Piping	1	LS	\$ 5,000	\$ 5,000	167%	\$ 8,350	\$ 13,000
Paving	1	LS	\$ 20,000	\$ 20,000	100%	\$ 20,000	\$ 40,000
Subtotal							\$ 138,000
General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		27%					\$ 37,000
Shipping Rate		0%				included	
Sale Tax		8.00%					\$ 4,000
Project Contingency@		30%					\$ 54,000
Total Main Project Cost (Year of Estimate or Estimate Update)							
Original Estimate		2018 Dollars					\$ 233,000
Current Estimate		2018 Dollars					\$ 233,000

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 23,291	0%	\$ -	\$ -	\$ 23,000
Engr. During Construction	5.0%	\$ 11,645	0%	\$ -	\$ -	\$ 12,000
Construction Mgt.	10.0%	\$ 23,291	0%	\$ -	\$ -	\$ 23,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 291,000

Notes:

1 All Project costs provided by Lee and Rc

Regional Treatment Plant

Project Number 17353

SCADA System Upgrade - Phase II

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	PLC's (In Exist Cabinets)	12	EA	\$ 15,000	\$ 180,000	100%	\$ 180,000	\$ 360,000
	PLC's (In Exist Cabinets)	4	EA	\$ 40,000	\$ 160,000	75%	\$ 120,000	\$ 280,000
	Demolition	1	LS	-	-	-	-	\$ 64,000
	Track and Removal of Ab. Wire	1	LS	-	-	-	-	\$ 50,000
	Fiber Optic System	1	LS	-	-	-	-	\$ 200,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 173,000
Shipping Rate	0%							included
Sale Tax	8.00%							\$ 27,000
Project Contingency@	35%							\$ 404,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 1,558,000
Current Estimate	2018 Dollars							\$ 1,558,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	5.0%	\$ 77,895	0%	\$ -	\$ 78,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 155,790	0%	\$ -	\$ 156,000
Engr. During Construction	5.0%	\$ 77,895	0%	\$ -	\$ 78,000
Construction Mgt.	10.0%	\$ 155,790	0%	\$ -	\$ 156,000

Total Project Cost (Present Value in 2018 Dollars)					\$ 2,025,000
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Notes:

Regional Treatment Plant

Project Number 17520

Ferric Chloride System Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$	50,000
	Concrete Containment Area ¹	1	LS	-	-	-	-	\$	140,000
	Storage Tank ²	1	Ea	\$ 60,000	\$ 60,000	25%	\$ 15,000	\$	75,000
	Metering Pump ²	3	Ea	\$ 20,000	\$ 60,000	25%	\$ 15,000	\$	75,000
	Piping, Valves and Appurtenances	1	LS	-	-	-	-	\$	30,000
	Electrical and Instrumentation ¹	1	LS	-	-	-	-	\$	100,000
	Temporary System	1	LS	-	-	-	-	\$	40,000
					\$ 120,000				

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%							\$	-
Shipping Rate	0%							included	
Sale Tax	8.00%							\$	10,000
Project Contingency@	20%							\$	104,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$	624,000
Current Estimate	2018 Dollars							\$	624,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 15,588	0%	\$ -	\$ 16,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 62,352	0%	\$ -	\$ 62,000
Engr. During Construction	5.0%	\$ 31,176	0%	\$ -	\$ 31,000
Construction Mgt.	5.0%	\$ 31,176	0%	\$ -	\$ 31,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 764,000

Notes:

- 1 Based on 2015 bids for Coastal Treatment Plant Sodium Hypochlorite Feed System
- 2 Based on Crowley and Company quote dated 7/27/18.

Regional Treatment Plant

Project Number 17521

Emulsion Polymer Storage Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$	25,000
	Storage Tank ¹	1	Ea	\$ 50,000	\$ 50,000	25%	\$ 12,500	\$	63,000
	Transfer Pump	1	Ea	\$ 8,500	\$ 8,500	50%	\$ 4,250	\$	13,000
	Mixing Pump	1	Ea	\$ 8,500	\$ 8,500	50%	\$ 4,250	\$	13,000
	Piping, Valves and Appurtenances	1	LS	-	-	-	-	\$	10,000
	Electrical and Instrumentation	1	LS	-	-	-	-	\$	30,000
	Temporary Chemical Supply	1	LS	-	-	-	-	\$	30,000
					\$ 67,000				

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%							\$	-
Shipping Rate	0%							included	
Sale Tax	8.00%							\$	5,000
Project Contingency@	30%							\$	57,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$	245,000
Current Estimate	2018 Dollars							\$	245,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 24,487	0%	\$ -	\$ 24,000
Engr. During Construction	5.0%	\$ 12,243	0%	\$ -	\$ 12,000
Construction Mgt.	5.0%	\$ 12,243	0%	\$ -	\$ 12,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 294,000

Notes:

1 Based on Crowley and Company quote dated 7/27/18.

Regional Treatment Plant

Project Number 17522

Emulsion Polymer Feeder Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Emulsion Polymer Feeders ¹	1	LS	-	-	-	-	\$ 118,000
	Piping and Valving ¹	1	LS	-	-	-	-	\$ 36,000
	Electrical Improvements ¹	1	LS	-	-	-	-	\$ 45,000
	Other ¹	1	LS	-	-	-	-	\$ 27,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%							\$ -
Shipping Rate	0%							included
Sale Tax	0.00%							\$ -
Project Contingency@	20%							\$ 45,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 270,000
Current Estimate	2018 Dollars							\$ 270,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	7.5%	\$ 20,250	0%	\$ -	\$ 20,000
Engr. During Construction	5.0%	\$ 13,500	0%	\$ -	\$ 14,000
Construction Mgt.	5.0%	\$ 13,500	0%	\$ -	\$ 14,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 317,000

Notes:

1 Based on the 2011 bids for the relocation and replacement of the existing polymer feed system

Regional Treatment Plant

Project Number 17523

Sludge Equalization System Mechanical and Electrical Rehabilitation Project

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Repipe Manifold and Valving	1	LS	\$ 125,000	\$ 125,000	75%	\$ 93,750	\$ 219,000
Replace Recirculation Pumps	2	EA	\$ 20,000	\$ 40,000	50%	\$ 20,000	\$ 60,000
Add/Replace Grinder	2	EA	\$ 40,000	\$ 80,000	150%	\$ 120,000	\$ 200,000
Replace Sludge Pumps	6	EA	\$ 14,000	\$ 84,000	50%	\$ 42,000	\$ 126,000
Repair/Recoat SETs	2	EA	\$ 15,000	\$ 30,000	150%	\$ 45,000	\$ 75,000
Replace Instrumentation	1	LS	\$ 20,000	\$ 20,000	50%	\$ 10,000	\$ 30,000
Electrical	1	LS	\$ 100,000	\$ 100,000	75%	\$ 75,000	\$ 175,000
Programming	1	LS	\$ -	\$ -	0%	\$ 35,000	\$ 35,000
Subtotal							\$ 920,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 248,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 38,000

Project Contingency@

20% \$ 241,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,448,000
Current Estimate	2018 Dollars	\$ 1,448,000

Project Phases Cost		Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA	Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 CS	Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 DS	Design	15.0%	\$ 217,152	0%	\$ -	\$ -	\$ 217,000
1.1.005 EDC	Engr. During Construction	5.0%	\$ 72,384	0%	\$ -	\$ -	\$ 72,000
1.1.005 CM	Construction Mgt.	5.0%	\$ 72,384	0%	\$ -	\$ -	\$ 72,000
Total Project Cost (Present Value in 2018 Dollars)							\$ 1,810,000

Notes:

- 1 Equipment Cost estimate provided by SOCWA

Regional Treatment Plant

Project Number 17525

Solids Building Structural Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost²

Solids Building Roof Reconstruction ¹	1	LS	\$	-		\$	55,000
Replace Single Doors (2)	1	LS	\$	-		\$	17,000
Replace Windows (6)	1	LS	\$	-		\$	66,000
Replace Louver (1)	1	LS	\$	-		\$	10,000
Replace Lighting and Power Receptacl	1	LS	\$	-		\$	40,000

Subtotal

\$ 188,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 56,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	244,000
Current Estimate	2018 Dollars	\$	244,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	2.5%	\$ 6,110	0%	\$ -	\$ -	\$ 6,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	10.0%	\$ 24,440	0%	\$ -	\$ -	\$ 24,000
Engr. During Construction	5.0%	\$ 12,220	0%	\$ -	\$ -	\$ 12,000
Construction Mgt.	7.5%	\$ 18,330	0%	\$ -	\$ -	\$ 18,000

Total Project Cost (Present Value in 2018 Dollars) \$ 306,000

Notes:

- 1 Cost estimate provided by CH2MHill Facility Plan
- 2 Architectural hardware costs based on unit values provided by Hazen & Sawyer

Regional Treatment Plant

Project Number 17526

Motor Control Center D Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Motor Control Center ¹	1	Ea	\$ 130,000	\$ 130,000	40%	\$ 52,000	\$ 182,000
	Wiring	1	LS	-	-	-	-	\$ 30,000
	Demolition	1	LS	-	-	-	-	\$ 20,000
	Temporary Power Supply	1	LS	-	-	-	-	\$ 35,000
					\$ 130,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 49,000
Shipping Rate	0%						included	
Sale Tax	8.00%							\$ 10,000
Project Contingency@	30%							\$ 98,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 425,000
Current Estimate	2018 Dollars							\$ 425,000

