



Montecito Sanitary District WWTP Upgrade Project

May 22, 2025



Montecito Sanitary District

Agenda

- Overview of Firm
- References
- Current Overview of WWTP
- Overview of Technologies
 - Membrane Bioreactor (MBR)
 - Integrated Fixed Film Activated Sludge (IFAS) Package Plant
 - Sequencing Batch Reactor (SBR)
 - Conventional Activated Sludge (CAS)
- Comparison of Technologies
- District Objectives
- Measures Yet to be Investigated
- Project Benefits

Meet the Team



Ashu Jain, PE

(Mechanical)

Senior Manager

Years in the Industry:

40+ years

Education:

BS, Mechanical Engineering,
IIT, Kanpur, India
MBA, UCLA, CA



Boyd Gregg, PE

(Civil)

Senior Wastewater Engineer

Years in the Industry:

21 years

Education:

BS & MS, Civil Engineering,
Clemson University,
Clemson, SC



Ravi Bhaskar, PhD

Senior Wastewater Engineer

Years in the Industry:

36 years

Education:

BSc, Chemical, Loyola College,
Madras, India
MSc, Chemical, University of
Madras, Madras, India
MS, Chemical Engineering,
University of Kansas
PhD, Chemical Engineering,
University of Kansas



Amelia Cottrell

Program Development Manager

Years in the Industry:

7 years

Education:

BA, Michigan State University

ENGIE Services U.S.

Local Company with Deep History in the Central Coast

ENGIE Services U.S. has a 50-year track record of energy solutions serving public sector in CA

Full-service energy company with expertise in all renewable energy, water & wastewater process upgrades, and energy efficiency



10 dedicated in-house wastewater subject matter experts



Offers a no-risk and transparent development process



Consistent project team from ideation to completion

We are the largest ESCO in California in terms of number of in-house resources



180+

employees dedicated to energy/wastewater projects for public sector in CA



35/75

licensed/degreed engineers



30

employees providing O&M

7 Offices in CA

Pasadena Office closest to the District

500+

turnkey energy projects implemented in the last 5 years

Over 105%

actual savings compared to guaranteed

\$150 Million

in projects in the Central Coast

Why is our Approach Successful?

Decades of Experience and Qualified Team Members

- Honed this approach for the last 50 years
- In-house energy and wastewater subject matter experts
- Exhaustive process – does not miss any facility or scope
- Offers transparent pricing with our customers
- Mutually developed, as your staff knows the facilities the best
- Multiple internal reviews and approvals on scope, savings, and cost
- Minimal change orders except for changes requested by customer
- Technology neutral and vendor agnostic
- This approach has been very successful – largest ESCO in CA, over \$1 billion in projects in 5 years in CA
- In 2023, the actual savings were 105% of \$90 million guaranteed savings based on a portfolio of 246 projects

Demonstrated by multiple phases of work

Kings County	Developing Phase 5	21-year history
Compton USD	Developing Phase 6	10-year history
Chula Vista Elementary SD	2 Phases	5-year history
Hartnell College	5 Phases	12-year history
City of Hanford	Developing Phase 3	13-year history

Local Projects in the Area

\$150 Million of Work in the Region

- Santa Barbara USD – \$22.1 Million
- Santa Maria Bonita School District – \$26.5 Million
- Santa Maria Joint Union School District – \$5.3 Million
- Ventura USD – \$39.9 Million
- Lucia Mar USD - \$13.9 Million
- Paso Robles Joint USD – \$4.2 Million
- Pleasant Valley School District – \$9.6 Million
- City of Buellton – \$4.5 Million
- City of Lompoc – \$5.9 Million
- City of Simi Valley – \$9.5 Million
- City of Port Hueneme – \$3.7 Million
- City of Pismo Beach – \$4.9 Million



*Santa Barbara USD Resiliency Project Ribbon Cutting Event –
April 6, 2025*

Santa Barbara Unified School District, CA

Contract Amount – \$22.1 Million

Need for Resiliency

After the 2017-18 Thomas Fire, District staff at Santa Barbara USD, a southern California school district of 15,000 students, faculty and staff, started looking into energy resiliency solutions to preserve critical operations during emergencies and power outages

Solution

In a competitive RFP process, ENGIE was selected for its comprehensive solar PV and microgrid solution:

- 4.2 MW of solar PV across 14 District locations and 6 microgrids with 5.7 MWh of battery energy storage for resiliency (backup power) and peak demand charge reduction services
- Complete system design, installation and maintenance – including a deep analysis and prioritization of critical loads
- 28-year, no money down, Power Purchase Agreement (PPA) with performance guarantees

Benefits

- Ability to **operate critical facilities during power outages** – backing up lighting, food storage, data and communication systems
- **Reduced utility bills** with about 90% of the District's energy needs met by solar.
- An **affordable, low-carbon** energy resiliency solution backed by **performance guarantees**
- Expert operations and maintenance requiring **minimal District staff time**



Yucaipa Valley Water District, CA

Contract Amount – \$31.0 Million

Opportunity

The YVWD provides a combination of water, sewer, and recycled water connections to more than 22,000 ratepayers in the Inland Empire. The project will significantly improve the District's capacity to serve residents, keep rates stable, and hedge against rising energy costs. It is designed to meet the District's long-term resiliency goals and ensure safe, reliable power to key facilities during public safety power shutoff (PSPS) events

Solution

ENGIE Services U.S. proposed a comprehensive resiliency program:

- 7.5 MW of solar PV across 2 sites
- 13.2 MWh of battery storage across 2 sites
- 3.25 MW of natural gas backup gensets across 2 sites
- Complete system design, installation and maintenance – including a deep analysis and prioritize of critical loads
- 28-year, no money down, Power Purchase Agreement (PPA) with performance guarantees

Benefits

- \$73 Million in savings over the program life
- Reduces District electricity spend by approximately 78%
- Provides resiliency for critical facilities paid out of project savings
- Free 4-hour battery storage systems due to Self Generation Incentive Program
- Expected to reduce carbon emissions equivalent to removing 2,104 cars from highways annually



