NOTICE OF ENGINEERING COMMITTEE MEETING

Covering Design, Construction, Capital Improvement, Master Plan and other Engineering, Operational and Planning Related Matters

NOTICE IS HEREBY GIVEN that the San Lorenzo Valley Water District has called a meeting of the Engineering Committee to be held Thursday, June 6, 2019 at 2:00 pm at 13057 Highway 9, Boulder Creek, CA.

AGENDA

1. Convene Meeting/Roll Call

2. Oral Communications
   This portion of the agenda is reserved for Oral Communications by the public for items which are not on the Agenda. Please understand that California law (The Brown Act) limits what the Board can do regarding issues raised during Oral Communication. No action or discussion may occur on issues outside of those already listed on today's agenda. Any person may address the Committee at this time, on any subject that lies within the jurisdiction of this committee. Normally, presentations must not exceed five (5) minutes in length, and individuals may only speak once during Oral Communications. Any Director may request that the matter be placed on a future agenda or staff may be directed to provide a brief response.

3. New Business:
   Members of the public will be given the opportunity to address each scheduled item prior to Committee action. The Chairperson of the Committee may establish a time limit for members of the public to address the Committee on agendized items.

   A. APPOINT THE COMMITTEE CHAIR
      Discussion by the Committee to appoint a chair of the Committee.

   B. BEAR CREEK ESTATES WASTEWATER TREATMENT FACILITY ALTERNATIVE ANALYSIS – REQUEST FOR PROPOSAL
      Discussion and possible recommendation to Board regarding proposals for BCE RFP.

   C. 2019 MASTER WATER PLAN - REQUEST FOR PROPOSAL
      Discussion and possible recommendation to Board regarding 2019 Master Water Plan RFP.

4. Old Business:
   Members of the public will be given the opportunity to address each scheduled item prior to Committee action. The Chairperson of the Committee may establish a time limit for members of the public to address the Committee on agendized items.

   A. USDA PROJECTS
      Update and discussion regarding the Swim Tank Project.

   B. LOMPICO PRVs
      Update and discussion regarding construction of Lompico PRVs Project.

   C. PROBATION TANK

Update and discussion regarding construction of Probation Tank.

D. LOMPICO TANKS
Update and discussion regarding design of Lompico Tanks.

E. GLEN ARBOR BRIDGE
Update and discussion regarding status of water main leak inside of the bridge.

F. LOMPICO ASSESSMENT PROJECTS
Update and discussion regarding Lompico Assessment Projects.

5. Future Meeting recommendations:

6. Adjournment

In compliance with the requirements of Title II of the American Disabilities Act of 1990, the San Lorenzo Valley Water District requires that any person in need of any type of special equipment, assistance or accommodation(s) in order to communicate at the District's Public Meeting can contact the District Office at (831) 338-2153 a minimum of 72 hours prior to the scheduled meeting.

Agenda documents, including materials related to an item on this agenda submitted to the Committee after distribution of the agenda packet, are available for public inspection and may be reviewed at the office of the District Secretary, 13060 Highway 9, Boulder Creek, CA 95006 during normal business hours. Such documents may also be available on the District website at www.slvwd.com subject to staff's ability to post the documents before the meeting.

Certification of Posting

I hereby certify that on May 31, 2019, I posted a copy of the foregoing agenda in the outside display case at the District Office, 13060 Highway 9, Boulder Creek, California, said time being at least 72 hours in advance of the meeting of the Engineering Committee of the San Lorenzo Valley Water District in compliance with California Government Code Section 54956.

Executed at Boulder Creek, California, on May 31, 2019.

_____
Holly B. Hossack, District Secretary
San Lorenzo Valley Water District

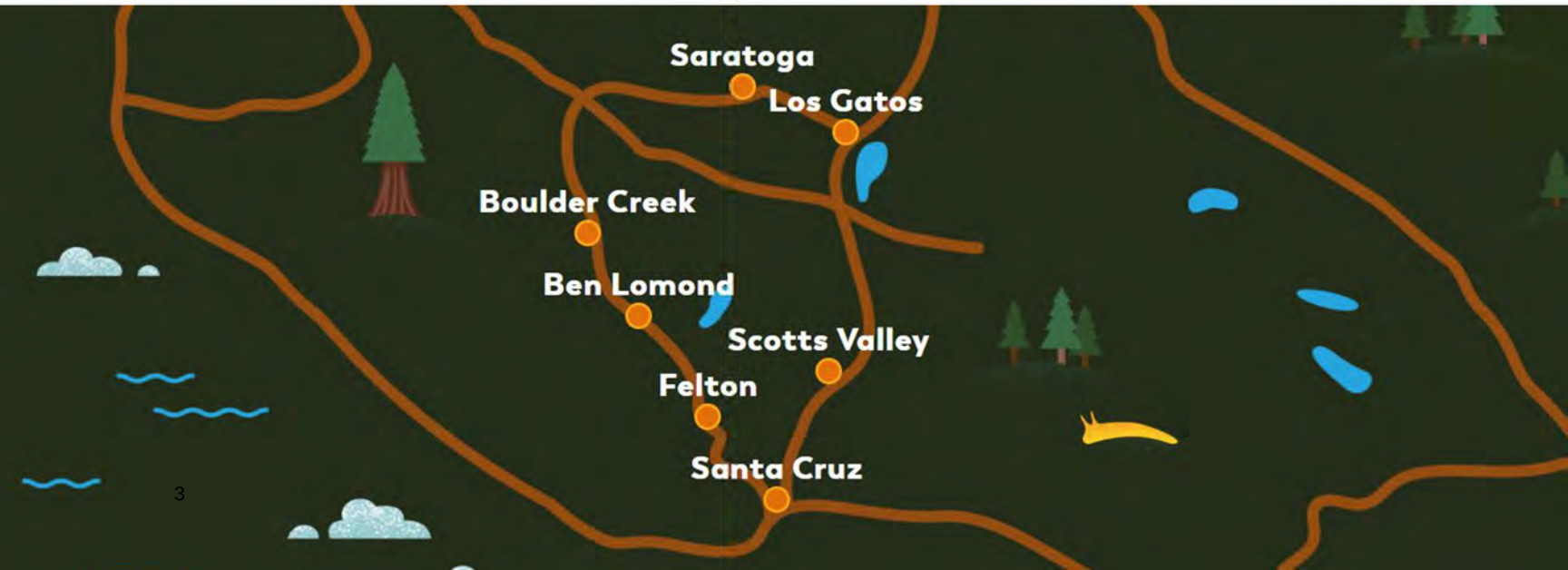
San Lorenzo Valley WATER DISTRICT

PROPOSAL FOR

BEAR CREEK ESTATES WASTEWATER TREATMENT FACILITY ALTERNATIVES ANALYSIS

MAY 31, 2019

IEC



May 29, 2019

Mr. Darren Langfield
Engineering Manager
San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, CA 95006

RE: Proposal for Professional Design Services for the Bear Creek Estate Wastewater Treatment Facility Alternatives Analysis

Dear Mr. Langfield:

Infrastructure Engineering Corporation (IEC) is pleased to provide the San Lorenzo Valley Water District (District) with this proposal for Engineering and Professional Engineering Services for the Bear Creek Estate Wastewater Treatment Facility Alternatives Analysis. This proposal is in response to the District's recent Request for Proposal.

The wastewater system for Bear Creek Estates Subdivisions 3, 4 and 5 is operated by the San Lorenzo Valley Water District. The system treats domestic wastewater flow from 56 residential units. The treatment plant was initially constructed in 1985 as a septic tank treatment system. The wastewater system is regulated by the California Central Coast Regional Water Quality Board (Regional Board) under Waste Discharge Order No. 00-43 (WDR).

Modifications to the treatment plant were made during the years 2009 through 2013 after the Regional Board amended the District's WDR to include reduction of nitrogen in the plant effluent by 50%, however, the plant does not currently reduce nitrogen by 50% despite the additional of a third stage trickling filter.

IEC has an excellent understanding of the issues of this project, having prepared previous studies for District. We have been involved in process modifications to assist District staff in meeting the nitrogen reduction requirement of their permit. We are prepared to continue troubleshooting plant operations with staff, if we are selected for this work. We have also contacted several package treatment plant manufacturer's using design data, which we developed, for cost and footprint information. We are ready to analyze whether a new treatment plant is the solution to the nitrogen reduction problem. We have also reviewed the Santa Cruz County regulations on permit requirements for private septic systems and are prepared to interact with stakeholders on this option for compliance with the permit.

We are confident that IEC, along with District staff, will select a preferred alternative that will have considered permit compliance, cost, impact on operations and maintenance, environmental issues and potential funding sources.

1735 North First Street, Suite 304, San José, California 95110 T 408.495.4107 F 408.479.3220

We will be ready on Day 1 for a kick-off meeting and workshop, with our ideas ready to go. We will work collaboratively with the District to make sure the best alternative is selected to meet the District's permit. IEC brings the experience and capability to do the work. We sincerely appreciate the opportunity to provide this proposal and assist the District with this project. Please contact me at (858) 842-6978 should you have any questions or need further information.

Sincerely,

Robert S. Weber, PE
Principal
14271 Danielson Street
Poway, CA 92064
858-583-6193
rweber@iecorporation.com

PROJECT DESCRIPTION AND APPROACH

PROJECT UNDERSTANDING

The San Lorenzo Valley Water District (District) in Boulder Creek, California was established in 1941 to supply water to the communities of Boulder Creek, Brookdale, Ben Lomond, Lompico, Scotts Valley and Felton. The city of Boulder Creek is located in the Santa Cruz Mountains Region just below the peak of the Santa Cruz Mountains and is the gateway to Big Basin Redwoods State Park, California's oldest state park. The residents served by the San Lorenzo Valley Water District treasure the area for its redwood forests and turn-of-the century mountain town culture. Water supply, water quality as well as rehabilitation of aging infrastructure are key goals of the San Lorenzo Valley Water District to keep this unique area sustainable for the future.

Bear Creek Estates Subdivisions 3, 4 and 5 were developed in 1984. Some residences in the area date back to 1962. The wastewater system for Bear Creek Estates Subdivisions 3, 4 and 5 is operated by the San Lorenzo Valley Water District. The system treats domestic wastewater flow from 56 residential units. The wastewater system includes a collection system, which consists of 19 manholes, approximately 3,600 linear feet of 6-inch ACP and PVC gravity sewer, 2,600 linear feet of force mains, 2 sewer pump stations and 56 laterals. The wastewater treatment plant is a septic tank-trickling filter treatment system discharging treated effluent to subsurface leach fields. The wastewater system is regulated by the California Central Coast Regional Water Quality Board (Regional Board) under Waste Discharge Order No. 00-43 (WDR).

The Bear Creek Wastewater Treatment plant is located at 15900 Bear Creek Road, Boulder Creek, California. It was initially constructed in 1985 as a septic tank treatment system. It was designed to treat a design daily average flow of 12,000 gallons per day (gpd) and a peak wet weather flow of 32,500 gallons per day (gpd). In its original form, it consisted of two (2) cast-in-place, underground concrete tanks, an influent pump station, an effluent pump station, and a 2.3-acre leach field. Modification to the treatment plant were made during the years 2009 through 2013 after the Regional Board amended the District's WDR to include reduction of nitrogen in the plant effluent by 50%. A third stage trickling filter was added, piping modifications were made, and blowers added to Clarifier #1.

On April 1, 2016, the Regional Board issued a Notice of Violation (NOV) of Wastewater Discharge Permit to the District citing ongoing violations with insufficient total nitrogen reduction since 2007 as well as excess flow from inflow and infiltration (I & I) related violations. The District retained IEC in 2015 to develop recommendations to address the violations. IEC prepared three technical memoranda:

- Memorandum No. 1 – Engineering Controls to Reduce I & I during rain events
- Memorandum No. 2 – Wastewater Treatment Plant Modification to reduce total nitrogen by 50%
- Memorandum No. 3 – Emergency Spill Response Plan

PROJECT APPROACH

SUMMARY OF PAST WORK

An analysis of treatment plant effluent permit data demonstrates that the Bear Creek treatment plant removes 80% of both Biological Oxygen Demand (BOD) and Total Suspended Solids (TSS). The District's WDR does not state an effluent limit or % removal requirement for these constituents, only that the wastewater system discharge shall not exceed Maximum Contaminant Level for chemical constituents in the Title 22. BOD and TSS are not listed as contaminants in this regulation. Removal of BOD and TSS in the 80% range is typical for activated sludge plants and suggests that the plant is treating the incoming wastewater effectively.

While it appears that the first stage of the tricking filter is removing BOD and TSS to less than 45 mg/L each, the first stage trickling filter does not appear to reduce total nitrogen. The wastewater treatment plant is not achieving the 50% reduction in total nitrogen in the influent, a limit required by the District's WDR, however. Current incoming average concentration of total nitrogen are 55 mg/L and outgoing effluent are 49 mg/L for an average removal of 20% over the years 2016-2018.

The removal of nitrogen requires a healthy population of nitrifying microorganisms. These aerobes require a longer time to grow (than carbonaceous "bugs") and require more oxygen. In 2017 the District installed blowers in Tank #3 (Clarifier #1) to increase the dissolved oxygen in the activated sludge leaving the first stage tricking filter (Trickling Filter #1). The addition of dissolved oxygen did not improve the reduction of Total Nitrogen by the wastewater system.

IEC will develop three alternatives to achieve compliance with the District's WDR requirement for nitrogen reduction. We will describe each alternative, develop costs and address associated regulatory issues, operations and maintenance needs and associated environmental permit requirements. An alternatives analysis will be performed and sent to the District for review. After District review, one alternative recommended. Implementation steps and a schedule will be included in the technical memorandum documenting the alternatives analysis.

Alternative 1: Rehabilitate the Existing Treatment Plant

IEC will define what measures need to be undertaken to rehabilitate the existing treatment plant to meet the nitrogen removal permit requirements. Some of these measures were discussed in Technical Memorandum No. 2 – Wastewater Treatment Plant Process Assessment dated July 29, 2017. The status and feasibility of implementing these measures will be further described in this alternative. The status and feasibility of the process modification recommended in the Engineering Update Report dated October 2018 will also be evaluated. These process modification recommendations are summarized in Table 1. A plant modification project to implement these process modifications will be identified, a layout prepared and a planning level cost opinion (± 30%) prepared.

Table 1 – Process Modification Steps

Step 1	Obtain baseline influent wastewater characteristics at key locations
Step 2	Isolate and test performance of each trickling filter stage
Step 3	Improve process control, maintain DO level with new blowers
Step 4	Improve the microbiological population in the second stage tricking filter (Trickling Filter #3) Improve the mass of "food" or BOD in the second stage trickling filter (Trickling Filter #3). The District could bypass one of the first stage trickling filter tanks, which would allow a higher strength BOD wastewater stream to pass through the second stage trickling filter.

Alternative 2: Decentralized Treatment

The decentralization of treatment would entail the construction of a private septic tank system at each residence in the Bear Creek Estates Subdivision 3, 4 and 5. New private septic tank systems are required to be permitted by Santa Cruz County. The county code Section 7.38 Sewage Disposal outlines the requirements for private sewage systems. According to the code, because Bear Creek Estates is located in the San Lorenzo Water Supply Watershed, septic systems are only allowed on parcels of one (1) acre or more. IEC performed a cursory review of the 56 residential parcels in the Bear Creek Estates Subdivisions 3, 4 and 5. The bulk of the residential parcels are ½ acre or less. Another prohibition in the county code is the requirement that septic tanks systems are not allowed if there is an existing sewer within 200 feet for connection. While we find it unlikely that the District could return to individual septic systems, we will consider it as an alternative and speak to various agencies to determine ground truth on the issue.

Alternative 3: Replace Existing Treatment Plant with New Package Treatment System

IEC proposed a third alternative – replacement of the existing treatment plant with a new package treatment system. A conventional activated sludge system will readily remove BOD, TSS and reduce nitrogen to meet the District's permit. Such a system would need to be designed according to the design parameters in Table 2.

Table 2 – Treatment Plant Basis of Design

Parameters	**Flow Rate (gpd)**	**Influent** Concentration **(mg/L)**	Projected **Effluent** Concentration **(mg/L)**	% Removal
Average Daily Flow Rate	12,500			
Peak Daily Flow Rate	31,250			
BOD (mg/L)		250	≤ 5	98

Parameters	**Flow Rate (gpd)**	**Influent** Concentration **(mg/L)**	Projected **Effluent** Concentration **(mg/L)**	% Removal
TSS (mg/L)		250	≤ 5	98
Total Kjeldahl Nitrogen (TKN) (mg/L)		55	25	≥50
Ammonia (mg/L)		30	≤ 5	98
Phosphorus (mg/L)		8	NA	NA
pH		6.5 to 8.5		

The District would be best served by a modular conventional activated sludge plant with nitrogen removal capabilities. The plant would include flow equalization, aeration tank with air diffusers, digester tank with air diffusers, clarifier, blowers and required electrical and controls equipment. The footprint for such a plant is 15 feet by 35 feet and would fit on the existing plant site. The existing final effluent pumps would be replaced in kind or the existing pumps reused to pump the effluent from the package plant to the existing leach field. IEC would likely recommend that no modifications be made to the existing leach field. We would, however, recommend telemetry so the plant could be monitored by operators at a central location. Fiberglass enclosures may be needed to house blower to alleviate noise issues and odor control may also need to be added due to the proximity to residential neighbors. The manufacturer's estimated cost for the package plant itself, not including a concrete slab, installation – both mechanical and electrical, not including the final effluent pump station or telemetry is approximately $300,000. IEC will contact these manufacturer's after Alternative 3 is fully developed for budgetary quotes. We will also develop a full Engineer's Opinion of Probable Cost for this alternative, which is likely to be in the range of $750,000 to $900,000.

When the alternative has been selected, steps for implementing the project will be established. One of those steps would be the procurement of grant funding through state or federal sources such as the USDA or Bureau of Reclamation. Grant programs require a specific engineering report and grant application, costs for which, will be developed. Whichever alternative is recommended it will meet the goal of permit compliance in keeping with the District's goal of protection of water quality in the San Lorenzo area.

As part of the alternatives analysis, the District has requested that costs for associated environmental issues be included in the overall project cost for each alternative. The environmental issues for the new plant alternative, for example, will not be do to an increase in plant capacity, but rather because the plant is located in the Timber Production Zone of Santa Cruz County. The County may require a public hearing for zoning approval of utilities. If so, the project will require a discretionary permit from the County Planning Department and is considered a Project under CEQA Statutes and Guidelines. Since the proposed plant is a small expansion of an existing treatment plant, the Project could qualify from one of the following CEQA Categorical Exemptions.

> Class 1 Existing Facilities: consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination, or
>
> Class 3 New Facilities or Conversion of Existing Facilities: consists of construction of small structures. (Guidelines §15303) (d) Water main, sewage, electrical, gas, and other utility extensions, including street improvements, of reasonable length to serve such construction. The applicability of a Class 3 Exemption is dependent on the location of the project in relation to sensitive resources.

In addition, the Project must comply with the Migratory Bird Treaty Act and Endangered Species Act based on potential to create elevated noise within proximity to migratory bird or endangered species which have been seen in the surrounding forest area. Likewise, the project will involve ground disturbance and must comply with the National Historic Preservation Act. The project is not located on federal land; however, if the project is funded by federal agency grant money, NEPA clearance will be required. Since the project involves a minor expansion of an existing utility, it is expected to qualify for a Categorical Exclusion under NEPA.

IDENTIFICATION OF PRIME CONSULTANT/SUBCONSULTANTS

PRIME CONSULTANT

INFRASTRUCTURE ENGINEERING CORPORATION

LEGAL NAME & ADDRESS OF THE COMPANY:	Infrastructure Engineering Corporation 14271 Danielson Street, Poway, CA 92064
LEGAL FORM OF COMPANY:	State of California – Subchapter C Corporation
PARENT COMPANY:	N/A
CONTACT:	Jane Costello, PE – *Project Manager* 14271 Danielson Street, Poway, CA 92064 858.842.4425 | jcostello@iecorporation.com
SIZE OF FIRM:	56
LOCATION OF OFFICES:	
SAN FRANCISCO BAY AREA:	1735 North First Street, Suite 304, San Jose, CA 95110
RIVERSIDE COUNTY:	41593 Winchester Road, Suite 110, Temecula, CA 92590
SAN DIEGO:	14271 Danielson Street, Poway, CA 92064
OCEANSIDE:	301 Mission Avenue, Suite 202, Oceanside, CA 92054
ORANGE COUNTY:	300 Spectrum Center Drive, Suite 400, Irvine, CA 92618
CENTRAL VALLEY:	1401 Commercial Way, Suite 100, Bakersfield, CA 93309
YEARS IN BUSINESS:	17 years
BANKRUPTCY FILING, TERMINATED CONTRACTS	None
DISCIPLINE/JOB TITLE	See table below
SUBCONSULTANT INFORMATION	IEC will self perform required work. No subconsultants will be utilized.

