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FY2022 ENCINA COMPREHENSIVE ASSET MANAGEMENT PLAN (E-CAMP)

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Prepared for

Encina Wastewater Authority
6200 Avenida Encinas
Carlsbad, California 92011-1095

K/J Project No. 2044101*00

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Abbreviations and Acronyms List

AACE	Association for the Advancement of Cost Engineering
AB	Aeration Basin
AFRF	Alternative Fuels Receiving Facility
APCD	Air Pollution Control District
BMS	Building Management System
BOE	Basis of Estimate
CCBE	Chlorine Contact Basin Effluent
CCI	Construction Cost Index
CCT	Chlorine Contact Tanks
CCTV	Closed Caption Television
CDFW	California Department of Fish and Wildlife
CEPT	Chemically Enhanced Primary Treatment
CGCM	Combined Generator Control Modules
CIP	Capital Improvement Projects
CMMS	Computerized Maintenance Management System
CMU	Concrete Masonry Unit
CO	Carbon Monoxide
CPS	Combined Pump Station
CWRF	Carlsbad Water Recycling Facility
DAFT	Dissolved Air Flotation Thickeners
DB	Design-Build
DBB	Design-Bid-Build
DBO	Design-Build-Operate
DBOO	Design-Build-Own-Operate
DPR	Direct Potable Reuse
E-CAMP	Encina Comprehensive Asset Management Plan
EI&C	Electrical, Instrumentation and Control
EMH	Electrical Manholes
ENR	Engineering News Record
EPS	Effluent Pump Station
EWA	Encina Wastewater Authority
EWPCF	Encina Water Pollution Control Facility
FCC	Flood Control Channel
FOG	Fats, Oils and Grease

FRP	Fiberglass Reinforced Plastic
FY	Fiscal Year
H2S	Hydrogen Sulfide
HH	Handholes
HVAC	Heating, Ventilation and Air-Conditioning
IP	Internet Protocol
IT	Information Technology
IPR	Indirect Potable Reuse
LFRS	Lateral Force-Resisting System
MAD	Mesophilic Anaerobic Digestion
MCC	Motor Control Center
MCP	Master Control Panel
MGD/mgd	Million Gallons per Day
NOx	Nitrogen Oxides
O&M	Operations & Maintenance
OM	Operations Manual
ORF	Odor Reduction Facility
OSA	Outside Air Systems
OT	Operational Technology
PE	Primary Effluent
PLC	Programmable Logic Controller
PSB	Primary Sedimentation Basins
PVC	Polyvinyl Chloride
RAS	Return Activated Sludge
R-CAMP	Remote Comprehensive Asset Management Plan
RCP	Reinforced Concrete Pipe
R&D	Research and Development
RDT	Rotary Drum Thickeners
ROV	Remotely Operated Vehicle
R&R	Rehabilitation and Replacement
RSC	Reduced Sulfur Compound
RWQCB	Regional Water Quality Control Board
SAN	Storage Area Network
SCADA	Supervisory Control and Data Acquisition
SDCWA	San Diego County Water Authority
SE	Secondary Effluent

SEEPS	Secondary Effluent Equalization Pump Station
SDPS	Storm Drainage Pump Station
SLC	State Lands Commission
SRT	Solids Retention Time
TWAS	Thickened Waste Activated Sludge
USACOE	US Army Corps of Engineers
UV	Ultraviolet
VAV	Variable Air Volume
VFD	Variable Frequency Drive
VOC	Volatile Organic Compounds
VRF	Variable Refrigerant Flow
WAS	Waste Activated Sludge

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Executive Summary

ES.1 Introduction

Encina Wastewater Authority (EWA) is a public joint powers authority located in Carlsbad, California that provides wastewater treatment services to over 400,000 North San Diego County residents and industrial customers. EWA is owned by six member agencies consisting of the: City of Carlsbad, City of Vista, City of Encinitas, Buena Sanitation District, Leucadia Wastewater District, and Vallecitos Water District.

The Encina Water Pollution Control Facility (EWPCF) was initially constructed in 1963 to treat wastewater from the cities of Carlsbad and Vista. Since its original design and construction, the EWPCF has undergone five major expansion phases with the latest (Phase V) completed in 2009. Current average dry weather flow capacity of the EWPCF is 40.5 million gallons per day (mgd) of liquid treatment and 43.3 mgd of solids treatment. Several rehabilitation projects have been completed since the Phase V expansion, but no increase in the capacities noted above was provided.

EWA strives to conduct sound planning to maintain reliable and cost-effective service, as well as to invest appropriately to fully fund the cost of service, including capital improvements. The Encina Comprehensive Asset Management Plan (E-CAMP) was established in 1993 and serves as a planning tool used to cost effectively manage assets by planning and prioritizing condition assessments and asset rehabilitation and replacement (R&R) for the EWPCF. The focus of most projects identified for the EWPCF in the E-CAMP are safety, regulatory compliance, reliability, public and EWA impacts, energy or organizational related.