Project Phases Cost	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0% \$ -	\$ -
Conceptual Study	0.0%	\$ -	0% \$ -	\$ -
Design	10.0%	\$ 42,450	0% \$ -	\$ 42,000
Engr. During Construction	5.0%	\$ 21,225	0% \$ -	\$ 21,000
Construction Mgt.	7.5%	\$ 31,838	0% \$ -	\$ 32,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 520,000

Notes:

1 Based on review with Maddox Electric.

Regional Treatment Plant

Project Number 17527

Anerobic Digester Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	4	LS	\$ -	\$ -	0%	\$ 75,000	\$ 75,000
Dome Replacement	4	EA	\$ 890,000	\$ 3,560,000	30%	\$ 1,068,000	\$ 4,628,000
Crack Repair	4	EA	\$ 100,000	\$ 400,000	40%	\$ 160,000	\$ 560,000
Mixing System Upgrades	4	EA	\$ 100,000	\$ 400,000	30%	\$ 120,000	\$ 520,000
Replace Piping/Valves	4	LS	\$ 75,000	\$ 300,000	30%	\$ 90,000	\$ 390,000
Electrical	4	LS	\$ 50,000	\$ 200,000	100%	\$ 200,000	\$ 400,000
Programming	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000
Subtotal							\$ 6,623,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 1,788,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 389,000

Project Contingency@

20% \$ 1,760,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 10,560,000
Current Estimate	2018 Dollars	\$ 10,560,000

Total Main Project Cost (CAMP Report Year)

Project Phases Cost		Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA	Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 CS	Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 DS	Design	7.5%	\$ 792,001	0%	\$ -	\$ -	\$ 792,000
1.1.005 EDC	Engr. During Construction	5.0%	\$ 528,001	0%	\$ -	\$ -	\$ 528,000
1.1.005 CM	Construction Mgt.	5.0%	\$ 528,001	0%	\$ -	\$ -	\$ 528,000
Total Project Cost (Present Value in 2018 Dollars)							\$ 12,408,000

Notes:

- 1 Equipment Cost estimate provided by Carollo

Regional Treatment Plant

Project Number 17528

Heating System Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 30,000	\$ 30,000
Heat Exchangers	4	EA	\$ 60,000	\$ 240,000	50%	\$ 120,000	\$ 360,000
Hot Water Pumps	4	EA	\$ 8,000	\$ 32,000	75%	\$ 24,000	\$ 56,000
Sludge Recirculation Pumps	4	EA	\$ 30,000	\$ 120,000	100%	\$ 120,000	\$ 240,000
Electrical	1	LS	\$ 125,000	\$ 125,000	75%	\$ 93,750	\$ 219,000
Programming	1	LS	\$ -	\$ -	0%	\$ 35,000	\$ 35,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$ 254,000
Shipping Rate	0%		included
Sale Tax	8.00%		\$ 41,000
Project Contingency@	20%		\$ 247,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,482,000
Current Estimate	2018 Dollars	\$ 1,482,000

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 148,181	0%	\$ -	\$ -	\$ 148,000
Engr. During Construction	5.0%	\$ 74,091	0%	\$ -	\$ -	\$ 74,000
Construction Mgt.	5.0%	\$ 74,091	0%	\$ -	\$ -	\$ 74,000

Total Project Cost (Present Value in 2018 Dollars)		\$ 1,778,000
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Notes:

- 1 Equipment Cost estimate provided by Carollo

Regional Treatment Plant

Project Number 17529

Digester Gas Management Building Rehab

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Roof Reconstruction ¹	1	LS	\$	-		\$	55,000
Replace Single Doors (1)	1	LS	\$	-		\$	9,000
Replace Double Doors (3)	1	LS	\$	-		\$	36,000
Replace Louver (7)	1	LS	\$	-		\$	70,000
Replace Lighting and Power Receptacl	1	LS	\$	-		\$	40,000
Rehabilitation Stairway	1	LS	\$	-		\$	15,000

Subtotal

\$ 225,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 67,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	292,000
Current Estimate	2018 Dollars	\$	292,000

Project Phases Cost		Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA	Condition Assessment	2.5%	\$ 7,296	0%	\$ -	\$ -	\$ 7,000
1.1.005 CS	Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 DS	Design	10.0%	\$ 29,185	0%	\$ -	\$ -	\$ 29,000
1.1.005 EDC	Engr. During Construction	10.0%	\$ 29,185	0%	\$ -	\$ -	\$ 29,000
1.1.005 CM	Construction Mgt.	5.0%	\$ 14,593	0%	\$ -	\$ -	\$ 15,000
Total Project Cost (Present Value in 2018 Dollars)							\$ 372,000

Notes:

- 1 Cost estimate provided by CH2MHill Facility Plan
- 2 Architectural hardware costs based on unit values provided by Hazen & Sawyer

Regional Treatment Plant

Project Number 17530

Digested Sludge Pump System Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 30,000	\$ 30,000
Replace Sludge Pumps (chopper)	4	EA	\$ 14,000	\$ 56,000	50%	\$ 28,000	\$ 84,000
Replace Piping/Valves	1	LS	\$ 30,000	\$ 30,000	75%	\$ 22,500	\$ 53,000
Electrical	1	LS	\$ 50,000	\$ 50,000	100%	\$ 50,000	\$ 100,000

Subtotal

\$ 267,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 72,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 11,000

Project Contingency@

30% \$ 105,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 454,000
Current Estimate	2018 Dollars	\$ 454,000

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 45,414	0%	\$ -	\$ -	\$ 45,000
Engr. During Construction	5.0%	\$ 22,707	0%	\$ -	\$ -	\$ 23,000
Construction Mgt.	5.0%	\$ 22,707	0%	\$ -	\$ -	\$ 23,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 545,000

Notes:

1 Equipment Cost estimate provided by Carollo

Regional Treatment Plant

Project Number 17531

Motor Control Center M Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Motor Control Center ¹	1	Ea	\$ 106,000	\$ 106,000	40%	\$ 42,400	\$ 148,000
	Wiring	1	LS	-	-	-	-	\$ 30,000
	Demolition	1	LS	-	-	-	-	\$ 20,000
	Temporary Power Supply	1	LS	-	-	-	-	\$ 35,000
	Electrical Study	1	LS	-	-	-	-	\$ 20,000
					\$ 106,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ 40,000
Shipping Rate	0%						included
Sale Tax	8.00%						\$ 8,000
Project Contingency@	30%						\$ 91,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$ 393,000
Current Estimate	2018 Dollars						\$ 393,000

Project Phases Cost		Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 9,813	0%	\$ -	\$ 10,000
Design	10.0%	\$ 39,253	0%	\$ -	\$ 39,000
Engr. During Construction	5.0%	\$ 19,627	0%	\$ -	\$ 20,000
Construction Mgt.	7.5%	\$ 29,440	0%	\$ -	\$ 29,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 491,000

Notes:

1 Based on review with Maddox Electric.

Regional Treatment Plant

Project Number 17532

Dewatering System Reconstruction

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Mar-18
Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Centrifuge Piping Modifications	1	LS	\$ 95,000	\$ 95,000	100%	\$ 95,000	\$ 190,000
Replace Centrifuges	4	EA	\$ 450,000	\$ 1,800,000	50%	\$ 900,000	\$ 2,700,000
Replace Centrifuge VFDs	8	EA	\$ 15,000	\$ 120,000	50%	\$ 60,000	\$ 180,000
Replace Centrifuge Control Panel	4	EA	\$ 20,000	\$ 80,000	50%	\$ 40,000	\$ 120,000
Odor Control/Ventilation Rebalancing	1	LS	\$ 15,000	\$ 15,000	200%	\$ 30,000	\$ 45,000
Centrifuge Floor Repairs	1	LS	\$ 350,000	\$ 350,000	100%	\$ 350,000	\$ 700,000
Polymer System Improvements	1	LS	\$ 250,000	\$ 250,000	50%	\$ 125,000	\$ 375,000
Electrical	1	LS	\$ 200,000	\$ 200,000	75%	\$ 150,000	\$ 350,000
Programming	1	LS	\$ -	\$ -	0%	\$ 75,000	\$ 75,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ 233,000

Project Contingency@

20% \$ 994,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 5,961,000
Current Estimate	2018 Dollars	\$ 5,961,000

Project Phases Cost	Rate ¹	Amount	Contingency	Subtotal	Minimum	Total
1.1.005 CA Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 CS Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
1.1.005 DS Design	10.0%	\$ 596,136	0%	\$ -	\$ -	\$ 596,000
1.1.005 EDC Engr. During Construction	5.0%	\$ 298,068	0%	\$ -	\$ -	\$ 298,000
1.1.005 CM Construction Mgt.	5.0%	\$ 298,068	0%	\$ -	\$ -	\$ 298,000
1.1.005 CY Total Project Contingency ²	0.0%	\$ -	0%	\$ -	\$ -	\$ -

Total Project Cost (Present Value in 2018 Dollars) \$ 7,154,000

Notes:

1 Project cost provided by Carollo. Costs include demo and other overhead cost:

Regional Treatment Plant

Project Number 17533

Solids Conveyor Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Demo	1	LS	\$ -	\$ -	0%	\$ 100,000	\$ 100,000
Centrifuge Horizontal Conveyors	2	LS	\$ 150,000	\$ 300,000	50%	\$ 150,000	\$ 450,000
Centrifuge Elevated Conveyors	2	LS	\$ 350,000	\$ 700,000	50%	\$ 350,000	\$ 1,050,000
Cross Conveyor	1	LS	\$ 150,000	\$ 150,000	50%	\$ 75,000	\$ 225,000
Electrical	1	LS	\$ 75,000	\$ 75,000	75%	\$ 56,250	\$ 131,000
Programming	1	LS	\$ -	\$ -	0%	\$ 50,000	\$ 50,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

27% \$ 542,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 98,000

Project Contingency@

20% \$ 529,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 3,175,000
Current Estimate	2018 Dollars	\$ 3,175,000

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	10.0%	\$ 317,513	0%	\$ -	\$ -	\$ 318,000
Engr. During Construction	5.0%	\$ 158,756	0%	\$ -	\$ -	\$ 159,000
Construction Mgt.	5.0%	\$ 158,756	0%	\$ -	\$ -	\$ 159,000

Total Project Cost (Present Value in 2018 Dollars) \$ 3,810,000

Notes:

Regional Treatment Plant

Project Number 17534

Storage and Truck Loading Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By JM

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Truck Bay Improvements	1	LS	\$ 25,000	\$ 25,000	50%	\$ 12,500	\$ 38,000
Recoat/Repair Hopper	1	LS	\$ 50,000	\$ 50,000	75%	\$ 37,500	\$ 88,000
Replace Truck Scale	1	LS	\$ 125,000	\$ 125,000	40%	\$ 50,000	\$ 175,000
Electrical	1	LS	\$ 50,000	\$ 50,000	130%	\$ 65,000	\$ 115,000

Subtotal

\$ 415,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 112,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 20,000

Project Contingency@

20% \$ 109,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 656,000
Current Estimate	2018 Dollars	\$ 656,000

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate ^c	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	
Design	10.0%	\$ 65,646	0%	\$ -	\$ -	\$ 66,000
Engr. During Construction	5.0%	\$ 32,823	0%	\$ -	\$ -	\$ 33,000
Construction Mgt.	5.0%	\$ 32,823	0%	\$ -	\$ -	\$ 33,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 788,000

Notes:

- 1 Equipment Cost estimate provided by Carollo

Regional Treatment Plant

Project Number 17535

Odor Control Scrubber No.3 Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Odor Control System	1	LS	\$ -	\$ -	-	-	\$ -	\$ 725,000
	Temporary Odor Control System	1	LS	\$ -	\$ -	-	-	\$ -	\$ 75,000
	Electrical	1	LS	\$ -	\$ -	-	-	\$ -	\$ 20,000
	Instrumentation	1	LS	\$ -	\$ -	-	-	\$ -	\$ 15,000
				\$ -	\$ -	-	-	\$ -	\$ -
Subtotal								\$ -	\$ 835,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 225,000

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

20% \$ 212,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 1,273,000
Current Estimate	2018 Dollars	\$ 1,273,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 31,813.50	0%	\$ -	\$ 32,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 127,254	0%	\$ -	\$ 127,000
Engr. During Construction	5.0%	\$ 63,627	0%	\$ -	\$ 64,000
Construction Mgt.	5.0%	\$ 63,627	0%	\$ -	\$ 64,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 1,559,000

Notes:

1 Odor Control System based on DHK Engineers evaluation for Coastal Treatment Plant (4/17)

Regional Treatment Plant

Project Number 17536

Digester Gas Flare Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jun-18
 Estimate Update Jun-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition ¹	1	LS	\$ 16,000	\$ 16,000	-	\$ 66,000	\$ 82,000
	Flares w/Base Equipment ¹	2	Ea	\$ 364,590	\$ 729,180	-	\$ 297,820	\$ 1,027,000
	Misc. Aux. Equipment ¹	1	LS	\$ 54,689	\$ 54,689	-	\$ 20,611	\$ 75,000
	Miscellaneous Piping/Valves ¹	1	LS	\$ 36,459	\$ 36,459	-	\$ 14,941	\$ 51,000
	Electrical ¹	1	LS	-	-	-	-	\$ 44,000
	Instrumentation ¹	1	LS	-	-	-	-	\$ 44,000
	Source Testing ¹	1	LS	-	-	-	-	\$ 25,000
	Site Work	1	LS	-	-	-	-	\$ 50,000
					\$ 836,328			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%		\$ 378,000
Shipping Rate	0%		included
Sale Tax	8.00%		\$ 67,000
Project Contingency@	20%		\$ 369,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 2,211,000
Current Estimate	2018 Dollars	\$ 2,211,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	2.5%	\$ 55,282	0%	\$ -	\$ 55,000
Design	10.0%	\$ 221,130	0%	\$ -	\$ 221,000
Engr. During Construction	5.0%	\$ 110,565	0%	\$ -	\$ 111,000
Construction Mgt.	5.0%	\$ 110,565	0%	\$ -	\$ 111,000

Total Project Cost (Present Value in 2018 Dollars)		\$ 2,709,000
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Notes:

- 1 Regional Treatment Plant Digester Gas Flare Upgrades/Modifications Technical Memorandum - DHK Engineers (9/13)
- 2 Siting needed to determine impact of site work

Regional Treatment Plant

Project Number 17538

Digested and Equalized Sludge Pump VFD Pump Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Demolition	1	LS	-	-	-	-	\$ 20,000
	VFD	1	LS	-	-	-	-	\$ 100,000
	VFD Cabinet Door	1	LS	-	-	-	-	\$ 24,000
	Electrical	1	LS	-	-	-	-	\$ 40,000
					\$ -			

Subtotal

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 55,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 239,000
Current Estimate	2018 Dollars	\$ 239,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 23,920	0%	\$ -	\$ 24,000
Engr. During Construction	5.0%	\$ 11,960	0%	\$ -	\$ 12,000
Construction Mgt.	5.0%	\$ 11,960	0%	\$ -	\$ 12,000

Total Project Cost (Present Value in 2018 Dollars) \$ 287,000

Notes:

Regional Treatment Plant

Project Number 17541

Emulsion Polymer Storage Tank Shade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	Foundation	1	LS	-	-	-	-	\$	30,000
	Shade Structure	1	LS	-	-	-	-	\$	80,000
	Lighting	1	LS	-	-	-	-	\$	15,000
Subtotal								\$	125,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 38,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	163,000
Current Estimate	2018 Dollars	\$	163,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 16,250	0%	\$ -	\$ 16,000
Engr. During Construction	5.0%	\$ 8,125	0%	\$ -	\$ 8,000
Construction Mgt.	5.0%	\$ 8,125	0%	\$ -	\$ 8,000

Total Project Cost (Present Value in 2018 Dollars) \$ 195,000

Notes:

- 1 Based on construction cost of hypochlorite tank shade at J. B. Latham Treatment Plant

Regional Treatment Plant

Project Number 17720

AWT Sodium Hypochlorite Pumps and Instrument Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost³

Remove existing AWT Hypochlorite Pu	1	LS					\$	10,000
Install new AWT Hypochlorite pumps	1	LS					\$	85,000
Electrical and Instrumentation	1	LS					\$	40,000
Other	1	LS					\$	25,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	0%						\$	-
Shipping Rate	0%						included	
Sale Tax	0.00%						\$	-
Project Contingency@	30%						\$	12,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$	172,000
Current Estimate	2018 Dollars						\$	172,000

Total Main Project Cost (CAMP Report Year)

Project Phases Cost	Rate ²	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 17,200	0%	\$ -	\$ -	\$ 17,000
Engr. During Construction	5.0%	\$ 8,600	0%	\$ -	\$ -	\$ 9,000
Construction Mgt.	5.0%	\$ 8,600	0%	\$ -	\$ -	\$ 9,000

Total Project Cost (Present Value in 2018 Dollars)

\$ 206,000

Notes:

1 Cost estimate provided by RTP Sodium Hypochlorite 2014 Project Bid

Regional Treatment Plant

Project Number 17721

AWT No.2 Contact Basin Upgrades

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost ¹	CCT Sluice Gate	1	EA	\$ 11,000	\$ 11,000	40%	\$ 4,400	\$ 15,000
	CCT Sluice Gate	1	EA	\$ 9,500	\$ 9,500	40%	\$ 3,800	\$ 13,000
	Replace Chem Clean System	1	LS	\$ -	\$ -			\$ 15,000
	Structural Repairs	1	LS	\$ -	\$ -			\$ 15,000
	Replace Fiberglass Covers	1	LS	\$ -	\$ -			\$ 45,000
Subtotal								\$ 104,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

27% \$ 28,000

Shipping Rate

0% included

Sale Tax

8.00% \$ 2,000

Project Contingency@

30% \$ 40,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 173,000
Current Estimate	2018 Dollars	\$ 173,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	15.0%	\$ 26,001.11	0%	\$ -	\$ 26,000
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	15.0%	\$ 26,001	0%	\$ -	\$ 26,000
Engr. During Construction	5.0%	\$ 8,667	0%	\$ -	\$ 9,000
Construction Mgt.	5.0%	\$ 8,667	0%	\$ -	\$ 9,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 243,000

Notes:

1 Sluice gate quotation provided by Whipps.

Regional Treatment Plant

Project Number 17722

AWT Building Rehabilitation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By RYG

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost²

AWT Building Roof Reconstruction ¹	1	LS	\$	-		\$	121,000
Replace Single Doors (5)	1	LS	\$	-		\$	43,000
Replace Double Doors (2)	1	LS	\$	-		\$	24,000
Replace Louver (7)	1	LS	\$	-		\$	70,000
Replace Lighting and Power Receptacle	1	LS	\$	-		\$	20,000
Replace Skylights (3)	1	LS	\$	-		\$	30,000

Subtotal

\$ 308,000

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 92,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	400,000
Current Estimate	2018 Dollars	\$	400,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Minimum	Total
Condition Assessment	2.5%	\$ 10,004	0%	\$ -	\$ -	\$ 10,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -	\$ -
Design	10.0%	\$ 40,014	0%	\$ -	\$ -	\$ 40,000
Engr. During Construction	5.0%	\$ 20,007	0%	\$ -	\$ -	\$ 20,000
Construction Mgt.	7.5%	\$ 30,011	0%	\$ -	\$ -	\$ 30,000
Total Project Cost (Present Value in 2018 Dollars)						\$ 500,000

Notes:

- 1 Cost estimate provided by CH2MHill Facility Plan
- 2 Architectural hardware costs provided by Hazen & Sawyer.