DISCIPLINE/JOB TITLE	NUMBER OF STAFF
Principal	4
Senior Project Manager	4
Project Manager	7
Senior Project Engineer	1
Project Engineer	2
Senior Designer	1
Engineer I	2
Engineer II	3
Engineer III	1
Program Manager	1
Assistant Program Manager	1
Project Surveyor	1

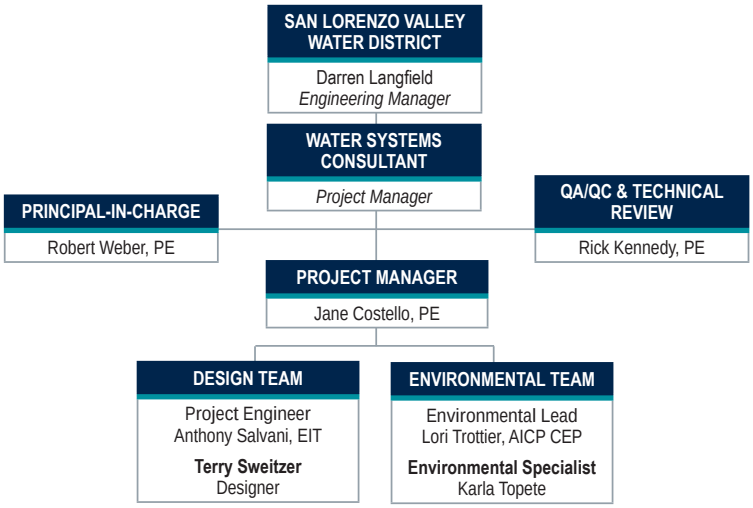
DISCIPLINE/JOB TITLE	NUMBER OF STAFF
CADD Manager	1
CADD Designer	2
Construction Manager	2
Assistant Construction Manager	1
Senior Construction Inspector	9
Environmental Specialist I	1
Environmental Sr. Technical Staff	1
Flow Monitoring Manager	1
Flow Monitoring Technician	1
Intern	1
Administrative	8

PROJECT ORGANIZATION & EXPERIENCE

TEAM ORGANIZATION

IEC's proposed team for San Lorenzo Valley Water District's (District) contract has the resources, capabilities, and commitment to deliver a successful project. The team, under the leadership of Jane Costello, PE as Project Manager is well prepared to deliver a project on-time and within budget. Supporting Costello are Rob Weber, PE and **Rick Kennedy, PE** as Principal-in-Charge and QA/QC & Technical Review, respectively. Mr. Weber and Mr. Kennedy will provide guidance, resources, and technical oversight to the team, and will ensure the District is delivered a successful project. The organization chart, to the right, depicts the roles and reporting structure for key staff available for the project.

Resumes have been provided in an Appendix.



KEY PERSONNEL

PROJECT MANGER – JANE COSTELLO, PE

Ms. Costello has over 28 years of experience in the water and wastewater field. Her experience includes project management and design of water and wastewater treatment plant improvements, office engineering services during construction and resident engineering. She frequently leads multi-disciplinary teams on her projects. Recent projects include: 1) Leucadia Wastewater District's Gafner Advanced Water Treatment Plant Improvements, 2) City of Oceanside San Luis Rey Wastewater Reclamation Plant Aeration Tank Improvements, 3) Clarifier and RAS/Scum Pumping Station, Ramona Municipal Water District. The projects include upgrades to treatment plant pumping, chemical mixing, aeration tank gate replacement including aeration tank partial bypass pumping while maintaining treatment requirements, and clarifier design, return activated sludge pump station retrofit and hydraulic improvements, respectively.

Ms. Costello served as resident engineer for two large water utility projects. The first project was at the St. Paul, MN McCarron's 35 MGD surface water treatment plant, which included building additions, mechanical piping, equipment installation and start-up for nine water treatment chemicals: chlorine gas, aqueous ammonia, Powder Activated Carbon (PAC), ferric chloride, alum, sodium hydroxide, fluoride, potassium permanganate and slaked lime. The second project included engineering services during construction for the ground-up construction of a 50 mgd water booster station including pump factory witness testing of one 20 mgd and one 30 mgd split case centrifugal pump for Water Booster Pump Station No. 9 for Minneapolis Water Works, MN. All systems in both projects have been operational for the past ten years.

PRINCIPAL-IN-CHARGE – ROBERT S. WEBER, PE

Mr. Weber, PE has over 28 years of civil engineering and project management experience and has worked in the wastewater/water/recycled water field for his entire career. Mr. Weber is a Principal and owner of IEC. He leads IEC's wastewater/water design practice and regularly serves as project manager and principal-in-charge on a variety of water infrastructure design projects. Mr. Weber brings to the team technical oversight and project management advice. He also brings to the District the firm's commitment of our staff and resources. Mr. Weber is known for his sincere commitment to provide responsive service, quality work products, and high client satisfaction.

QA/QC & TECHNICAL REVIEW – RICK KENNEDY, PE

In his 42 years of experience, Mr. Kennedy has managed the design of more than 12 new and retrofit pump station projects ranging in size from 400 gpm to over 400 mgd, with a variety of types of pumps and drive configurations. He has managed the design of new and retrofit treatment plant projects. He is a specialist in mechanical process equipment of all types, piping, and valves. He prides himself in

working closely with his clients, and ensuring the design team understands the critical issues of the project. He is dedicated to delivering detailed and quality bid packages. He effectively manages project budgets, schedules and risks and continually finds ways to minimizing construction and operational costs.

PROJECT MANAGEMENT

A successful project must solve several technical challenges while meeting the District's goals. IEC's project management approach provides the well-structured procedures to plan, track, and execute the work while communicating effectively within the team, with the District and with the project stakeholders. The specific management steps our team leaders will take are described below.

IEC'S MANAGEMENT APPROACH MAKES IT EASY FOR THE DISTRICT TO MANAGE IEC

PLAN

- ✓ Develop detailed scope of services, fee and schedule that meets District expectations.
- ✓ Develop detailed schedule, and identify milestones, critical path tasks, and data collection tasks.
- ✓ Identify lines of communication and points of contact, and provide contact list to the team members and District.
- ✓ Establish clear assignments for each team member with appropriate schedule and level of effort.

EXECUTE

- ✓ Start the project quickly with a well-organized kick-off meeting that outlines the project goals, clarifies any initial ambiguities, and assigns immediate responsibilities for IEC and the District.
- ✓ Identify and address project issues that are critical to schedule milestones and/or key design decisions.
- ✓ Establish and implement information management procedures - set up and maintain a ShareFile site for documents.
- ✓ Coordinate with IEC staff to provide a unified approach to the project.
- ✓ Define QA/QC roles for key staff and confirm requirements with team members.

TRACK

- ✓ Check progress in terms of meeting project requirements and goals in accordance with scope of services and schedule, and adjust efforts to accommodate unforeseen changes that arise.
- ✓ Monitor project documentation and meeting minutes to confirm follow-through on action items and District comments.
- ✓ Regularly evaluate project progress in terms of production versus expenditures. Identify issues and adjust staff levels and activities accordingly.

COMMUNICATE

- ✓ Implement routine communication to keep District Project Manager informed of project progress/status – weekly e-mail/verbal contacts, bi-weekly progress updates, and monthly progress reports by IEC Project Manager.
- ✓ Hold conference call or face-to-face meetings with selected District staff when needed for discussion of technical issues and information exchange.
- ✓ Hold workshop presentations with District-wide stakeholders for comprehensive project review, interdepartmental coordination, and information exchange.
- ✓ Hold regularly scheduled meetings internally with team to review project progress, schedule, and outstanding issues.
- ✓ Coordinate closely with District to achieve coherent project approach.

CAPACITY TO PERFORM THE WORK

IEC has the staff and resources immediately available to perform the work as described.

EXPERIENCE AND PAST PERFORMANCE

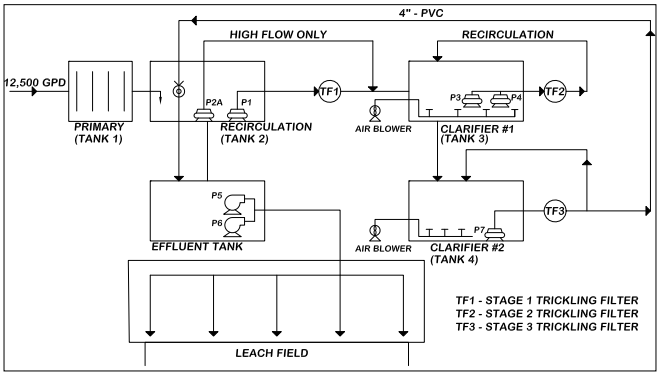
BEAR CREEK WASTEWATER TREATMENT PLANT

Client/Location:	San Lorenzo Valley Water District 13060 Highway 9 Boulder Creek, CA 95006	**Client Contact:** **Phone:** **E-mail:**	Rick Rogers 831.430.4625 rrogers@slvwd.com
Dates of Engagement:	May 2016 – Present	**Total Project Value:**	$40,000

IEC is providing process evaluation for a septic tank/biotrickling filter wastewater system for the San Lorenzo Valley Water District (District) intended to bring the District in compliance with the Central Coast Regional Water Resources Control Board's regulations for total nitrogen reduction and identify solutions to minimize inflow and infiltration during rainfall event. Through an exhaustive study involving sampling and testing, IEC recommended and implemented process and collection system improvements to bring the District in compliance with regulation.

Key Project Components & Issues

- Ongoing Violations with insufficient Total Nitrogen (TN) percent reduction
- Excess flow violations from inflow and infiltration (I&I)
- Operator emergency response training for sewer/WWTP spills



IEC provided mechanical/process consultation to the District regarding process optimization at the plant

SANTA MARGARITA CONJUNCTIVE USE PROJECT

Client/Location:	Fallbook Public Utility District 990 E Mission Road PO Box 2290 Fallbrook, CA 92028	**Client Contact:** **Phone:** **E-mail:**	Jack Bebee, PE 760.728.1125 x1105 jackb@fpud.com
Dates of Engagement:	November 2014 – December 2015	**Total Project Value:**	$43,000,000

The Santa Margarita Conjunctive Use Project (SMCUP) consists of the design of treatment facilities associated with an agreement between FPUD and the federal government that settled a century long dispute over water rights of the Santa Margarita River. The agreement included Camp Pendleton providing approximately 8 mgd of ground water to FPUD, actual flowrates being dependent on the month of the year and rainfall of the previous year, that was high in iron, manganese, and TDS. The treatment train included 8 mgd of iron and manganese removal utilizing greensand media within five 12' diameter and 30'long pressure vessels. A side stream, treated with RO membranes, was remixed to create a product water to match the water quality of FPUD's imported water. The product water was pumped directly into the distribution systems. Distribution system improvements included two miles of 24-inch CML&C steel pipe, a remote 8 mgd pump station and 4 MG steel water storage tank. Project services included: 1.) distribution system modeling, 2.) establishment of water quality goals, 3.) evaluation of potential process treatment trains and configurations, 4.) preliminary design, 5.) final design, 6.) design service during construction phases, 7.) public outreach, and 8.) permitting assistance.

IEC provided all the process mechanical design of 8 MGD treatment plant and product water pump station

SAN LUIS REY WATER RECLAMATION FACILITY MAJOR PLANT UPGRADES PHASE 1

Client/Location:	City of Oceanside 300 North Coast Hwy Oceanside, CA 92054	**Client Contact:** **Phone:**	Rudy Guzman* 858.668.4705 * now with City of Poway
Dates of Engagement:	2015	**Total Project Value:**	$1.6M

Ms. Costello, while at another firm, provided plant upgrades to a 15 million gallons per day (mgd) conventional activated sludge plants. Project components included replacement of influent and effluent aeration tank gates, 30" steel clarifier transfer pipes and plant water supply piping. The project also included concrete rehabilitation of the aeration tank influent channel and demolition of miscellaneous piping and appurtenances in the plant galleries. Individual aeration basins were taken out of service to complete the work. A maintenance of plant operations (MOPO) plant was developed that involved bypass pumping primary effluent around the out-of-service basins.

LOCAL EXPERIENCE/EXCEPTIONS TO THIS RFP

LOCAL EXPERIENCE

BEAR CREEK WASTEWATER TREATMENT PLANT

Client/Location:	San Lorenzo Valley Water District 13060 Highway 9 Boulder Creek, CA 95006	**Client Contact:** **Phone:** **E-mail:**	Rick Rogers 831.430.4625 rrogers@slvwd.com
Dates of Engagement:	May 2016 – Present	**Total Project Value:**	$40,000

IEC is providing process evaluation for a septic tank/biotrickling filter wastewater system for the San Lorenzo Valley Water District (District) intended to bring the District in compliance with the Central Coast Regional Water Resources Control Board's regulations for total nitrogen reduction and identify solutions to minimize inflow and infiltration during rainfall event. Through an exhaustive study involving sampling and testing, IEC recommended and implemented process and collection system improvements to bring the District in compliance with regulation.

Key Project Components & Issues

- Ongoing Violations with insufficient Total Nitrogen (TN) percent reduction
- Excess flow violations from inflow and infiltration (I&I)
- Operator emergency response training for sewer/WWTP spills

PROFESSIONAL SERVICES AGREEMENT

IEC does not take any exceptions to this RFP including, but not limited to, the Professional Services Agreement.

SCOPE OF SERVICES

SCOPE OF SERVICES

TASK 1 - PROJECT MANAGEMENT AND ADMINISTRATION

IEC will attend a project kick-off meeting with the District to confirm the direction of the project, discuss the communication protocol and the deliverables and schedule for the project. The kick-off meeting will include a site visit to the existing wastewater treatment plant. IEC will prepare an agenda and take and distribute meeting minutes. Additional communication will take by phone or email throughout the project. IEC will administer the project invoicing the District monthly. This task also includes time for an internal Quality Control/Quality Assurance (QA/QC) review of the technical memorandum.

Deliverable: Agenda and meeting minutes

TASK 2 – DATA COLLECTION AND REVIEW

IEC will review as built drawings, the District permit and regulatory correspondence, previous reports and treatment plant data.

TASK 3 - ALTERNATIVES ANALYSIS

IEC will document the existing conditions and future needs for wastewater treatment for the Bear Creek Estates. IEC will develop three alternatives to address compliance with the District's Waste Discharge Requirements (WDR), which require a 50% reduction in nitrogen. Each alternative will include a description, layout, a planning level cost opinion (± 30%) and Operations and Maintenance requirements including staff time. We will review the need for telemetry for remote monitoring and consider electrical and structural components of the project for cost estimating purposes. We will use industry standard planning level cost estimates for electrical and controls costs. No structural or electrical subconsultants are included in this scope and fee. IEC will recommend an alternative and outline steps to implement the alternative. We will identify the anticipated environmental compliance and permitting path for the project.

TASK 4 - TECHNICAL MEMORANDUM DRAFT/FINAL

The technical memorandum will document existing conditions, future conditions and describe three alternatives to meet the requirements of the District's future needs. The technical memorandum will include layouts of each alternative, cost tables and describe permit and regulatory issues. A draft and final technical memorandum in Adobe PDF format will be provided to the District for review and comment. The time for District review as scheduled is one week. Following receipt of District comments, IEC will incorporate mutually agreed upon comments, finalize the report and submit a final version

Deliverable: A draft and final technical memorandum in Adobe PDF format.

OPTIONAL TASK

TASK 5 ENVIRONMENTAL PERMITS

Task 5.1 Kick-off Meeting, Site Visit, Research and Project Description

IEC will prepare a project description for clearance under CEQA and NEPA. IEC will conduct research of existing available agency data bases. The project description will be the basis for environmental analysis and will describe: Permits needed for project approval, and the scope of temporary construction activities, permanent changes occurring on the project site, and long-term project operations. A description of any federal grant funding sources will be provided. A comprehensive database review will be conducted to document existing baseline conditions and environmental commitments for the project as well as agency clearances and permits needed for project implementation. IEC will present our Draft Project Description and findings from background research to the District and will make our field and research notes available for District review upon request.

Task 5.2 Technical Studies

Technical Studies for Compliance with the Endangered Species Act, Migratory Bird Treaty Act and the National Historical Preservation Act (Section 106 Compliance)

Project implementation will require compliance with resource protection legislation, including but not limited to Endangered Species Act, Migratory Bird Treaty Act, and the National Historical Preservation Act. Therefore, IEC will prepare the following technical studies to support environmental findings of fact:

NHPA Section 106 Compliance: IEC will prepare a Phase I Cultural Resources report for the project including a records search and literature review at Northwest Information Center (NWIC) of the California Historical Resources Information System, Sonoma State University, Rohnert Park, California, to document potential for impacts to Historic Properties or cultural resources. IEC will conduct a field visit and shovel assessment of the existing conditions of the site pertaining to cultural and historic resources. IEC will conduct a Tribal Consultation meeting the requirements of SB 18 and AB 56 and for compliance with Section 106 of the National Historic Preservation Act.

Biological Resource Assessment for Compliance with the ESA and MBTA: IEC will conduct a field survey and mapping within a 500-foot and 1,000-foot radius for historic roosts, raptor nests and evidence of endangered species which are known to occur within this region per the Natural Diversity Data Base published by the California Department of Fish and Wildlife. This work will include records search and literature review of existing available studies and a field visit and field map of existing resources within the area of potential impact for the project that could be affected by elevated noise during construction. Recommendations will be provided to avoiding any potential for impacts related to nesting birds and raptors or any terrestrial species found during the field visit.

Task 5.3 CEQA and NEPA Documents

NEPA Exclusion Checklist: IEC will draft a NEPA Checklist for Categorical Exclusion on the Project using the Department of Interior Fish and Wildlife Service Form 3-2185. The completed checklist will contain a concise and thorough final project description and findings of fact supporting the conclusion that the Project will have less than significant effects on the environmental from during construction, operation and maintenance. Because the Project is a small expansion of an existing land use, it is not expected to have substantial effect on the quality of the environment. This document will be given to the District for one round of comments, then finalized. The Categorical Exclusion from NEPA will be completed and printed in a PDF format and delivered to the District, USDA and Bureau of Reclamation.

Deliverables: Draft and Final NEPA Documents

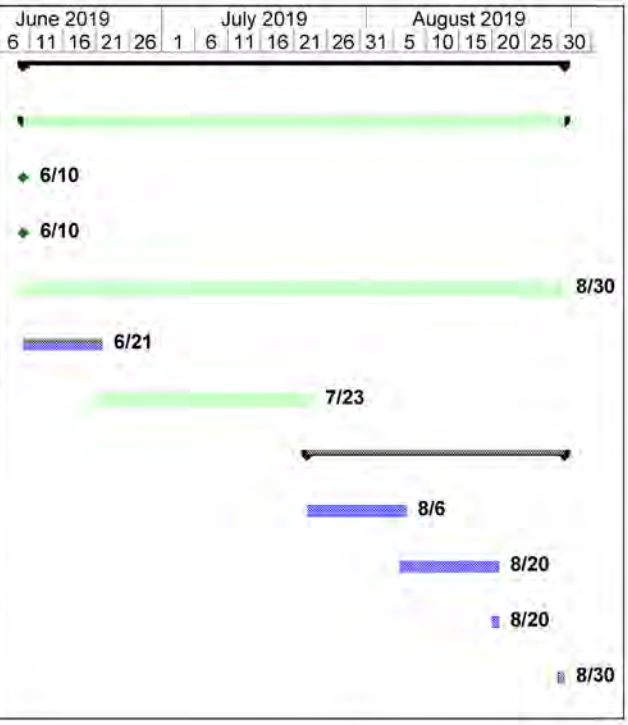
CEQA Notice of Exemption and Notice of Determination: IEC will complete a draft CEQA Notice of Exemption and Notice of Determination using the forms from the CEQA Guidelines, Title 14, California Code of Regulations. These documents will contain a concise and thorough final project description that has been approved by the District, the finding of exemption, along with the guideline citation of the exemption, and statements of reasoning to support the exemption. These documents will be given to the District for one round of comments, then finalized. The Notice of Exemption will be completed and printed in a PDF format and delivered to the District. Notice of Exemption and Notice of Determination Forms will then be filed at the County Clerk's Office by IEC staff.

Deliverables: Draft and Final CEQA Documents

SCHEDULE

San Lorenzo Valley Water District
Bear Creek Estates Wastewater Treatment Facility Alternatives Analysis
PROJECT SCHEDULE

ID	Task Name	Start	Finish
1	**Project Schedule**		
2	**TASK 1 - Project Management**	**Mon 6/10/19**	**Fri 8/30/19**
3	Notice to Proceed	Mon 6/10/19	Mon 6/10/19
4	Kickoff Meeting	Mon 6/10/19	Mon 6/10/19
5	Project Management/QA/QC	Mon 6/10/19	Fri 8/30/19
6	**TASK 2 - Data Collection and Review**	**Mon 6/10/19**	**Fri 6/21/19**
7	**TASK 3 - Alternative Analysis**	**Fri 6/21/19**	**Tue 7/23/19**
8	**TASK 4 - Technical Memorandum**	**Tue 7/23/19**	**Fri 8/30/19**
9	Draft Technical Memorandum	Tue 7/23/19	Tue 8/6/19
10	District Review	Tue 8/6/19	Tue 8/20/19
11	Meeting	Tue 8/20/19	Tue 8/20/19
12	Final Technical Memorandum	Fri 8/30/19	Fri 8/30/19



JANE COSTELLO, PE
PROJECT MANAGER

PROFESSIONAL REGISTRATION
Registered Professional Engineer
California No. 82185
Wisconsin No. 36427
Minnesota No. 45344
Arizona No. 48557

EDUCATION
University of Minnesota,
M.S. Civil Engineering, 1998

University of Wisconsin - Madison,
B.S. Chemistry, 1984

AFFILIATIONS
Water Environment Federation (WEF)

California Water Environment Association (CWEA)

QUALIFICATIONS

Jane Costello has 33 years of experience in the water and wastewater field. Her experience includes project management and design of water and wastewater treatment plant improvements, office engineering services during construction and resident engineering. She frequently leads multi-disciplinary teams on her projects. Recent projects include: 1) Leucadia Wastewater District's Gafner Advanced Water Treatment Plant Improvements, 2) City of Oceanside San Luis Rey Wastewater Reclamation Plant Aeration Tank Improvements, 3) Clarifier and RAS/Scum Pumping Station, Ramona Municipal Water District. The projects include upgrades to treatment plant pumping, chemical mixing, aeration tank gate replacement including aeration tank partial bypass pumping while maintaining treatment requirements, and clarifier design, return activated sludge pump station retrofit and hydraulic improvements, respectively.