The E-CAMP identifies future expenditures for capital improvement projects (CIP) while functioning as a communication tool for the proposed improvements to the member agencies, their representatives, and EWA staff. This E-CAMP update includes recommendations for fiscal year (FY) 2022 through FY2027. Capital asset related to projects for EWA's remote facilities are identified in the Remote Comprehensive Asset Management Plan (R-CAMP) and are not evaluated in this E-CAMP.

While the E-CAMP for the EWPCF is periodically updated independent of the budgeting process, the information is leveraged in the budgeting process to provide direction for EWA staff.

ES.2 E-CAMP Process

The E-CAMP process includes five task elements: project identification and grouping; project evaluation; project cost estimating; project prioritization; and implementation schedule. A flow diagram of the EWA CIP development, including the E-CAMP process, is provided as Figure ES-1 with the E-CAMP task elements shown in blue.

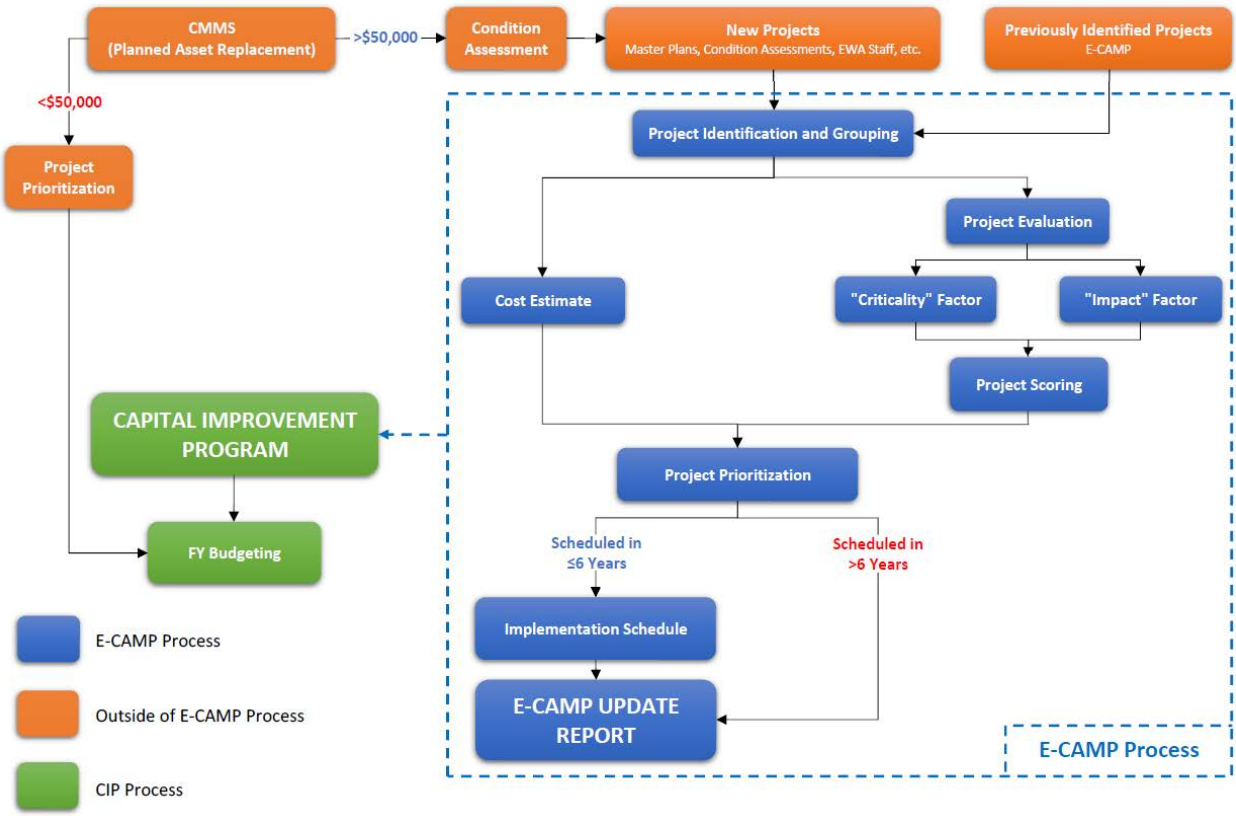

Figure ES-1: EWA CIP Development

Projects that are included in the E-CAMP are identified through a number of means including EWA's Computerized Maintenance Management System (CMMS), condition assessments, the previous E-CAMP update, EWA staff, studies and reports, and other engineering services performed for EWA. Projects may be grouped based on proximity, type of work, or priority to increase efficiency and reduce costs.

After the final list of E-CAMP projects is established, each project is evaluated using a set of six evaluation criteria: safety; regulatory compliance; reliability; impacts to the public and EWA; energy efficiency; and organizational efficiency. These evaluation criteria are assigned a criticality factor that represent the level of importance of each across all the projects. Each project is scored across each of the evaluation criteria and the sum of the six criteria scores is the evaluation score for each project.

