ENCINA WASTEWATER AUTHORITY

Serving North San Diego County

Vision for 2040

(2040 Master Plan)

Executive Summary

July 2014

Prepared by:

BLACK & VEATCH
Building a world of difference.®

B&V PROJECT NO. 178042

This Master Plan is designed to guide Encina Joint Facilitles planning for a wide range of possible conditions.

Master Plan Overview

The Encina Wastewater Authority (EWA) is pleased to present this innovative 2040 Master Plan (Master Plan). A key challenge with traditional Master Plans is maintaining relevance as conditions change. The past decade has emphasized this challenge and how quickly, and significantly, conditions can change. Recent examples include:

- Rapid technological innovation
- Global-scale economic downturn
- Lower regional electrical generation capacity
- Electricity deregulation and escalation
- Unprecedented droughts
- Land disposal restrictions

Therefore, EWA approached this Master Plan differently than previous master planning efforts. The primary objective of this Master Plan was to consider broad scenarios and specific tactics to guide future facility planning for expected conditions as well as a set of selected alternative scenarios.

Photo: The Encina Water Authority Headquartes, Carlsbad, CA.

Vision and Focus

EWA's Vision is: "Together, we are a model of excellence and innovation." This Vision is anchored in achievement across the four Strategic Focus Areas specified in EWA's Business Plan:

- Environmental Performance
- Effective and Motivated Workforce
- Asset Management
- Continuous Improvement

The Master Plan supports EWA's Vision: Together, we are a model of excellence and innovation

EWA is a joint powers agency headquartered in Carlsbad, California. EWA's alliance includes six (6) member agencies: the City of Carlsbad, the City of Vista, the Buena Sanitation District, the Vallecitos Water District, the Leucadia Wastewater District, and the City of Encinitas. EWA and its member agencies provide services to the 358,000 citizens who reside in its 123 square mile service area of northwest San Diego County.

EWA's primary function is to operate, maintain, and administer the the Encina Water Pollution Control Facilities (EWPCF). The EWPCF includes regional treatment, water recycling, energy production, fertilizer manufacturing, and ocean outfall facilities. The EWPCF were developed in five phases - the most recent completed in 2009. EWA also operates the Carlsbad Water Reclamation Facility and four regional pump stations.

Branding Platform

As an environmental leader, EWA is committed to the delivery of clear, engaging, and consistent messaging to its customers, the clean water community, and the public. EWA developed a unified brand platform that leverages the success of PureGreen Organic Nitrogen Fertilizer to drive communication about its services and products. The brand platform aligns with EWA's Mission and Vision.

This Master Plan complements EWA's Unified Brand Platform.

EWA Leadership and Awards

EWA promotes excellence and innovation across its enterprise with an emphasis sound planning, operational efficiency, and collaborative partnering. Adopting the scenario based planning approach set forth in this Master Plan is just one of many examples of industry leadership.

EWA has received over 40 diverse awards over the last 10 years. These awards include being named the state's top Large Plant of the Year two of the past three years, and receiving awards for safety, public education, green power, Pacific Ocean discharge permit compliance, financial reporting, as well as excellence in engineering and operations.

The consistency and diversity of these accolades showcase why EWA leadership is important at the local, regional, and industry level.

The Headquarters Lobby highlights EWA's industry awards and recognition of achievements.

Scenario Planning

A scenario planning approach was used to in developing this Master Plan. This is a broader, more robust planning method than previous EWA master plans. It is broader because the process forces the consideration of alternative potential conditions, and, more robust because the resulting plan includes methods for addressing the broader set of potential future conditions.

Scenario planning starts by considering possible future conditions the organization may have to operate within. This is accomplished by asking two questions. First, what are the expected future conditions? Second, what other conditions could occur that warrant planning? These are not easy questions to answer. For example, the past ten years have provided numerous challenges for public utilities, such as: rapidly evolving technology, financial constraints, power cost escalation, regulation uncertainty, and water scarcity. Therefore, scenario definition is a critical part of the planning process. Once scenarios are defined, tactics can be developed to address or mitigate these possible conditions. This process was carried out in part through three workshops held as part of this study. All workshops were designed to promote valuable discussions, debate, creative ideas, and diversity of thought.

Baseline and Adaptive Scenarios

The Baseline Scenario is the set of conditions most likely to be experienced by EWA in the future. Examples of these conditions included anticipated population growth rates, cost escalation, and regulatory requirements. In past master plans, this was the only scenario considered. For this Master Plan, Adaptive Scenarios were also considered.

Adaptive Scenarios are defined as a set of conditions that were deemed plausible and highly impactful, but less likely to occur compared to the baseline conditions. A total of ten adaptive scenarios were initially identified and, after screening, four were selected to be included in this Master Plan.

The Baseline Scenario is the expected set of conditions that EWA will face.

Four adaptive, "what-if" scenarios were also planned for.

Tactic Development

Tactics are specific actions that can be implemented to address one or more of the scenarios. As the Master Plan evolved, over 100 tactics were developed by workshop participants and the technical team. These tactics were organized and prioritized into the following categories:

Prioritized Tactics

- **Best Practices Tactics:** These are tactics that are more organizational in nature such as continuing to be an employer of choice or monitoring regulatory trends. All best practices tactics are recommended regardless of the future scenario.
- **Baseline Tactics that Require Study:** These are tactics that appear to provide value, but require more study prior to full implementation.
- **High Priority Baseline Tactics:** These are tactics that are deemed to be highly effective in addressing baseline conditions and should be implemented via the annual Comprehensive Asset Management Planning (CAMP) and budgeting processes.