PROJECT EXPERIENCE

Bear Creek Wastewater Treatment Plant, *San Lorenzo Valley Water District* – The Bear Creek Wastewater Treatment Plant (WWTP) experiences difficulties in meeting the nitrogen reduction require by its Wastewater Discharge Permit. IEC developed technical memoranda, which documented the conditions of excess flow due to inflow and infiltration (I&) into the collection system and WWTP plant process operation efficacy. A protocol for process testing, oversight of process improvements and an emergency spill response plan were developed. Optimization of recent process improvements is ongoing.

Lester J. Berglund Water Treatment Plant, Chemical Building, and Tank Farm Upgrades, *City of Poway* – IEC prepared design documents, bid phase and construction support for a retrofit of the City of Poway Lester J. Berglund Water Treatment Plant (WTP). The WTP plant is a conventional rapid mix, coagulation, sedimentation and media filtration plants using chlorine and ammonia for disinfection. The retrofit and rehabilitation project involved key water treatment plant processes such as disinfection, coagulation, and filtration. Modifications to the gaseous chlorine system were designed as well as replacement of polymer, permanganate chemical storage and handling systems and filter valves and actuators. The project included a specific Maintenance of Plant Operations (MOPO) specification and close coordination with City staff.

Gafner Advanced Water Treatment Plant Improvements, *Leucadia Wastewater District* – Project Manager for condition assessment and design for the 1.0 MGD Gafner Advanced Water Treatment Plant (AWTP) treats secondary effluent from the Encina Wastewater Plant in Carlsbad, CA. The Gafner AWTP consists of pumping, rapid mix, coagulation and flocculation tanks as well as enhanced settling sedimentation tanks, continuously backwashing sand filters and chlorine contact tank, chemical systems and a reclaimed water pump station. The improvement project includes pump replacement, mixer replacements, design of a new filter to waste system for "off spec" water, structural and electrical improvements, new grating, safety railings and steel beam pump supports.

Santa Margarita Conjunctive Use Project Facilities, *Fallbrook Public Utility District* – Senior Project Engineer for technical specification development for chemical feed system, sludge pumps and other process mechanical equipment.

Fluoridation at Santa Teresa Water Treatment Plant, *Santa Clara Valley Water District* – Senior Project Engineer for routed chemical piping from new fluoride metering pipe area to injection point at East and West Filter Gallery locations. Routed double containment piping through congested pipe trench, across existing filters and along gallery wall to existing injection location. The design

at the injection point included routing chemical piping in congested location which required leak detection sensor piping and new specification of a new Hastelloy injection quill. Additional services included design of an HVAC system for the fluoride metering pipe area.

San Luis Rey Water Reclamation Facility Major Plant Upgrades Phase 1, *City of Oceanside* – Project Manager for design of a plant upgrade project involving replacement of influent and effluent aeration tank gates, 30" steel clarifier transfer pipes and plant water supply piping. The project also included concrete rehabilitation of the aeration tank influent channel and demolition of miscellaneous piping and appurtenances in the plant galleries. The design plans and specifications included construction sequencing and bypass pumping plans and a maintenance of plant operations specifications.

Odor Control Study, *City of Oceanside* – Project Manager for a collection system odor study and chemical usage report for the City. The City's wastewater disposal system consists of gravity sewers, force mains, 22 lift stations, two wastewater treatment plants and an ocean outfall. The study documented odor "hot spots" using pressure testing and hydrogen sulfide gas monitoring. Chemical usage in the collection system as well as at the plants was analyzed and quantified. Odor scrubber performance was also evaluated.

Santa Margarita Wastewater Treatment Plant Secondary Clarifier and Miscellaneous Improvements Project, *Ramona Municipal Water District* – Project Manager and lead design engineer for this project, which included addition of one new 90-foot clarifier, modifications to the activated sludge splitter box to the clarifiers, RAS pumps and piping.

Major Plant Rehab ORF Chemical Feed System, *Encina Wastewater Authority* – Project manager for the design of several chemical feed systems, hypochlorite and caustic solution, for odor scrubbers at the Encina plant. Produced plans and specifications detailing the replacement of pumps and accessories, chemical piping, a pipe trench and restoration of concrete in the containment area; project at 90% design phase.

Oceanside Boulevard Sewer Lift Station Relocation, *City of Oceanside* – Project Engineer for a 2,000 gpm replacement sewer lift station to pump from the tributary area surrounding Oceanside Boulevard to the La Salina Wastewater Treatment Plant. The existing lift station is more than 60 years old and is in poor condition; due to the critical nature of this pumping facility, this project is a significant milestone in the ongoing rehabilitation and maintenance of the City's sewer infrastructure. The new lift station will consist of a custom design wet pit/dry pit station that has four (4) dry-pit submersible pumps, control valves, flow meter, odor control system, bioxide injection system, surge control system, standby power system, emergency storage, and site piping to connect to the existing sewer force main. The project also includes approximately 650 linear feet of gravity sewer main to convey flow from the existing lift station to the new lift station.

Village Park No. 5 Pump Station Replacement, *Leucadia Wastewater District* – Project Manager for pump station rehabilitation project consisting of a new submersible duplex station, valve vault, bypass connection, electrical upgrades, bypass pumping and sequence of construction specifications.

Saxony Pump Station Rehabilitation, *Leucadia Wastewater District* – Project Manager for pump station rehabilitation consisting of new pumps, valve, flow meter, wet well rehabilitation and bypass pumping.

Storm Pump Station No. 1, *City of Sunnyvale* – Project Engineer. The facility consists of, among other things, an approximately 25'x25' concrete masonry unit structure with a trash screen, two large natural gas powered duty pumps, one small electric pump, SCADA components, and three discharge pipes. The Preliminary Design report included conducting a complete investigation and analysis of the existing pump station to establish a basis of design for a comprehensive rehabilitation and update of the pump station. This included generating a complete list of deficiencies, and determining feasible options for rehabilitation and updating. The report presents alternatives, and includes preliminary construction schedules and cost estimates. The report was used to determine the scope of work to be used as a basis of design for construction documents. The project is currently in the design phase.

MCES Empire/ Rosemount Interceptor Improvements Phase I and II – Managed a $70 million large pipeline conveyance project. Took charge of the project at critical design juncture. Succeeded in meeting all client deliverables and internal budgets. Managed multi-disciplinary engineers. Provided engineering services during construction.

WWTF, Headworks/Hydraulic (H/H) Improvements, *City of Moorhead (MN)* – Prepared plans and specification for new hydraulic structures, an equalization basin and pump station and new grit pumping equipment.

WWTF, Moving Bed Biofilm Design and Construction, *City of Moorhead (MN)* – Designed the aeration system for a Moving Bed Biofilm Reactor (MBBR) basin for nutrient removal. Provided engineering services during construction.

Pecan Creek Water Reclamation Facility, *City of Denton, TX* – Lead design engineer for a 21 mgd raw wastewater influent pump station, three new 100-ft diameter clarifiers and rehabilitation of three other clarifiers. Clarifier rehabilitation included specifying clarifier mechanism, coating, inlet piping, scum beach, skimmer, sludge scraper and walkway.

Massard Wet Weather Improvements, *City of Fort Smith, Arkansas* – Lead design engineer for a 20 mgd raw water influent pump station, retrofit of a RAS pump station and new and rehabilitation of secondary and primary clarifiers.

P Street Wet Weather Improvements, *City of Fort Smith, Arkansas* – Lead design engineer for a 24 mgd secondary effluent vertical turbine pump station, primary and secondary clarifier upgrades, splitter box and hydraulic gate modifications. Prepared a full hydraulic model for the plant in excel using surveyed surface water elevations.

MCES Septage Management Study, *St. Paul, MN* – Managed a feasibility study of septage management practices for large metropolitan service area. Coordinated stakeholder meetings. Developed a prototype septage receiving facility.

Interceptor Master Plan, *Metropolitan Council Environmental Services (MCES), St. Paul, MN* – Developed alternatives for large wastewater interceptor and pumping station system for county-size area in metropolitan Minneapolis. Options included interceptor relief sewers, river crossing, in-line storage, lift stations and complex connections in an urban setting. Project costs estimated near $100 million.

MCES South St. Paul Forcemain Improvements, *St. Paul, MN* – Managed a $500,000 facility planning effort for a four mile 48-inch forcemain replacement. Prepared facility plan compliant with State Revolving Fund criteria. Incorporated supporting environmental and archaeological work; assisted with public involvement efforts. Construction cost estimated at $30 million.

Septage Receiving Station, *Coachella Valley Water District* – Project Manager for Construction Engineering Office Services for Septage Receiving Project at the Water Reclamation Plant 10 plant. Project elements include a building addition to house a grinder, bar screen, wash presses, grit classifiers and grit conveyors. Engineering services include submittal review, RFI response, and potential change order review, coordination with electrical and structural engineer for above services including structural inspection scheduling. Planned start-up of mechanical equipment and controls in May 2015.

Miscellaneous Plant Rehab Projects, *Encina Wastewater Authority* – Project Manager for fiscal year 2013 Major Plant Rehab Cooling Water Strainer, Filter Drain and Roof Safety Equipment (not Design Engineer). Project elements include installation of an automatic strainer on Encina 3WLC water line that sends cooling water to the cogeneration operation. Engineering services during construction include submittal review, RFI response, and potential change order review, coordination with Encina staff and electrical design engineer.

Lift Station No. 73, *City of Phoenix, AZ* – Managed the office and field construction services for this $4 million lift station. Project was fast-track Construction Manager at Risk (CMAR) for spring-training baseball facility. Oversaw start-up of pumps, chemical scrubber and chemical feed system.

River Falls Water Reclamation Facility, *River Falls, WI* – Managed construction phase of $3.1 million wastewater treatment retrofit of grit pumps, grit tanks, a secondary clarifier and RAS pumping.

MCES Colby Lake Tunnel and Lift Station Improvements, *St. Paul, MN* – Engineering services during construction included submittal review of submersible pumps, piping, valves; RFI responses, potential change order reviews and coordination with geotechnical engineering subconsultant.

Bulk Chlorine Chemical Handling Improvements, *Dallas Water Utilities, TX* – Construction office services for bulk chlorine retrofit at 200 mgd wastewater treatment plant.

Chemical Handling and Storage Improvements Project, *MN Regional Water Services* – Engineering services during construction including submittal reviews of mechanical equipment and coordination with other disciplines, responded to RFIs and reviewed potential change order. Also served as a full time resident engineer (RE) for two years for the construction of buildings, building additions, mechanical piping, equipment installation and instrumentation and controls for a 35 MGD surface water treatment plant; the RE role included the start-up of nine water treatment chemicals: chlorine gas, aqueous ammonia, Powder Activated Carbon (PAC), ferric chloride, alum, sodium hydroxide, fluoride, potassium permanganate and slaked lime.

Water Booster Pump Station No. 9, *Minneapolis Water Works, MN* – Provided engineering services during construction and served as a full time resident engineer for 18 months (concurrent

with the St. Paul project above) for ground-up construction of a 50 mgd water booster station including pump factory witness testing of one 20 mgd and one 30 mgd split case centrifugal pump.

Flygt Pump Manufacturer's Application Engineer – Directed engineers on pump selection, project hydraulics and product data.

Wastewater Plant, *City of Appleton, WI* – Lab/Industrial Pretreatment Manager. Managed a municipal wastewater plant laboratory and pretreatment program for 16 mgd plant under construction. Industrial users (19) were permitted from paper to dairy.

Madison Metropolitan Wastewater Treatment Plant (WI) – *Lab Analyst.* Conducted laboratory analysis for typical wastewater treatment plant samples.

Pace Analytical Laboratory Services Inorganic Laboratory Manager, *Minneapolis, MN* – Managed 12 chemists/technicians to produce laboratory results for multiple federal/state permitted programs.

ROBERT S. WEBER, PE
PRINCIPAL-IN-CHARGE

PROFESSIONAL REGISTRATION
Registered Professional Engineer
California No. C59312

EDUCATION
State University of New York at Buffalo
B.S. Civil Engineering, 1990

PROFESSIONAL AFFILIATIONS
American Society of Civil Engineers

American Water Works Association

American Consulting Engineers Council – California (Water Resources Committee)

AWARDS
San Elijo Hills Pump Station –
ACEC CA Engineering Excellence Merit Award, 2015

Pala Mesa Tank –
ASCE San Diego Section: Award of Merit, 2012
ASCE - Region 9: Outstanding Water Project Award, 2013

Carmel Valley Recycled Water Pipeline –
APWA San Diego-Imperial Counties Chapter: Project of the Year, 2013

Gano Reservoir and Unit X Pipelines –
ASCE San Diego Section: Award of Merit, 2004
CELSOC (now ACEC CA) Engineering Excellence Merit Award, 2006

4S Ranch Water Reclamation Facility, Plant 'A' and 'B' Modifications –
APWA San Diego-Imperial Counties Chapter: Project of the Year, 2007

QUALIFICATIONS

Mr. Weber has 28 years of civil engineering and project management experience on a variety of municipal and public works water, wastewater, and recycled water projects. Specific project experience includes conveyance pipelines; reservoirs and tanks, water pump stations, and sewer lift stations. He has also successfully managed several as-needed services contracts for municipalities and water/wastewater utilities. Mr. Weber is thoroughly familiar with design standards, techniques and analytical methods, bid specifications, and cost estimating. His experience extends beyond civil engineering to include securing required project permits, fostering cooperative interagency approvals, and gaining community project acceptance.

Mr. Weber's project success based is on his ability to understand the client's needs and objectives and translate them into actions during execution of the project. He prides himself in involving the client in the project, and ensuring the technical staff understands the critical issues of the project. His engineering decisions and designs are based on careful considerations of project needs and specific site characteristics. His dedication to quality effectively manages project risks and controls construction and operational costs.

PROJECT EXPERIENCE

The following tables highlight the range of Mr. Weber's experience:

PIPELINES		
Olivenhain Trunk Sewer	2,800 lf 15-inch trunk sewer	City of Encinitas
South Oceanside Water & Sewer Main Replacement	7,400 lf 8-inch PVC water 2,771 lf 8-inch PVC sewer	City of Oceanside
Upas Street Pipeline	14,980 lf 8-inch - 12-inch PVC 8,160 lf 24-inch CML&C 1,640 lf 30-inch HDPE HDD	City of San Diego
Wolf Store Road 12-inch Inter-tie	5,000 lf 12-inch PVC	Rancho California Water District
West Feeder (ID-A) Pipeline Replacement	2,039 lf 12-inch DIP 269 12-inch fusible PVC 270 lf 16-inch fusible PVC	Rincon del Diablo Municipal Water District
B2/B3 Forcemain	2,600 lf 24-inch PVC 1,400 lf 14-inch PVC	Leucadia Wastewater District
District 1, 4, & 6 Water Main Replacements	11,130 lf 6-/16-/18-inch ductile iron	City of Pomona
Mission San Luis Rey Waterline	3,000 lf 10-inch PVC	City of Oceanside

PUMP STATIONS		
San Elijo Hills Pump Station	2,700 gpm	Vallecitos Water District
Tenaja Pump Station	6,300 gpm	Rancho California Water District
Batiquitos Pump Station Rehabilitation	40 MGD	Leucadia Wastewater District
North Bay Pump Station Project	3,500 gpm	Lake Arrowhead Community Services District

STORAGE		
Pala Mesa Tank	6.0 MG prestressed concrete	Rainbow Municipal Water District
Post Road Tank	3.5 MG steel	Eastern Municipal Water District
Salter Road Tank	1.0 MG steel	Eastern Municipal Water District
640 Reservoir	(2) 10 MG prestressed concrete	Otay Water District
North Twin Oaks Tank No. 2	3.5 MG steel	Vallecitos Water District

RICK KENNEDY, PE

QA/QC & TECHNICAL REVIEW

PROFESSIONAL REGISTRATION
Registered Professional Engineer
California No. M18710

Certified Construction Documents Technologist (CDT)

EDUCATION
California Polytechnic State University, San Luis Obispo
B.S. Mechanical Engineering, 1975

AFFILIATIONS
American Water Works Association

California Water Pollution Control Association

Water Environment Federation

HEALTH & SAFETY TRAINING
Ergonomics

Health & Safety Training for Project Management

PROJECT AWARDS
AWTP Ozone –
ASCE National 2013 Civil Engineering Achievement Award

ACEC National 2011 Recognition Award

ASCE California 2011 Outstanding Water Treatment Project

ACEC California 2011 Engineering Excellence Award

AWPA San Diego 2011 Project of the Year Award Project

ASCE San Diego 2010 Project of the Year Award Project

AWTP Flocculation and Sedimentation Basins –
ASCE San Diego 2007 Award of Excellence

QUALIFICATIONS

Much of Mr. Kennedy's 42 year career has been devoted to the management of the design of water treatment plant projects. Recent projects include the City of San Diego's Miramar Water Treatment Plant Clearwells Project (215 mgd- ongoing), KSD Joint Venture's (for Poseidon Water) Carlsbad Desalination DBO Project (50 mgd - in construction), the San Diego County Water Authority's DBO Twin Oaks Valley Water Treatment Plant (owner's agent for this 100 mgd plant), and the ASCE 2013 Outstanding Civil Engineering Award winner - City of San Diego's Alvarado Water Filtration Plant Project (200 mgd).

PROJECT EXPERIENCE

Cost Analysis of the La Salina Wastewater Treatment Plant Options, *City of Oceanside* – Project Manager for the effort to evaluate alternatives associated with the future of the City's the La Salina Wastewater Treatment Plant. Alternatives evaluated include: 1.) upgrading the plant, 2.) replacing the plant with a membrane bio-reactor (MBR), and 3.) replacing the plant with a pump station to move waste water to the City's San Luis Rey treatment facility where it could be treated to reclaimed water standards and distributed to costumers. Alternative 3 was the recommended.

Santa Margarita Conjunctive Use Project Facilities, *Fallbrook Public Utilities District (FPUD)* – Project Manager for the design of treatment facilities associated with an agreement between FPUD and the federal government that settled a century long dispute over water rights of the Santa Margarita River. The agreement included Camp Pendleton providing approximately 8 mgd of ground water to FPUD, actual flowrates being dependent on the month of the year and rainfall of the previous year, that was high in iron, manganese, and TDS. The treatment train included 8 mgd of iron and manganese utilizing greensand media within six 12' diameter and 30' long pressure vessels. A side stream treated with RO membranes was remixed to create a product water to match the water quality of FPUD's imported water. The product water was pumped directly in the distribution systems. Distribution system improvements included two miles of 24-inch CML&C steel pipe, a remote 8 mgd pump station and 6 MG steel water storage tank. Project services included: 1.) distribution system modeling, 2.) establishment of water quality goals, 3.) evaluation of potential process treatment trains and configurations, 4.) preliminary design, 5.) final design, 6.) design service during construction phases, 7.) public outreach, and 8.) permitting assistance.

Overland Trail Lift Station Rehabilitation, *Fallbrook Public Utilities District* – Project Manager for the rehabilitation of a high head (two pumps-in-series) wastewater lift station. The project includes a permanent diversion of the District's Anthony Corner's Lift Station flow to the Overland Trail Lift Station with a subsequent increase in pump capacity and overall footprint of the station. The electrical service will be increased due to larger pumps and the existing control building reconfigured for larger electrical gear. Other improvements include an increase in the size of the dry pit and a new cast-in-place top of the wet well. The flow from Anthony's Corner Lift Station will flow to an existing diversion box on Mission Road in Fallbrook. One 8-in sewer, the Mission Oaks sewer, will be relocated to connect with Mission Road trunk sewer and the lift station demolished.

Leucadia Pump Station, *Leucadia Wastewater District* – Project Manager for the condition assessment, preliminary and final design for a 4.0 MGD wastewater lift station for the Leucadia Wastewater District. The project will include the reuse of two relatively new 200 hp VFDs for two of the new 150 hp pumps, all new ductile iron piping, valve and appurtanences. The new pumps will be dry pit submersible type. The T-locked wet well will be repaired, and odor control equipment and other minor equipment replaced.

ANTHONY SALVANI, EIT

PROJECT ENGINEER

PROFESSIONAL REGISTRATION
Certified Engineer-in-Training
California No. 150915

EDUCATION
San Diego State University
B.S. Civil Engineering, 2014

AFFILIATIONS
American Society of Civil Engineers

Chi Epsilon - San Diego State University Chapter Past President

Tau Beta Pi

QUALIFICATIONS

Mr. Salvani is an Engineer III with experience in design engineering and AutoCAD drafting on a wide variety of projects including water and recycled water pipelines, pump stations, sewer gravity mains, sewer force mains, groundwater wells, and water treatment plant upgrades. Anthony specializes in the development of details and pipeline plan and profile drawings using AutoCAD and Civil 3D, development of detailed cost estimates, and preparation of preliminary design reports.