Project cost estimates are developed for the full list of projects included in the E-CAMP. The project cost estimates include construction, condition assessment, study, design, engineering during construction, and construction management costs. Additionally, allowances for electrical, instrumentation and control (EI&C) during design and construction are included in the cost estimates.

All projects identified in the E-CAMP are prioritized by considering the evaluation scoring results and estimated costs. The project prioritization process provides EWA with informed condition and cost data to select which projects to schedule for implementation over the next six fiscal

years (through FY2027). A recommended implementation schedule is prepared and provides direction for upcoming capital improvements to be included in the budgeting process. Projects that are not selected for implementation over the next six fiscal years are not scheduled in the E-CAMP but are included for future reference.

ES.3 Condition Assessment Summary

Condition assessments are a key component of a robust asset management program. Condition assessments are regularly conducted by EWA to reduce risks of disrupted service and provide sound budget allocations based on up-to-date facilities evaluations. Condition assessments are also triggered when an asset is within five years of its nominal service life or by staff observations of condition. When a condition assessment is completed, either the assessed service life is extended or a project is identified to replace or rehabilitate the asset. If identified for replacement or rehabilitation, the proposed work is incorporated into a project.

ES.4 Studies and Professional Services

Studies are completed to provide planning information for maintaining EWA facilities. Additional professional services include engineering services, research and development (R&D) services, air permitting, and other services. A more detailed description of the identified studies and professional services can be found in Section 4 of this report.

ES.5 Identification of E-CAMP Projects

As described in the E-CAMP process, the first step is to identify projects for consideration of implementation. Over 90 projects, and related studies, were identified through this process and more detailed information regarding these projects, including background, description, justification/consequences, and project delivery method can be found in Sections 4 and 5 of this report. Projects are categorized into the following seven different categories related to the EWPCF:

1. Liquid Process
2. Outfall
3. Solids Process
4. Energy Management
5. General
6. Technology
7. *Reserved
8. Professional Services

ES.6 Project Evaluation

Projects in the E-CAMP are evaluated using a set of six evaluation criteria. These evaluation criteria are assigned a criticality factor from 1 to 6, with 1 representing the lowest level of importance and 6 representing the highest. Table ES-1 provides the six evaluation criteria and their assigned criticality factors.

Table ES-1: Evaluation Criteria

Evaluation Criteria	Criticality Factor
Safety	6
Regulatory Compliance	5
Reliability	4
Public and EWA Impacts	3
Energy Efficiency	2
Organizational Efficiency	1

Each project is assigned an impact factor across each of the six defined evaluation criteria from 0 to 5, with 0 representing the lowest impact and 5 representing the highest impact. The impact factors assigned to a project for each evaluation criteria are then multiplied by the criticality factor of the evaluation criteria to calculate criteria scores. The six criteria scores are then summed to determine the evaluation score for each project.

ES.7 Project Prioritization

Projects identified in the E-CAMP include those recommended for implementation in the next six fiscal years and potential future projects. Projects, studies, and professional services recommended for implementation over the next six fiscal years are identified in Table ES-2 along with a brief project description for each. A consequence of deferment for each project and study is also provided in the table which represents the area of impact, across the evaluation criteria, where not implementing the project, study, or professional service would have a negative effect. For projects and studies that were scored, an impact factor of 3 or more for an evaluation criterion results in a noted consequence of deferment, and for projects and studies that were not scored, a consequence of deferment is noted based on staff input.

Table ES-2: Overview of Projects Recommended for Implementation for FY2022 - FY2027