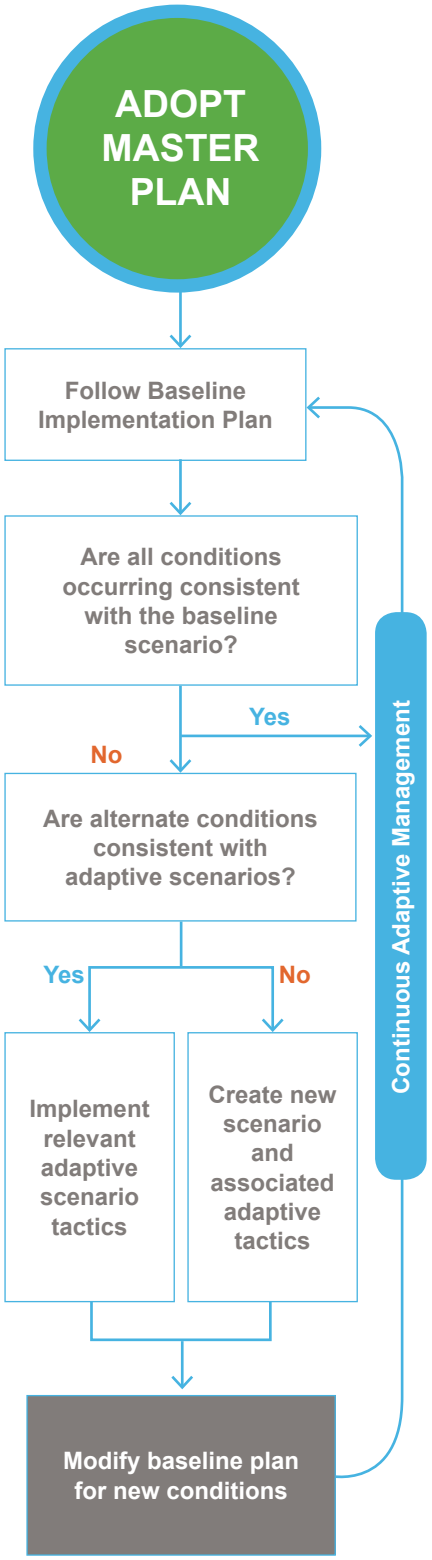
Other Tactics

- **Lower Priority Baseline Tactics:** These are tactics that should be implemented if funding is available, or in some cases, if the tactic can be efficiently implemented in coordination with another tactic or project.
- **Adaptive Tactics:** Tactics implemented if an adaptive trigger event occurs.

Adaptive Aspects of the Plan

The inset graphic outlines the process EWA will use to execute the guidance provided in this Master Plan. The process focuses first on the Baseline Scenario. If conditions that vary from the Baseline Scenario occur, the adaptive management steps begin. This process enables the report to function as a dynamic planning framework, providing the ability to add scenarios and tactics as future conditions arise. The process culminates with defining a new baseline scenario. The result is a constantly evolving plan that continuously aligns and prepares the organization for the future.

This Master Plan includes a process for adapting to unexpected scenarios.



The Encina Water Pollution Control Facilties (EWPCF) has a rated capacity (the maximum amount the treatment plant is permitted to process) of about 41 million gallons per day (mgd). The EWPCF is designed to treat stronger wastewater concentrations in support of its Member Agencies' upstream water recycling programs which result in more concentrated influent water.

The EWPCF has sufficient capacity through the 2040 planning horizon.

Influent flow and loading projections were developed through to guide infrastructure planning decisions. In order to provide a range of possible flow and loading conditions, multiple scenarios were developed. These include historical trends, continued conservation, and expanded upstream reuse. The resulting 2040 projected flow (the amount of flow expected to reach the plant) ranges from 24 mgd to 37 mgd, which is less than the current plant capacity of 41 mgd. The total flow expected when the service area is completely developed (referred to as build-out) is 43 mgd, however, this is not expected to occur within the 2040 planning horizon of this Master Plan.

Changing Viewpoint – from Waste to Resource

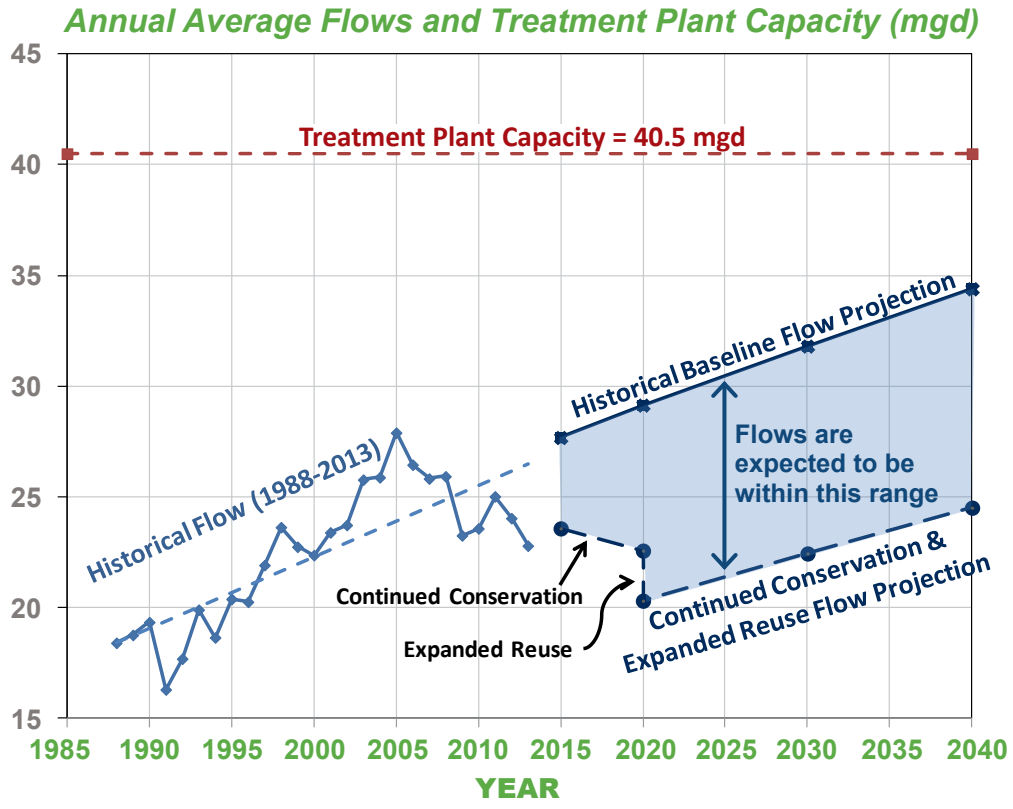
Flows to any treatment plant similar to EWPCF were historically considered wastes – something to be treated and disposed. Leading organizations have recognized that these flows are in fact a resource and this view has shifted the way clean water facilities are planned, designed, and constructed. The goal is to benefit ratepayers and the community at large through maximizing the resources available. EWA has been a leader in these areas, with particular recognition for its award winning “Pure Green” fertilizer and onsite energy production. This master plan continues this focus, with several tactics to further maximize biosolids (fertilizer) use and energy generation; and expand opportunities for water and nutrient recovery.