PROJECT EXPERIENCE

Lester J. Berglund Water Treatment Plant, Chemical Building, and Tank Farm Upgrades, *City of Poway* – Design Engineer. IEC prepared design documents, bid phase and construction support for a retrofit of the City of Poway Lester J. Berglund Water Treatment Plant (WTP). The WTP plant is a conventional rapid mix, coagulation, sedimentation and media filtration plants using chlorine and ammonia for disinfection. The retrofit and rehabilitation project involved key water treatment plant processes such as disinfection, coagulation, and filtration. Modifications to the gaseous chlorine system were designed as well as replacement of polymer, permanganate chemical storage and handling systems and filter valves and actuators. The project included a specific Maintenance of Plant Operations (MOPO) specification and close coordination with City staff.

Miramar Water Treatment Plant Clearwell Improvements, *City of San Diego* – Design Engineer for a 215 mgd low lift pump station and chlorine contact chamber. The treatment plant had two issues in need of resolution. One, a recent upgrade to the plant included a new ozone system functioning as the primary disinfectant, but in order to allow the conventional downstream gravity filters to go biological to further reduce TOC in the treated water, the CDPH required that emergency chlorine disinfecting facilities be provided. Two, at high flows and high levels in the on-site clearwells the plant's 215 mgd design capacity could be limited to only 80 mgd even when peak distribution demands could reach 260 mgd.

FY 15 Gravity Sewer Repair Project, *Leucadia Wastewater District* – Design Engineer for the design of 2,829 linear feet of cured-in-place pipe lining, one manhole rehabilitation, replacement in place of 916 linear feet of 8" gravity sewer main, two excavated gravity sewer repairs.

Scott's Valley Sewer Rehabilitation, *Leucadia Wastewater District* – Design Engineer for the rehabilitation of three manholes via cured-in-place manhole lining, 678 linear feet of 15" cured in place pipe lining, sewer bypassing for cured-in-place pipe lining, six manholes rehabilitated via epoxy manhole lining.

Storm Pump Station No. 1, *City of Sunnyvale* – Design Engineer. The facility consists of, among other things, an approximately 25'x25' concrete masonry unit structure with a trash screen, two large natural gas powered duty pumps, one small electric pump, SCADA components, and three discharge pipes. The Preliminary Design report included conducting a complete investigation and analysis of the existing pump station to establish a basis of design for a comprehensive rehabilitation and update of the pump station. This included generating a complete list of deficiencies, and determining feasible options for rehabilitation and updating. The report presents alternatives, and includes preliminary construction schedules and cost estimates. The report was used to determine the scope of work to be used as a basis of design for construction documents. The project is currently in the design phase.

TERRY SWEITZER

CADD DESIGNER

EDUCATION
York College of Pennsylvania,
B.S. Marketing, 2012

Harrisburg Area Community College,
A.A. Civil Design and Technology,
2005

York Technical Institute
A.A. Computer Aided Drafting, 1998

AFFILIATIONS
AutoCAD

Microstation V8i

QUALIFICATIONS

Mr. Sweitzer has 19 years of experience in several areas of the civil engineering industry; ranging from civil design to marketing and business development.

PROJECT EXPERIENCE

Overland Trail Lift Station Rehabilitation, *Fallbrook Public Utility District* – Lead CADD Designer for the rehabilitation of a high head (two pumps-in-series) wastewater lift station. The project includes a permanent diversion of the District's Anthony Corner's Lift Station flow to the Overland Trail Lift Station with a subsequent increase in pump capacity and overall footprint of the station. The electrical service will be increased due to larger pumps and the existing control building reconfigured for larger electrical gear. Other improvements include an increase in the size of the dry pit and a new cast-in-place top of the wet well. The flow from Anthony's Corner Lift Station will flow to an existing diversion box on Mission Road in Fallbrook. One 8-in sewer, the Mission Oaks sewer, will be relocated to connect with Mission Road trunk sewer and the lift station demolished.

Lester J. Berglund Water Treatment Plant, Chemical Building, and Tank Farm Upgrades, *City of Poway* – Lead CADD Designer for design documents, bid phase and construction support for a retrofit of the City of Poway Lester J. Berglund Water Treatment Plant (WTP). The WTP plant is a conventional rapid mix, coagulation, sedimentation and media filtration plants using chlorine and ammonia for disinfection. The retrofit and rehabilitation project involved key water treatment plant processes such as disinfection, coagulation, and filtration. Modifications to the gaseous chlorine system were designed as well as replacement of polymer, permanganate chemical storage and handling systems and filter valves and actuators. The project included a specific Maintenance of Plant Operations (MOPO) specification and close coordination with City staff.

Santa Margarita Conjunctive Use Project, *Fallbrook Public Utilities District* – Design team member providing CAD support for an 8 MGD groundwater water treatment project that includes 11,300 ft of 24" welded steel pipe for product water delivery and a pump station. The pipeline follows public roadways, District easements, and includes several points of connection to the existing system.

South Oceanside Waterline Replacement & Sewer Upsizing, *City of Oceanside* – CADD Designer for approximately 7,400 lf of replacement water distribution mains and 2,771 lf of sewer upsizing to 8-inch, with 4 manhole rehabilitations and 8 manhole replacements, within residential areas of south Oceanside. The project encompassed evaluation of replace-in-place versus parallel alignments as well as re-routing of several existing water services in order to eliminate a problematic alley main.

MBC Cooling Water System Chiller Upgrade, *City of San Diego* – Lead CADD Designer for replacing and optimizing the existing Chilled Water System (CW System) at the City of San Diego's MBC facility. The project replaces two 370 ton chillers, that provide ambient environment cooling for multiple on-site buildings, with three 250 ton chillers and upgrades the CW System necessary due to operational and reliability issues, outmoded controls, and overall age of the equipment. Three primary pumps were replaced with new and the addition of a forth. Two secondary pumps were replaced with the same capacity and with VFD's to control flow to the air handling units based on cooling demand. Ancillary equipment including air separator, expansion tank, chemical injection pot, and makeup water feed system were also replaced.

FEE ESTIMATE
SAN LORENZO VALLEY WATER DISTRICT
BEAR CREEK ESTATES
WASTEWATER TREATMENT FACILITY ALTERNATIVES ANALYSIS

Task/ Subtask	Task/Subtask Description	*Principal-In-Charge (Rob Weber)*	*Quality Control/Quality Assurance (Rick Kennedy)*	*Principal Environmental (Lori Trattler)*	*Project Manager (Jane Castella)*	*Engineer III/CAD III Designer (Anthony Salvani/Terry Sweitzer)*	*Environmental Specialist II (Karla Topete)*	*Word Processor (Annette Moore)*	Subtask Labor-Hours	Subtask Labor Cost	Direct Cost	Total Cost
		$245.00	$230.00	$230.00	$220.00	$150.00	$150.00	$65.00				
TASK 1	**Project Management**											**$6,505**
	Project Management/QA/QC	1	4		4				9	$2,045		$2,045
	Kickoff Meeting/Site Visit				8	8			16	$2,960	$1,500	$4,460
TASK 2	**Data Collection and Review**											**$4,160**
	Data Collection and Review				8	16			24	$4,160		$4,160
TASK 3	**Alternatives Analysis**											**$18,900**
	Develop three alternatives			2	16	32	8		58	$9,980		$9,980
	Estimate Cost Opinions for Alternatives				2	12			14	$2,240		$2,240
	Selection of Alternative				8	12			20	$3,560		$3,560
	Implementation Plan and Schedule				6	12			18	$3,120		$3,120
TASK 4	**Technical Memorandum**											**$8,485**
	Draft/Final Technical Memorandum	1			32	8			41	$8,485		$8,485
		2	4	2	84	100	8	0	200			
		$490	$920	$460	$18,480	$15,000	$1,200	$0		$36,550	$1,500	$38,050

FEE NOT TO EXCEED: ***$38,050***

OPTIONAL TASK

TASKS 5	**Environmental Permits**											**$33,463**
5.1	Kick-off Meeting, Site Visit, Research and Project Description			22			45		67	$11,810	$800	$12,610
5.2	Technical Studies			2			2		4	$760	$10,373	$11,133
5.3	CEQA and NEPA Documents			24			28		52	$9,720		$9,720
		0	0	48	0	0	75	0	123			
		$0	$0	$11,040	$0	$0	$11,250	$0		$22,290	$11,173	$33,463

FEE NOT TO EXCEED: ***$33,463***

Cover Letter

May 31, 2019

San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, CA 95006

Attn: Darren Langfield, Engineering Manager

Subject: Proposal for **2019 Water Master Plan**

Dear Darren,

We understand that San Lorenzo Valley is requesting proposals from qualified firms to prepare the District's 2019 Water Master Plan. Akel Engineering Group, Inc. (Akel) has the experience and qualifications to meet and exceed the expectations expressed in your Request for Proposals. Our team offers the following benefits:

- **Effective and Reliable Project Manager:** Our proposed project manager, Tony Akel, offers the value of a seasoned effective and reliable project manager in hydraulic modeling, supply and drought planning, and infrastructure master planning. Tony has a proven record of accomplishments in establishing effective working relationships with client staff and successfully producing concise and quality products.

- **Specialty Firm and Expert Team:** Our firm specializes in the development of GIS asset inventories and models, model calibrations, hydraulic and water quality analysis, risk analysis and condition assessment, and preparation of water master plans. We have 55 years of specialty experience in hydraulic modeling and infrastructure master planning servicing clients throughout the State of California.

- **Quick Response and Quality Deliverables:** Our extensive professional experience, and our approach to project management and attention to details, allow us to work efficiently, respond quickly, and communicate effectively with quality deliverables.

We have reviewed the RFP and acknowledge our understanding of the project and required scope of services, and comply with the terms of the RFP. Our team is committed and eager to working with you and your staff on this opportunity. We thank you for your consideration and look forward to hearing from you during the selection phase.

Respectfully Submitted,
AKEL ENGINEERING GROUP, INC.

Tony Akel, P.E.
President

7433 North First Street, Suite 103
Fresno, CA 93720
Office: (559) 436-0600, ext. 12
Mobile: (559) 593-5937
Email: takel@akeleng.com

Executive Summary

Proposal Organization

This proposal follows the directions and guidance in the RFP, and includes 7 sections as follows:

1. **Executive Summary**: Summarizes the content of the firm's proposal in a concise format.
2. **Firm Background**: This section includes an overview about our firm and a summary of our provided services.
3. **Project Organization and Experience of the Project Team**: This section provides an introduction to our key staff members and an organizational structure of our team on the project. We include the experiences of the Project Manager and the proposed personnel.
4. **Project Understanding and Approach**: This section demonstrates the understanding of the project and methodology that will be used in the approach.
5. **Past Projects**: This section lists our firm's past relevant projects in detail.
6. **Proposed Total Professional Fee and Fee Schedules Submitted Under Separate Sealed Cover**: This section directs you to the proposed fee schedule located in a separate sealed envelope.
7. **Exceptions to this RFP**

Firm Qualifications

Akel Engineering Group, Inc. (Akel) was formed in 2006 as a specialty engineering firm providing consulting services in water resources infrastructure modeling and master planning, and services clients throughout the state of California. Akel has developed a proven efficiency gained through many years of successful project management and implementation.

Our Project Manager and Principal Engineer, Tony Akel, has built a **reputation for delivering accurate high-quality infrastructure studies** that meet client's specific needs and standards, and available resources.

Our capabilities rely heavily our project approach and management abilities. Similar projects addressing water and sewer regulatory documents are provided in the Project Experience section. As this is a regulatory document, we expect a similar effort as the 2015 Urban Water Management Plan, which Akel Engineering Group successfully completed and submitted to the State of California for review.

Project Approach

We follow a proven project management technique specific to hydraulic modeling and master planning, developed based on over 25 years of specialty experience. This technique emphasizes effective communication and quick response to address expected and unplanned challenges throughout the duration of the project.

Our mission on this project is to provide the District with **high quality product** that meet the project requirements, **efficiently**, while promoting a **flexible teamwork approach**.

Firm Background and Experience

Akel Engineering Group, Inc. (Akel) is a specialty engineering firm with over **55 years of combined staff experience** providing consulting services in water resources infrastructure modeling and master planning. Akel has developed a proven efficiency gained through many years of successful project management and implementation, and is recognized in the industry for our **commitment to provide clients with high quality products**. We proudly serve clients throughout the state of California, and we continually strive to bring industry leading products and expertise to each of our projects.

Akel Engineering Group, Inc.

Name of Owner and Main Contact:
Tony Akel, PE
Years in Business: 13
Size of Organization: 11 Employees
Water Master Planning Specialists: 7
GIS Analysts: 2
Location:
7433 North First Street, Suite 103
Fresno, CA 93720

The firm's **infrastructure planning services** include hydraulic modeling, water quality modeling, risk and condition assessment, and infrastructure master planning for: water distribution, wastewater collection, non-potable/recycled water, irrigation, and storm drainage system master plans. Planning-related specialties include urban water management plans, water supply assessments, hydraulic model development and calibration, capital improvement budgets, cost sharing analysis, model conversions and GIS development and integration. Akel maintains state-of-the-art hydraulic modeling, water quality modeling, surge analysis, and risk and condition assessment modeling applications. These software packages include Innovyze's InfoWater, InfoSWMM, InfoSewer, InfoSURGE, and InfoAsset Planner.

The firm's infrastructure design related services include utility design, preliminary utility planning, utility relocations, and peer review services for documents by other design firms. Additionally, we have developed effective and lasting partnerships with several national firms to provide our clients with quick response on various project specific expertise.

I. Experience with Water Master Planning services for water agencies.

Water Systems
Hydraulic Modeling and Master Planning

Recent Experience (within the **past 6 years**)

Client	Project	Land Use Characteristics/Inventory	Demand Coefficients Analysis/Projections	Hydraulic Model Development/Calibration	Hydraulic Modeling and Analysis	Storage Analysis	Transmission Analysis	Fire Flow Analysis	Emergency Supply Planning	Water Supply Capacity	Water Quality Analysis	Recommend Infrastructure Improvements	Construction Phasing and Triggers	Develop Capital Improvement Program	AB 1600 Cost Sharing Analysis	Hydraulic Model Training	Risk and Condition Assessment
		Project Elements															
City of Fresno, CA	2016 GIS-Based Hydraulic Model Development and Evaluations 2017 Renewal and Replacement Plan Development	•	•	•	•	•	•	•	•	•	•	•	•	•			•
Coachella Valley Water District, CA	2015 GIS-Based Hydraulic Model Development and Evaluations 2016 Chromium 6 Well Treatement Analysis	•	•	•	•	•	•	•		•		•	•	•	•		
City of Madera, CA	2014 Water System Master Plan and related studies 2017-2018 Condition Assessment and Assert Management Plan	•	•	•	•	•	•	•	•	•		•	•	•	•		•
City of Clovis, CA	2017 Water System Master Plan			•	•	•	•	•	•	•		•	•	•	•	•	
City of Santa Cruz, CA	2014 Hydraulic Model Development and Desal Plant Evaluation	•	•	•	•	•	•	•	•		•						
City of Hanford, CA	2017 Water System Master Plan	•	•	•	•	•	•	•	•	•		•	•	•	•		
City of Morgan Hill, CA	2017 Water System Master Plan and related studies	•	•	•	•	•	•	•	•	•		•	•	•	•		•
City of Gilroy, CA	2018 Water System Master Plan	•	•	•	•	•	•	•	•	•		•	•	•	•		
City of Pittsburg, CA	2015 Water System Master Plan	•	•	•	•	•	•	•				•	•	•	•		
Soquel Creek Water District, CA	2014 Model Update and Desal Plant Evaluation 2015 Water Quality Analysis	•	•	•	•		•	•	•		•	•					
Newhall County Water District, CA	2016 Newhall Water System Master Plan Updates	•	•	•	•		•	•	•			•	•	•	•		
Marina Coast Water District	2018 Master Plans and Capacity Fees for Sewer, Water and Recycled Water	•	•	•	•	•	•	•	•	•		•	•	•	•		
Town of Hillsborough, CA	2013 Model Development, Calibration, and Evaluation	•	•	•	•	•	•	•									

II. Experience developing cost estimates for water projects

Our firm has assisted City's in the planning-level project cost estimates for water main replacements, tanks, and pump stations

III. Experience in water systems planning, water pipeline design, and water system modeling

Our firm has extensive knowledge in the preparation of water system planning and modeling. As a specialty firm, we have completed water system master plans and hydraulic models throughout the State of California. Our firm has combined for over 50 years of specialized master planning and modeling experience.

As part of our modeling and master planning experience, we have developed pre-design studies and performed design review for large diameter water mains, pump stations, tanks, and pressure reducing stations. This work may include pipeline connectivity guidance, or specifying valves. Additionally, our firm principal, Tony Akel, has experience in design of large diameter transmission mains and the general design of water distribution mains.

IV. Similar projects with other government agencies

Our firm has completed numerous master plans throughout the State of California.

V. Firm's local experience

Our firm has worked with Soquel Creek Water Agency, the City of Santa Cruz, Marina Coast Water District, Half Moon Bay, Castroville Community Services District, the City of Morgan Hill, and the City of Gilroy.

VI. Procedures and/or policies associated with or related to work quality and cost control

Our approach to QA/QA involves inventorying the typical data involved in a master plan and providing clear tables and figures to aid staff in the review of the model. This includes documentation of physical mapping data versus GIS electronic mapping, as well as interviews with field operations staff to confirm the operational objectives of the system and to document any anecdotal information that may not be available in electronic form.

VII. Management and organizational capabilities

We follow a proven project management technique specific to master planning and developed based on over 25 years of specialty experience. The technique emphasizes effective communication and quick response to address expected and unplanned challenges throughout the duration of the project.

➢ Quality of Deliverables

Tony Akel has built a reputation for delivering high-quality infrastructure studies that meet client's specific needs and standards, and available resources. First, he served as an employee of national firms, and since 2006 as a principal with Akel Engineering Group, Inc. We have also effectively retained national and local firms, as subconsultants, to assist in preliminary design, wastewater treatment plant decommissioning studies, wastewater treatment plant evaluations, flow monitoring, potholing, CCTV of sewer systems, surveying, and other specialties associated with the master planning efforts.

Deliverables will vary based on the type, nature, and scope of the specific project. Typical deliverables may include:

- Project Schedule
- Project base map in AutoCAD and GIS format
- Preliminary and Final Hydraulic Model Studies
- Preliminary Design Report
- Legal descriptions, plats, and easement documents (preliminary title reports, etc.)
- Plans for decommissioning of existing facilities to be abandoned

- Theory of Operation Document.

➢ Monthly Progress Reports

We have been praised by our clients on our **monthly progress reports** that detail:

- Project expenditures in the previous period, by task
- Budget Expended versus Budget Remaining, by task.
- Items requiring decision
- Upcoming milestones (submittals, workshops, meetings, etc.)

Project Organization and Experience of the Project Team

I. Describe proposed project organization, including identification and responsibilities of key personnel, including sub-consultants.

Project Organizational Chart

II. Describe the experience of the Project Manager and the experience that the proposed personnel have working on past projects as a team.

Tony Akel has over 30 years of Master Planning and hydraulic modeling experience, including time spent at large engineering firms, prior to starting his own company. Tony has completed over 300 master plans and many more models in his time as a specialist.

The Akel Team has continued that trend, with Brad Kooiman having over 11 years of specialized master plan and modeling experience, and Kevin Tuttle having over 10 years. This team is experienced modeling, master planning, condition and risk assessments, and isolated planning studies in support of infrastructure design.

III. Describe project management approach to the work effort, locations where work will be done, responsibilities for coordination with the District, and lines of communication necessary to maintain project on schedule.

The San Lorenzo Valley Water District can expect a strong Line of Communication, from our proposed Project Manager and Principal-in-Charge, Tony Akel. Tony will serve as the primary contact for correspondence between District Staff and Akel Engineering Group, Inc. Additional technical staff will be allocated, as needed, to provide quick support to address District needs. Our goal is to provide high quality products while promoting a flexible teamwork approach to ensure timely responses to City requests.

➢ Direct Communication and Teamwork Approach with City staff

- Plan, coordinate, and manage the Project in order to achieve Project goals within the approved budget and schedule
- Prepare and maintain Project schedule on a regular basis
- Effectively communicate project status via e-mail, written correspondence, phone, and meetings
- Work closely with San Bruno's engineering and public works staff
- Develop Project alternatives and resolution to issues in a timely manner
- Provide direct supervision over work product of staff and subconsultants
- Provide quality control/quality assurance

➢ Project Workshops and Meetings

Frequent Teleconference, Web Conferences, Technical memorandums, meetings, and project workshops, are elements of communication to confirm project directions at every milestone, and to receive City staff approval. Documentation of workshops and meetings include: Listing attendees, Brief description of discussions items, Key decisions, Action items log, maintained throughout the project, and dates to complete, and Next milestone/meeting/workshop and tentative dates

Project Team Descriptions

The following section contains brief summaries of our proposed project team which includes our Principal/Project Manager, and our key staff. One-page resumes are included in the Appendix.