Regional Treatment Plant

Project Number 17723

AWT No.2 Applied Water Pump Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost

Remove existing AWT Applied Water F	1	LS			\$	-	\$	15,000
Install new Applied Water Pump	1	LS			\$	-	\$	110,000
Applied Water Pump Bay Structural Irr	1	LS			\$	-	\$	10,000
Applied Water Pump Electrical Modific	1	LS			\$	-	\$	1,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @		0%					\$	-
Shipping Rate		0%					included	
Sale Tax		8.00%					\$	-
Project Contingency@		30%					\$	41,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$	177,000
Current Estimate	2018 Dollars						\$	177,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 17,680	0%	\$ -	\$ 18,000
Engr. During Construction	5.0%	\$ 8,840	0%	\$ -	\$ 9,000
Construction Mgt.	5.0%	\$ 8,840	0%	\$ -	\$ 9,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 212,000

Notes:

Regional Treatment Plant

Project Number 17725

AWT SCADA System Upgrade

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	PLC's	1	EA	\$ 40,000	\$ 40,000	75%	\$ 30,000	\$ 70,000
								\$ -
								\$ 70,000

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%							\$ 19,000
Shipping Rate	0%							included
Sale Tax	8.00%							\$ 3,000
Project Contingency@	30%							\$ 28,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars							\$ 120,000
Current Estimate	2018 Dollars							\$ 120,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 2,993	0%	\$ -	\$ 3,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 11,973	0%	\$ -	\$ 12,000
Engr. During Construction	5.0%	\$ 5,987	0%	\$ -	\$ 6,000
Construction Mgt.	5.0%	\$ 5,987	0%	\$ -	\$ 6,000

Total Project Cost (Present Value in 2018 Dollars)					\$ 147,000
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Notes:

Regional Treatment Plant

Project Number 17726

AWT No.2 Filter Sand Replacement and Underdrain Repair

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Media and Support Mesh ¹	1	LS	\$ -	\$ -	0%	\$ -	\$ 175,000
	Other	1	LS	\$ -	\$ -	0%	\$ -	\$ 50,000
				\$ -	\$ -		\$ -	\$ -
Subtotal								\$ 225,000

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 68,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$ 293,000
Current Estimate	2018 Dollars	\$ 293,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 7,313	0%	\$ -	\$ 7,000
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	10.0%	\$ 29,250	0%	\$ -	\$ 29,000
Engr. During Construction	5.0%	\$ 14,625	0%	\$ -	\$ 15,000
Construction Mgt.	5.0%	\$ 14,625	0%	\$ -	\$ 15,000

Total Project Cost (Present Value in 2018 Dollars) \$ 358,000

Notes:

1 Based on Carollo/Evoqua estimates for current projects

Regional Treatment Plant

Project Number 17727

Motor Control Center L Replacement

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Jul-18
 Estimate Update Jul-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Motor Control Center ¹	1	Ea	\$ 96,000	\$ 96,000	40%	\$ 38,400	\$ 134,000
	Wiring	1	LS	-	-	-	-	\$ 30,000
	Demolition	1	LS	-	-	-	-	\$ 15,000
	Temporary Power Supply	1	LS	-	-	-	-	\$ 25,000
	Electrical Study	1	LS	-	-	-	-	\$ 20,000
					\$ 96,000			

Subtotal

General Conditions, Contractor Overhead and Profit, and Bonds and Insurance @	27%						\$ 36,000
Shipping Rate	0%					included	
Sale Tax	8.00%						\$ 8,000
Project Contingency@	30%						\$ 81,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars						\$ 349,000
Current Estimate	2018 Dollars						\$ 349,000

Project Phases Cost		Amount	Contingency	Subtotal	Total
Condition Assessment	2.5%	\$ 8,721.96	0%	\$ -	\$ 9,000
Conceptual Study	0.0%	\$ -	0%	\$ -	\$ -
Design	10.0%	\$ 34,888	0%	\$ -	\$ 35,000
Engr. During Construction	5.0%	\$ 17,444	0%	\$ -	\$ 17,000
Construction Mgt.	7.5%	\$ 26,166	0%	\$ -	\$ 26,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 436,000

Notes:

1 Based on Review with Maddox Electric.

Regional Treatment Plant

Project Number 17728

AWT No.2 Water Quality Instrumentation

Main Project Type

New Facility	
Facility Rehabilitation	X
Major maintenance	
Asset Replacement	X
Special Study	

Key Dates

Initial Estimate Aug-18
 Estimate Update Aug-18

Prepared By BP

Main Project Cost	Quantity		Material Cost		Labor Cost		Total Cost
	No.	Units	Unit Cost	Total	% of Mat'l	Total	

Project Task Elements

Total Construction Cost	Turbidimeters (2) ¹	1	LS	-	-	-	-	\$	40,000	
	Miscellaneous Piping /Valves	1	LS	\$	-	\$	-	25%	\$	10,000
	Chlorine Residual Analyzers (2) ¹	1	LS	-	-	-	-	\$	40,000	
					\$	-	-	\$	-	
Subtotal								\$	90,000	

General Conditions, Contractor Overhead and Profit,
 and Bonds and Insurance @

0% \$ -

Shipping Rate

0% included

Sale Tax

8.00% \$ -

Project Contingency@

30% \$ 27,000

Total Main Project Cost (Year of Estimate or Estimate Update)

Original Estimate	2018 Dollars	\$	117,000
Current Estimate	2018 Dollars	\$	117,000

Project Phases Cost	Rate	Amount	Contingency	Subtotal	Total
Condition Assessment	0.0%	\$ -	0%	\$ -	
Conceptual Study	0.0%	\$ -	0%	\$ -	
Design	5.0%	\$ 5,850	0%	\$ -	\$ 6,000
Engr. During Construction	5.0%	\$ 5,850	0%	\$ -	\$ 6,000
Construction Mgt.	5.0%	\$ 5,850	0%	\$ -	\$ 6,000
Total Project Cost (Present Value in 2018 Dollars)					\$ 135,000

Notes:

1 Cost Based on Bids for the Regional Treatment Plant Miscellaneous Improvements 2016 Project

Appendix L
Effluent Transmission Main Ten Year Plan

DESCRIPTION

The Effluent Transmission Main (ETM) is located predominantly along the route of Aliso Creek. The ETM begins at the Irvine Ranch Water District (IRWD) Los Alisos Water Reclamation Plant on Muirlands Road in the City of Lake Forest and continues to the Coastal Treatment Plant within the County of Orange Aliso and Wood Canyons Wilderness Park. The ETM conveys treated secondary effluent from the IRWD Los Alisos Water Reclamation Plant, the El Toro Water District Reclamation Plant, the SOCWA Joint Regional Treatment Plant and the SOCWA Coastal Treatment Plant to the Aliso Creek Ocean Outfall. In 2005 the Effluent Transmission Main also began carrying reverse osmosis brine discharges from the IRWD Irvine Desalter and the Shallow Groundwater Treatment Unit.

The ETM was constructed during the period from 1978 through 1979. The pipeline consists of four separate reaches: A, B-C, D and E. The four reaches are described in Table L.1. In 2000 the Aliso Water Management Agency (AWMA) transferred ownership of Reach A to the Los Alisos Water District (which was subsequently merged into IRWD). Reach A is not addressed further in this version of the SOCWA Ten Year Plan as it is owned and managed completely by IRWD.

Figure L.1 shows the location of the Reaches B-C, D, and E. The percentage of capacity ownership for each agency is shown in Table L.2. The ownership percentages were set forth in the 'Memorandum of Understanding Regarding Allocation of Costs, Grant

Funds, and Use of Facilities Funded by Project Committee 2' from November 1989. The Effluent Transmission Main was originally identified as part of the Project Committee 2 for the Aliso Water Management Agency (AWMA) as opposed to the Southeast Regional Reclamation Authority (SERRA) Project Committee 2 covering the J. B. Latham Treatment Plant. The AWMA Project Committee 2 was subsequently changed to Project Committee 21.