Project Numbers and Titles		Project Description	Consequence of Deferment						Score	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	Total (FY22 - FY27)
			Safety	Regulatory Compliance	Reliability	Public and EWA Impacts	Energy Efficiency	Organizational Efficiency								
Liquid Process (1.X)										$ 6,619,000	$ 881,000	$ 1,300,000	$ 2,600,000	$ 1,300,000	$ 1,300,000	$ 14,000,000
P-1.1.005	Primary Area Improvements	This project will rehabilitate the primary sedimentation basins, replace the existing bar screens, replace the existing belt conveyor, provide a new grit and screenings building extension and new washer compactors, replace the existing grit washing and dewatering system, and modify the existing odor control facilities.			X		X	X	NS	$ 2,697,000	$ -	$ -	$ -	$ -	$ -	$ 2,697,000
P-1.2.009	PSB Structural and Mechanical Rehab	This project will include mechanical rehabilitation and replacement of sludge collectors, scum skimmers, weirs, launders, and rotating mechanisms on the helical skimmers for Primary Sedimentation Basins 1 through 6.			X			X	25	$ -	$ -	$ 1,300,000	$ 2,600,000	$ 1,300,000	$ 1,300,000	$ 6,500,000
P-1.2.010	Primary Sedimentation Basins Scum and Centrate Pipeline Replacement	This project will replace sections of the primary scum and centrate pipelines that are dipping.			X			X	32	$ -	$ 289,000	$ -	$ -	$ -	$ -	$ 289,000
P-1.3.007	Secondary Clarifiers and Strainers Improvements	This project will include mechanical rehabilitation of secondary clarifiers 5, 6, and 8 as well as rehab the gates, spray and wash systems, and launder trough and support systems and weirs of secondary clarifiers 1 through 8. The auto strainers on the 3W, 3WL, and 3WHP plant water systems will be replaced.	X						NS	$ 3,922,000	$ 341,000	$ -	$ -	$ -	$ -	$ 4,263,000
P-1.3.023	Aeration Diffuser Replacement	This project will replace the aeration diffusers of Aeration Basins 1 to 3.			X				27	$ -	$ 251,000	$ -	$ -	$ -	$ -	$ 251,000
Outfall (2.X)										$ -	$ 103,000	$ 171,000	$ 103,000	$ -	$ 613,000	$ 990,000
P-2.1.002	Ocean Outfall Maintenance and Inspection - External	This routine project will provide general overview inspection of the pipe exterior including ballast condition and assess the cathodic protection system. This project will also complete the recommendations provided in the inspection report which may include minor repair or debris removal.		X	X				NS	$ -	$ 103,000	$ -	$ 103,000	$ -	$ 103,000	$ 309,000
P-2.1.005	Ocean Outfall Bathymetric Survey - External	This routine project would complete a bathymetric survey of the exterior of the Ocean Outfall, which would provide an exact location of the outfall, and documentation of the pipeline and ballast material, and a bathymetric chart of the surrounding area.		X	X				NS	$ -	$ -	$ -	$ -	$ -	$ 112,000	$ 112,000
P-2.1.006	Ocean Outfall - Integrity Assessment	This routine project includes performing core sampling of the land outfall and sample analysis for an assessment of the structural integrity.		X	X				NS	$ -	$ -	$ -	$ -	$ -	$ 227,000	$ 227,000
P-2.1.007	84-inch Outfall Inspection - Internal	This routine project will inspect/assess the concrete of the 84-inch reinforced concrete pipe (RCP) outfall.		X	X				NS	$ -	$ -	$ 171,000	$ -	$ -	$ 171,000	$ 342,000
Solids Process (3.X)										$ 6,424,000	$ 10,491,000	$ 8,682,000	$ 6,790,000	$ 16,970,000	$ 20,710,000	$ 70,070,000
P-3.1.002	Solids Thickening Improvements	This project will replace the Dissolved Air Flotation Thickeners (DAFT) with Rotary Drum Thickeners, replace half the MCCs and conductors in the Dewatering Building, replace a section of thickened waste activated sludge (TWAS) piping, and construct an enclosure for the Dryer Building satellite laboratory.						X	27	$ -	$ -	$ 1,022,000	$ 3,719,000	$ 7,738,000	$ 7,438,000	$ 19,917,000
P-3.1.006	DAFT Repairs	This project will repair the DAFTs to extend their useful life until they are replace through the Solids Thickening Project.	X		X				44	$ 2,010,000	$ 502,000	$ -	$ -	$ -	$ -	$ 2,512,000
P-3.2.013	Digester Rehabilitation and Improvements	This project will perform structural repairs/reinforcement, coating, and mixing system improvements to Digesters 4, 5, and 6. The heat exchangers for each digester will be replaced or rehabbed. This project will also add a second waste gas flare.		X	X				NS	$ 2,951,000	$ 9,837,000	$ 6,886,000	$ -	$ -	$ -	$ 19,674,000
P-3.2.018	Digester Cleaning Cycle	This project will include cleaning and assessing the condition of one digester biennially, beginning in FY2026.			X			X	NS	$ -	$ -	$ -	$ -	$ 994,000	$ -	$ 994,000
P-3.2.020	Digester 1, 2, and 3 Improvements	This project will rehabilitate Digesters No. 1, 2, and 3 per the recommendations of recent condition assessments and the 2020 Biosolids Management Plan Update.		X	X				28	$ -	$ -	$ 574,000	$ 2,871,000	$ 8,038,000	$ 7,655,000	$ 19,138,000
P-3.3.025	Existing Dryer Components Rehab and Interim Dryer Improvements	This study will evaluate the heat dryer process to establish the assessed useful life of major process components. This study will also determine the feasibility and process modifications required to produce Class A and Class B biosolids and how to optimize the phasing of the existing and second heat dryer.		X	X			X	NS	$ 152,000	$ 152,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 1,104,000
P-3.3.026	Drying Safety Improvements	This project will implement high priority improvements from the FY2020 Dust Hazard Analysis Implementation Plan.	X						40	$ 1,311,000	$ -	$ -	$ -	$ -	$ -	$ 1,311,000
P-3.3.030	Existing Dryer Major Rehabilitation	This project will rehabilitate the existing dryer by "re-skinning" and/or replacement of the rotary drum.			X			X	25	$ -	$ -	$ -	$ -	$ -	$ 5,417,000	$ 5,417,000