FLOW PROJECTIONS

This chart summarizes historical and projected flows for the EWPCF.

Based on these projections, the EWPCF will have sufficient liquid and solids treatment capacity beyond the planning horizon.

Influent flow trends will be monitored each year and capacities addressed accordingly.

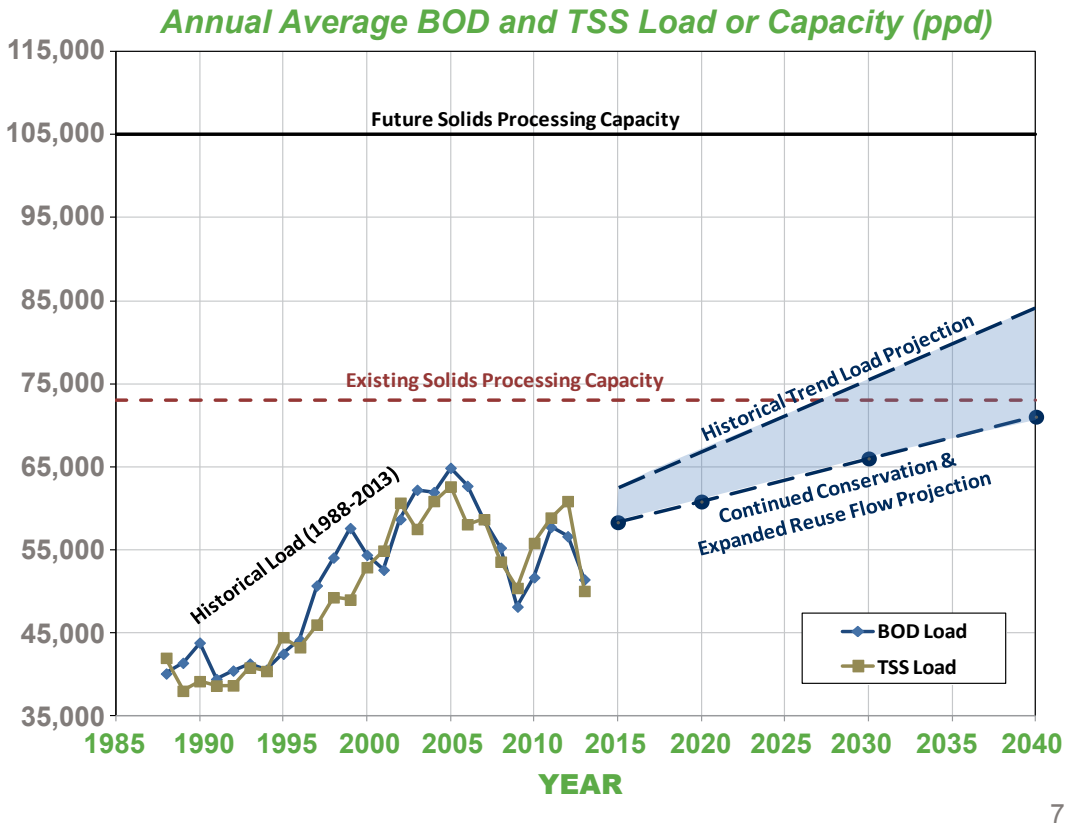


LOADING PROJECTIONS

This chart smmarizes historical and projected loading for the EWPCF.

Loading parameters are a means of determining appropriate clean water infrastructure design and permit standards. The parameters are Total Suspended Solids (TSS) and Biochemical Oxygen Demand (BOD).

Loading trends will be monitored each year and capacities addressed accordingly.