City of Milpitas, CA

Contract Amount – \$35.0 Million

Opportunity

The City of Milpitas is a Silicon Valley community of about 84,000 residents. As part of an ongoing effort to maintain and improve public services, City leadership solicited innovative ways to improve public facilities and infrastructure, reduce operating costs, and positively impact the local environment

Solution

ENGIE Services U.S. proposed a comprehensive smart city program including:

- 200 kW solar PV system, resilient microgrid solution and electric vehicle charging stations
- 15,600 advanced metering infrastructure (AMI) water meters with leak detection, water, wastewater, and stormwater management SCADA system, touchless efficient water fixtures
- 2,185 LED streetlight retrofits & controls upgrades with outage detection; LED lighting upgrades in parks, sports fields, and buildings
- Integrated community impact program; O&M and performance guarantees



Benefits

- \$50 million in net savings over the life of the program
- Improves city services and infrastructure for residents and businesses
- Energy resiliency (back up power) for community centers
- Addresses safety, efficiency, and climate action goals
- Provides workforce and education opportunities



West County Wastewater District, CA

Contract Amount – \$69.1 Million

Need for Sustainability and Cost Reduction

This wastewater district in California's Bay Area set aggressive goals to reduce greenhouse gas emissions. They also faced looming state regulations on short-lived climate pollutants (SLCP) and wanted to reduce ongoing disposal costs. A comprehensive plan was developed with ENGIE Services U. S. to include improvements to energy infrastructure and plant processes

Solution

ENGIE Services U.S. will implement all plant improvements and maintain the equipment for 20 years under an energy savings performance contract.

Project includes:

- Wastewater Treatment Process Upgrades: New Grit Separation System, Rotary Drum Thickeners, High Efficiency Aeration Blower, New Digesters, 450 kW Cogeneration System, Sludge Dewatering System, Sludge Thermal Dryer System, Equalization Basins
- 1.1 MW of onsite solar power generation
- Upgrades to LED lighting
- New EV charging stations
- Battery energy storage



Benefits

- **\$83 million** forecast in net program life savings
- **4.2 million kWh** energy reduction guaranteed per year
- **93% reduction** in greenhouse gas over the life of the program
- Reduced disposal costs, less waste, and a new revenue stream via **Class A biosolids production**
- Robust community impact program that is inclusive of internship opportunities and career pathways for high school and college students, especially women, in the wastewater industry



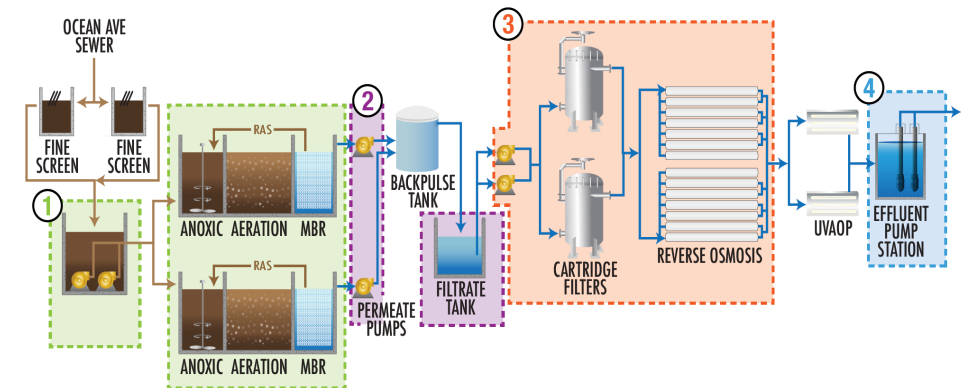
PACE | Advanced Water Engineering

– About PACE

- Specialized water resources civil engineering firm
 - Advanced water and wastewater treatment design experience
 - More than 40 new or expanded wastewater treatment facilities designed in the past 10 years
 - Experience with numerous process evaluations using Biowin modeling and electrical demand studies
 - Alternatives assessments and energy efficiency studies to maximize improvement value
 - Emphasis on constructability and operability of treatment facility designs
- Notably: Specializes in advanced conversions of brown field sites to modernized facilities for recycled water, specifically several MBR conversions in California with reduced disinfection requirements using field validation studies. Examples include City of Lathrop, City of Mountain House, City of Patterson, City of Chumash. Greenfield MBRs nearby include City of Santa Monica and City of Santa Paula

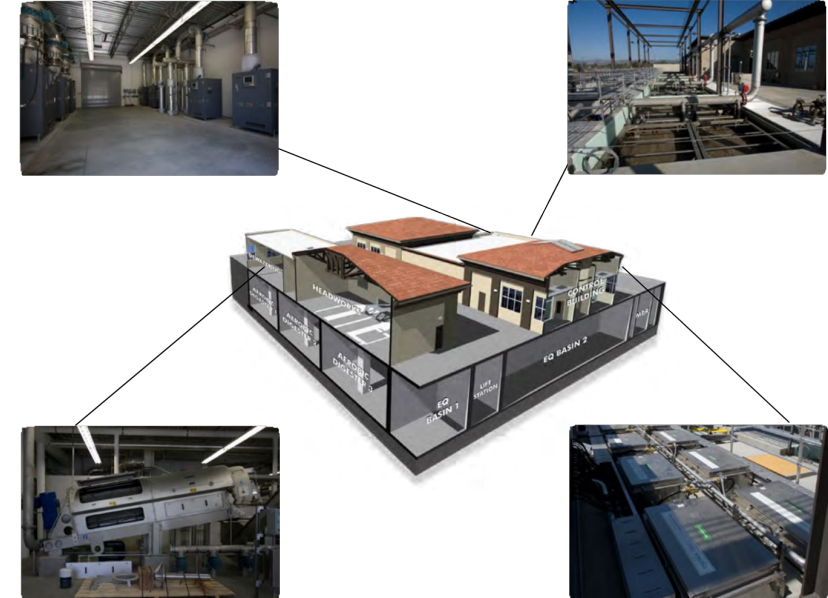
PACE – Santa Monica Sustainable Water Infrastructure Project