Table L.1
Effluent Transmission Main – Physical Description

REACH	DIAMETER (INCHES)	LENGTH (FEET)	MATERIAL	PEAK FLOW CAPACITY (MGD)
A (Pressure)	21	1,001	Reinforced Plastic Mortar Pipe	7.5
B (Pressure)	27	4,266	Reinforced Plastic Mortar Pipe	15.0
C (Gravity)	24	5,100	Reinforced Plastic Mortar Pipe	15.0
D (Gravity)	24	18,339	Reinforced Concrete Pipe	15.0
E (Gravity)	39	9,576	Reinforced Concrete Pipe	32.0
E (Gravity)	36	7,544	Reinforced Concrete Pipe	32.0

Table L.2
Effluent Transmission Main – Agency Ownership By Percentage

REACH	EL TORO WATER DISTRICT	IRVINE RANCH WATER DISTRICT	MOULTON NIGUEL WATER DISTRICT
B	50%	50%	0%
C	50%	50%	0%
D	50%	50%	0%
E	23.29%	23.29%	53.42%

UTILIZATION AND AGREEMENT LIFE

The Effluent Transmission Main has remained largely unchanged since its original construction in 1979. Annual utilization has largely decreased through the life of the system as the amount of water reclamation from the upstream treatment plant increased. This trend was not significantly impacted by the introduction of brine flows from IRWD facilities in the early 2000's.

SOCWA Ten Year Capital Improvement Program
August 5, 2019

of brine flows from IRWD facilities in the early 2000's.

The agreement for Project Committee 2 (renamed Project Committee 21) dates to 1975. This agreement established a 50-year term which will end in 2025. There have been no plans regarding utilization of the pipeline or renewal of the agreement that have an impact on the current Ten Year Plan. The projects

identified for the ETM in the Ten Year Plan are largely limited to the following:

- Life expectancy of reinforced plastic mortar (Techite) piping
- Replacement of pipeline appurtenances
- Erosion protection

TECHITE LIFE EXPECTANCY

Reaches A and B-C were constructed with a type of reinforced plastic mortar pipe that was commonly used in the 1970's. This fiberglass material had two standard suppliers and has been typically identified by the trade name "Techite". Many concerns have been raised about the structural integrity and the anticipated life of Techite due to failures experienced throughout the United States. These concerns were exacerbated after a failure of a pipe section in June, 2007, followed by a rupture in ETM caused by an independent contractor in September, 2007. Both incidents happened within Reach B inside the boundaries of the Laguna Woods Golf Course.

As part of the follow-up regulatory action to the discharge from the June 2007 break in Reach B, the Regional Water Quality Control Board (RWQCB) issued a Notice of Violation (NOV). The NOV required SOCWA to prepare a Condition Assessment and an Implementation Plan for Reaches B and C. CH2MHill was retained to prepare the Condition Assessment in November, 2007. The draft Condition Assessment has been completed. The key findings of that report

are as follows:

- The Techite pipe may be very vulnerable due to inconsistent quality control in the manufacture of the pipe. The development of small cracks within the pipe can result in the infiltration of water into the core of the wall. This causes a steady deterioration of the pipe material.
- Pictures taken of the 2000 and 2007 failures of the Techite pipe show a 'tearing' of the pipe wall which is consistent with the industry experience with Techite pipe failures.
- All of the major failures of the pipeline have occurred within Reach B. This section of pressure pipe may be exposed to a combination of conditions (including transient surges from upstream lift stations and groundwater mounding) that can accelerate the deterioration of the pipe.
- There have been no recorded failures within the gravity section Reach C.
- It was recommended that SOCWA proceed with the replacement of Reach B according to a schedule to be set as part of the Implementation Plan.

The draft Implementation Plan was completed by Kennedy/Jenks in November, 2009. The recommendation of the plan was to implement a series of monitoring manholes through the golf course section of Reach B.

Findings of previous studies were updated in an evaluation prepared by Tetra Tech in 2017. This study raised a series of

issues regarding proposed monitoring within the Reaches B and C:

- The most application methods of pipeline monitoring are using acoustical instrumentation and closed-circuit television (CCTV)
- Neither of these techniques are likely to capture the development of small cracks likely to initiate failure of the Techite pipe
- The construction of the manholes in Reaches B and C might itself be a long-term source of failures by disrupting the existing pipe material.

The 2017 Tetra Tech study updated a prior 2003 analysis of the potential replacement of Reaches B and C. This analysis focused on the use of open cut technology to replace the pipelines. The costs from this evaluation serve as the basis for the proposed project costs identified in Table L.3. The 2017 study also identified the potential costs for relining the existing Techite pipelines to serve as back-up pipelines to the new pipelines installed through the open-cut method. These relining costs are not included in the current version of the Ten Year Plan.

The projects for the replacement of Reaches B and C are identified in the current plan as beginning in Year 7 (2025/26). This allows the replacement of the pipelines to be addressed as part of the renewal of the Project Committee 21 Agreement.

REINFORCED CONCRETE PIPING

Reaches D and E of the ETM are constructed of reinforced concrete piping (RCP). The expected life of the RCP is 75 years so the replacement of these assets is not anticipated during the span of the current Ten Year Plan. However, an analysis developed by Tetra Tech in 2018 identified options for pipeline access and condition assessment. This project entails the construction of eight access manholes followed by CCTV inspection. The cost for this condition assessment program is included in Table L.3.

REPLACEMENT OF PIPELINE APPURTENANCES

The ETM system has relatively few appurtenances. These items include the following:

- Vault between Reaches B and C
- Limited number of manholes
- Combination air valves.

The Reach B/C vault was modified in 2012 as part of County of Orange project for the regrading of Moulton Parkway. This involved the replacement of the vault lid and the subsequent burial of the vault. The vault can no longer be accessed.

Reach D of the ETM was installed with four 3-inch combination air valves. The downstream Reach E was equipped with five 4-inch combination valves. The location of these valves is shown in Figure

E.2. The combination air valves for Reaches B and C are not addressed in this version of the Ten Year Plan as they are currently maintained by the El Toro Water District. The replacement of these combination air valves with lighter PVC valves was projected as part of the SOCWA Fiscal Year 2017/18 capital improvement budget. However, the design reconnaissance by Tetra Tech identified a series of issues including missing isolation valves and broken valve bases. The cost of valve replacement was recalculated; the modified projects are identified in Table L.3.

EROSION PROTECTION

The protection of the ETM against erosion along Aliso Creek has been an ongoing issue. A major slope protection project was undertaken in 1998 along the slope adjacent to Alicia Parkway. An exposed creek crossing in the Pecten Reef section of the County of Orange Aliso and Wood Canyons Wilderness Park in Reach D of the ETM was protected by rip rap addition in the autumn of 2001 (as shown in Figure L.3).

The ETM crosses beneath Aliso Creek in four locations. These locations are shown in Figure L.1. The down cutting of Aliso Creek exposes the concrete encasement of the crossings. More severe erosion can undermine the concrete encasements. Two of these projects have been identified for protection projects: the Trail Bridge Crossing and the Pecten Reef Crossing. These protection projects were the subject of preliminary designs by TetraTech in 2014. The Trail Bridge Crossing Protection Project is currently under design. The budgeting of the

construction of this project is identified in Table L.3. The future protection project for the Pecten Reef Crossing is also identified in Table L.3. The crossing near the Aliso Creek Road Bridge is believed to be well protected by the existing creek grade control structure. The crossing adjacent to the Coastal Treatment Plant should be monitored for changing conditions.

The ETM is also potentially impacted by the stability of the embankment that runs parallel to the pipeline alignment. Potential erosion risks are most significant in the area between Alicia Parkway and the Coastal Treatment Plant. This area is contained within the County of Orange Aliso and Wood Canyon Wilderness Park. The area that appears to pose the most significant risk is at the confluence of Aliso and Sulphur Creeks. A portion of this area was protected by an emergency rip-rap project after the winter storms of 1997. The remainder of the area was addressed in an evaluation by Tetra Tech in 2014. The proposed project cost from this evaluation is included in Table L.3. The remaining portions of the alignment should be subject to ongoing inspection to monitor for changing conditions leading to potential hazards.

TEN YEAR PLAN PROJECTS

Table L.3 summarizes the proposed capital improvement projects for the Effluent Transmission Main. The presented costs do not include the SOCWA administration costs. These costs are reflected in the main Ten Year Plan presentation.