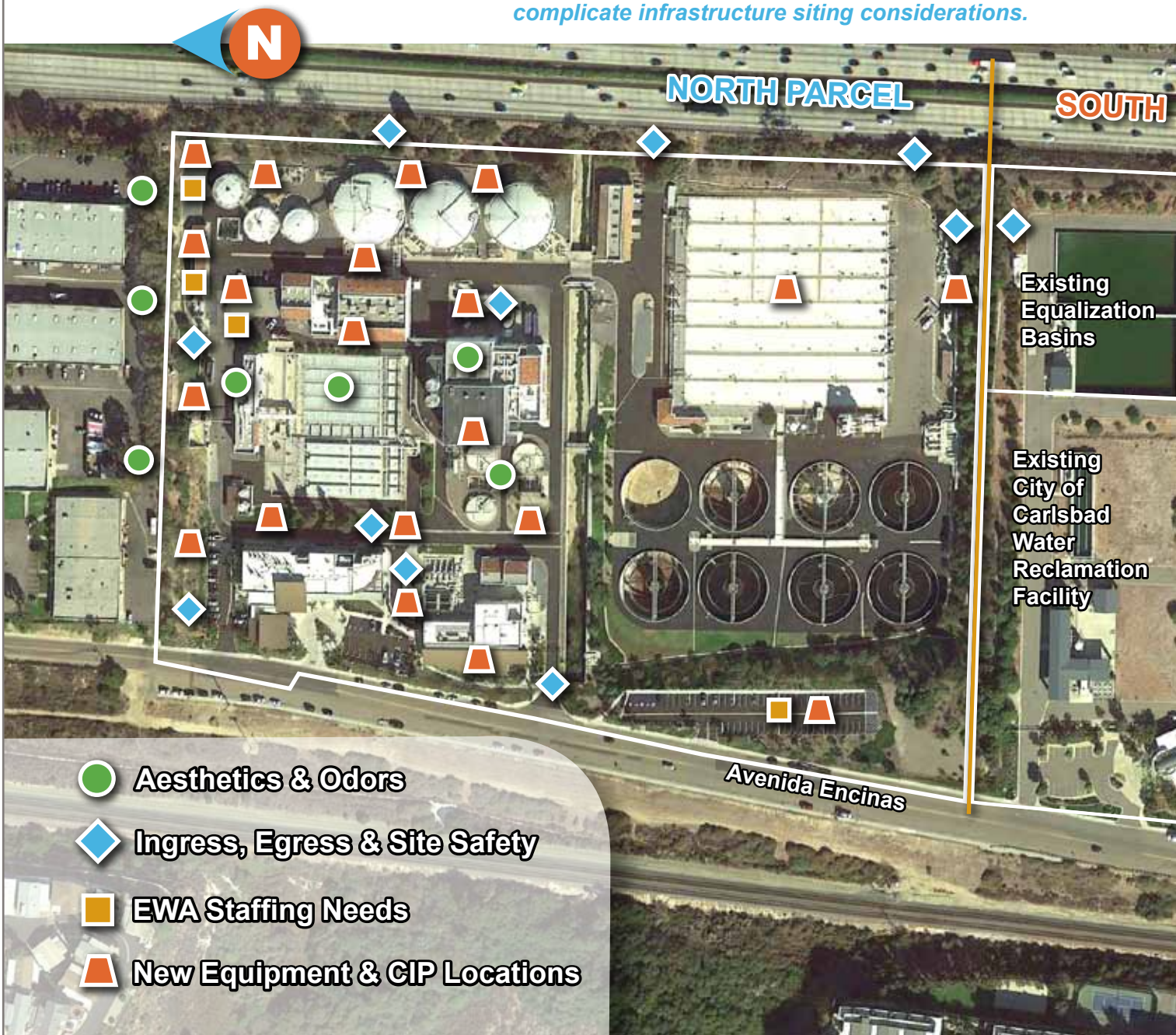
The Encina Water Pollution Control Facilites (EWPCF) is the largest and most complex iinfrastructure system operated by the EWA. The site is bounded by residences, businesses, Interstate 5, and the Pacific Ocean, in an area slated for intensive community development activity in the coming years. Therefore, siting considerations and constraints warranted specific attention in this Master Plan.

North Parcel Siting Considerations

The North Parcel is heavily developed, so siting considerations focused on space optimization, as well as impacts from offsite development, such as the expansion of Interstate 5.

- Aesthetics (offsite odor/visual impacts)
- Ingress, egress, site safety (site access, traffic flow, parking)
- Staffing space needs (office space expansions, building repurposing)
- Proposed treatment facilities (gas conditioning, alternative fuel drop off station)

The EWPCF is complex and site constrained - these factors complicate infrastructure siting considerations.



South Parcel Siting Considerations

The South Parcel is virtually undeveloped, so siting considerations focused on identifying potential uses. Pending adoption of the General Plan Update by the City of Carlsbad, proposed uses for the South Parcel could include:

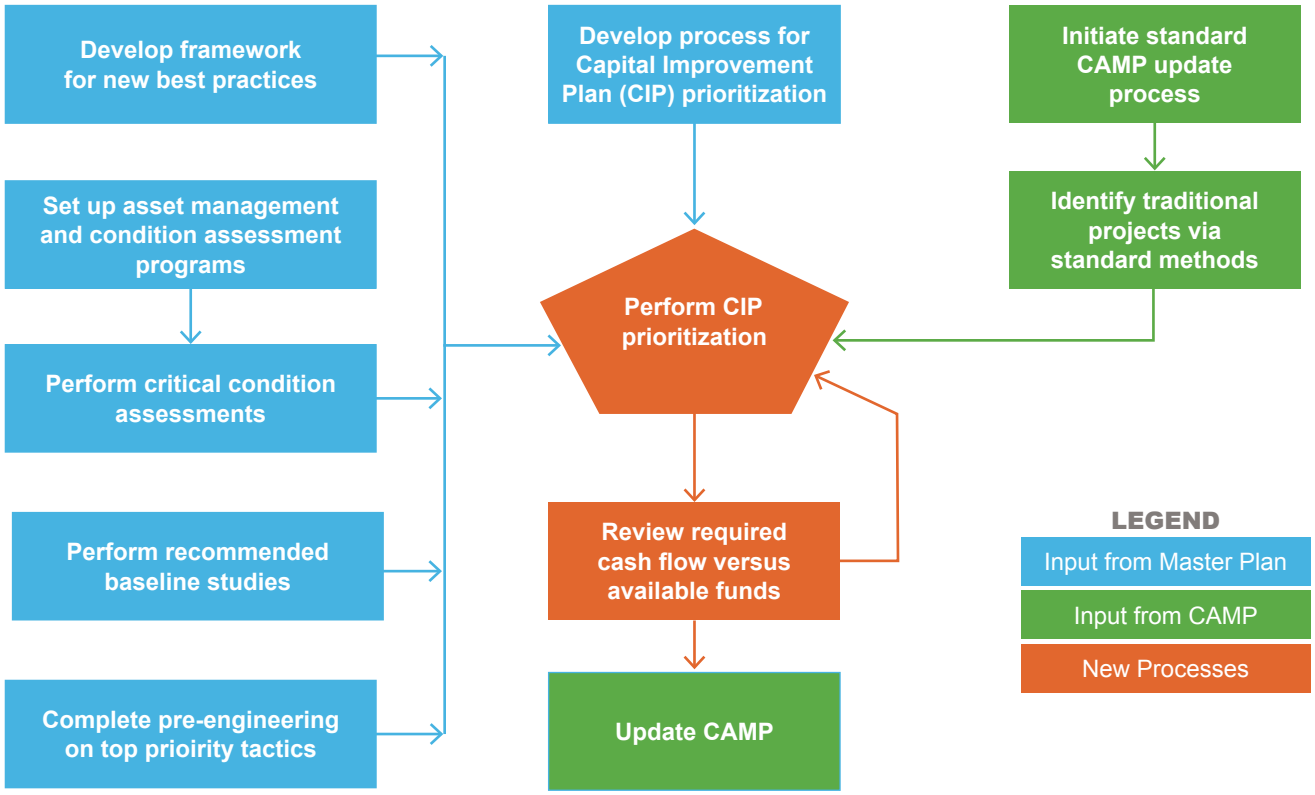
- Leasing opportunities to create revenue and offset operating costs
- Development of an advanced water treatment facility to support potable reuse
- A water-energy technology incubator and innovation campus
- Areas set aside to demonstrate resource recovery and sustainable practices
- Expansion of the treatment plant's secondary effluent flow equalization capacity