- PACE is responsible for the design of the Advanced Water Treatment Facility (AWTF) that is a key component of the City of Santa Monica's Sustainable Water Infrastructure Project (SWIP)
- The AWTF treats a combination of raw wastewater and harvested stormwater, producing 1.0 MGD of purified water for groundwater augmentation
- The facility is one of the first to take in raw wastewater, fully oxidize the stream via biological treatment, and provide the pathogen reduction requirements to meet California Title 22 regulations for Indirect Potable Reuse (IPR)
- The treatment process consists of a five-barrier stream: membrane bioreactor (MBR), cartridge filtration, reverse osmosis (RO), ultraviolet advanced oxidation process (UVAOP), and chlorine disinfection
- **Advanced Elements**
 - Sustainable production of 1,680 AFY through Indirect Potable Reuse
 - 50% reduction of City's dependence on imported water
 - Improve beach water quality by storing and treating first flush stormwater for reuse
 - Minimal space and visual impact through underground installation, making it ideal for urban location



PACE – Santa Paula Water Recycling Facility

- The Santa Paula WWTP is one of the largest Membrane Bioreactor (MBR) facilities in California and features all-enclosed treatment made possible by innovative common-wall design and creative redundancy features
 - The state-of-the-art 4.2 MGD MBR treatment facility ensures a neighbor-friendly facility both in terms of aesthetics and odor. The treated effluent meets California's stringent Title 22 effluent requirements allowing for full reuse opportunity or groundwater recharge
- **Advanced Elements**
 - One of the largest operating MBR facilities in California that produces high quality effluent exceeding CA Title 22 Recycled Water Standards for unrestricted reuse
 - Common wall construction and covered underground process tanks further minimizes site footprint while providing thermal insulation and odor control of the biological process
 - Architectural design and water features provide an aesthetically pleasing element for the community as opposed to traditional WWTP concrete clad design
 - Received a \$500,000 energy grant from SCE for the installation of turbine blower technology coupled with fine bubble membrane aeration system, which maximizes aeration efficiency and significantly reduces aeration power
 - Award recognition by Global Water Intelligence, Design Build Institute of America and the Environmental Business Journal

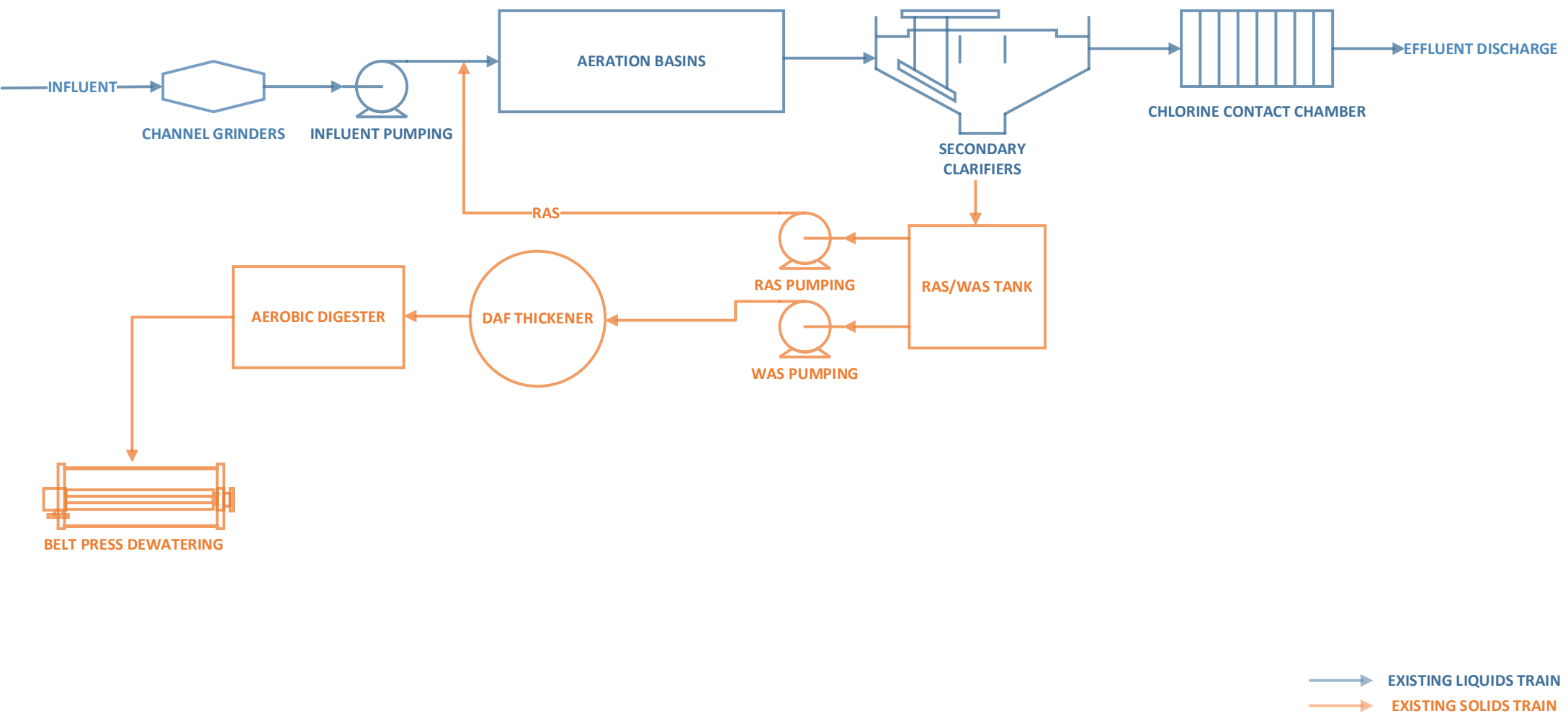


WWTP Measures – Existing Condition

- Old equipment – prone to failure and no redundancy
- No influent screening – causing ragging issues in the plant
- No grit removal – causing inefficiency and increased maintenance in downstream processes
- Inefficient aeration technology – resulting in higher energy costs
- High chemical usage for disinfection and dichlorination
- Concrete is structurally deficient and in need of replacement
- Obsolete motor control technology
- Obsolete SCADA system
- Existing process not capable of producing Title 22 water