Table L.3
Capital Improvement Projects for the Effluent Transmission Main

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) ETWD	Project cost (adjusted) IRWD	Project cost (adjusted) MNWD
YEAR 1 (19/20)							
	3105-000	Air Valve Replacement Design and Permitting (Reach D)	\$64,004	\$64,004	\$32,002	\$32,002	\$0
	3106-000	Air Valve Replacement Design and Permitting (Reach E)	\$103,674	\$103,674	\$24,146	\$24,146	\$55,383
	3101-000	Trail Bridge Crossing - Design and Permitting (Reach D)	\$161,987	\$161,987	\$80,994	\$80,994	\$0
TOTALS			\$329,665	\$329,665	\$137,141	\$137,141	\$55,383
YEAR 2 (20/21)							
	3109-000	Trail Bridge Crossing Protection Construction Phase I (Reach D)	\$104,635	\$104,635	\$52,318	\$52,318	\$0
	3107-000	Air Valve Replacement Construction (Reach D)	\$64,004	\$64,004	\$32,002	\$32,002	\$0
	3108-000	Air Valve Replacement Construction (Reach E)	\$103,674	\$103,674	\$24,146	\$24,146	\$55,383
TOTALS			\$272,313	\$272,313	\$108,465	\$108,465	\$55,383

Table L.3 (continued)
Capital Improvement Projects for the Effluent Transmission Main

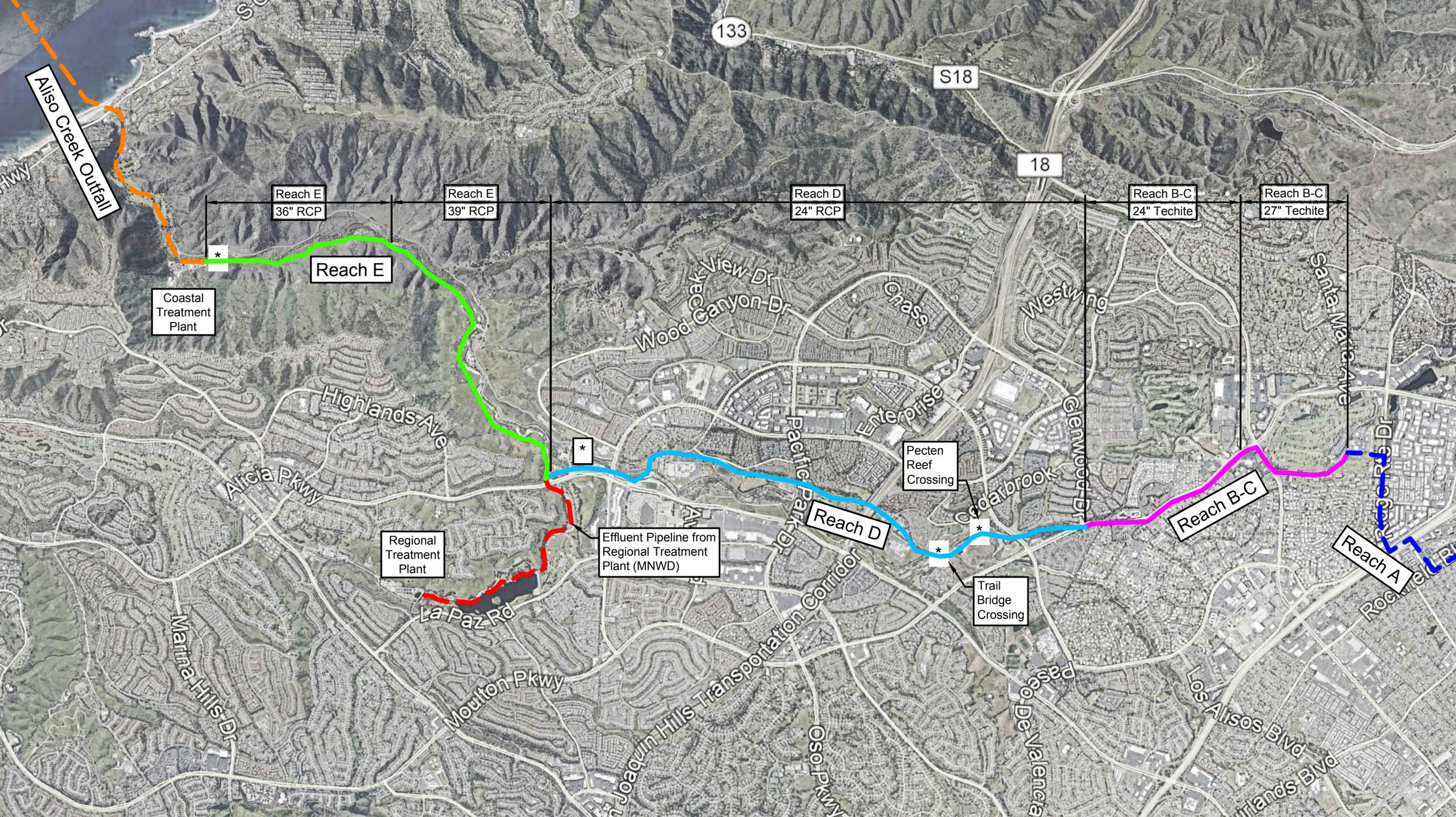
Project date	Project code	Capital Projects	Project cost	Project cost Inflation adjusted	Project cost (adjusted) ETWD	Project cost (adjusted) IRWD	Project cost (adjusted) MNWD
YEAR 3 ('21/'22)							
	21311	Trail Bridge Crossing Protection Construction Phase II (Reach D)	\$918,461	\$918,461	\$459,231	\$459,231	\$0
TOTALS			\$918,461	\$918,461	\$459,231	\$459,231	\$0
YEAR 5 ('23/'24)							
	21312	Pecten Reef Crossing Protection Design (Reach D)	\$300,000	\$337,653	\$168,826	\$168,826	\$0
TOTALS			\$300,000	\$337,653	\$168,826	\$168,826	\$0
YEAR 6 ('24/'25)							
	21313	Pecten Reef Crossing Protection Construction (Reach D)	\$1,200,000	\$1,391,129	\$695,564	\$695,564	\$0
	21314	Reach D CCTV Inspection (Reach D)	\$335,000	\$388,357	\$194,178	\$194,178	\$0
TOTALS			\$1,535,000	\$1,779,486	\$889,743	\$889,743	\$0

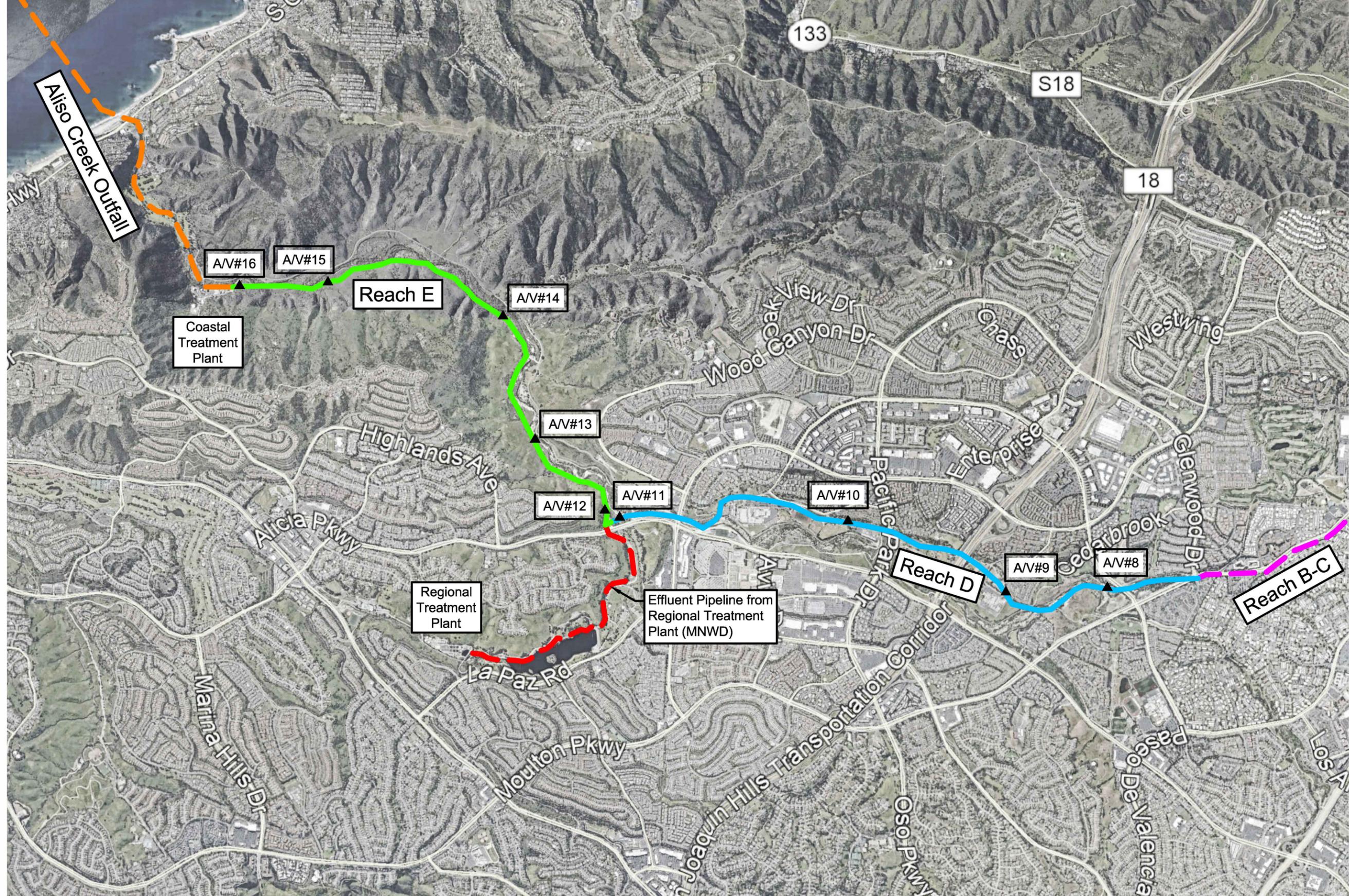
Table L.3 (continued)
Capital Improvement Projects for the Effluent Transmission Main