Thoughtful use of the South Parcel balances revenue opportunities with future EWA needs.

The Baseline Scenario represents the set of future conditions that EWA expects to occur and operate within. Conditions are assumed to be consistent with current trends and focus on key topics such as:

- Water cost escalation due to water scarcity
- Electrical and natural gas energy cost escalation
- Labor cost escalation due to inflation
- Chemical cost escalation due to inflation
- Increased value of renewable resources
- Increased contractor deliveries onsite
- Nominal changes in regulatory requirements
- Natural disasters with typical frequency and magnitude
- Typical fluctuation in the economy with ordinary cost control required by EWA
- Typical institutional coordination issues and change
- Small scale or short-term supply disruptions
- Expected odor control and aesthetic requirements
- Nominal changes in the relative volume and makeup of residential and industrial influent flows
- Site utilization similar to past with minor modifications
- Typical land value escalation

Based on these assumed conditions, Baseline Scenario tactics were identified and prioritized, as shown on the following pages. The figure below illustrates the interaction between the results of this study and EWA's yearly CAMP planning process (through which specific projects are executed).



Best Practices Tactics

Many best practices were identified as critical to meeting current and future EWA objectives. A comprehensive list of the recommended practices is presented below. Although EWA has on-going initiatives that include several of these Best Practices Tactics, this Master Plan recommends consideration and, if warranted, implementation of all Best Practices Tactics. Implementation may take the form of new initiatives or a review of identified Best Practices Tactics already in use by EWA.

ID# Best Practices Tactics

B-1/12 **Data collection:** Develop a long range plan for improving data collection and analytic capabilities. Drive towards optimizing unit processes and reducing operations costs throughout the collection system and plant.

B-13 **Procedure to evaluate new technologies:** Develop a procedure to evaluate developing technologies that may benefit EWA. Consider development of a pilot lab on the South Parcel to facilitate research and development.

B-27 **Regional biosolids workgroup:** Encourage the engagement of a regional workgroup to leverage knowledge of other agencies and share EWA's industry leading knowledge of biosolids processing, handling, marketing, and sales.

B-32/64 **Monitor reuse regulations and plans:** Monitor non-potable reuse (NPR) plans and identify opportunities for increased reuse.

B-41 **Siloxanes:** Siloxanes are used by various industries and are present in EWPCF influent. Siloxanes present problems for energy generation from biogas. Monitor concentrations of and evaluate processes to remove siloxanes.

B-42 **Partnership with San Diego Gas and Electric (SDG&E):** Partnering with SDG&E may identify mutually beneficial options to reduce energy costs for EWA and help meet peak demand on the SDG&E grid.

B-57 **Keep all permits current:** Keep all permits current and track of pollutants of concern.

B-58/59/60* **Air quality regulation trends:** Keep permits required to generate power current and monitor air emissions regulations in other regions as an indicator of potential future local regulations.

B-61* **Greenhouse gas regulations and related credit programs:** Monitor regulatory trends and develop a plan to meet potential future regulations related to greenhouse gas (GHG) emissions.

B-62* **RWQCB ocean discharge regulations:** Monitor trends and develop a plan to meet stricter discharge limits in the event that RWQCB implements additional requirements.

B-65 **Grant funding:** Many of EWA's future projects may qualify for grants related to resource use efficiency. Develop a program or contract for services to identify and make use these incentives.

B-67 **Capital prioritization:** Develop priorities for implementing projects by considering available funds versus risk of not implementing projects.

B-71 **Capital expenditure policy:** Develop priorities to reduce non-essential operating expenses during financial crisis.

B-73 **Collaboration with local agencies:** Assess collaboration opportunities with Member Agencies, public entities, and other interested parties to ascertain how EWA can appropriately leverage its resources to enhance the region.

B-74* **Capital projects through E-CAMP:** Continue using existing asset (E-CAMP) and maintenance (CMMS) management systems to prioritize and implement maintenance and replacement of aging infrastructure.

B-78 **Ocean outfall condition assessment:** Contract with a company to perform underwater inspection of ocean outfalls per the terms of EWA's lease with the California State Lands Commission.

B-79 **Enhanced engagement with member agencies and the influential public:** Implement a structure for ensuring regular communication with member agency executive level leaders and influential community members.

B-80 **Operator-maintainer model:** Perform a pilot to test the potential benefits of having employees both operate and maintain dedicated areas of the plant.

Indicates tactic is part of an existing EWA best practices program.