Table ES-2: Overview of Projects Recommended for Implementation for FY2022 - FY2027 (continued)

Project Numbers and Titles		Project Description	Consequence of Deferment						Score	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	Total (FY22 - FY27)
			Safety	Regulatory Compliance	Reliability	Public and EWA Impacts	Energy Efficiency	Organizational Efficiency								
Energy Management (4.X)										$ 519,000	$ 540,000	$ 1,138,000	$ 1,802,000	$ 3,786,000	$ 3,786,000	$ 11,570,000
P-4.1.005	Cogen Engine Top-End Overhaul	This routine project will provide top-end overhaul services of the Cogen engines.		X	X		X		NS	$ 340,000	$ 340,000	$ 340,000	$ 340,000	$ -	$ -	$ 1,360,000
P-4.1.006	Cogen Engine In-Frame Overhaul	This routine project will provide in-frame overhaul services of the Cogen engines.		X	X		X		NS	$ -	$ -	$ -	$ -	$ 862,000	$ 862,000	$ 1,724,000
P-4.1.015	Cogen Engine Catalyst System and Gas Conditioning Facilities	This project will include installation of the Cogen engine catalyst system for four engines and construction of an integrated gas conditioning system.		X			X		25	$ -	$ -	$ 798,000	$ 1,462,000	$ 2,924,000	$ 2,924,000	$ 8,108,000
P-4.1.024	Automate Main Breakers in Cogen	This project will include automation of main breakers through the Master Control Panel.	X					X	35	$ 129,000	$ -	$ -	$ -	$ -	$ -	$ 129,000
P-4.1.025	Combined Generator Control Module Replacement	This project will replace the existing Combined Generator Control Models as the existing modules are no longer supported.			X		X	X	30	$ 50,000	$ 200,000	$ -	$ -	$ -	$ -	$ 250,000
General (5.X)										$ 4,746,000	$ 4,852,000	$ 5,429,000	$ 3,945,000	$ 3,945,000	$ 1,600,000	$ 24,520,000
P-5.1.001	ORF I Short-Term improvements	This project will rehabilitate the coating on Levels 1 and 2 of the odor reduction facility (ORF) 1 unit and perform maintenance coating on roof-top ductwork.			X	X			36	$ -	$ 348,000	$ -	$ -	$ -	$ -	$ 348,000
P-5.1.002	ORF Carbon Media Replacement	This routine project will replace the activated carbon in ORF I, II or III as part of on-going maintenance.			X	X			NS	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 900,000
P-5.1.016	New ORF IA Treatment System	This project will install a new ORF IA odor control system to serve the Primary Sedimentation Basins and Screening Building Annex in conjunction with ORF I.			X	X			33	$ 556,000	$ 1,854,000	$ 2,200,000	$ -	$ -	$ -	$ 4,610,000
P-5.1.017	ORF III Short-Term Improvements	This project will include improvements to fans, ductwork, chemical scrubbers, mist eliminator, carbon adsorbers, and secondary misting system.			X	X			43	$ 356,000	$ -	$ -	$ -	$ -	$ -	$ 356,000
P-5.1.018	New ORF III Treatment System	This project will replace the existing ORF III treatment system with a new system with increased capacity.				X			28	$ -	$ -	$ 315,000	$ 1,397,000	$ 1,397,000	$ -	$ 3,109,000
P-5.2.012	Site Security Facilities - Tier 1	This project will develop a set of applicable security policies, procedures, and protocols; replace perimeter fencing; and repair and improve lighting systems.	X					X	26	$ 232,000	$ 232,000	$ -	$ -	$ -	$ -	$ 464,000
P-5.2.019	Plant Landscaping	This project will assess the entire EWPCF and create sustainable landscaping and irrigation design guidelines for EWA's facilities transition to a sustainable, low-maintenance landscaped environment that is regionally appropriate, utilizes sustainable materials and construction practices, and conserves water resources.						X	17	$ 101,000	$ 206,000	$ -	$ -	$ -	$ -	$ 307,000
P-5.2.021	Climate Control at Cogen Building	This project will improve MCC climate control through weather sealing to prevent coastal air infiltration, installation of corrosion protection coating, and insulation to minimize heat gains from outdoors.			X			X	40	$ 1,482,000	$ -	$ -	$ -	$ -	$ -	$ 1,482,000
S/P-5.2.026	Plant Waste Stream Rerouting	This study will identify improvements to existing waste stream infrastructure and characterize major plant waste streams for routing alternatives and treatment options.					X	X	30	$ -	$ 100,000	$ -	$ -	$ -	$ -	$ 100,000
P-5.2.027	Plant-Wide Seal Coating	This routine project will slurry seal the asphalt pavement across the EWPCF.			X				NS	$ -	$ -	$ 78,000	$ -	$ -	$ -	$ 78,000
P-5.2.032	Plant-Wide Asset Painting and Protective Coating	This routine project will provide painting and protective coating to all outside piping and equipment for asset corrosion control.			X			X	NS	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 900,000
S/P-5.2.044	Flood Control Channel Restoration	This study will analyze removal of sediment buildup at the rip rap dissipation apron and will develop a plan for project implementation and permitting.		X					30	$ 100,000	$ -	$ -	$ -	$ -	$ -	$ 100,000
P-5.2.047	Site Security Facilities - Tier 2-4	This project will include deployment of new cameras, expansion of the video surveillance system, expansion of the access control system, and addition of door/gate/hatch position monitoring devices.	X					X	26	$ -	$ -	$ -	$ 948,000	$ 948,000	$ -	$ 1,896,000
P-5.3.004	Admin Building HVAC Upgrades	This project will supplement the Administration Building chiller with a new absorption chiller and hot water loop utilizing heat waste from the internal combustion (IC) engines hot water recovery system.			X			X	21	$ -	$ 412,000	$ 1,236,000	$ -	$ -	$ -	$ 1,648,000
P-5.3.013	Headworks Building Roof	This project will replace the existing Headworks Building Roof with new.	X		X			X	38	$ 269,000	$ -	$ -	$ -	$ -	$ -	$ 269,000
S/P-5.3.015	Dewatering Building Rehabilitation	This study will assess the condition of the Dewatering Building and identify infrastructure approaching the end of its useful life and summarize the recommendations associated with the Solids Thickening Project preliminary design.			X			X	31	$ -	$ 50,000	$ -	$ -	$ -	$ -	$ 50,000
S/P-5.3.017	Secondaries Building Rehabilitation	This study will assess the condition of the Dewatering Building and identify infrastructure approaching the end of its useful life, the roof, the shared RAS channel/Secondaries Building wall.			X			X	31	$ -	$ 50,000	$ -	$ -	$ -	$ -	$ 50,000
P-5.4.005	Implement Minor Condition Assessment Recommendations	This routine project implements minor recommendations made during condition assessments on an ongoing basis.	X	X	X			X	NS	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 900,000
P-5.4.006	As-Needed Contractor Services	This routine project provides contractor services for needs that develop on an ongoing basis.	X	X	X	X	X	X	NS	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 1,000,000	$ 6,000,000