Tony Akel, PE, **Principal** Role: **Key Personnel and Project Manager.**

Total Years of Experience: 31. Years with Akel: 13.

Tony Akel has over 30 years of professional experience and has effectively served as project manager, project engineer, and lead technical advisor on over 300 water, sewer, or storm system, and recycled water master plans through California. Tony is very effective at managing, developing, and coordinating comprehensive, accurate and defensible water system master plans. These plans include existing system inventories, GIS and mapping, water demand evaluations and forecasting, water supply capacity evaluations, hydraulic model developments and capacity evaluations, condition and risk assessments, rehabilitation and replacement plans, and capital improvement programs. Tony has a proven record of accomplishments in establishing effective working relationships with client staff, subconsultants, and stakeholders and successfully producing concise and quality products that meet the project objectives, based on team consensus.

Kevin Tuttle, PE, **Senior Engineer** Role: **Project Engineer.**

Total Years of Experience: 10. Years with Akel: 10.

Kevin Tuttle has over 10 years of specialized experienced, as a hydraulic modeling and risk and condition assessment task manager on a variety of water and sewer system master plans, including the Water/Sewer/Storm Drainage System Master Plans for the City of Morgan Hill, Water System Master Plan for the City of Pittsburg and the Sewer System Master Plans for the City of Madera. Kevin is NASSCO PACP (Pipeline Assessment Certification Program) certified and has completed several criticality and condition assessment projects using Innovyze's InfoMaster software. He is experienced in risk and condition assessment, hydraulic model calibration, resolving GIS data discrepancies, analyzing water system hydraulic performance, and developing hydraulic improvements, and is experienced in a variety of Innovyze's hydraulic and criticality modeling software. Kevin also has extensive experience with water demand evaluations and projections.

Brad Kooiman, PE, **Senior Engineer** Role: **Project QA/QC.**

Total Years of Experience: 11. Years with Akel: 11.

Brad Kooiman has over 11 years of specialized experience, as a hydraulic modeling task manager on a variety of water system evaluations and master plans, including ongoing water system master plan for Newhall County Water District, ongoing planning studies for Coachella Valley Water District, and performing hydraulic and water quality analysis for integrating a new 80 mgd water treatment facility for the City of Fresno. He is trained and experienced in using a number of modeling software, including Innovyze's InfoWater, InfoSewer, and InfoMaster. He is experienced in hydraulic model calibration, resolving GIS data discrepancies, analyzing water system hydraulic performance, developing hydraulic improvements and corresponding capital cost estimates.

Scott Orcutt, PE, **Associate Engineer** Role: **Associate Engineer.**

Total Years of Experience: 5. Years with Akel: 5.

Scott Orcutt will serve as a staff assistant engineer for this project. He has over 5 years of specialized experience, as a hydraulic modeling task assistant on a variety of water evaluations. He is trained and experienced in using a number of hydraulic modeling software, including Innovyze's InfoWater and InfoSWMM. He is experienced in hydraulic model calibration, resolving GIS data discrepancies, and analyzing wastewater system hydraulic performance. Mr. Orcutt also has experience in developing Capital Improvement Program's to conform to AB 1600, and has developed construction triggers to identify timing of improvements.

Parker Klemin, **GIS Analyst** Role: **GIS Analyst and Mapping Support.**

Total Years of Experience: 7, Years with Akel: 7.

Parker Klemin has over 7 years of specialized GIS experience in performing g analysis and analysis support tasks for a variety of hydraulic model development projects. Experience includes digitizing water and sewer systems using exported CAD data and As-Built files for use in updating hydraulic models. He has geocoded water billing records and digitized planning areas for use in updating the demands or loads in hydraulic models. Mr. Klemin has developed GIS Plat Sheets for water, sewer, and storm drainage systems and is also skilled in generating miscellaneous master planning exhibits.

Steven Hash, **GIS Analyst** Role: **GIS Analyst and Mapping Support.**

Total Years of Experience: 2. Years with Akel: 2.

Steven Hash has over 2 years of specialized GIS experience in performing analysis and analysis support tasks for a variety of hydraulic model development projects. Experience includes digitizing water and sewer systems using exported CAD data and As-Built files for use in updating hydraulic models. He has digitized planning areas for use in updating the demands or loads in hydraulic models. Mr. Hash has developed GIS Plat Sheets for water, sewer, storm drainage, and irrigation systems, is skilled in generating miscellaneous master planning exhibits, and also has extensive knowledge in creating multi-figure packets using data driven pages.

Project Understanding and Approach

Project Approach

APPROACH	SCOPE OF WORK
Task 1: Project Management	
Our firm provides monthly project status updates, including a schedule and key decisions made throughout the project.	Project Administration Consultant shall create a Project Administration Plan to direct, coordinate, and monitor the activities of the project with respect to budget, schedule, and contractual obligations. Coordination and Meetings Anticipated meetings include: • Project Kick-off meeting with District Staff • Monthly conference calls and/or meetings between the Consultant and District personnel to review project progress, discuss project challenges and findings, and review early study results • Hydraulic model review meeting • Draft Water Master Plan review meeting Quality Assurance and Quality Control Review Consultant shall conduct internal Quality Assurance and Quality Control meetings and follow-up with technical experts as necessary during the course of the project. Comply with Grant Requirements Consultant will facilitate one (1) community workshop located within or near the original DAC designated area on which the grant is based to present the 2019 Water Master Plan. Consultant will coordinate with District to be sure appropriate advertising for the meeting has been provided by the District for both the original and new DAC areas. All public members are welcome to attend the meeting.
Task 2: Date Gathering and Water System Evaluation Criteria	
Part of our initial kick-off meeting will include a matrix of items that are required for the completion of the master plan. This will include SCADA, pump records, as well as GIS information and other items. We will also summarize design and performance criteria and submit for review.	Data Request The selected consultant shall request via a Request for Information (RFI) all data needs from the District necessary for the Water Master Plan and hydraulic model creation. Establish Design and Evaluation Criteria Consultant shall submit criteria to be used in the evaluation of the distribution system and the design of proposed improvements for review and approval. The criteria will be based on the latest governing

	regulatory requirements, general engineering practice, and San Lorenzo Valley Water District development standards.
Task 3: Water System Supply and Demand Forecast	
Our team will develop water demands based on historical billing records, and nexus the demands to their physical locations, as well as to the corresponding production records. This will identify gaps in data, potential leakage, and water demand factors.	Calculate Existing Water Demands Consultant shall determine current system-wide water use based on water production records. Monthly water production records will be provided for Consultant's review and summary. Consultant shall identify the maximum water use for the period of available record and shall develop seasonal water use trends. Consultant shall calculate water usage for average day, maximum day, and peak hour demand conditions. System-wide production for these conditions will be used to adjust customer water demands before they are allocated to the hydraulic model. Consultant shall calculate individual user water demands from water billing data. Water use for individual water users will be calculated for average and maximum day. Consultant shall develop diurnal demand patterns using hourly water production and tank level data that are representative of the maximum day water use patterns for the District. Water System Demand Forecast Consultant shall create future demand projections in five-year increments through year 2040 using current land use, land planning information for the cities and counties within the District's service area and information on proposed developments within the District's service area. Consultant shall integrate temperature and precipitation forecasts into future demand projections. Water System Storage and Supply Consultant shall evaluate the District's storage and supply capacities and compare them to operational and regulatory requirements under existing and future water demand scenarios. Consultant shall identify storage and supply deficiencies and evaluate alternatives to increase District's storage and supply needs to meet future water demand.
Task 4: Hydraulic Model	
Our team is very experienced in hydraulic model development, and will utilize the latest information available to accurately reflect the existing conditions and to plan for future growth.	Develop Hydraulic Model Consultant shall create a hydraulic network model for the District's potable water system using a District provided GIS database. Assign Water Demands Consultant shall assign existing and future spatially allocated average day demand sets using the results from Task 3. Consultant shall also assign peaking factors in the model, including monthly, daily, and hourly peaking factors and diurnal demand patterns.

	Model Calibration Consultant shall prepare a hydrant flow testing plan showing recommended number and locations of proposed hydrants for approval by District. District staff will perform hydrant testing with Consultant oversight and recording of data. District will provide SCADA data during hydrant testing. Consultant shall calibrate the model using hydrant test results and communicate any abnormalities or questionable data to the District. This plan and data collected should be included as an appendix in the final report. Consultant shall use hydrant flow data to calibrate the model under steady state conditions. Consultant shall utilize SCADA data to perform extended period model calibration.
Task 5: Distribution System Evaluation	
Our firm is very experienced in using Innovyze's InfoWater software to evaluate water distribution systems. We will clearly document results of the evaluation on graphics for staff review.	Evaluate Distribution System Capacities Consultant shall run the model under current and future demand sets and evaluate the distribution system capacity and ability to meet the system evaluation criteria established in Task 2. All deficiencies discovered in the distribution systems will be identified. In addition, the Consultant shall run the model under three (3) different existing and future water supply source scenarios and evaluate the distribution system capacity and ability to meet the system evaluation criteria established in Task 2. All deficiencies discovered in the distribution systems will be identified. Consultant shall identify system improvements to allow the system to meet the evaluation criteria, review these with District staff, and make one round of adjustments to reflect input from District staff. As part of this task, a separate technical memorandum should be developed for the DAC area on which the grant is based. This TM must be included as an appendix in the final report. Evaluate Capacity and Determine Sizing for Lyon Pipeline Consultant shall run the model under current and future demand sets and evaluate the correct sizing for the Lyon Pipeline, as described in the USDA Loan Preliminary Engineering Report.
Task 6: System Condition Assessment	
Our team will evaluate the existing assets, and using industry standards, will develop estimates of remaining useful life. This will also include a risk score for each asset based on it's overall criticality to the system.	Evaluate Rehabilitation and Replacement Needs Consultant shall inventory system assets, including water system pipes, storage tanks, pumps, wells, and pressure reducing valves. Consultant shall prepare a set of estimated useful life valves for different asset classes and estimate remaining useful life based on installation dates. Consultant shall prepare projected rehabilitation and replacement needs and costs based on remaining useful life values.

Task 7: Energy Reliability/Efficiency Analysis	
Our team will use Innovyze's InfoWater to assess the overall power needs for the system based on pumping efficiencies and the system characteristics.	Identify Critical Power Needs Consultant shall review existing system energy usage and make recommendations for CIP projects to provide reliable power to critical facilities in event of an extended power outage. Evaluate Potential Energy Savings Consultant shall review existing system energy usage and make recommendations for CIP projects to improve energy efficiency.
Task 8: Water System Capital Improvement Plan	
Our team will develop an itemized list of improvements, and include the in a capital improvement plan list. Additionally, improvements will be grouped into logical projects, and submitted in project sheets once the CIP has been approved by staff.	20-year Prioritized Capital Improvement Plan Consultant shall group identified improvements into projects with planning level cost estimates for each project. Consultant shall develop a 20-year Capital Improvement Plan (CIP) for the water system. The improvement projects will be prioritized in order of importance and suggested dates for construction will be assigned.
Task 9: Water Master Plan Report	
A final master plan will be assembled and submitted to staff for review.	Draft Water Master Plan Upon completion of Tasks 1-8, Consultant shall submit 8 printed copies and 1 digital copy in PDF format of a draft Water Master Plan report to the District for review and comment. Final Water Master Plan Upon District approval of the draft materials, Consultant shall produce final report and submit 12 printed copies and 1 digital copy in PDF format. Consultant shall also provide a final electronic copy of the hydraulic model, exported GIS files from the model for each feature type, and electronic copies of all tables and figures.

Proposed Project Schedule

San Lorenzo Valley Water District
2019 Water Master Plan
Project Schedule

Task	Task Description	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20
Task 1	Project Management														
Task 2	Data Gathering and Water System Evaluation Criteria														
Task 3	Water System Supply and Demand Forecast														
Task 4	Hydraulic Model														
Task 5	Distribution System Evaluation														
Task 6	System Condition Assessment														
Task 7	Energy Reliability/Efficiency Analysis														
Task 8	Water System Capital Improvement Plan														
Task 9	Water Master Plan Report														

AKEL ENGINEERING GROUP, INC.

Past Projects

The following section includes a summary of our firm's past experience. Descriptions of projects include: contact name, phone number, project team members, and project cost and description.

Past Project 1

2010 and 2015 Water System Master Plan

Project Description:

The objective of these master plans was to evaluate the City of Pittsburg's water distribution system, identify and recommend improvements necessary to service the current and future City water demands, and develop a capital improvement program (CIP) for implementing the improvements. These master plans are based on specific development requirements, and included detailed cost responsibilities for water infrastructure.

CITY OF PITTSBURG

CONTRACT COST: $300,000

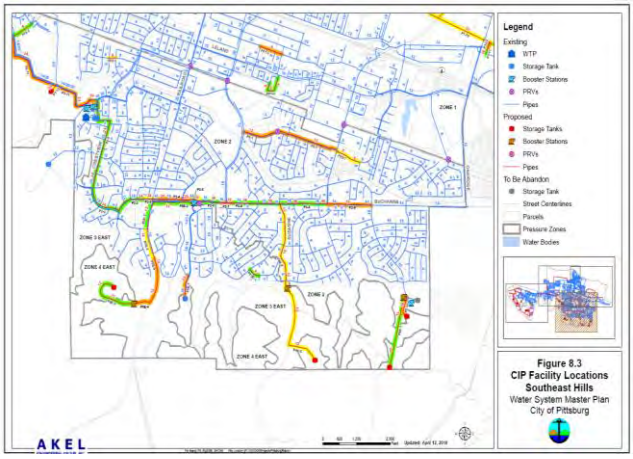
PROJECT DURATION: 2010 – 2015

AKEL TEAM ON THE PROJECT:
Tony Akel (PE), Brad Kooiman (PE), Kevin Tuttle (PE), Scott Orcutt (EIT), Parker Klemin (GIS)

CLIENT REFERENCE:
Fritz McKinley, Public Works Director
City of Pittsburg
65 Civic Center Avenue
Pittsburg, CA 94565
(925) 252-4928
FMckinley@ci.pittsburg.ca.us

Project Highlights:

- Update water system planning and design criteria.
- Project future demands through the Urban Growth Boundary based on planned developments (Residential Dwelling Units and Non-Residential acreages).
- Develop and calibrate a hydraulic model to EPS using Innovyze's Infowater and based on the most current GIS data.
- Evaluate the capacity of the water facilities to service existing users.
- Perform storage analysis and fire flow analysis for each pressure zone.
- Recommend improvements necessary to mitigate existing deficiencies and to service future growth.
- Develop a Capital Improvement Program with a short-term, intermediate-term and long-term phasing.
- Perform cost sharing analysis for each recommended project between existing users and future developments.
- Recommend storage site placement criteria.
- Prepare master plan report.



Past Project 2

2010 Model Development and Bay Street Reservoir Replacement 2012 Regional Desalination Plant Hydraulic Analysis

City of Santa Cruz

CONTRACT COST: $210,000

PROJECT DURATION: 2010 – 2016

AKEL TEAM ON THE PROJECT:
Tony Akel (PE), Brad Kooiman (PE), Kevin Tuttle (PE), Scott Orcutt (EIT), Parker Klemin (GIS)

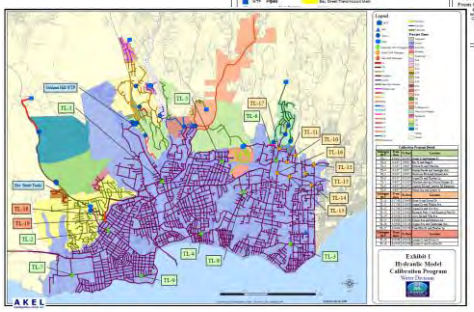
CLIENT REFERENCE:
Doug Valby, P.E., Associate Civil Engineer
City of Santa Cruz
212 Locust Street, Suite C
Santa Cruz, CA 95060
(831) 420-5212
dvalby@cityofsantacruz.com

Project Description:

The objective of these plans was to develop a calibrated hydraulic model, evaluate the in impact of the Bay Street Reservoir replacement, determine the hydraulic impact of a proposed regional desalination plant including transferring water via new interties to Soquel Creek Water District. Also included in these plans is merging the City of Santa Cruz and Soquel Creek Water Districts water models to evaluate the transfer of water between each water system

Project Highlights:

- Model Development: Developed and calibrated a hydraulic model to EPS using Innovyze's Infowater and based on the most current GIS data.
- Storage Replacement Phase 1 sensitivity analysis recommended a size that was appropriate for the short-term service, yet provided reasonable emergency storage coverage for its intended service life.
- Storage Replacement Phase 2 sensitivity analysis recommended a size that was appropriate for the long-range needs of the system and final tank pad elevation.
- Desal Project: Consolidated the City's hydraulic model with the Soquel Creek Water District hydraulic model, and recalibrated both systems.
- Desal Project: Performed sensitivity analysis to optimize the use of the existing system while conveying various production amounts form the proposed desal plant.
- Desal Project: Developed transmission main alternatives from a proposed desalination plant on the west side of the system to mitigate low pressures in the east and potential transfer of water via new interties with Soquel Creek Water District.
- Desal Project: Evaluated various alignments through the City of Santa Cruz and Soquel Creek Water District to deliver desalinated water and prepared a cost benefit analysis for each water agency.
- Identified impacts of adding the new source of water on water age and quality in the existing storage tanks and recommended operation improvements to mitigate high water age.



Past Project 3

2012 Regional Desalination Plant Hydraulic Analysis
2016 Hydraulic Modeling Analysis for Water Quality

Project Description:

The objective of these plans was to update and calibrate the Soquel Creek Water District Hydraulic Model, merge the City of Santa Cruz hydraulic model with Soquel Creeks Water Model to evaluate the impact of the new City of Santa Cruz interties to the water distribution system and recommend capacity improvements required to transfer water the eastside of the water system. Water quality scenarios were also performed to determine the water age impact these new interties would have and recommend operational changes to mitigate any high water age issues.

Project Highlights:

- Consolidated the City of Santa Cruz's hydraulic model with the Soquel Creek Water District hydraulic model, and recalibrated both systems.
- Updated water system planning and design criteria.
- Performed a hydraulic analysis to determine the amount of water that could be transferred to Soquel Creek Water District from the City of Santa Cruz via 3 new potential interties.
- Evaluated various transmission main alignments through the City of Santa Cruz and Soquel Creek Water District to deliver desalinated water and prepared a cost benefit analysis for each water agency.
- Performed a water age analysis to determine the impact of the new interties and also recommend operation improvements to mitigate areas with high water age concerns.

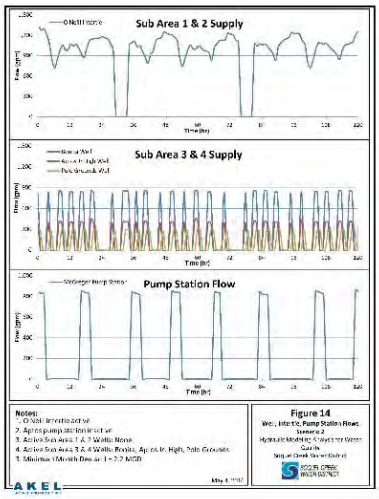
Soquel Creek Water District

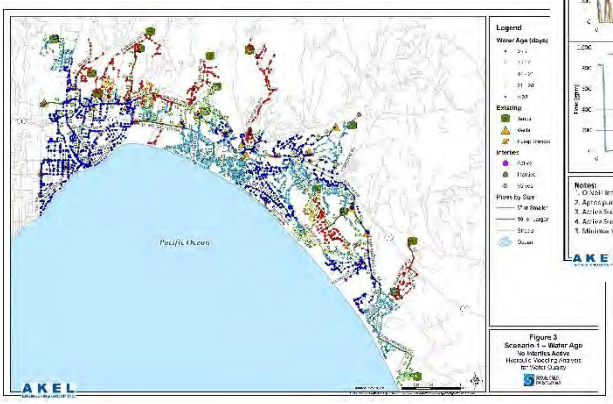
CONTRACT COST: $55,000

PROJECT DURATION: 2010 – 2016

AKEL TEAM ON THE PROJECT:
Tony Akel (PE), Brad Kooiman (PE), Kevin Tuttle (PE), Scott Orcutt (EIT), Parker Klemin (GIS)

CLIENT REFERENCE:
Taj A. Dufour, P.E., Engineering Manage/Chief Engineer
Soquel Creek Water District
5180 Soquel Dr.
Soquel, CA 95073
(831)475-8500
tajd@soquelcreekwater.org





Proposed Total Professional Fee and Fee Schedules

The proposed fee schedule is included and attached in the separate sealed envelope labeled,

'FEE ESTIMATE – 2019 WMP"

Exceptions to this RFP

Akel Engineering Group, Inc. has **no proposed exceptions, alterations or amendments** to the Scope of Services or other requirements stated in this RFP, including the Consultant Services Agreement.

Appendix

The Appendix includes our Project Team's One-Page resumes.

Tony Akel, P.E.