Existing Process Flow Diagram

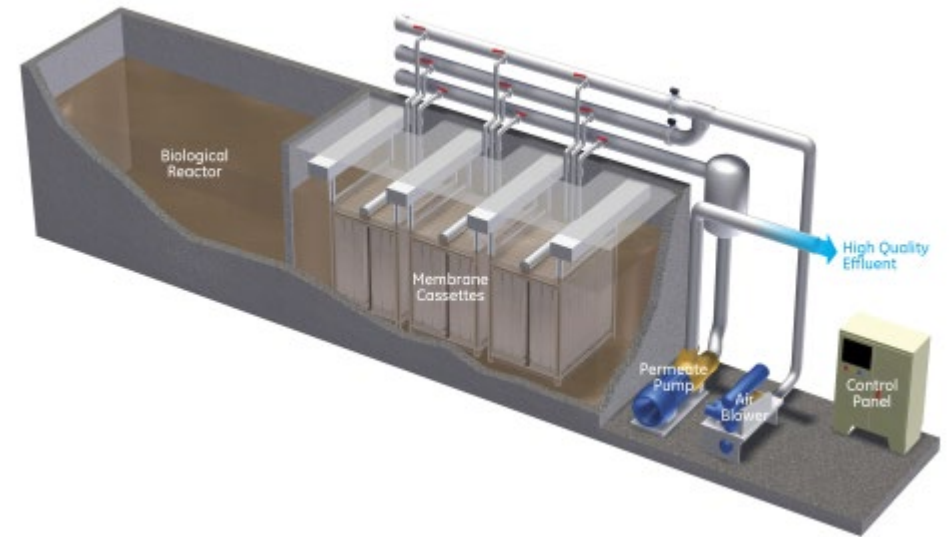


Technology Evaluation

- Membrane Bioreactor (MBR)
- Integrated Fixed Film Activated Sludge (IFAS) Package Plant
- Sequencing Batch Reactor (SBR)
- Conventional Activated Sludge (CAS)

Membrane Bioreactor (MBR) Scope

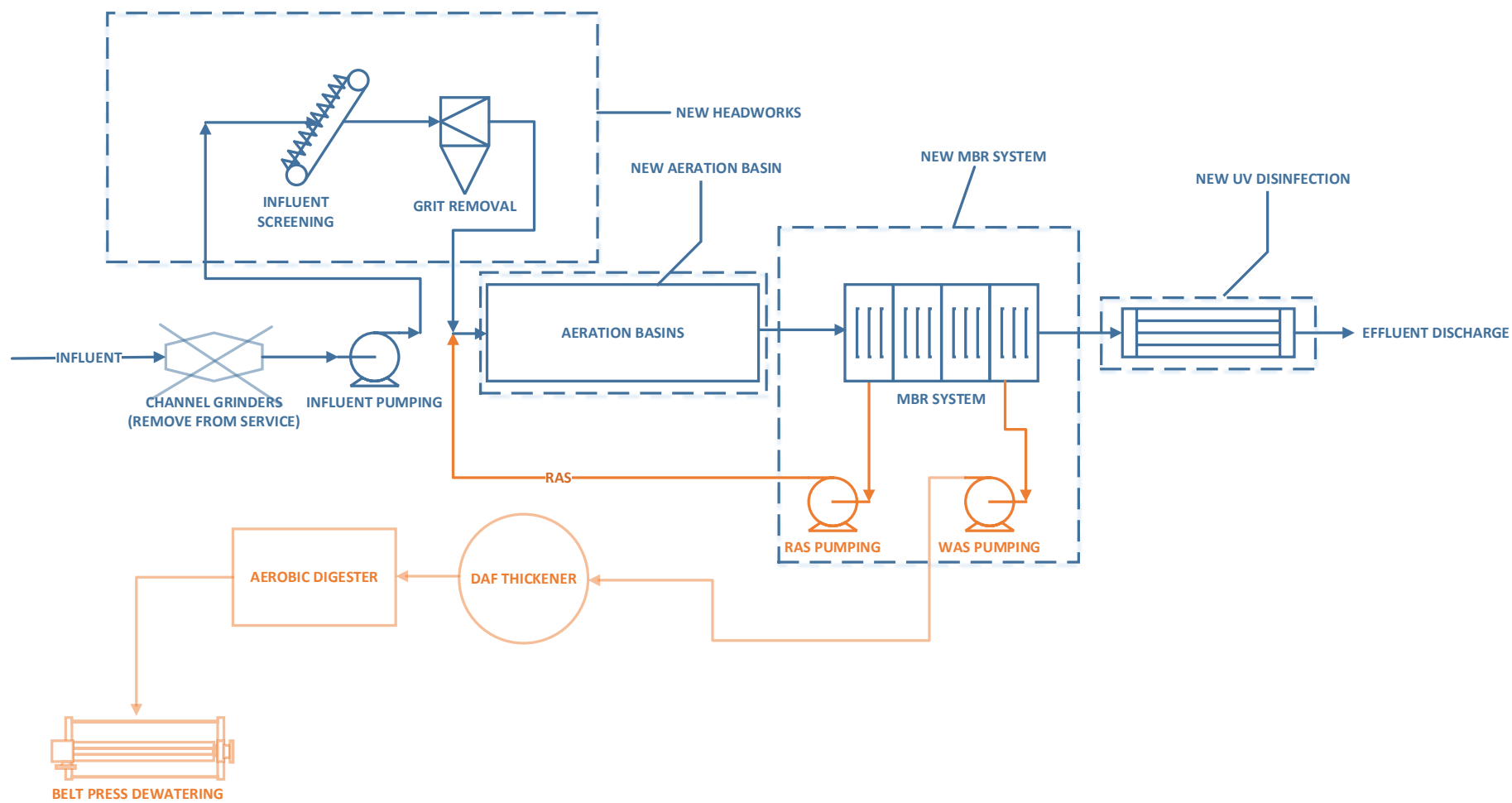
- Two (2) 0.75 MGD MBR trains
- Build a new headworks with coarse screening, fine screening, and grit removal
- Demolish existing aeration basins and clarifiers
- Replace clarifiers with MBR System
- Build new aeration basins
- RAS/WAS Pump Station would be incorporated into the MBR system
- Build a new UV disinfection facility