Table ES-2: Overview of Projects Recommended for Implementation for FY2022 - FY2027 (continued)

Project Numbers and Titles		Project Description	Consequence of Deferment						Score	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	Total (FY22 - FY27)
			Safety	Regulatory Compliance	Reliability	Public and EWA Impacts	Energy Efficiency	Organizational Efficiency								
P-5.4.007	Miscellaneous Building Rehabilitation	This routine project provides miscellaneous building rehabilitation and temporary facility services for needs that develop on an ongoing basis.	X		X			X	NS	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 900,000
S/P-5.4.010	Site Structural Improvements	This study will assess site safety guardrails and the pedestrian bridge spanning the flood control channel.	X					X	34	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ 50,000
Technology (6.X)										**$ 1,568,000**	**$ 4,197,000**	**$ 8,944,000**	**$ 10,140,000**	**$ 410,000**	**$ 867,000**	**$ 26,130,000**
P-6.1.206	Secondaries Electrical and Controls Improvements	This project will replace MCCs in the secondaries building and implement SCADA system modifications and additions.			X			X	27	$ 397,000	$ 913,000	$ 913,000	$ -	$ -	$ -	$ 2,223,000
P-6.1.207	Cogen Electrical and Controls Improvements	This project will replace the electrical and automation systems that manage engine, distribution, grid sync, and ancillary equipment that serves Cogen.			X			X	33	$ -	$ -	$ 3,882,000	$ 3,882,000	$ -	$ -	$ 7,764,000
P-6.1.208	CPS/SEEPS Controls Improvements	This project will replace MCCs in the secondaries building and implement SCADA system modifications and additions.			X			X	17	$ 155,000	$ 292,000	$ 292,000	$ -	$ -	$ -	$ 739,000
P-6.1.209	Blower Controls Improvements	This project will implement SCADA system modifications and additions.			X			X	17	$ 95,000	$ 256,000	$ 256,000	$ -	$ -	$ -	$ 607,000
P-6.1.210	Heat Dryer Controls Improvements	This project will implement SCADA system modifications and additions.			X			X	21	$ -	$ -	$ 456,000	$ 3,470,000	$ -	$ -	$ 3,926,000
P-6.1.211	Chlorine Building and EPS Electrical and Controls Improvements	This project will replace MCCs, incorporate new climate controls, and implement SCADA system modifications and additions.			X			X	37	$ 411,000	$ 1,875,000	$ 1,875,000	$ -	$ -	$ -	$ 4,161,000
P-6.1.212	Centrifuge & Ancillary Systems Controls Improvements	This project will implement SCADA system modifications and additions.			X			X	17	$ -	$ -	$ 318,000	$ 2,280,000	$ -	$ -	$ 2,598,000
P-6.1.514	As-Needed Integration Services	This routine project provides integrator services for needs that develop on an ongoing basis.			X	X		X	NS	$ 210,000	$ 210,000	$ 210,000	$ 210,000	$ 210,000	$ 210,000	$ 1,260,000
P-6.2.705	Host Server Replacement - IT	This routine project will replace the IT host servers.			X			X	NS	$ -	$ -	$ 442,000	$ -	$ -	$ -	$ 442,000
P-6.2.706	Host Server Replacement - OT	This routine project will replace the OT host servers.			X			X	NS	$ -	$ 351,000	$ -	$ -	$ -	$ 457,000	$ 808,000
P-6.2.707	Backup Host Servers	This routine project will replace the backup host servers.			X			X	NS	$ -	$ -	$ -	$ 98,000	$ -	$ -	$ 98,000
P-6.2.708	Document Management System Upgrade	This routine project will maintain and improve the EWPCFs document management system.			X			X	NS	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 300,000