Contact

7433 N. First Street, Suite 103
Fresno, California 93720
Phone: 559-436-0060
Fax: 559-436-0622
www.akeleng.com

Education

MS Civil Engineering, California State University, Fresno, 1985
BS Civil Engineering, California State University, Fresno, 1983

Registration

Professional Civil Engineer:
California License No. C-41682
Washington License No. 46708

Professional Affiliations

American Public Works Association (APWA)
San Joaquin Chapter Secretary 2017-2019
San Joaquin Chapter Director 2016-2017

American Society of Civil Engineers (ASCE)
National Leader Training Committee 2015-2021
California Infrastructure Report Card Co-Chair 2018-2019
National Infrastructure Policy Committee 2015-2018
National Engineers Week Committee 2011-2019
Region 9 (California) Governor 2007-2010
San Francisco Section President 2004
Fresno Branch President 2000, 2001

American Water Works Association (AWWA)

Association of California Water Agencies (ACWA)

Rotary International (RI)
North Fresno

Toastmasters International (TI)
Fresno TLC President 2000
District 33 Area F4 Past Governor 2001

Employment History

2006-Present - Akel Engineering Group, Inc.
1997-2006 - Carollo Engineers
1992-1997 - Montgomery Watson (MWH Americas)
1987-1992 - Boyle Engineering Corporation (AECOM)
1985-1987 - Dimmick Corporation

Experience Summary

Tony Akel has over 30 years of professional experience in providing planning and design services related to the water, sewer, storm, recycled water, and irrigation delivery infrastructure.

Tony is especially effective in developing and maintaining clear project communications that provide quick response to challenges as they surface and result in successful project completions. Prior to starting his own business, he served as the Infrastructure Master Planning Group Manager for a major engineering firm.

Tony has effectively served as project manager, project engineer, and lead technical advisor on over 300 master plans. He is adept in the design of large utility pipelines and has prepared plans, specifications, and engineering estimates for 21,000 linear feet of 90-inch gravity sewer pipes, 10,000 linear feet of 42-inch double barrel force mains, and 22,000 linear feet of up to 30-inch water mains.

A solid computer background includes a proven efficient and analytical use of a variety of computer programs for engineering design applications and mapping, to include: water/wastewater systems analysis, Geographic Information System (GIS), database conversion and management, project scheduling, cost estimating, and other engineering applications.

He has substantial knowledge of state-of-the-art water distribution and wastewater collection hydraulic computer models and has provided on-line technical support on water/wastewater hydraulic computer modeling techniques throughout the continental United States.

Brad Kooiman, P.E

Contact

7433 N First Street, Suite 103
Fresno, California 93720
Phone: 559-436-0600
Fax: 559-436-0622
www.akeleng.com

Education

Bachelor of Science in Civil Engineering
California State University, Fresno 2010

Registration

California License No. C-82658

Employment History

2007 - Akel Engineering Group, Inc.

Professional Affiliations

American Society of Civil Engineers *(ASCE)*

Experience Summary

Water Distribution

- Current analysis lead for the City of Fresno, California (Population 510,000) hydraulic modeling and consulting services. Part of a team which developed and calibrated an extended period simulation hydraulic model which includes 240 existing wells and 1,800 miles of pipelines. On-going hydraulic modeling support including water quality and optimization analysis of the regional transmission main analysis for a new 80 MGD water treatment facility, including on-going operation concerns.
- Current task manager in Coachella Valley Water District, California (population 260,000). Updated hydraulic model with new developments and analyzed the impacts of these developments using Innovyze InfoWater. Current hydraulic model contains approximately 2,000 miles of pipe, 66 pressure zones, 135 MG of storage, and 100 supply wells.

- Project analysis lead in **Newhall County Water District**, California (population 30,000) hydraulic model and master plan update. The hydraulic model was updated using as-builts provided by the District and converted from a steady-state simulation to an extended period simulation model. The system was then analyzed for deficiencies and a Master Plan CIP was developed for each build-out year.

- Task manager in developing the **City of Santa Cruz**, California (population 62,000) hydraulic model. Part of a team that sized a new water tank based on current and anticipated water demands. Challenges were resolving discrepancies with the City's GIS and calibrating the system in Innovyze Infowater. Project consisted of updating a 2,000 pipe model into a 12,000 pipe model and calibration. Water system includes 21 pressure zones, 14 tanks, 18 PRVs, 11 booster stations, and two water sources. Used model for developing operational strategies during daily and emergency use.

- Hydraulic modeling task manager in **Palmdale Water District**, California (population 125,000) Initial Distribution System Evaluation (IDSE) for meeting the requirements of IDSE Stage 2 DDBP Rule, using complex modeling analysis for a system with multiple water sources. Resolved convergence in a 20,000-pipe model extracted from GIS to Innovyze Infowater and used for developing improvements and operational strategies. System with 20 storage tanks (50 MG), 14 booster stations, 10 pressure zones, PRVs, surface and groundwater supply sources. Performed a 7-week water age analysis.

- Task manager for **Morgan Hill**, California (population 40,000) 2014 Water Master Plan Update and hydraulic modeling analysis. Tasks include updating and calibrating the hydraulic model, analyzing the impact of the new General Plan, and recommending improvements for the existing system and future expansion.

- Task manager for **Gilroy**, California (population 51,000) 2014 Water Master Plan Update and hydraulic modeling analysis. Tasks include updating and calibrating the hydraulic model, analyzing the impact of the new General Plan, and recommending improvements for the existing system and future expansion.

- Task manager in **City of Pittsburg**, California 2010 Master Plan (population 60,000). Updated and calibrated the hydraulic model. Part of a team that redeveloped the hydraulic model for the City. The hydraulic model was created using Innovyze H_2OMap Water, to include elevations, demands, and then calibrated to the City's field data provided. Overall, the model includes 5 Pressures Zones, 211 Miles of Pipe, and 4 PRV's. Data Analysis includes demands by pressure zone and by developer, as well as a storage analysis for the City-Wide developments by Pressure Zone.

Kevin Tuttle, P.E.

Contact

7433 N First Street, Suite 103
Fresno, California 93720
Phone: 559-436-0600
Fax: 559-436-0622
www.akeleng.com

Education

Civil Engineering Undergraduate, California State University, Fresno 2011

Employment History

2008–Present. Akel Engineering Group, Inc.

Professional Affiliations

American Society of Civil Engineers (ASCE)

Professional Certifications

Professional Engineer (CA) C-85524
NASSCO PACP U-816-07004890

Experience Summary

Integrated Master Planning

- Senior Engineer for the Water, Sewer, and Storm Drainage Master Plans and Urban Water Management Plan of the **City of Morgan Hill**, California (population 42,000). Leads a team that developed land use planning assumptions and customized demand and flow factors for hydraulic modeling of each of the three systems. A long-term capital improvement plan was developed for each system.

- Senior Engineer for the Water, Sewer, Storm Drainage, and Recycled Water Master Plans and Urban Water Management Plan of the **City of Gilroy**, California (population 54,000). Leads a team that developed land use planning assumptions and customized demand and flow factors for hydraulic modeling of each of the three systems. A long-term capital improvement plan was developed for each system.

- Senior Engineer for the Water, Sewer, and Recycled Water Master Plans of the **Marina Coast Water District**, California (population 35,000). Leads a team that developed land use planning assumptions and customized demand and flow factors for hydraulic modeling of each of the three systems. A long-term capital improvement plan was developed for each system.

- Project Task Lead for the Water, Sewer, and Storm Drainage Master Plans of the **City of Hanford**, California (population 55,000). Leads a team that developed land use planning assumptions and customized demand and flow factors for hydraulic modeling of each of the three systems. A long-term capital improvement plan was developed for each system.

- Project Task Lead for the Water, Sewer, and Storm Drainage Master Plans and Recycled Water Feasibility Study of the **City of Madera**, California (population 61,000). Leads a team that developed land use planning assumptions and customized demand and flow factors for hydraulic modeling of each of the three systems. Also performed a recycled water feasibility study intended to document the potential for a new system offsetting potable water use. A long-term capital improvement plan was developed for each system.

Wastewater Collection

- Senior Engineer for the Sanitation System Collection Master Plan of **Coachella Valley Water District**, California (population 260,000). Leads a team that developed land use planning assumptions and customized flow factors for an "all pipe" hydraulic model. The model is used for the intermediate and long-term planning of the sanitation collection system, and the implementation of a large-scale manifolded force main decommissioning project.

- Project Analysis Lead for the Sanitary Sewer Model of **Coachella Valley Water District**, California (population 260,000). Part of a team that develops and analyzes project scenarios with the use of H_20Map SWMM, which facilitates in the development of viable statistics in which the Water District is capable of evaluating their sewer system. This project consists of maintaining a 4,000+ pipe model, with 3 WRP's, and over 20 Lift Stations. User modeling has been developed to calculate different emergency scenarios as well as design flow diversion scenarios.

Scott Orcutt, E.I.T

Contact

7433 N First Street, Suite 103
Fresno, California 93720
Phone: 559-436-0600
Fax: 559-436-0622
www.akeleng.com

Education

Civil Engineering Undergraduate, California State University, Fresno 2014

Engineer-in-Training, State of California, No. EIT 152604

Employment History

2013–Present. Akel Engineering Group, Inc.

Professional Affiliations

American Society of Civil Engineers (ASCE)

Experience Summary

Wastewater Collection

- Task Assistant in the **Marina Coast Water District** (population 34,300) Sewer System Master Plan. Responsibilities included updating the existing hydraulic model, developing existing flow factors, projecting future system flows, evaluating existing sewer system and recommending improvements to mitigate existing deficiencies and serve future growth, and assisting in report preparation.

- Task Assistant in the **City of Shasta Lake** (population 9,400) Wastewater Master Plan. Responsibilities included reviewing sewer system survey data, developing a sewer system hydraulic model using Innovyze InfoSewer, performing extended period simulation model calibration, and identifying improvements to mitigate existing deficiencies and service future growth.

- Task Assistant in the **City of Hanford** (population 54,600) Sewer System Master Plan. Responsibilities include updating the city sewer flows to match the wastewater treatment plant and reviewing as-builts and survey information for the purpose of updating the hydraulic model. The updated model is used to evaluate capacity availability for the accommodation of new development.

- Task Assistant in the **City of South San Francisco (E. of 101)** Sewer System Master Plan. This plan was prepared for the City's East of 101 service area and responsibilities include updating the City's sewer system hydraulic model, as-builts and lift station operational information, developing future system sewer flows, and identifying improvements to service future growth.

- Current Task Assistant in the **City of South San Francisco (W. of 101)** (population 65,500) Sewer System Master Plan. Responsibilities include the preparation of a flow monitoring program, development of existing and future sewer system flows, updating the hydraulic model based on new construction and City-wide survey. Additional tasks include identifying improvements to mitigate existing deficiencies and service and future growth.

- Current Task Assistant in the **City of South Soledad** (population 26,000) Sewer System Master Plan. Responsibilities include the preparation of a manhole survey program and flow monitoring program, developing sewer system hydraulic model based on GIS using Innovyze Infosewer, estimating existing and future sewer system flows, updating the hydraulic model based on new construction and City-wide survey. Additional tasks include identifying improvements to mitigate existing deficiencies and service and future growth.

- Task Assistant in the **City of Morgan Hill** (population 45,000) Sewer System Master Plan. Responsibilities included updating the existing hydraulic model, developing existing flow factors, projecting future system flows, evaluating existing sewer system and recommending improvements to mitigate existing deficiencies and serve future growth, and assist in report preparation.

- Task Assistant in the **County of Kern** Sewer System Master Plan. Responsibilities included developing and updating the hydraulic model. The existing system was updated based on recent construction provided by County staff. Future improvements were recommended based on recent planning studies, and capacity availability was analyzed to determine the development triggers for new improvements.

Parker Klemin

Contact

7433 N First Street, Suite 103
Fresno, California 93720
Phone: 559-436-0600
Fax: 559-436-0622
www.akeleng.com

Education

BA Geography
California State University, Fresno 2011

GIS Certificate of Completion
California State University, Fresno 2010

Employment History

2011-Present – Akel Engineering Group, Inc.
2011 – California State University, Fresno

Experience Summary

Wastewater Collection

- **Moss Landing, CA** – Complete digitization and database development of the sanitation system from As-Built drawings, for use in a pipeline Risk Assessment and GIS based hydraulic model. Created GIS report figures and large exhibits documenting the existing system, pipeline risk assessment, as well as the recommended improvements.

- **Marina Coast Water district, CA** – Created over a dozen figures for the Sewer Master Plan. Reviewed and converted CAD system drawings into Arcgis for import into a GIS based hydraulic model. Created figures and performed spatial analyses to aid in the development of the hydraulic model.

- **City of Shasta Lake, CA** – Created over two dozen figures and large exhibits for the 2016 Master Plan; including, regional location and planning area, system capacity and flow performance, existing collection facilities, flow monitoring program meter locations, future system improvements, and infiltration and structural defects for Condition Assessment. Comparison details between the existing GIS and the hydraulic model. Created a GIS Topology to ensure data integrity.

- **City of Soledad, CA** – Created figures for the Sanitary Sewer Master Plan; including, existing and future land use, and existing collection system with meter locations for a flow monitoring program.

- **City of Hanford, CA** – Generated figures for the 2017 Master Plan; including, existing system, proposed system improvements, modeled trunks, existing deficiencies, existing and future land use, and regional location maps.

- **City of Santa Barbara, CA** – Updated and generated exhibits for the existing collection system, sewer basins, high inflow and infiltration, flow monitoring program, existing deficiencies, septic areas, 2030 and 2050 flow projections, pipe rehabilitation and replacement, and special studies.

- **City of Morgan Hill, CA** – Generated numerous figures for the 2018 Master Plan, including existing sanitary sewer system, system improvements, flow monitoring, sewer basins, existing and future land use, as well as figures for special studies. Joined sewer demands to parcel data to generate a new point file for hydraulic analysis.

- **City of South San Francisco, CA** – Created figures and large exhibits for the East of Highway 101 Sewer System Master Plan; to include, the regional location, existing collection facilities, collection basins, existing deficiencies during wet and dry weather, and capital improvement program figures.

- Created figures and large exhibits for the ongoing City-Wide Sewer System Master Plan; to include, regional location, existing and future land use, existing collection facilities with meter locations for a flow monitoring program. Performed spatial analyses to aid in the development of the hydraulic model.

- **City of Visalia, CA** - Generated exhibits for the hydraulic analysis of the sanitary sewer system and of the proposed improvements.

Steven Hash

Contact

7433 N First Street, Suite 103
Fresno, California 93720
Phone: 559-436-0600
Fax: 559-436-0622
www.akeleng.com

Education

BA Geography
California State University, Fresno 2016

GIS Certificate of Completion
California State University, Fresno 2015

Employment History

2016–Present. Akel Engineering Group, Inc.

Experience Summary

Wastewater Collection

- **City of Madera, CA** – Detailed mapping was created to document the system, create an Infrastructure Risk and Condition Assessment figure, and Create dynamic Data Driven map pack for CCTV review.

- **City of Morgan Hill, CA** – Generated numerous figures for the existing Sewer System Condition Risk Assessment along with CCTV review, and figure packs denoting rehabilitation costs for pipes.

- **City of South San Francisco, CA** – Generated numerous figures for the existing Sewer System and for the sewer system manhole survey project.

Water Distribution

- **Coachella Valley Water District, CA** – Generated detailed figures of existing system infrastructure and proposed system improvements. Created exhibits of water system pressure loggers, existing water system supply, and proposed water system supply improvements. Created detailed figures of system pressures, velocities, and head losses, as experienced in various different fire flow scenarios.

- **City of Fresno, CA** – Extensive and thorough review of the existing water system to create map packets showcasing the most optimal set up location for the Neutral Output Discharge Elimination System (NO-DES) vehicle throughout the city. For each setup location, a dynamic table was generated to show the total length of each flushing sequence.

- **City of Madera, CA** – Extensive review of As-Built drawings, CAD data, field inspections, and other data sources to create a completer and more accurate GIS, for use in an Infrastructure Risk and Condition Assessment. Detailed mapping was created to document the system as well as areas needing verification.

- **City of Morgan Hill, CA** – Generated numerous figures for the water supply assessment along with new annexation areas that are to become part of the city.

- **Santa Clarita Valley Water Agency, CA** – Digitized existing pipes based on thorough review of As-Builts. Generated figures to showcase the newly digitized existing pipes.

Irrigation

- **Coachella Valley Water District,** – Complete digitization and database development of over 435 miles of pipeline and 1,629 pipe stand and pipe vent structures, from As-Built drawings and AutoCAD plat sheets. Data integrity was verified and aligned to orthographic aerial imagery and GPS data. The database was structured for use a GIS based hydraulic model. Reviewed drawings spanning 68 years in order to establish the most accurate and up to date system. Communicated with the District to locate missing drawings and aid in identifying over 67 miles of abandoned pipeline and 55 miles of new or replacement pipeline. System wide adjustment of system elevations to determine pipe invert elevations for use in the hydraulic model.

SAN LORENZO VALLEY WATER DISTRICT

May 31, 2019

PROPOSAL TO PROVIDE CONSULTING SERVICES FOR THE

2019 WATER MASTER PLAN

WSC
WATER SYSTEMS CONSULTING, INC.

MR. DARREN LANGFIELD

Engineering Manager
San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, CA 95006

PROPOSAL FOR THE

2019 Water Master Plan

WATER SYSTEMS CONSULTING, INC.

111 North Market Street
San Jose, CA 95113

Business Phone and E-Fax:
(408) 785-6419

DEAR MR. LANGFIELD,

Water Systems Consulting, Inc. (WSC) is pleased to present this proposal to provide consulting services to the San Lorenzo Valley Water District (District) for the 2019 Water Master Plan. This procurement provides an exciting opportunity for the District to develop its first hydraulic model and system-wide master plan which will have long-term benefits for the reliability and resiliency of its water system and water supply.

WSC has worked with the District since 2013 and we have continued to provide responsive, thoughtful engineering and project management services since. Our proposed Project Manager, Kirsten Plonka, has worked out of the District office for the past two years and has built strong relationships with staff, and a thorough understanding of the District's unique conditions and constraints.

Ms. Plonka is an experienced master planner who will be able to draw upon her knowledge of the District to minimize the unnecessary impacts on District staff and deliver a well thought out and useful Water Master Plan to guide the development of vital water system improvement projects. Based on our understanding of the District and its needs, our approach is tailored around five key opportunities:

- **Justifiable and prioritized master plan will support future decision-making and rates.** WSC will develop a Water Master Plan that provides the "why" necessary to justifying capital improvement projects and rate setting. Projects in the recently annexed areas must be balanced with projects that benefit the remainder of the District. Careful prioritization based on defensible metrics will give District staff a clear path for which projects to start first.
- **Prioritized review of U.S. Department of Agriculture (USDA) program projects will assure the District of building optimally sized pipelines.** Before a project goes to design, it is important to verify accurate pipe sizing for both existing and future needs to have confidence that a pipe is the right size to meet multiple operational scenarios. WSC will prioritize the sizing of the Lyon pipeline, and the District's four other USDA-funded pipelines, to fit the District's program timelines.
- **Analyzing future water supply and storage scenarios will identify ways to improve operational efficiency.** The District has potential for supply changes with the upcoming Santa Margarita Groundwater Sustainability Plan and a planned Conjunctive Use project. In addition, multiple tanks are currently under construction and the up-sizing and possible relocation of Swim Tank will increase storage. Documenting how these scenarios will affect the District's infrastructure and conveyance needs is an important step to increase operational efficiency.
- **Strategic up-sizing of small pipelines will meet fire flow requirements.** Fire protection is critical in the Santa Cruz Mountains. The District has many 2-to 6-inch lines that likely do not provide adequate fire flow. WSC understands that some of these pipelines are in sensitive environmental habitat and should be relocated to existing right-of-way for ease of future maintenance. A strategic replacement program for these pipelines is critical for meeting current and future fire flow requirements.
- **Capturing legacy information in the hydraulic model and master plan will preserve operational knowledge when staff members retire.** WSC understands the importance long-term employees play in the operations of a District's water system. The District is faced with the prospect of retirement of some key employees, and it is not alone. Industry organizations recognize this industry-wide trend and are promoting

MR. DARREN LANGFIELD

Engineering Manager
San Lorenzo Valley Water District
13060 Highway 9
Boulder Creek, CA 95006

PROPOSAL FOR THE

2019 Water Master Plan

WATER SYSTEMS CONSULTING, INC.

111 North Market Street
San Jose, CA 95113

Business Phone and E-Fax:
(408) 785-6419

effective transition processes. WSC will make knowledge capture a priority in this master planning process. We will very quickly download available information, incorporate it into the hydraulic model and work with staff to discuss what is accurate or inaccurate in District records. We will do all we can to capture their knowledge and transfer it into our work products and the datasets that we prepare for the District.

WSC takes no exceptions with the RFP and is in substantial agreement with the terms and conditions contained in the Consultant Services Agreement. WSC is currently under contract with the District and we are confident we can efficiently come to a mutual agreement on the provided terms. WSC is committed to working with the District consistent with our ongoing commitments and long-term partnership.

If you have any questions on any aspect of this proposal, please feel free to contact WSC's proposed Project Manager, Ms. Kirsten Plonka, at (858) 397-2617, ext. 304 (kplonka@wsc-inc.com) or WSC's proposed Principal in Charge, Mr. Dylan Wade, at (805) 457-8833, ext. 111 (dwade@wsc-inc.com). Thank you again for your consideration, and we look forward to your response.