Proposed MBR Site Layout



Proposed MBR Process Flow Diagram



Integrated Fixed Film Activated Sludge (IFAS) Package Plant Scope

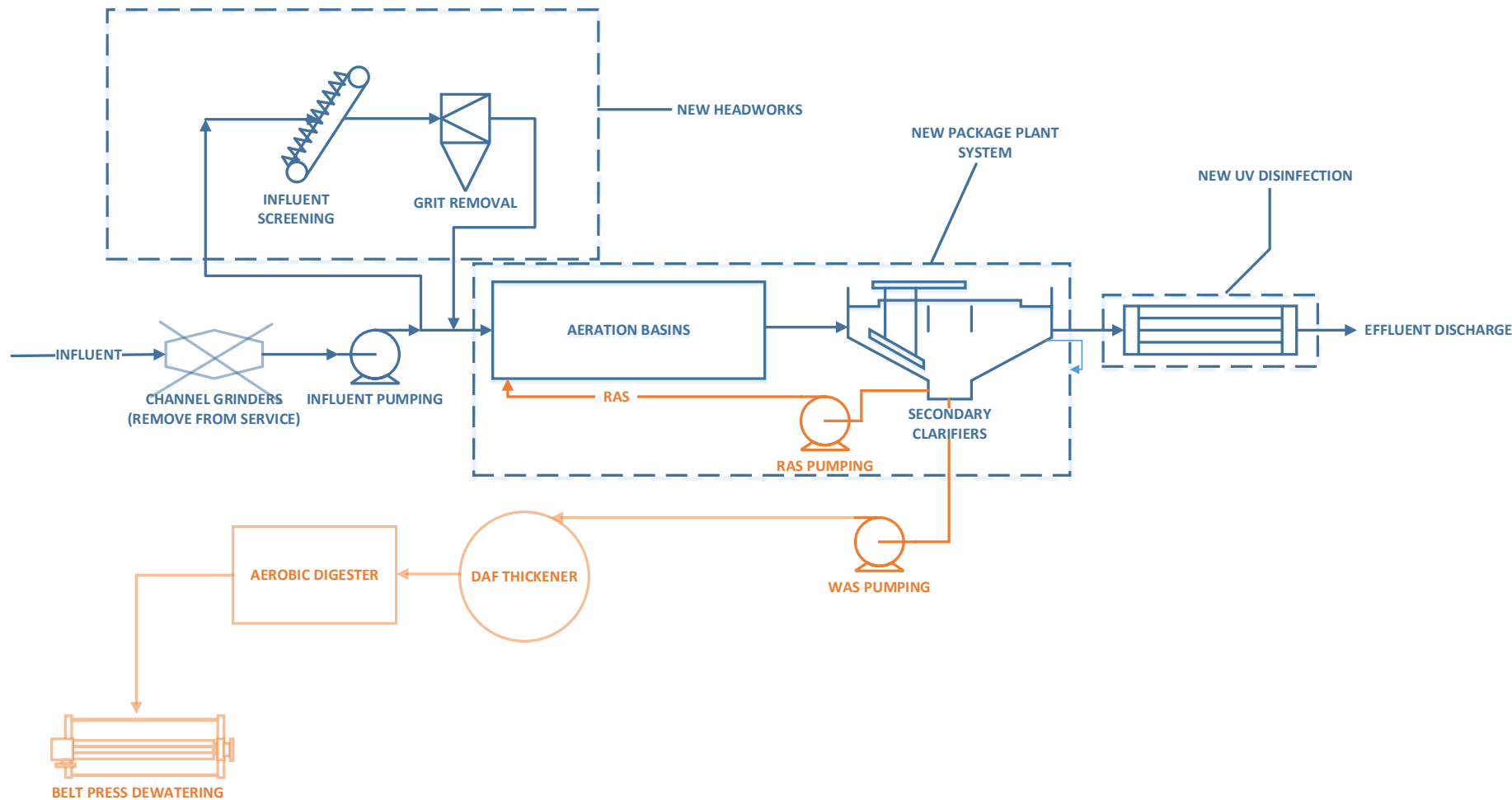
- Capacity – Two (2) 0.75 MGD package plants
- Build a new headworks with screening and grit removal
- Demolish existing aeration basins and clarifiers
- Build Package Plant with integrated IFAS and Clarifier system
- RAS/WAS Pump Station and blowers would be incorporated into the package plant
- Build a new UV disinfection facility