Tactics That Warrant Further Study

Several tactics were identified by the workshop attendees and technical team as having a high potential to provide benefits under the baseline conditions. However, the team cannot say with certainty that the anticipated benefits will be realized without further study. A comprehensive list of these tactics is presented below.

ID# Tactics for Further Study

B-4 **Reevaluation of CEPT:** Chemically enhanced primary treatment (CEPT) is currently used at the EWPCF. Optimization of chemical addition may result in enhanced performance and should be evaluated.

B-5 **Primary effluent equalization:** Evaluate increasing primary effluent storage and equalization capacity to improve process reliability and provide emergency storage in the event of a short term power loss.

B-6 **Solids contact stabilization:** Evaluate the addition of a solids contact stabilization basin to maximize BOD removal without additional aeration demand.

B-8 **Blower replacement and possible relocation:** Study the payback period for replacing the existing blowers with more energy efficient units and possibly relocating the blowers to a location closer to the aeration tanks.

B-15 **Implementation of odor monitoring measure(s):** Evaluate options such as daily staff logs or an automated sensor system to monitor odors if complaints from the public increase.

B-18 **Cell lysing:** Evaluate cell lysing systems to improve the digestibility of biosolids. Benefits include increasing biogas production and reducing biosolids disposal quantities.

B-20 **Repurposing of DAF tanks:** Evaluate converting the existing dissolved air flotation (DAF) tanks to digested sludge storage. This could improve operational flexibility and mitigate risk during events such as power outages.

B-21 **Digester management and optimization study:** Evaluate existing digester processes and facilities to optimize mixing efficiency and potentially repurpose smaller digesters if excess capacity exists.

B-23 **Strategic plan for biosolids processing:** Evaluate alternative technologies and process improvements to reduce energy usage in the biosolids drying process.

B-25 **Gasification, pyrolysis, and other developing technologies:** Monitor status of emerging technologies and identify feasible processes to recover energy from dried pellets.

B-29/ 30/40 **Optimization of onsite energy production:** Evaluate the use of natural gas when biogas is limited, the storage of biogas, and the scheduling of energy intensive operations.

B-36 **Reduced solids retention time (SRT):** Evaluate and implement strategies to reduce SRT in the secondary treatment process, thus lowering aeration time and associated energy demand and cost.

B-40 **Standby engine generators:** Evaluate the use of diesel generators to provide a backup power source and reduce reliance on SDG&E.

B-43 **ESCO opportunities:** Study the potential benefits of engaging an energy services company (ESCO) that would fund installation of new resource savings equipment in exchange for a percentage of the resulting benefits.

B-48/ 49 **Siting, traffic, and security:** Identify the best use of traffic corridors to accommodate process additions while maximizing on-site safety and security. Also consider Caltrans's I-5 expansion plans and employee parking needs.

B-53 **South Parcel site plan:** Develop a land use plan for the South Parcel to identify areas for future treatment-related facilities and determine areas available for potential other uses including public educational facilities.

B-54/ 63 **Track IPR/DPR regulations and opportunities:** Track indirect and direct potable reuse (IPR/DPR) regulations and outline business models for increased reuse, including identifying potential hurdles.

B-77/ 52 **Expanded asset management program:** Complete an asset management gap assessment to identify benefits of an expanded program, which may include maintenance priorities based on condition/reliability rather than age.

B-81 **Innovation/research campus:** Evaluate/implement the development of an innovation and research campus, most likely located on the South Parcel.

High Priority Baseline Tactics

Workshop attendees and the technical team identified tactics that could be implemented under the baseline condition with very little risk compared to the anticipated benefits. These tactics were deemed High Priority Baseline Tactics. Lower priority tactics were also identified in the Master Plan but are not included here. Lower priority tactics should be implemented if funding is available, or in some cases, if the tactic can be efficiently implemented in coordination with another tactic or project.

ID# High Priority Tactics

B-2 **Addition of nitrate in the collection system:** Nitrate addition in the collection system can reduce fermentation that occurs during conveyance, thereby resulting in preservation of suspended BOD.

B-3 **Improvements to screenings removal:** Implement the findings of a 2011 study to replace existing bar screens and evaluate options to address peak flow hydraulic concerns.

B-7 **Automated DO control/aeration improvements:** Improved efficiency could be realized by installing new dissolved oxygen (DO) measuring equipment and an air flow control system.

B-10 **Automated sludge wasting:** Improve SRT control with real-time total suspended solids (TSS) monitoring of the mixed liquor and return activated sludge (RAS). Benefits include lower energy demands and enhanced biogas production.

B-17 **Additional sources of high strength wastes:** Evaluate the feasibility of utilizing different high strength waste sources to maximize the production of biogas from anaerobic digestion.

B-19 **Mechanical co-thickening:** Replace the existing DAF system with co-thickening options such as rotary drums, rotary screws, or centrifuges to increase solids concentrations and reduce energy requirements.

B-24 **Dryer safety and pellet reheating:** Implement recommendations of 2013 study to improve thermal drying system performance and safety.

B-26 **Biosolids market expansion to Tier 2 customers:** Develop/implement a marketing plan to expand/diversify customers for pelletized biosolids beyond the current customer base.

B-34 **Implement measures to reduce energy costs:** Previous studies have identified energy efficiency measures focused on repairing or replacing damaged or dated equipment and installing reduced voltage startup features.

B-35 **Load shedding:** Assess energy use to identify loads that can be regularly scheduled or dropped during an emergency to reduce standby charges, which ensure the availability of unscheduled commercial power.

B-37 **Biogas treatment:** Installing equipment to remove biogas impurities would allow for longer generator run times and reduced generator maintenance, while staying within air quality emissions limits.

B-46 **Power monitoring and management system:** Implement a power monitoring and management system to prioritize process units and optimize energy consumption.

B-47 **Technology master plan and process control strategies:** Implement the 2013 Technology Master Plan recommendations. Evaluate and implement process control strategies to improve plant performance and reduce operating costs.