Project date	Project code	Capital Projects	Project cost	Project cost Inflation adjusted	Project cost (adjusted) ETWD	Project cost (adjusted) IRWD	Project cost (adjusted) MNWD
YEAR 7 (25/26)							
	21111	Reach B Replacement Design (Reach B)	\$350,000	\$417,918	\$208,959	\$208,959	\$0
	21411	Reach E CCTV Inspection (Reach E)	\$335,000	\$400,008	\$93,162	\$93,162	\$213,684
TOTALS			\$685,000	\$817,926	\$302,121	\$302,121	\$213,684
YEAR 8 (26/27)							
	21112	Reach B Replacement (Reach B)	\$2,370,000	\$2,914,801	\$1,457,401	\$1,457,401	\$0
	21412	Aliso Sulfur Creek Confluence Protection (Reach E)	\$1,293,000	\$1,590,227	\$370,364	\$370,364	\$849,499
TOTALS			\$3,663,000	\$4,505,028	\$1,827,764	\$1,827,764	\$849,499
YEAR 9 (27/28)							
	21211	Reach C Replacement Design (Reach C)	\$219,000	\$277,423	\$138,711	\$138,711	\$0
TOTALS			\$219,000	\$277,423	\$138,711	\$138,711	\$0

Table L.3 (continued)
Capital Improvement Projects for the Effluent Transmission Main

Project date	Project code	Capital Projects	Project cost	Project cost Inflation adjusted	Project cost (adjusted) ETWD	Project cost (adjusted) IRWD	Project cost (adjusted) MNWD
YEAR 10 (‘28/‘29)							
	21212	Reach C Replacement (Reach C)	\$2,050,000	\$2,674,785	\$1,337,393	\$1,337,393	\$0
		TOTALS	\$2,050,000	\$2,674,785	\$1,337,393	\$1,337,393	\$0





Prepared by:

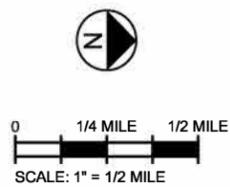


Figure L.2
ETM Air Valve Locations
Reach D and E

Appendix M
Aliso Creek Ocean Outfall Ten Year Plan

BACKGROUND

The Aliso Creek Outfall receives secondary effluent discharged from the Irvine Ranch Water District (IRWD) Los Alisos Water Reclamation Plant, the El Toro Water District Reclamation Plant, the SOCWA Regional Treatment Plant and the SOCWA Coastal Treatment Plant via the Effluent Transmission Main (ETM). The Aliso Creek Outfall also discharges reverse osmosis brine from the IRWD Irvine Desalter and the Shallow Groundwater Treatment Unit.

The Outfall was constructed during the period from December 1977 through July 1978 with 8,600 feet of 48-inch double rubber gasket reinforced concrete pipe. The land portion of the outfall begins at the Coastal Treatment Plant (CTP) discharge connection to the Effluent Transmission Main (ETM). The land outfall is buried beneath Aliso Creek through the Aliso Creek Golf Resort. The ocean portion of the outfall begins at the metering manhole in a parking lot north of Pacific Coast Highway and ends approximately 8,000 feet from the beach in 184 feet of water. The last 1,200 feet of the outfall contains approximately two hundred 2-inch diameter diffuser ports. (one hundred ports on each side of the outfall). These ports are spaced in 12 feet intervals on alternating sides. The diffuser ports are located approximately 6-inches above the centerline of the 48-inch pipe. The location of the Aliso Creek Outfall is shown in Figure M.1

The Outfall has a peak hourly hydraulic design capacity of approximately 50 million gallons per day (mgd) at high tide. The current annual average discharge

through the outfall is approximately 10 million gallons per day.

OCEAN OUTFALL SEALS

The Aliso Creek Ocean Outfall has undergone periodic analysis since the early 1990's related to damage to the Outfall. After a series of heavy rainstorms in February, 1992, an inspection found five circumferential breaks in five sections of the Outfall pipe. Five fabricated seals made from 12-inch wide stainless steel bands with neoprene foam rubber gaskets were installed. These fabricated seals were considered to be a temporary repair.

A consultant report titled "Preliminary Design of an Improved Repair of the Near Shore Section of the AWMA Ocean Outfall and Planning for Future Relocation of the Outfall" completed in early 2002 considered alternatives for the replacement. This analysis considered alternatives including the following:

- Replacement of the temporary internal seals.
- Slip lining the damaged portion of the outfall.
- Replacement and realignment of the damaged section of the outfall.

SOCWA proceeded with the installation of the replacement seals in 2003. A schematic of a typical seal replacement is shown in Figure M.2.

The seals are scheduled to be replaced in Fiscal Year 2019/2020 through a previously budgeted project. The expected life of the replacement seals

ranges from 10 to 20 years. SOCWA will continue to contract a bi-annual internal inspection of the outfall.

For planning purposes, the replacement of the seals is estimated at 15 years of life. The Ten Year Plan includes a prospective replacement project in Year 15 (Fiscal Year 2033/2034).

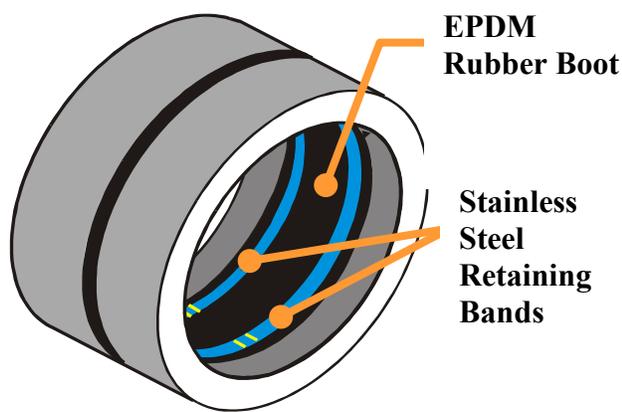


Figure M.2 Typical Detail of Boot Seal

DIFFUSER MODIFICATIONS

SOCWA retained Michael Baker Inc. (MBI) in 2018 to conduct an updated dilution modeling analysis and report for the Aliso Creek Ocean Outfall. The goals of the ACOO study were as follows:

- Assess the function of the outfall diffuser systems.
- Determine current outfall dilution capacity under varying flow volumes.

The study found that the minimum initial dilution is well above 200:1, with the smallest value being 234:1 at maximum discharge of 35 mgd (the current capacity

set forth under the NPDES permit). The analysis concluded that the ACOO has a well performing diffuser due primarily to its depth (170 feet at the inshore end of the diffuser and 195 feet at the offshore end).

The MBI evaluation did not identify any needed modifications to the diffuser system for the Aliso Creek Ocean Outfall.

INSPECTIONS AND ASSESSMENTS

The Aliso Creek Ocean Outfall undergoes an external inspection with a remotely operated vehicle every three to four years. The external inspection is typically followed by a port cleaning project. The outfall diffuser ports tend to become partially obstructed over time by plant growth and/or shifting sands. The external inspections and the port cleanings have historically been included in the SOCWA Operations budget.

The Ocean Outfall has an access point through a manhole located in the County of Orange Aliso Beach Inland Parking Lot. This manhole is used by contract dive team doing an internal inspection of the outfall biannually. The dive team travels from the manhole down to the surf zone where the outfall was cracked in 1992. The dive team performs the following tasks:

- Check seal condition.
- Tighten seals as necessary.
- Measure spacing in pipe joints to evaluate potential movement of the outfall piping.

The internal inspections have historically been included in the SOCWA Operations budget.

Ocean outfalls are operated under leases with the California State Lands Commission. These leases come up for periodic renewal. In recent lease renewals the Lands Commission has been presenting agencies with a lease requirement to conduct internal and external inspections. Most agencies have conducted periodic external inspections; however, there is little available technology to allow remote inspections of the interiors of the submerged or partially submerged outfalls. The Aliso Ocean Outfall does have the ability for internal access. However, this access has not been used for full internal inspection; the only covered area is between the access manhole and the surf zone. It is not known if this extent of internal inspection will be acceptable to the State Lands Commission. This Ten Year Plan does not include any additional projects related to internal inspection.

SAMPLING AND METERING

The same manhole located in the County of Orange Aliso Beach Inland Parking Lot is also the point of sampling for conformance to NPDES requirement. Sample is pumped from a lance in a tee flange to a sampler unit located in a small masonry building located adjacent to the Parking Lot. This sample system has been prone to periodic disruptions due to the pump suction conditions. A project is included in Year 1 (2019/2020) to address this

condition.

The NPDES permit for the Aliso Creek Ocean Outfall allows the metering of the outfall discharge to be done as a totalization of the upstream flow meters. The last couple of permit negotiations have raised the potential need for a dedicated flow meter for the outfall (similar to the requirement for the San Juan Creek Ocean Outfall). In 2012 Tetra Tech was retained to develop an option for a new meter structure on the Outfall. This structure would also be located in the County of Orange Aliso Beach Inland Parking Lot. This project has never been budgeted as the NPDES permit conditions have not been changed. The Ten Year Plan includes projects to update the metering concept, design the system, and construct the meter station in Years 4 (2022/2023), 6 (2024/2025) and 7 (2025/2026) respectively. The design and construction phases will ultimately be budgeted only to meet a regulatory requirement.