Proposed IFAS Package Plant Site Layout



Proposed Package Plant IFAS Process Flow Diagram



Sequencing Batch Reactor (SBR) Scope

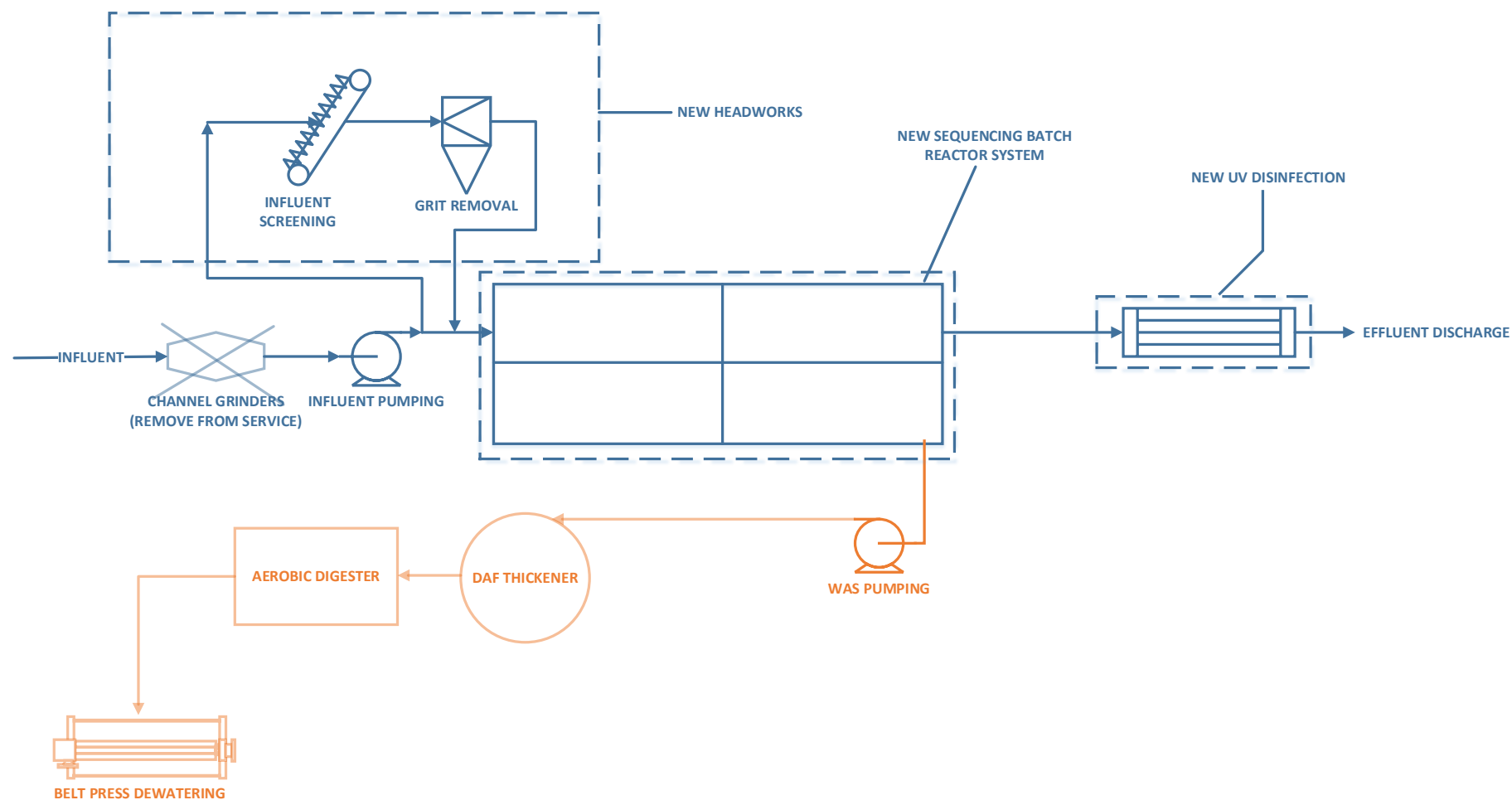
- Capacity – Two (2) 0.75 MGD reactors
- Build a new headworks with screening and grit removal
- Demolish existing aeration basins and clarifiers
- Build SBR plant with two cells
- RAS/WAS Pump Station and blowers would be incorporated into the SBR system
- Build a new UV disinfection facility