B-50 **Electrical rooms:** Develop a plan for upgrading electrical rooms to replace aged equipment. Improve equipment cooling and fire protection to reduce the chance for catastrophic failure.

B-68 **Reserve fund:** Establish a reserve fund for operations and capital projects in order to provide a buffer and minimize ratepayer impacts in times of financial stress and uncertainty.

Major Water Cost Escalation Scenario

This scenario assumes that demand for high quality water sources along the coast causes significant water cost escalation.

Triggers for Implementing Adaptive Tactics

- The cost of acquiring new water supplies increases such that the cost of advanced treatment at the EWPCF, combined with the cost to convey the water to users, is less than the cost of new supplies.
- The US Environmental Protection Agency (EPA) or Regional Water Quality Control Board (RWQCB) adopts more stringent ocean discharge requirements such that it is nearly impossible to cost effectively discharge to the ocean.

ID# Major Water Cost Escalation Adaptive Tactics*

W-1 **Evaluate potential impacts of water scarcity:** Upstream reuse projects could result in low EWPCF influent flows and extremely high load concentrations. Evaluate the impacts of this condition on both treatment processes and financial stability.

W-2 **Evaluate and implement NPR/IPR/DPR projects:** Evaluate options for reusing water currently discharged to the ocean such as a coastal non-potable system or various indirect or direct reuse concepts.

W-3 **Modify permitting and financial structure:** Research the permitting requirements and likely need for alternate financial structures associated with EWA becoming a wholesale reuse water purveyor.

W-6 **Diversion and treatment of urban runoff/stormwater:** Determine the feasibility of diverting, treating and delivering stormwater in addition to reuse water.

W-5 **Nitrate removal:** If EWA were to implement a potable reuse project, nitrate removal using a deammonification processes would likely be required.

W-7 **Ocean desalination plant in South Parcel:** The South Parcel is adjacent to similar land uses and could potentially site an ocean desalination plant and utilize available EWPCF ocean outfall capacity for brine disposal.

**Tactics are listed in order of anticipated benefit. Some tactics are not shown due to minimal expectation of benefit.*

Major Electrical Cost Escalation Scenario

This scenario assumes electrical costs escalate well above average inflation costs, resulting in scrutiny on energy intensive processes. This adaptive scenario also considers the risk of significant service disruption.

Triggers for Implementing Adaptive Tactics

- Cost of energy increases such that the payback period for changing to lower energy intensive processes is less than 5 years.
- Cost of energy increases such that the payback period for installing new “harness-able” energy technologies is less than 5 years.
- Cost for reliable standby power from regional power providers increases such that implementation of back-up onsite power generation has a payback period of less than 5 years.

ID# Major Electrical Cost Escalation Adaptive Tactics*

E-1 **Separation of high strength waste:** Implementation of a program to separate high strength waste from normal liquid streams and deliver it directly to the plant digesters would reduce BOD and thereby energy demands.

E-4 **Alternative technologies to IC engines:** Replacing the existing internal combustion engines with fuel cells or micro turbines may be cost effective if electricity costs increase significantly.

E-5 **Microbial fuel cells:** Converting organic matter to electricity using bacteria is still in the research phase, but may be feasible with additional technology development if energy costs increase significantly.

E-2 **Co-Mag process:** Conversion from ferric chloride based CEPT to a magnetite process could result in lower aeration demand and higher methane gas production, thereby lowering energy demand and increasing energy generation.

E-3 **Mechanical BOD removal:** Mechanical processes can be used to remove suspended BOD at the front of the plant, thus reducing aeration requirements in the secondary process and lowering energy demands.

**Tactics are listed in order of anticipated benefit. Some tactics are not shown due to minimal expectation of benefit.*

Major Financial Challenges Scenario

This scenario assumes a major, unexpected, financial hardship is encountered that significantly impacts the ability to operate the facilities or fund needed capital improvement projects. Financial impacts could occur at the public level (widespread economic downturn) or occur within individual agencies.

Triggers for Implementing Adaptive Tactics

- Member agencies do not agree to fund needed improvements.
- Member agencies default on their EWA financial obligations or declare bankruptcy.
- A major recession/depression occurs resulting in less than 50% of customers paying for service.

ID# Major Financial Challenges Adaptive Tactics*

F-5 **Resource sharing:** It may be possible during a financial down turn to work with other California Association of Sewer Agencies (CASA) to reduce costs by sharing resources.

F-2 **Reduce labor costs:** During a financial crisis, reducing labor costs can preserve the financial viability of EWA. However, staff reductions must be made consistent with current labor agreements or renegotiated terms.

F-7 **Low interest rates:** EWA may need to borrow money during a major financial downturn. The cost of interest can be managed by maintaining a reserve fund and raising rates if/when prudent, resulting in a high credit score.

F-4 **State/federal funding:** Investigate state and federal funding options that are often available during financial crises.

F-1 **Reduce capital spending:** During a major financial crisis, it may be possible to reduce discretionary capital spending (such as replacing aging equipment or installing upgraded equipment) by as much as 90 percent.

F-8 **Member agency defaults:** During an economic crisis, it is possible that member agencies may not have financial means to meet their commitments to EWA. Policies should be outlined to address this issue if it were to occur.

F-3 **Reduce operating expenses:** During a major financial crisis, it may be possible to reduce operating expenses by adjusting plant operations to minimize chemical or energy use to less than typical optimum usage.

F-6 **Temporary waiver of regulatory requirements:** In extreme cases, revised operations could result in EWPCF not meeting permit requirements. Negotiating a temporary permit with CASA may be required.

**Tactics are listed in order of anticipated benefit and/or order of most likely to be implemented.*

Stringent Air Emission Regulations Scenario

This scenario assumes air quality regulations become significantly more stringent than current and expected conditions, driving EWA to reconsider treatment processes and operations.