LAND OUTFALL

A significant portion of the Land Outfall lies within the course of Aliso Creek. This section is within Ben Brown's Golf Course (The Ranch at Laguna Beach) as shown in Figure M.1. This routing poses potential exposures to scour and rock fall. The potential relocation of the Land Outfall was considered by SOCWA staff and the SOCWA Engineering Committee in 2008 - 2009. There are two reasons the outfall location was reviewed:

- The planned modification of the Aliso Creek Golf Resort by the Athens

Group (the owner of the resort at that time) with integral rehabilitation of the Aliso Creek watershed within the resort boundaries).

presented in Table M.1 do not include administration costs. These costs are added to the costs presented in Chapter 8 of the Ten Year Plan.

- Potential risks to the Land Outfall due to storm event scour within Aliso Creek.

A consultant prepared a white paper regarding the vulnerability of the Land Outfall and the potential cost of relocation. The finding of the white paper indicated that the Land Outfall is vulnerable to scour in its current location. However, the consultant noted that relocation of the Land Outfall would not significantly reduce the risk of a scour event unless the Aliso Creek watershed within the golf resort was modified and protected. Subsequent to the preparation of the white paper, the plan for a significant reconfiguration of the golf resort was abandoned. No further work has been done regarding the relocation of the Land Outfall.

The Ten Year Plan includes an evaluation in Year 2 (Fiscal Year 2020/2021) to update the approach and cost of a relocation of the Land Outfall outside of the existing boundaries of Aliso Creek. The Ten Year Plan also includes projects to design and construct the relocation in Years 8 (2026/27) and 10 (2028/29) respectively. However, the scope and timing of these projects are highly speculative at this time.

TEN YEAR PROJECT

The capital projects for Project Committee 24 are presented in Table M.1. The projects identified in Years 6 to 10 are highly speculative. The values

Table M.1

Aliso Creek Ocean Outfall Capital Improvement Program

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) ETWD	Project cost (adjusted) EBSD	Project cost (adjusted) IRWD	Project cost (adjusted) CLB	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD
YEAR 1 (2019/20)										
	3408-000	Sampling System Rehabilitation	\$106,253	\$106,253	\$17,319	\$829	\$16,745	\$11,688	\$46,592	\$13,080
		TOTALS	\$106,253	\$106,253	\$17,319	\$829	\$16,745	\$11,688	\$46,592	\$13,080
YEAR 2 (2020/21)										
	4401-000	Creek Section Pipeline Replacement Estimate Update	\$50,703	\$50,703	\$8,265	\$395	\$7,991	\$5,577	\$22,233	\$6,242
		TOTALS	\$50,703	\$50,703	\$8,265	\$395	\$7,991	\$5,577	\$22,233	\$6,242
YEAR 4 (2022/23)										
	24111	Metering and Sampling Review	\$60,000	\$65,946	\$10,749	\$514	\$10,393	\$7,254	\$28,917	\$8,118
		TOTALS	\$60,000	\$65,946	\$10,749	\$514	\$10,393	\$7,254	\$28,917	\$8,118

Table M.1

Aliso Creek Ocean Outfall Capital Improvement Program

Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) ETWD	Project cost (adjusted) EBSD	Project cost (adjusted) IRWD	Project cost (adjusted) CLB	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD
YEAR 6 (2024/25)										
	24112	Metering Station Reconstruction Design and Permitting	\$150,000	\$175,586	\$28,621	\$1,370	\$27,672	\$19,314	\$76,994	\$21,615
		TOTALS	\$150,000	\$175,586	\$28,621	\$1,370	\$27,672	\$19,314	\$76,994	\$21,615
YEAR 7 (2025/26)										
	24113	Metering Station Reconstruction	\$1,250,000	\$1,510,039	\$246,136	\$11,778	\$237,982	\$166,104	\$662,152	\$185,886
		TOTALS	\$1,250,000	\$1,510,039	\$246,136	\$11,778	\$237,982	\$166,104	\$662,152	\$185,886
YEAR 8 (2026/27)										
	24114	Land Outfall Realignment Design and Permitting	\$480,000	\$598,410	\$97,541	\$4,668	\$94,309	\$65,825	\$262,403	\$73,664
		TOTALS	\$480,000	\$598,410	\$97,541	\$4,668	\$94,309	\$65,825	\$262,403	\$73,664

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Project date	Project code	Capital Projects	Project cost	Project cost inflation adjusted	Project cost (adjusted) ETWD	Project cost (adjusted) EBSD	Project cost (adjusted) IRWD	Project cost (adjusted) CLB	Project cost (adjusted) MNWD	Project cost (adjusted) SCWD
YEAR 10 (2028/29)										
	24115	Land Outfall Realignment Construction	\$6,000,000	\$7,966,518	\$1,298,542	\$62,139	\$1,255,523	\$876,317	\$3,493,318	\$980,678
		TOTALS	\$6,000,000	\$7,966,518	\$1,298,542	\$62,139	\$1,255,523	\$876,317	\$3,493,318	\$980,678
YEAR 15 (2033/34)										
	24116	Internal Seal Replacement	\$95,000	\$147,652	\$24,067	\$1,152	\$23,270	\$16,242	\$64,745	\$18,176
		TOTALS	\$95,000	\$147,652	\$24,067	\$1,152	\$23,270	\$16,242	\$64,745	\$18,176

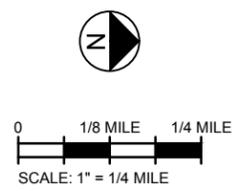
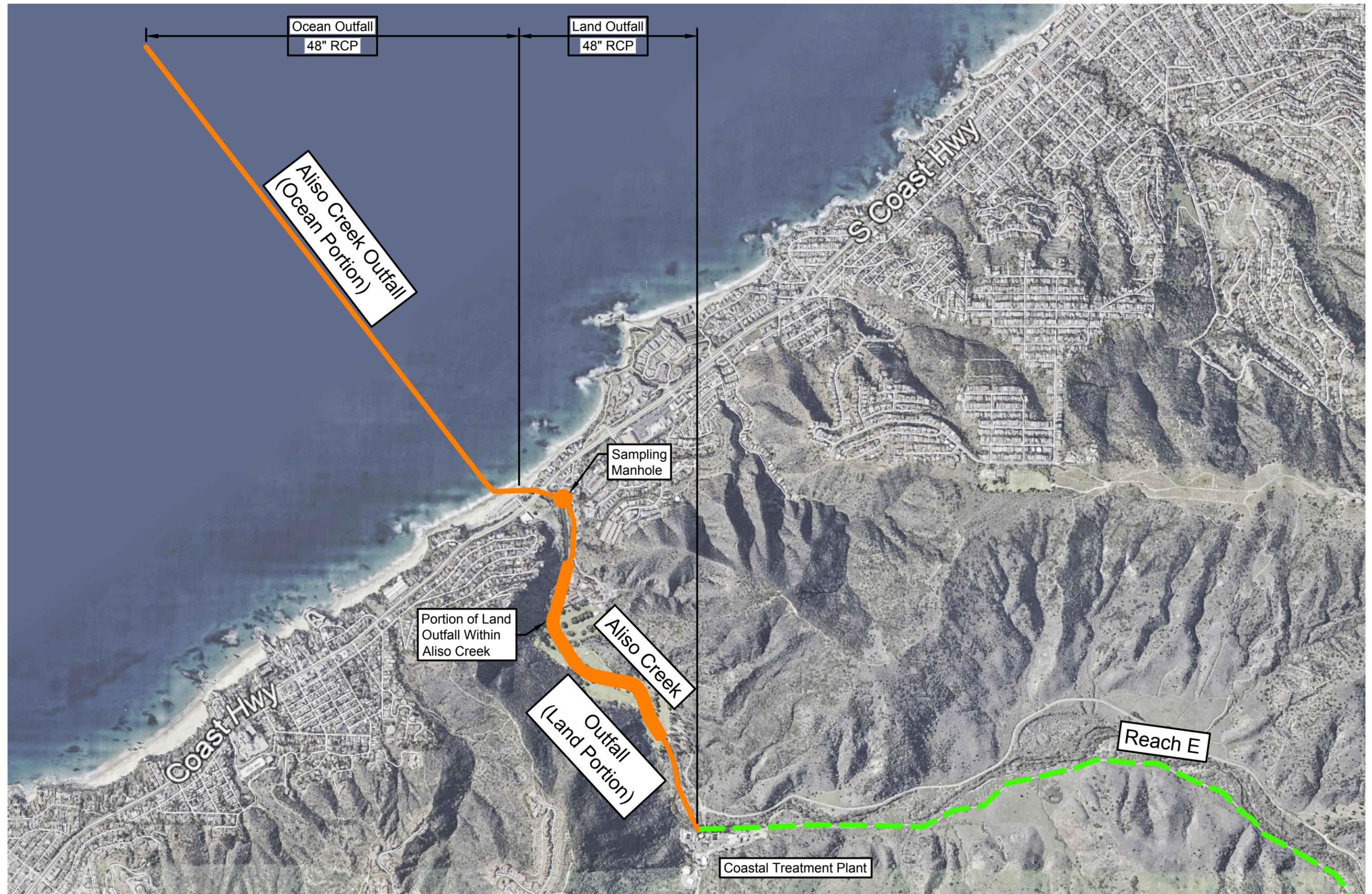


Figure M.1
 Aliso Creek Land Outfall
 and Ocean Outfall