Proposed Sequencing Batch Reactor Site Layout



Proposed Sequencing Batch Reactor Process Flow Diagram



- NEW LIQUIDS TRAIN
- EXISTING LIQUIDS TRAIN
- NEW SOLIDS TRAIN
- EXISTING SOLIDS TRAIN

Conventional Activated Sludge Scope

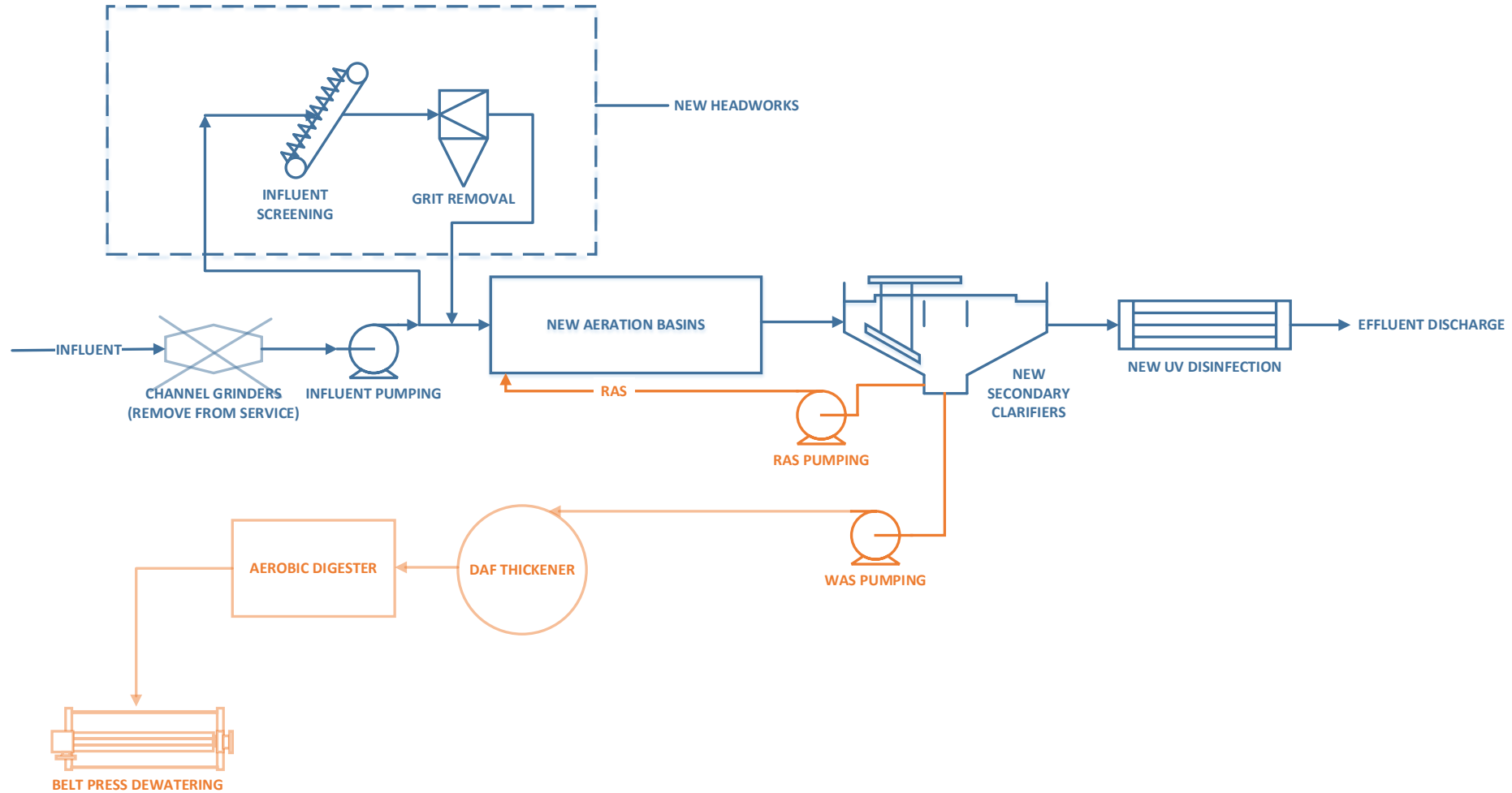
- Capacity – Two (2) 0.75 MGD treatment trains
- Build a new headworks with screening and grit removal
- Demolish existing aeration basins and clarifiers
- Build new aeration basin with fine bubble diffused air
- Build new blower building
- Build new secondary clarifiers
- Build new RAS/WAS pump station
- Build a new UV disinfection facility



Proposed Activated Sludge Site Layout



Proposed Activated Sludge Process Flow Diagram



Headworks Scope – Applicable to all Technologies

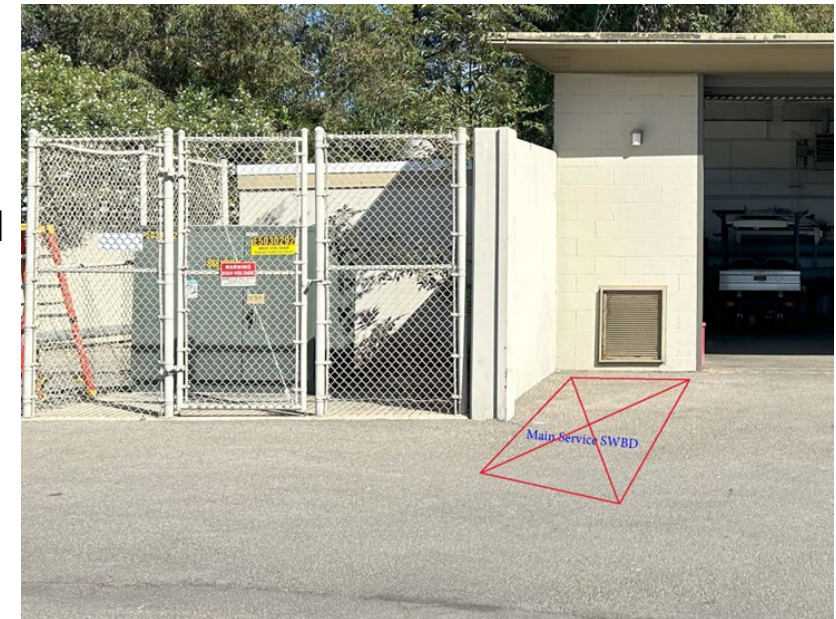
- Build a new headworks with screening and grit removal
- Benefits include:
 - Prevent grit and rags from entering the treatment train
 - Dramatically improve efficiency of aeration by allowing fine bubble diffusers to be installed
 - Reduce maintenance costs incurred by periodically lifting up and cleaning existing diffuser arrays



Electrical Gear Upgrade

Proposed New 800A Main Service Switchboard

- MCC-1 is serving as main service panel (600A 480V 3-phase 3-wire) with outdated feeder breakers
- New main service switchboard to be rated 800A 480/277V 3-phase 4-wire with electronic trip unit and ground fault protection
- Free up space in Operation Room by removing old MCC-1 and alarm panel
- New 800A switchboard will have reserve capacity for future plant loads
- Dedicated feeder breaker with electronic trip unit to supply 480 volts to each MCC
- Single integral 600A ATS switch to back up the entire plant with existing standby emergency generator
- Eliminate the need for separate ATS for each MCC
- Integral IntelliCenter integration unit to monitor power supply feeder breakers to all MCCs
- Integral surge protective device and power meter
- State-of-the-Art technology Allen-Bradley IntelliCenter MCCs to replace existing MCCs
- Integral PowerFlex variable frequency drives for influent pumps



WWTP Operation Room

New Rockwell Automation System (SCADA)

- Desktop server class PC with server OS
- 24" wide screen monitor, keyboard & hard-wired mouse
- Display server and FactoryTalk View
- Studio 5000 Professional Software
- Ethernet cables redundant network
- Wall mount alarms display panel & Auto Notifier
- Compact Logic L3 processor controller