Triggers for Implementing Adaptive Tactics

- Internal combustion emissions regulations become so strict that it is no longer viable to generate onsite power, or the payback of implementing alternative onsite technology is less than 5 years.
- California GHG significance thresholds are reduced, requiring EWA to purchase carbon credits at such a price that the payback for modifying existing equipment or processes is less than 5 years.

*ID# Stringent Air Emission Regulations Adaptive Tactics**

A-4 **Air emissions associated with IPR/DPR project:** The advanced water treatment process required to implement potable reuse projects is highly energy intensive and may exceed GHG thresholds. Therefore, investigation into the cost to acquire GHG credits or fund wind or solar projects may be required.

A-1 **Reduced air pollutants from the heat dryer:** Exhaust from the heat dryer is currently treated with a regenerative thermal oxidizer. However, future regulations could further reduce the allowable emissions and alternative technologies such as solar drying may need to be considered.

A-3 **Stop generating power:** Currently emissions for the co-generation facilities account for a larger portion of the total plant air emissions. If reduced emissions are required, ceasing to operate the co-generation facilities could provide the largest emissions reduction.

A-2 **Title V permit:** Currently EWA is regulated under a minor source permit with limited allowable emissions. EWA could apply for a Title V permit allowing emissions levels equal to or greater than the Major Source thresholds, which would allow greater generation of onsite power, but may have public perception challenges.

**Tactics are listed in order of anticipated benefit and/or order of most likely tactic to need to be implemented.*

EWA's vision is: "Together, we are model of excellence and innovation." Excellence and innovation are only achieved through sound planning. The planning process is also fundamental to achieving EWA's mission of providing sustainable and fiscally responsible services. The following summarizes EWA's major planning efforts, and their relationship to each other.

Sound planning enables sustainable and fiscally responsible services.

SFA = Strategic Focus Area; CAMP = Comprehensive Asset Management Plan

Organizational Effectiveness Through Sound Planning

Master planning is a bridge between business planning processes and facility planning processes. The following steps are proposed to better tie the study efforts together and further promote organizational effectiveness:

- Coordination with Business Planning. Sequence future Master Plan updates with the strategic focus areas (SFAs) of the business plan to connect organizational strategy to facility planning scenarios and tactics.
- Coordination with CAMP. Incorporate tactics into EWA's ongoing CAMP process. Drive continuous improvement and continue to refine capital prioritization processes. Ensure alignment between studies.
- Coordination with Financial Planning. Coordinate saving and cost impacts from the tactics in this study with the CAMP process and the broader EWA financial planning activities. Promote good financial decision making, cost efficiency, and accurate cost projections.

Promoting Organizational Efficiency

While prioritizing and implementing the tactics recommended in the Master Plan, it is important that EWA also remain focused on the following mission critical areas and to continue to strive for continuous innovation and improvement in these areas:

- Safety
- Fiscal responsibility
- Treatment process optimization
- Remaining an "Employer of Choice"
- Buried infrastructure condition assessment and maintenance
- Asset management systems and processes
- Resource recovery
- Information technology and management information systems
- Overall environmental performance

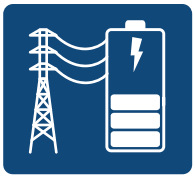
This Master Plan provides guidance on near-term actions for expected future conditions and includes an adaptable plan for a wide range of alternate future conditions. Several key success factors will need to be employed to get the most out of this investment.

Summary of Baseline Tactic Categories

Best Practices	Tactics Requiring Further Study	High Priority Baseline Tactics
■ Elements to continue ■ Elements to start	■ Determine whether implementation would lead to valuable outcomes	■ Tactics identified as contributing value if implemented

Summary of Adaptive Scenarios

Major Water Scarcity



Major Electrical Cost Inflation

Major Financial Challenges

Stringent Air Regulations

EWA's leadership in planning will drive efficiency and sustainability for future generations.

Implementation Success Factors

Enhanced Engagement of Stakeholders

Successful implementation of this Master Plan is highly dependent on the support and engagement of many stakeholders. The core stakeholder group is the owner organizations, which includes both staff and policy makers/executives. Other entities will also play important roles depending on the tactics ultimately pursued. This includes local community members, regulators, regional organizations, partner agencies, peer organizations, learning institutions and students, non-governmental organizations (such as environmental groups), consultant partners, and suppliers/ manufacturers. A complimentary stakeholder engagement effort should be considered as an important follow-on step to this study.

Coordination with Upcoming Planning Processes

EWA has important business and facility updates underway. The recommendations of the Master Plan will impact the updates of these other planning efforts. Similarly, changes to the business plan will need to be coordinated with the Master Plan recommendations. Ultimately a comprehensive and coordinated set of planning documents is a critical next step.

Embracing the Adaptive Management Framework of this Study

This Master Plan is intended to assist in shaping the organization's thinking related to forward planning specifically as it relates to being prepared for a broad range of future conditions. To gain the full benefit of the plan, EWA must embrace the adaptive aspects of this plan including allowing timely adjustments to the baseline scenario when required.

"As for the future, your task is not to foresee it, but to enable it." ***Antoine de Saint Exupery***

ACKNOWLEDGEMENTS

Encina Wastewater Authority Staff

Kevin Hardy, General Manager
Michael Steinlicht, Assistant General Manager
Debbie Biggs, Operations Director
Doug Campbell, Environmental Compliance Director
Garry Parker, General Services Director
Octavio Navarrete, Operations Manager
Joseph Sallay, Remote Facilities Supervisor
Leeann Warchol, Finance Director
Duane Larson, Engineering Manager Emeritus
James Kearns, Capital Project Manager

Peer Workshop Participants

Scott Goldman, EWA Consultant/RMC
James Gumpel, Vallecitos Water District
Jeremy Neill, Coombs-Hopkins
Michael Thornton, San Elijo Joint Powers Authority

Black & Veatch

Kevin Davis
James Strayer
Klint Reedy
David Cover

Evolving Logic Corporation