P-6.2.709	As-Needed Business Integration Services	This routine project will provide on-call business network services to implement recommendations from the IT Strategic Plan.			X			X	NS	$ 250,000	$ 250,000	$ 250,000	$ 150,000	$ 150,000	$ 150,000	$ 1,200,000
Professional Services (8.X)										**$ 1,175,000**	**$ 1,325,000**	**$ 1,100,000**	**$ 1,800,000**	**$ 1,800,000**	**$ 1,525,000**	**$ 8,730,000**
CA-8.1.016	Condition Assessment Services	This project provides condition assessment services on an ongoing basis.	X	X	X			X	NS	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 600,000
S-8.2.015	Potable Reuse Study	This routine study is to evaluate the most practical approach for implementation of a potable reuse program as regulations have developed and opportunities for collaboration with regional stakeholders are better understood.				X			NS	$ 75,000	$ 75,000	$ 150,000	$ 150,000	$ 300,000	$ 300,000	$ 1,050,000
S-8.2.019	EWA Public Response Plan	This study will identify and document how to respond publicly to a public nuisance issue.				X			NS	$ 50,000	$ -	$ -	$ -	$ -	$ -	$ 50,000
S-8.2.020	Energy and Emissions Strategic Plan Update	This routine study will provide a current evaluation of energy use and emissions at the EWPCF.		X			X		NS	$ -	$ 100,000	$ -	$ -	$ -	$ -	$ 100,000
S-8.2.021	Peak Flow	This routine study will analyze EWPCF peak flows in comparison to the volume of secondary equalization to confirm there is sufficient equalization to maintain flows through the outfall.			X			X	NS	$ -	$ -	$ -	$ 50,000	$ -	$ -	$ 50,000
S-8.2.022	Revenue and Financial Program Evaluation	This routine study will evaluate the Revenue and Financial Program, including the flow metering and sample program.						X	NS	$ -	$ -	$ -	$ 150,000	$ -	$ -	$ 150,000
S-8.2.023	Climate Change Action Plan Update	This routine study will update the Climate Change Action Plan based on applicable federal and state regulations.		X					NS	$ -	$ -	$ -	$ -	$ 75,000	$ -	$ 75,000
S-8.2.024	Source Control Program Evaluation	This routine study will evaluate the source control program based on the terms and conditions of the EWPCF NPDES permit.		X					NS	$ 125,000	$ -	$ -	$ -	$ -	$ 125,000	$ 250,000
S-8.2.025	OT Plan Update	This study updates the current Operational Tehcnology Plan to address issues with aging infrastructure and electrical and mechanical obsolescence.			X				NS	$ -	$ 50,000	$ -	$ 50,000	$ -	$ -	$ 100,000
S-8.2.026	2040 Loading	This study will gather and evaluate wastewater flow and quality projections from EWA's six member agencies for EWPCF expansion and treatment planning.			X				NS	$ -	$ -	$ -	$ 50,000	$ -	$ -	$ 50,000
S-8.2.027	Biosolids Management Plan Update	This routine study will update the Biosolids Management Plan by investigating improvement to the management and beneficial use of biosolids generated at the EWPCF.							NS	$ -	$ -	$ -	$ -	$ 350,000	$ -	$ 350,000
S-8.2.028	Heat Dryer HAZOP	This routine study will develop a hazard and operability study to examine potential heat dryer hazard and operability issues.	X						NS	$ -	$ -	$ -	$ 125,000	$ -	$ -	$ 125,000
S-8.2.029	Technology Master Plan Update	This study will evaluate and recommend updates to EWPCF technologies to meet current technology advancements and standards.						X	NS	$ -	$ -	$ -	$ 125,000	$ 125,000	$ -	$ 250,000