KIRSTEN PLONKA, PE
PROJECT MANAGER

DYLAN WADE, PE
PRINCIPAL IN CHARGE

WSC IS YOUR PREMIER WATER MASTER PLAN CONSULTING FIRM

WSC is a full service civil and environmental engineering consulting firm that specializes in innovative water master planning solutions, relationship building, and bringing value to our clients.

WSC serves clients throughout California and Oregon from nine offices, including our local office in San Jose. Our expert staff includes more than 50 skilled engineers, planners, hydrogeologists, operators, construction managers, and strategic communications professionals.

Our professional areas of expertise include water system master planning, hydraulic modeling, capital improvement planning, asset management, workshop facilitation, system optimization, and more. This expertise allows WSC to approach the District's 2019 Water Master Plan project from a holistic perspective that will result in a clear and defensible plan to address predicted needs for its water distribution system and water supply system.

WSC's proposed Project Manager, Kirsten Plonka has experience working out of the District's office which means we will be efficient with your time while maximizing the benefit of the master plan. She is supported by WSC's Principal in Charge, Dylan Wade, and quality control/quality assurance (QA/QC) engineer, Jeroen Olthof. Dylan has worked alongside Kirsten to provide responsive service to the District for the past two years, and Jeroen is a nationally recognized hydraulic modeling and asset management expert.

Through our work with the District, WSC understands the nuances of its GIS and water distribution systems, and the local environment and politics. Together, Kirsten and her team will work collaboratively with District staff to deliver a Water Master Plan that accurately describes a defensible plan to guide the development of system improvement projects.

GET TO KNOW US:

- WSC has worked on **16** Master Plans and more than **40** UWMPs in the past decade.
- WSC has an expert staff of **more than 50** skilled employees.
- WSC has **supported the District since 2013** in a variety of capacities.
- We have **nine offices** serving clients throughout the West Coast.
- WSC has been recognized as a **Best Place to Work** three consecutive years by Inc. Magazine.
- **Expect WSC**: Personalized Service. Sustainable Solutions. Exceptional Value.

FIRM'S EXPERIENCE

WSC has worked with the District since 2013, including developing the 2015 Urban Water Management Plan Update, and we have provided staff extension services to the District for the past two years. WSC's proposed Project Manager, Kirsten Plonka, has spent considerable time working out of the District's office and coordinating closely with District staff.

Through this experience, Kirsten and her team have valuable insight into the unique conditions and constraints that the District faces. WSC's experienced master planning team will leverage that local knowledge in the development of the 2019 Water Master Plan.

Our team includes hydraulic modeling experts who have built, calibrated, and updated hydraulic models during master planning efforts to identify hydraulic deficiencies. The hydraulic model is a useful tool that will help the District in its system planning and will guide the identification and development of system improvement projects.

WSC IS A TRUSTED PARTNER

WSC has worked closely with the District to support it staff, respond to emergency repairs, and acquire funding. We are committed to continuing to help the District improve the reliability of it water system and water supply.

WSC HAS A PLAN TO ADDRESS SYSTEM DEFICIENCIES

WSC will help find appropriate solutions at the right cost. To achieve this, WSC will model the water system and evaluate aging infrastructure to identify potential vulnerable areas throughout the system.

WSC'S KNOWLEDGE ABOUT THE DISTRICT'S SYSTEM REDUCES IMPACT ON DISTRICT STAFF

WSC's team is staffed with a project manager and engineers who are familiar with the District's system, staff, water supply, and constraints. This knowledge will maximize the benefit of the master plan while being efficient with District staff's time.

WSC USES RIGOROUS QA/QC PROCEDURES TO DELIVER HIGH-QUALITY WORK PRODUCTS

Quality must be planned in, not inspected in. WSC uses a combination of working technical sessions, and technical, formatting, and readability reviews throughout the process. Reviews include high-level working sessions focused on overall strategy and identification of innovative approaches, and detailed reviews of calculations, drawings, and technical writing to avoid errors.

WSC'S SYSTEMATIC APPROACH TO PROJECT MANAGEMENT DRIVES SUCCESS

WSC uses an integrated project management and accounting system, Ajera, to manage project progress and budget in real time. We use earned value management to identify discrepancies between planned and actual progress, allowing corrective measures to be implemented early to prevent cost overruns and schedule delays.

"WSC expertly prepared our Master Plans. I have been extremely impressed with their high level of competency and ability to work effectively and interactively with staff. WSC's assessment and modeling of our systems has been exemplary. I really enjoy working with staff at WSC, I know I will always get a prompt, insightful, and trustworthy response."

Ms. Teresa McClish, Community Development Director, City of Arroyo Grande

WE ARE WATER MASTER PLANNING EXPERTS

WSC brings considerable experience developing and completing Water Master Plans for local water utilities and will leverage that experience by efficiently integrating past work into future projects. Our approaches typically revolve around four primary objectives: creating a plan to reflect the unique aspects of the client and their long-term goals; optimize the use of water, energy, human, and financial resources; communicate the benefits of the plan to both internal and external customers; and deliver on expectations that are clearly understood and endorsed by all stakeholders.

RECENT WATER MASTER PLANS

Client	Status	Supply & Demand Forecast	Hydraulic Model	Capacity Evaluation	Condition Assessment	Energy Analysis	Capital Improvement Plan
Oak Lodge Water Services District	Ongoing	X	X	X		X	X
California American Water Monterey District	Draft Submitted	X	X	X	X	X	X
City of Victorville	Draft Submitted	X	X	X	X	X	X
City of Pismo Beach	Final Draft Submitted	X	X	X	X	X	X
Big Bear City Community Services District	Completed	X	X	X	X		X
Casitas Municipal Water District	Completed	X	X	X	X		X
City of Paso Robles	Completed	X	X	X			X
City of Arroyo Grande	Completed	X	X	X		X	X
City of Santa Maria	Completed	X	X	X	X		X

FIRM'S LOCAL EXPERIENCE

URBAN WATER MANAGEMENT PLAN & AS-NEEDED ENGINEERING SERVICES

SAN LORENZO VALLEY WATER DISTRICT, BOULDER CREEK, CA

WSC began working with the District in 2013 on the Fall Creek Fish Ladder Restoration Project and later developed its 2015 UWMP Update. That project gave our staff insight into your unique water supply and demand needs.

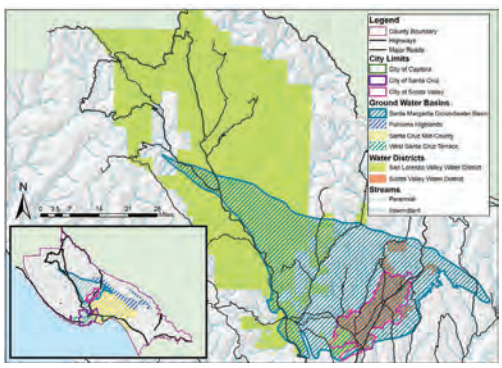
About two years ago, WSC began providing the District with as-needed engineering services which includes planning, design, and funding support. WSC supports the District in identifying funding sources, meeting requirements, and completing application packages to acquire funding from the USDA for a variety of projects, including a USDA funded pipeline project. Our familiarity with the District's staff and standards from these collaborative efforts enables us to efficiently deliver a wide range of projects. Some of the projects our team has supported the District on are:

- Bear Creek Estates Wastewater Treatment Facility Rehabilitation Project Management
- Bear Creek Road Water Pipeline
- Highway 9 Viaduct Water Pipeline
- Trout Farm Inn Fire Service
- Lompico Pressure Reducing Valves Replacement Project
- Lyon Tank Road Landslide Repair Project Project Management
- Fall Creek Fish Ladder Restoration and Debris Removal Projects
- 2015 Urban Water Management Plan

Key Staff:
Kirsten Plonka, Dylan Wade, Spencer Waterman

GROUNDWATER SUSTAINABILITY PLAN

SANTA MARGARITA GROUNDWATER AGENCY, SANTA CRUZ COUNTY, CA



WSC is on the team developing the Santa Margarita Groundwater Basin (SMGB) Groundwater Sustainability Plan. WSC's role on the team is to work with stakeholders to identify projects and management actions to achieve sustainability for the SMGB. WSC is providing groundwater modeling, cost-benefit analysis, stakeholder outreach, and project and management services for the Santa Margarita Groundwater Agency. The District is a member agency of the Agency and, through our role on the GSP, we will be able to bring unique insight to the water supply portion of the Water Master Plan.

Key Staff: Kirsten Plonka, Spencer Waterman

MEET THE WSC TEAM

WSC's team is functionally organized to take advantage of the strengths of our expert staff within a streamlined structure to provide a high level of responsiveness and quality.

WSC's proposed Project Manager, Kirsten Plonka, has experience directly working with your staff and will serve as the primary point of contact for this project. Kirsten has more than 15 years of experience in water system planning and her extensive experience in the public sector allows her to approach this project from an owner's perspective.

She will be supported by a highly qualified team which includes WSC Vice President and Principal in Charge, Dylan Wade, who has served in a similar role on multiple projects for the District. WSC's proposed QA/QC engineer, Jeroen Olthof, is a nationally recognized expert in hydraulic modeling and master planning whose expertise includes the optimization of capital improvements and operational changes.

Together, they will lead WSC's comprehensive team that includes the key staff listed in the organizational chart below. WSC confirms the availability and commitment of the key staff assigned to this project.

PRINCIPAL IN CHARGE
Dylan Wade, *PE, CCM*

PROJECT MANAGER
Kirsten Plonka, *PE*

QA / QC
Jeroen Olthof, *PE, MS, MBA*

DEPTH OF RESOURCES

Cost Estimating
Joshua Reynolds, *PE, MS*

Hydraulic Modeling
Heather Freed, *PE, MS*

Supply and Demand
Spencer Waterman

Energy Analysis
Lianne Westberg, *PE, MS, CEM*

Communications Specialist
Holly Tichenor

MEET THE WSC TEAM

KIRSTEN PLONKA, *PE*

PROJECT MANAGER | Ms. Plonka brings more than 15 years of experience in the planning, design, and management of water, wastewater and recycled water systems. She specializes in master planning, including Capital Improvement Plans and budgeting, in addition to project management, hydraulic modeling, feasibility studies, and infrastructure and water resource planning studies.

EDUCATION

BS, Civil Engineering, California Polytechnic State University, San Luis Obispo

REGISTRATIONS/CERTIFICATES

PE - Civil, CA #70746

PROJECT EXPERIENCE:

- **On Call As-Needed Services, San Lorenzo Valley Water District, Boulder Creek, CA. Project Manager.** Works in the District office weekly to lead projects. Work includes writing RFP's, helping with consultant selections, reviewing plans and specs, facilitating environmental compliance, and providing construction management services, among other duties.
- **USDA Funding Support, San Lorenzo Valley Water District, Boulder Creek, CA. Program Manager.** Successfully secured $9 million in low-interest loans for the District. Determined eligible projects, wrote a Preliminary Engineering Report (PER), created detailed project descriptions, developed cost estimates, coordinated environmental requirements for NEPA and CEQA, and completed the application package for the USDA Loan Program.
- **Comprehensive Planning Study, California American Water, Monterey District, CA. Project Engineer.** Developed a hydraulic model of more than 600 miles of pipeline and 50 pressure zones and developed a prioritized CIP.
- **Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Project Engineer.** The update includes development of an asset database to capture and track condition data for individual assets within the water system. The final update will include a CIP.
- **Water Master Plan Update, Big Bear City Community Services District, Big Bear City, CA. Project Manager.** Developed a comprehensive CIP that will be used to set annual budgets, establish rates and fees, prioritize improvements, and prepare for future customer needs.

DYLAN WADE, *PE, CCM*

PRINCIPAL IN CHARGE | Mr. Wade is a professional engineer with more than 20 years of experience leading water infrastructure projects. His extensive experience as a public utility manager enables him to solve problems from an owner's perspective, and he is familiar with local conditions through his prior work with the District.

EDUCATION

BS, Civil and Environmental Engineering, Brigham Young University, Provo, UT

REGISTRATION/CERTIFICATES

PE - Civil, CA #64044

PROJECT EXPERIENCE:

- **As-Needed Engineering Services, San Lorenzo Valley Water District, Boulder Creek, CA. Principal in Charge.** Provided support for WSC's project manager on multiple water infrastructure projects.
- **USDA Funding Support, San Lorenzo Valley Water District, Boulder Creek, CA. QA/QC.** Supported the development of the PER and application package that successfully secured $9 million in USDA low-interest loans for the District.
- **Fall Creek Fish Ladder Project, San Lorenzo Valley Water District, Boulder Creek, CA. Project Manager.** Designed the intake pump system for the Fall Creek Intake Facility.

JEROEN OLTHOF, *PE, MS, MBA*

QA/QC | Mr. Olthof brings 25 years of experience in planning, design, and management of water systems. He specializes in master planning, hydraulic modeling, and condition assessments. His experience includes database development and integration of GIS with hydraulic models, customer databases, and asset databases.

EDUCATION

MBA, University of Southern California

MS, Civil Engineering, University of Washington

BS, Civil Engineering, University of Colorado Boulder

REGISTRATIONS/CERTIFICATES

PE - Civil, CA #58597

PROJECT EXPERIENCE:

- **Comprehensive Planning Study, California American Water, Monterey District, CA. Project Manager.** Developed, calibrated and used a hydraulic model to support the condition and capacity evaluation as part of the master planning process.
- **Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. QA/QC.** Supported the development of a new model from the District's GIS database, hydrant testing, and calibration of the completed model prior to using the model to identify and evaluate system improvements.
- **Water Master Plan and Capital Improvement Plan, Casitas Municipal Water District, Ojai, CA. QA/QC.** Supported the development, calibration and use of the hydraulic model to support the condition and capacity evaluation as part of a new Water Master Plan.

HEATHER FREED, *PE, MS*

HYDRAULIC MODELING | Ms. Freed is a professional engineer with experience in water and wastewater treatment and distribution systems. She has experience evaluating various hydraulic measures including headloss through pipes, hydraulic jumps, and groundwater pumping.

EDUCATION

MS, Civil and Environmental Engineering, Cal Poly, San Luis Obispo

BS, Environmental Engineering, Cal Poly, San Luis Obispo

REGISTRATION/CERTIFICATES

PE - Civil, CA #89406

PROJECT EXPERIENCE:

- **Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Staff Engineer.** Preparing a Master Plan Update which will consider future water service commitments and build-out, including both area-specific water quality needs and system operations and maintenance priorities.
- **Ojai System Condition-Based Assessment and Water Master Plan, Casitas Municipal Water District, Ojai, CA. Staff Engineer.** Tasks include developing opinions of probable cost for recommended projects and developing, calibrating, and utilizing a hydraulic model of the system in conjunction with GIS datasets to improve system operations and CIP development.
- **2017 Water Master Plan Update, Big Bear City Community Services District, Big Bear City, CA. Staff Engineer.** Preparing a detailed analysis of the District's infrastructure to prepare a Master Plan which includes a comprehensive CIP.

JOSHUA REYNOLDS, *PE, MS*

COST ESTIMATING | Mr. Reynolds has 18 years of experience in water master planning, pipeline design, hydraulic analysis, and pump station design and analysis. His experience allows him to identify and analyze initial project concepts, and see the project through to completion.

EDUCATION

MS, Civil and Environmental Engineering, California Polytechnic University, San Luis Obispo, CA

BS, Civil Engineering, California Polytechnic University, San Luis Obispo, CA

REGISTRATION/CERTIFICATES

PE - Civil, CA # 65400

PROJECT EXPERIENCE:

- **Water Master Plan Update, City of Pismo Beach, Pismo Beach, CA. Project Manager.** Developed condition based-replacement plans for infrastructure and an updated CIP list to prepare for budget planning.
- **Water Master Plan Update, City of Paso Robles, CA. Project Manager.** Conducted a condition and capacity evaluation of the existing infrastructure and developed a CIP based on the results.
- **Water District Master Plan Update, Victorville Water District, Victorville, CA. QA/QC.** Work includes updates to existing hydraulic model, identifying system improvements, a CIP, and developing a Rehabilitation and Replacement Plan.

SPENCER WATERMAN

SUPPLY AND DEMAND

Mr. Waterman is a planner with experience developing water master plans, grant funding applications, water use efficiency and conservation services, and state water law compliance documents including Urban Water Management Plans.

EDUCATION

BS, City & Regional Planning, California Polytechnic State University, San Luis Obispo

REGISTRATION/CERTIFICATES

AWWA, California-Nevada Section, Water Use Efficiency Practitioner Grade 1, Certificate #1714

PROJECT EXPERIENCE:

- **2015 UWMP, San Lorenzo Valley Water District, Boulder Creek, CA. Program Manager.** Collaborated with District staff to prepare and complete the 2015 UWMP.
- **Comprehensive Planning Study, California American Water, Monterey County, CA. Staff Planner.** Developed customer and demand projections; assessed adequacy of supplies, treatment, and distribution system facilities; and evaluated alternatives for developing additional supplies.
- **Water Master Plan, Casitas Municipal Water District, Ojai, CA. Staff Planner.** Conducted a supply and demand analysis which included data gathering and updating GIS shapefiles.

LIANNE WESTBERG,
PE, CEM, MS

ENERGY ANALYSIS

Ms. Westberg is a mechanical engineer and Certified Energy Manager with more than 11 years experience including program and project management, water systems planning, life-cycle cost analysis and funding support, energy efficiency analysis and optimization, and renewable energy planning.

EDUCATION

MS, Civil and Environmental Engineering, Stanford University

BS, Mechanical Engineering, California Polytechnic State University, San Luis Obispo

REGISTRATION/CERTIFICATES

PE, Mechanical, CA #35941

Certified Energy Manager, #21981

PROJECT EXPERIENCE:

- **Water System Master Plan, City of Arroyo Grande, Arroyo Grande, CA. Staff Engineer.** Work included a condition assessment of the water distribution system, an energy usage evaluation, and a prioritized risk-based CIP.
- **Utility Master Plan Update, City of Santa Maria, Santa Maria, CA. Project Engineer.** Conducted a supply capacity and storage analysis and prepared a 5-year and 10-year CIP.
- **System Energy Plan, Heritage Ranch Community Services District, Heritage Ranch, CA. Project Engineer.** Assessed energy efficiency, optimization, and funding alternatives for the water system.

HOLLY TICHENOR

COMMUNICATIONS SUPPORT

Ms. Tichenor is WSC's Strategic Communications Director and has more than 22 years of strategic planning and communications experience in the water industry. She focuses on the value of effective water communications and is an advocate, creator, and supporter of branding and messaging that advance programs, projects, organizations, and initiatives.

EDUCATION

BA, Journalism, University of Texas at Austin

PROJECT EXPERIENCE:

- **Chino Basin Program, Inland Empire Utilities Agency, Ontario, CA. Project Manager of Strategic Communications.** Leading strategic communications support over the next two years for this unprecedented regional water treatment, storage and recharge program.
- **On-Call Strategic Communications, San Elijo Joint Powers Authority, Cardiff by the Sea, CA. Project Manager.** Providing on-call communications and outreach support to SEJPA, a progressive wastewater and recycled water provider that serves multiple coastal communities.
- **City of San Luis Obispo, Utilities Department Strategic Plan, San Luis Obispo, CA. Strategic Planning Facilitator.** Led a strategic planning workshop with Department managers and guided development of a working framework to achieve performance goals and measure results.

PROJECT UNDERSTANDING AND APPROACH

PROJECT UNDERSTANDING

The San Lorenzo Valley Water District (District) provides water to a service area that includes multiple communities including the unincorporated communities of Felton, Boulder Creek, Brookdale, Ben Lomond, Manana Woods, and a portion of Scotts Valley. The District has recently updated their GIS system and has been proactive about moving forward with their Capital Improvement Plan (CIP). Other factors supporting a Master Plan include:

- The District recently acquired neighboring water agencies, which has created new CIP considerations. A well thought out master plan can help tell the story to the District's diverse customer base about why and when investments are made.
- New Design and Construction standards currently under consideration may change the assumptions that were made in previous CIPs.
- Like that of all water agencies, the District's infrastructure has continued to age, and the District needs to plan for future investments to rehabilitate and replace infrastructure as it reaches the end of its useful life.
- The District has obtained approximately $75,000 to help fund the Water Master Plan as part of the Prop. 1 Integrated Regional Water Management program, which requires the Master Plan to be completed by the end of summer 2020.

This set of challenges requires an updated Master Plan to provide a complete evaluation of the water system based on current conditions and produce a comprehensive list of improvements needed to maintain a safe and reliable water system into the future.

KEY OPPORTUNITIES

Through our partnership and previous work with the District, we have identified several key opportunities that we believe will maximize the value of the Master Plan towards furthering the District's business objectives.

Prioritize Projects to Meet Community Needs and Expectations

As the District recently annexed neighboring agencies such as the Lompico County Water District, there are competing priorities for which CIP projects are completed first. Projects in Lompico must be balanced with projects that benefit the remainder of the District. Careful prioritization will give District staff a clear path for which projects to start first. The Water Master Plan will provide the "why" necessary in justifying capital improvement projects and rate setting.

Accurate Sizing of Key Pipelines for USDA projects

Lyon pipeline is a key asset for the District to move water throughout the North/South system. Verification of accurate pipe sizing for both existing and future needs before it goes to design is vital for the District to have confidence that pipe is neither too large or too small to meet multiple operational scenarios. WSC will prioritize the sizing of this and the District's four other USDA funded pipelines to ensure they are right-sized for the District's needs by November 2019 so that the District can begin design with confidence.