SOFTWARE

FactoryTalk View Site Edition

**Display Server with
FactoryTalk View**



VIDEO

Studio 5000 Design Software

Studio 5000 Professional



BROCHURE

Studio 5000 Infographic

**Studio 5000 Graphics
and Alarms**

Technology Comparison

	MBR	IFAS	SBR	CAS
Benefits	• Largely automated system, preferred by operators • Ability to produce Title 22 Water • Lower chemical usage • Lower aeration volume • Full redundancy • Improved screening and grit removal	• Package plant would reduce construction time and cost • Lower chemical usage • Lower aeration volume • Full redundancy • Improved screening and grit removal	• Lower chemical usage • Lower aeration volume • Full redundancy • Improved screening and grit removal	• Most similar to existing operations • Lower chemical usage • Lower aeration volume • Full redundancy • Improved screening and grit removal
Challenges	• Locked into membrane vendor for life of system	• Highest energy cost • Managing biomass will be challenging for operators • Steel tank construction will degrade over time/less resilient	• Most operator intensive system	• Largest footprint and would be most challenging to construct
Project Completion Time	2.5 years	2.0 years	2.5 years	3.0 years
Capital Cost	\$34.6 Million	\$29.5 Million	\$31.2 Million	\$37.2 Million
NPV of Net Savings over Project Life	\$583,467	\$(7,031,065)	\$460,662	\$(9,434,245)

Recommendation : MBR, because of small footprint, ease of construction, ability to produce Title 22 water, Aquifer Storage Recovery (ASR) eliminates need for ocean outfall, most automated system, and lowest odor potential

Regulatory/Permitting Process

- District operates under NPDES permit CA0047899 issued by the Central Coast Regional Water Quality Control Board – Permit expires 10/31/2027
- ENGIE will initiate discussions with the Regional Water Quality Control Board during preliminary design
- A Report of Waste Discharge will be presented along with final design
- ENGIE and the District will jointly apply for an Authority to Construct (ATC)
- ATC will detail monitoring and reporting requirements during the construction period
- After construction, a permit to operate (PTO) and a modified NPDES permit will be issued

Objective 3: Development of a Comprehensive Project & Reasonable Implementation Timeline

- Repair of Existing Plant is Financially Infeasible
 - Old equipment
 - Concrete is structurally deficient
- This Comprehensive Project Ensures Continuous Plant Operations
 - Phased, integrated planning keeps the WWTP running during construction
- Faster, More Cost-Effective
 - Bundled scope reduces costs, shortens timelines, and avoids rework
- Simplifies Permitting and Coordination
 - One cohesive plan streamlines regulatory and stakeholder processes
- Single Source Accountability
 - ENGIE is responsible for the entire project—from design through construction. No finger-pointing between engineer, contractor, or vendors
 - This is our specialty—delivering performance-based, cost-effective infrastructure upgrades with long-term value
- Our Solution is Aligned with District Objectives
 - Operational continuity
 - Long-term performance
 - Budget efficiency

Objective 4: District and ESCO Team Collaboration

- District Involvement Is Essential
 - District staff understands the WWTP operation the best
 - We fully support active District participation from design through construction
- Joint Decision-Making on Equipment & Design
 - ENGIE presents vetted technology and equipment options with performance data
 - The District has the final say on design, equipment makes, and subcontractor selection
- Structured Transparent Collaboration
 - Regular design workshops and review checkpoints
 - Seamless communication throughout development and construction
 - ENGIE uniquely offers open-book pricing
- Guided by ESCO Expertise
 - We bring deep technical knowledge in WWTP technologies, site layouts, and equipment selection
 - We align solutions with operational goals, budget, and lifecycle cost
 - We manage risk, guaranteed results and deliver long-term value

Objective 5: Project Phasing and Funding

- Collaborative Approach: ENGIE works closely with the District to discuss financing at every project phase, ensuring alignment with funding timelines and budget needs
- Transparent Pricing: Total project cost is known upfront, with full disclosure of all costs and profit margins
- Phased Milestones: Project is structured in clear phases in construction and each tied to specific payment milestones
- In-House Financial Expertise: ENGIE's finance team tracks grants, utility rebates, and market trends to optimize funding opportunities
- Proven Funding Success: Over the past 5 years, ENGIE has secured \$400M+ in state and utility funding for California clients
- Flexible Funding Strategy: We are funding-agnostic and experienced with nearly every type of funding—cash, grants, TELPs, COPs, and more
- Value Engineering: We will offer value engineering ideas to lower cost without compromising on quality

Measures Yet to be Investigated

- Solar PV
- EV Chargers
- Microgrid

Project Benefits

- Expedite project completion by a year – Reduce the impact of high inflation in construction costs
- ENGIE Services designs the project and develops turnkey proposal at risk
- Provide a hedge against rising electricity costs which are expected to increase substantially in the future
- Address critical infrastructure needs by doing WWTP upgrades paid out of project savings
- Use energy and operational savings to offset capital costs
- Guaranteed energy savings and performance
- Total project price known before investing any dollars
- Transparent pricing process with full disclosure of all costs and profit margin
- No low bid requirement – work with a company with a long, successful history
- Flexibility & collaboration – No requirement of low bid; use District preferred consultants, subcontractors and equipment
- Single source accountability – ENGIE Services is responsible for the entire project; no pointing fingers between Design Engineer and Contractor
- Communication and PR support to share positive story with community

Contact Information

Ashu Jain, PE

Senior Manager
ashu.jain@engie.com
(714) 473-7837

Ravi K. Bhaskar, PhD

Senior Wastewater Engineer
ravi.bhaskar@engie.com
(913) 484-4547

Boyd Gregg, PE

Senior Wastewater Engineer
boyd.gregg@engie.com
(843) 408-9798

Amelia Cottrell

Program Development Manager
amelia.cottrell@engie.com
(616) 901-6183



ENGIE Services U.S.
35 North Lake Ave., Ste 900
Pasadena, CA 91105