Table ES-2: Overview of Projects Recommended for Implementation for FY2022 - FY2027 (continued)

Project Numbers and Titles		Project Description	Consequence of Deferment						Score	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	Total (FY22 - FY27)
			Safety	Regulatory Compliance	Reliability	Public and EWA Impacts	Energy Efficiency	Organizational Efficiency								
ES-8.3.001	E-CAMP Update	The E-CAMP provides a recommended project implementation schedule for the EWPCF for EWA to use in planning capital project improvements.	X	X	X	X	X	X	NS	$ -	$ 150,000	$ -	$ 150,000	$ -	$ 150,000	$ 450,000
ES-8.4.001	Extension of Staff Engineering Services	This routine project provides engineering services for needs that develop on an ongoing basis.						X	NS	$ 650,000	$ 650,000	$ 650,000	$ 650,000	$ 650,000	$ 650,000	$ 3,900,000
ES-8.4.002	Research and Development Projects Services	This routine project provides research and development (R&D) services associated with potential energy or resource recovery related facilities.		X		X	X		NS	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 600,000
ES-8.4.008	Electronic Operations Manual and Document Management Updates	This routine project provides updates to the Operations Manual with the upgrades made to the EWPCF and to format the material into an electronic format.				X		X	NS	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 300,000
ES-8.4.012	Air Permitting Assistance	This routine project provides air permitting services for needs that develop on an ongoing basis.		X		X			NS	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 150,000
ES-8.4.013	South Parcel Initiatives	This routine project provides annual service to support miscellaneous iniatives for the South Parcel.			X	X		X	NS	$ -	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 125,000
Totals										**$ 21,050,000**	**$ 22,390,000**	**$ 26,760,000**	**$ 27,180,000**	**$ 28,210,000**	**$ 30,400,000**	**$ 156,010,000**

1. Total project costs are rounded to the nearest ten thousand dollars.
2. Costs shown in December 2020 dollars.
3. The E-CAMP is a living, dynamic document that is updated every two years and this table is updated as part of that process.

NS = Not Scored

ES.8 Recommended Project Implementation Schedule and Cost Summary

The recommended project implementation schedule is based upon the project evaluation process and prioritized projects presented in this E-CAMP. The capital improvement budgets for projects planned for execution over the next six years, FY2022 through FY2027, are summarized in Table ES-3 by category related to the EWPCF. A detailed project implementation schedule and cost summary of the capital improvement budgets planned over the next six years, on which Table ES-3 is based, are presented in Section 7 of this report. This information is then leveraged in the budgeting process by EWA staff.

In addition, subsequent E-CAMPs will monitor and re-evaluate projects in and beyond the six-year implementation schedule provided in this E-CAMP. Common themes of these projects that should continue to be evaluated and considered include:

- Rehabilitation and replacement of aging infrastructure
- Solids process improvements
- Foundational electrical and controls improvements
- Future regulatory and industry trends (such as water reuse and pending air quality regulations)
- Improvements to impacts to the public and EWA (such as odor, sound, appearance, and traffic)

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Table ES-3: Overview of Recommended Implementation Schedule for Prioritized Projects (FY2022 - FY2027)

Project Category	FY2022	FY2023	FY2024	FY2025	FY2026	FY2027	Total FY2022-FY2027
Liquid Process	$ 6,619,000	$ 881,000	$ 1,300,000	$ 2,600,000	$ 1,300,000	$ 1,300,000	$ 14,000,000
Outfall	$ -	$ 103,000	$ 171,000	$ 103,000	$ -	$ 613,000	$ 990,000
Solids Process	$ 6,424,000	$ 10,491,000	$ 8,682,000	$ 6,790,000	$ 16,970,000	$ 20,710,000	$ 70,070,000
Energy Management	$ 519,000	$ 540,000	$ 1,138,000	$ 1,802,000	$ 3,786,000	$ 3,786,000	$ 11,570,000
General	$ 4,746,000	$ 4,852,000	$ 5,429,000	$ 3,945,000	$ 3,945,000	$ 1,600,000	$ 24,520,000
Technology	$ 1,568,000	$ 4,197,000	$ 8,944,000	$ 10,140,000	$ 410,000	$ 867,000	$ 26,130,000
Professional Services	$ 1,175,000	$ 1,325,000	$ 1,100,000	$ 1,800,000	$ 1,800,000	$ 1,525,000	$ 8,730,000
Total	$ 21,050,000	$ 22,390,000	$ 26,760,000	$ 27,180,000	$ 28,210,000	$ 30,400,000	$ 156,010,000

Notes:

1. Costs totals are rounded to the nearest ten thousand dollars.
2. Costs shown in December 2020 dollars.
3. Projected capital expenditures do not account for carry forward funds.

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