Analyze Future Water Supply and Storage Scenarios

The District has the potential for supply changes with the upcoming Santa Margarita Groundwater Sustainability Plan and a planned Conjunctive Use project. In addition, multiple tanks currently under construction and the upsizing and possible relocation of Swim Tank will increase storage. Documenting how these scenarios will affect the District's infrastructure and conveyance needs is an important step to operational efficiency.

Upsizing Small Pipelines to Meet Fire Flow Requirements

Fire protection is critical in the rugged terrain and limited access found in the Santa Cruz Mountains. The District has many 2-to 6-inch lines that likely do not provide adequate fire flow. WSC understands that some pipelines in sensitive environmental habitat need to be relocated to existing right-of-way. A strategic replacement program for these pipelines is critical for the future.

Capture Legacy Information

WSC understands the importance long term employees play in the operations of a District's water system. The District is faced with the looming prospect of retirement of one or more of these key employees in the near future. AWWA and ASCE recognize this industry-wide trend and have held well-attended discussions at conferences in an attempt to promote an effective transition process. WSC will make this the first step in this master planning process. We will very quickly download available information, incorporate it into the hydraulic model, and sit down with staff to discuss what is accurate or inaccurate in District records. We will do all we can to capture their knowledge and transfer it into our work products and the datasets that we prepare for the District.

WWSC has been a significant partner to the District by guiding the development of much of the data needed for the 2019 Water Master Plan. Our approach, outlined below, will incorporate that knowledge and District-specific expertise to streamline a comprehensive planning document and a dynamic hydraulic modeling tool.

TASK 1 – PROJECT MANAGEMENT

KEY STAFF – KIRSTEN PLONKA, JEROEN OLTHOF, DYLAN WADE: DURATION – 12 MONTHS

Work Products: Project Administration Plan (updated monthly), decision logs, meeting agendas and minutes.

Required Input from District: Monthly check-in calls with District Project Manager, scheduling for meetings.

Summary of Work: Following the Notice to Proceed, WSC will prepare a Project Administration Plan (PAP) template including a project schedule, a work breakdown structure with budgets for each task and subtask, a data request register, and a decision log. A draft version will be submitted prior to the project kickoff meeting, where any comments on the template will be discussed and resolved. The kickoff meeting will be used to establish key success factors. The PAP will be updated monthly and provided to the District Project Manager ahead of a monthly check-in meeting. QA/QC reviews will be conducted by experienced WSC staff on all work products throughout the duration of the project.

Unique Approach: WSC has developed several unique approaches that have been proven to be successful in achieving client key success factors within the contractual budget and schedule:

- **Monthly Meetings With Documentation Avoid Miscommunications.** WSC has developed a monthly report template that effectively serves as the PAP. The two-page report summarizes all outstanding action items (including data requests), spending and estimates to complete each task and subtask, a summary of work completed in the previous month and of work to come in the next month, and an agenda of discussion items. A draft report is provided ahead of each monthly meeting to serve as an agenda, and any updates or key decisions are documented immediately afterwards in a final report. A living decision log, and updated schedule will be attached to the PAP report. Kirsten Plonka used this approach to successfully manage the Big Bear Community Services District Water Master Plan, and the project was completed under the original budget.
- **Continuous Quality Control Engages the Right Reviews at the Right Times.** WSC's QA/QC lead, Jeroen Olthof, is an experienced water master planner who will oversee a combination of working technical sessions, modeling checks, technical editing, formatting, and readability reviews to engage different levels of review throughout the process. Reviews include high-level working sessions focused on overall strategy and identification of innovative approaches, and detailed reviews are conducted on calculations, drawings, cost estimating, and technical writing to avoid errors.
- **Strategic Communication with Public including Disadvantaged Community (DAC) Areas.** WSC's Strategic Communication Director, Holly Tichenor, is an industry leader in pubic communication for California water agencies, including the Central Coast Blue and Chino Basin projects. She will work with the team to plan and create an engaging public presentation to meet the DAC grant funding requirements as well as inform the community about the Water Master Plan. WSC helped the District to revise the grant language, so we know what's expected by IRWM and want to continue to be a partner in fulfilling those requirements.

TASK 2 – DATA GATHERING

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED: DURATION – 2 MONTHS

Work Products: Data request log, kickoff meeting agenda and minutes, and design and evaluation criteria.

Required Input from District: Assistance in gathering and providing data.

Summary of Work: In parallel with the development of the PAP template, as described in Task 1, WSC will prepare a preliminary data request for review and discussion at a kickoff meeting with District staff. Interviews with District employees will be conducted to identify operational status, settings, and any known deficiencies in the system.

Unique Approach:

- **Focused Data Gathering:** WSC has already worked with the District's GIS staff to identify the data required to create an accurate

hydraulic model. This early review of the GIS mapping indicates that there may need to be some assumptions made as to pipe age and material. WSC is familiar with the District's system and can help to identify critical data that needs to be field verified and assumptions that will not affect the final results. This will be efficient with District staff time during data collection. WSC is aware that the GIS data will need connectivity updates and has allowed time and budget to resolve these issues.

- **Establish Evaluation Criteria:** Since the District does not have a previous master plan with established design and evaluation criteria, WSC can use its knowledge of the District to provide a recommendation tailored to the District's needs that meets all regulatory requirements and generally accepted engineering practice while incorporating the District's new design and construction standards.
- **Capture Staff Knowledge:** Nobody knows your system like you do. District managers and operators have the best knowledge of the current condition of the various water system facilities and specific problem areas that should be prioritized to minimize service interruptions and costly repairs. Some of this knowledge may not be well documented, so it is critical to actively engage key operators in the master planning process through workshops, interviews, and review of draft recommendations. Leveraging their experience and knowledge of the water system will contribute to the development of a valuable and realistic CIP. WSC has an established relationship with District staff making this a seamless part of the water master plan process.

WSC will actively engage key staff in the master planning process through workshops, interviews, and review of draft recommendations. Leveraging their experience and knowledge of the water system will ensure the development of a valuable and realistic CIP.

TASK 3 – WATER SYSTEM SUPPLY AND DEMAND FORECAST

KEY STAFF – KIRSTEN PLONKA, SPENCER WATERMAN: DURATION – 2 MONTHS

Work Products: Existing water system demands, future water system demand forecast, and supply and storage system evaluation.

Required Input from District: Review of recommendations and discussion.

Summary of Work: Using the information gathered in Task 2, WSC will characterize system-wide water production rates from the flow meters and tank levels at District facilities. Individual water meter billing data will be used to characterize existing water demands and seasonal trends. Data will be analyzed to develop system-wide average day, maximum day, and peak hour demand values and diurnal curves will be developed.

Expected growth shall be allocated across the District service area in 5-year increments through 2040, incorporating land use data, planning data, and climate data such as temperature and precipitation. Recommendations for future non-revenue water will be made based on findings from current District production, the ongoing Santa Margarita Groundwater Sustainability Plan (currently in development), and demand data.

System storage and supply capacities shall be evaluated against the existing and future demand scenarios. WSC will consider the future potential supply capacity provided through the District's stream diversions, groundwater wells, and spring because they depend on their conjunctive use within the constraints of the annual and long-term climatic cycle. Future storage and supply capacity deficiencies will be identified and will include recommended improvements to meet demands.

Unique Approach:

- **Leverage work completed for the 2015 UWMP.** As part of WSC's effort to develop the District's UWMP, WSC partnered with District staff to determine the most accurate data for each system to summarize consumption moving forward. This work involved reconciling unavailable or incorrect data during billing software transitions including Datastream and Springbrook. With this knowledge of the data available, WSC can efficiently update the 2015 UWMP supply and demand tool with 2015-2019 data, saving valuable time and effort. This effort will also set up streamlined updates in 2021 for the 2020 UWMP.
- **GIS-Based Demand Calculations to Improve Confidence.** WSC will use GIS and Access database tools to spatially allocate water meter billing data to associated properties within the District service area to calculate the demand scenarios. Our granular approach provides a higher confidence in results because demand scenarios are tied to real consumption data. Once the data is structured, future updates to the calculated demand scenarios can easily be made using new billing data.
- **Account for known non-revenue water.** The District has been proactive in addressing multiple sources of non-revenue water (water loss). Projects such as the Probation and Swim Tank replacements, as well as the Glen Arbor Bridge Pipeline

replacement project, will impact near term water loss. WSC will adjust demand projections based on the expected completion of these and other planned near-term projects.

- **Incorporate climatic cycles into supply and demand scenarios.** As summarized in the UWMP, the District's demand and available supply vary based on climatic cycles. The District conjunctively uses surface water during wet periods and groundwater during drier periods to optimize and sustain each source. WSC will build on its knowledge of the District's demand and supply portfolio variability under historical and projected climate conditions to develop reasonable modeling scenarios. Analysis of supply and demand forecasts can account for climatic cycles by incorporating temperature and precipitation models. Localized constructed analogs (LOCA) of global climate models (GCM) contain forecasted precipitation and temperature for varying areas of the District, which are scaled to 3.7-mile grids. These are two of the biggest influences on water use that can be projected based on historical correlations applied to forecasted data. Neighboring agencies have performed similar analyses in their water resources planning, such as the Soquel Creek Water District's 2015 UWMP prepared by WSC, the City of Santa Cruz's 2015 UWMP, and the Santa Cruz Mid-County Groundwater Agency.

TASK 4 – HYDRAULIC MODEL

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED: DURATION – 2 MONTHS

Work Products: Fire-Flow Testing Plan, Calibrated Hydraulic Model, and Model Calibration Report.

Required Input from District: Review of Fire-Flow Testing Plan, field verification of hydrant locations, and assistance in operating hydrants during model verification.

Summary of Work: WSC will create a hydraulic model based on the District-provided data described in Task 2, using Innovyze's InfoWater software program. Demand scenarios will be created for average and maximum day, and minimum and peak hour, using diurnal curves, peaking factors, and water meter billing information.

A Fire Flow Testing Plan will be developed identifying locations for fire flow and pump tests that will target critical areas of the District. Upon staff approval, field testing will occur and the collected results will be compared to the model results. Pump curves and pipeline friction factor assumptions will be adjusted in the model with a calibration target of model results within 10 percent of observed values. SCADA data will be used to calibrate the Extended Period Simulation. If any areas are encountered where calibration cannot be achieved through reasonable adjustments to the model, WSC will provide lists of possible partially-closed valves or other potential causes for field crews to investigate further. A model calibration technical memorandum will be prepared, and calibration results will be presented during a model review workshop.

Unique Approach: WSC will conduct an initial calibration of the model using SCADA data. Results will be used to help identify hydrant locations for field testing, and a draft hydrant testing plan will be developed incorporating WSC's knowledge of the District. WSC will then meet with field staff to discuss and confirm the timing and locations of all tests to be performed and methodology used. Optimizing the field testing plan with operations input will allow WSC to calibrate the model while avoiding significant burdens on field staff time.

TASK 5 – DISTRIBUTION SYSTEM EVALUATION

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED: DURATION – 1 MONTH

Work Products: Workshop to define alternative water supply source scenarios, and distribution system evaluation findings.

Required Input from District: Review of recommendations and discussion.

Summary of Work: The hydraulic model will be used to evaluate the capacity of the system to meet peak hour demand during maximum day, and maximum day plus fire flows, and any deficiencies will be identified. Current and future demand sets will be applied as well as three different water supply source scenarios, to be defined during a workshop with District staff.

System improvement recommendations will be developed using model results and District input. Lyon pipeline sizing will be prioritized to meet the District's timeline to fulfill USDA loan requirements. A separate technical memorandum will be developed for the DAC area to fulfill grant requirements.

Unique Approach: WSC understands that the District currently maximizes their surface water allocations and therefore runs the system differently throughout the year. New supply and storage projects may impact how the system is most efficiently operated in the future. WSC will run multiple scenarios to capture these potential changes and identify any necessary changes to the CIP if implemented. In addition, WSC will set up the hydraulic model so the District can run "what if" scenarios as supply and storage alternatives are developed in the future.

TASK 6 – SYSTEM CONDITION ASSESSMENT

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED: DURATION – 2 MONTHS

Work Products: Long-term replacement needs projection for pipes, storage tanks, pumps, wells, and pressure reducing valves.

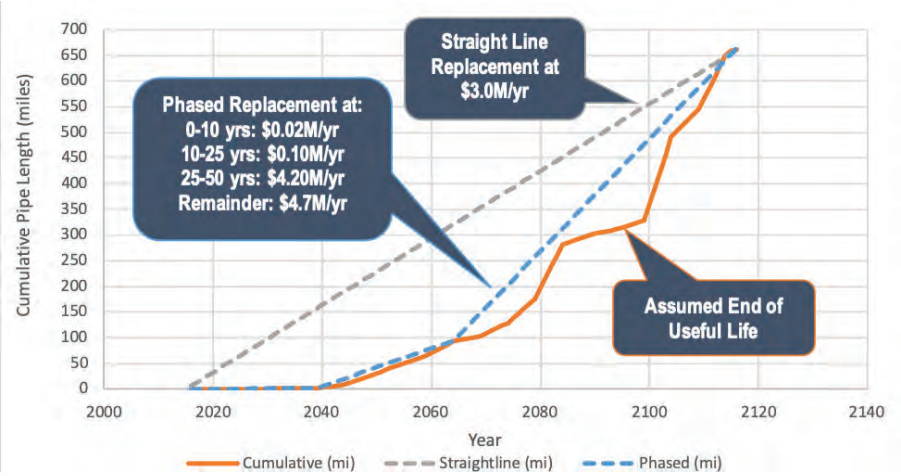
Required Input from District: Review of recommendations and discussion.

Summary of Work: A GIS-based asset database will be developed to track system assets such as water system pipes, storage tanks, pumps, wells, and pressure reducing valves. Remaining useful life for District assets will be evaluated and projected rehabilitation and replacement needs will be provided along with cost estimates.

Unique Approach: WSC understands the importance of establishing a routine replacement program for aging assets so that they can be replaced proactively to avoid accumulating a backlog of replacement needs that could lead to service interruptions and/or sudden and significant financial impacts to customers. To help the District establish an appropriate rate of replacement, WSC recommends an analysis of the distribution system facilities age and expected useful life to quantify the replacement liability facing the District. An example of this analysis shown below uses the District's input on the expected useful life of pipe material in your service area and evaluates how many feet of pipe will need to be replaced on an average annual basis over the next 50+ years to maintain the distribution system in safe and reliable operating condition.

TASK 7 – ENERGY RELIABILITY/EFFICIENCY ANALYSIS

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED, LIANNE WESTBERG: DURATION – 2 MONTHS



WSC will prepare a long-term replacement needs projection for the District's pipelines based on pipe age and material to help establish defensible long-term rehabilitation rates to maintain the system in its current condition. A similar approach could be used to develop replacement rates for tanks, pumps, wells, and pressure reducing valves. We will seek input from District staff on which projects should be prioritized to develop a realistic and flexible R&R Plan.

Work Products: Recommendations for energy related CIP projects.

Required Input from District: Review of recommendations and discussion.

Summary of Work: WSC will perform a review of power supplies for existing facilities within the distribution system and make recommendations for CIP projects to provide reliable power in the event of an extended power outage. The hydraulic model will be used to evaluate potential energy savings by way of alternative CIP projects or potential operational changes.

Unique Approach:

- **Provide Power Supply Alternatives.** Given the local energy climate in California, power outages are likely in the event of an emergency. Providing water during these outages is often a necessity. WSC will use its geographical knowledge of the District and its varied terrain to evaluate which critical facilities should be provided with permanent or temporary power supplies and the most cost-efficient way to provide this critical service.
- **Evaluate Potential Energy Savings.** Given the redwood canopy that stretches over much of the District, simple power alternatives like solar are generally not feasible. WSC proposes a more detailed analysis of operational efficiencies including equipment alternatives, optimized pumping controls, or site alternatives for future facilities to decrease energy use. WSC's familiarity with the District and established partnership with staff will enable us to make solid, realistic recommendations and identify which improvements may be eligible for grant funding.

TASK 8 – WATER SYSTEM CIP

KEY STAFF - KIRSTEN PLONKA, HEATHER FREED: DURATION – 2 MONTHS

Work Products: 20-year CIP for water system.

Required Input from District: Review of recommendations and discussion.

Summary of Work: WSC will identify all projects anticipated to be required within the next 20 years, and will prepare planning level cost estimates for each, and recommended construction dates. Projects will include existing capacity and level of service

deficiencies, abandonments, repairs or replacements at end of useful service life, and future capacity deficiencies caused by growth.

Unique Approach: To provide built-in flexibility in the implementation of the 20-year CIP, WSC proposes to prepare the CIP based on the assumptions used in the Water Master Plan, but also prioritize projects based on need and benefit to the system. WSC will also consider staffing limitations for project management and inspection when planning work out over the next 20 years.

TASK 9 – WATER SYSTEM MASTER PLAN

KEY STAFF – KIRSTEN PLONKA, HEATHER FREED: DURATION – 3 MONTHS

Work Products: Draft and Final Master Plans, condition assessment database, hydraulic model, and GIS shapefiles.

Required Input from District: Review of draft and final reports.

Summary of Work: A draft Water Master Plan shall be prepared summarizing the results of Tasks 2 through 8, and submitted for review. Comments will be compiled into a table, with preliminary responses provided. WSC will lead a review meeting to discuss and resolve comments. Resolution of comments will be addressed, and a Final Water Master Plan will be prepared, along with final versions of the condition assessment database. As mentioned in Task 1, WSC will attend up to three (3) meetings to present, discuss, and answer questions on the Water Master Plan, including a community workshop specifically aimed to inform the DAC areas of the District.

Unique Approach: WSC prides ourselves on easy to read reports that allow readers to quickly comprehend the key information. Information is conveyed in easy to read charts, figures, and tables to the maximum extent possible. Each graphic must be sufficiently clear to stand alone without excessive explanation, allowing the Master Plan to serve as an ongoing public outreach tool for communicating District activities.

TASK 10 – OPTIONAL TASK - RIP AND RUN SHEETS

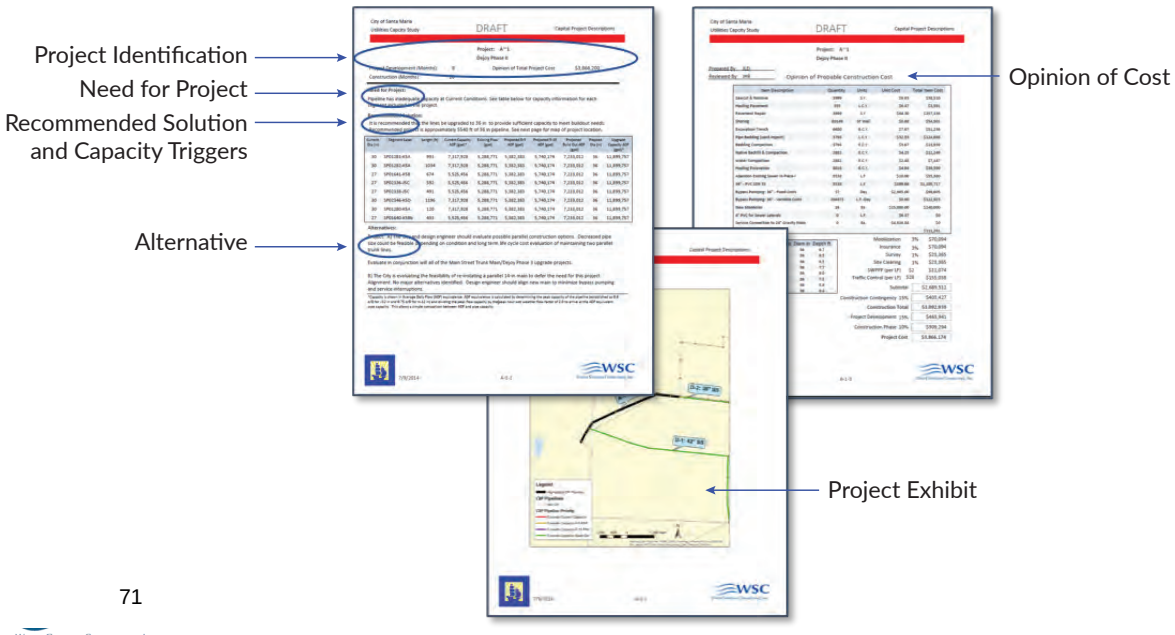
KEY STAFF – KIRSTEN PLONKA, HEATHER FREED: DURATION – 2 MONTHS

Work Products: Rip and Run Project Sheets for first 20 projects identified in CIP.

Required Input from District: Review of project sheets.

Summary of Work: WSC can create individual "Rip and Run" project sheets for each project identified in the CIP. These project sheets will include essential information on each of the proposed projects. WSC has used these sheets in several recent CIPs and management, engineering, and operations staff have expressed their appreciation for this ready and useful reference. The figure below provides an example of how WSC recommends the project sheets of the CIP be presented.

Unique Approach: WSC has developed a database-driven approach to cost-effectively support the preparation of these resources. Each "Rip and Run" sheet includes a description of the project, an estimated capital cost, and a map showing the project location. Because the cost estimates are prepared directly within the database, there is minimal need for re-entry of information or potential transcription errors. The project description sheets are included in the appendix of the master plan and can be used to initiate pre-design for selected improvements.



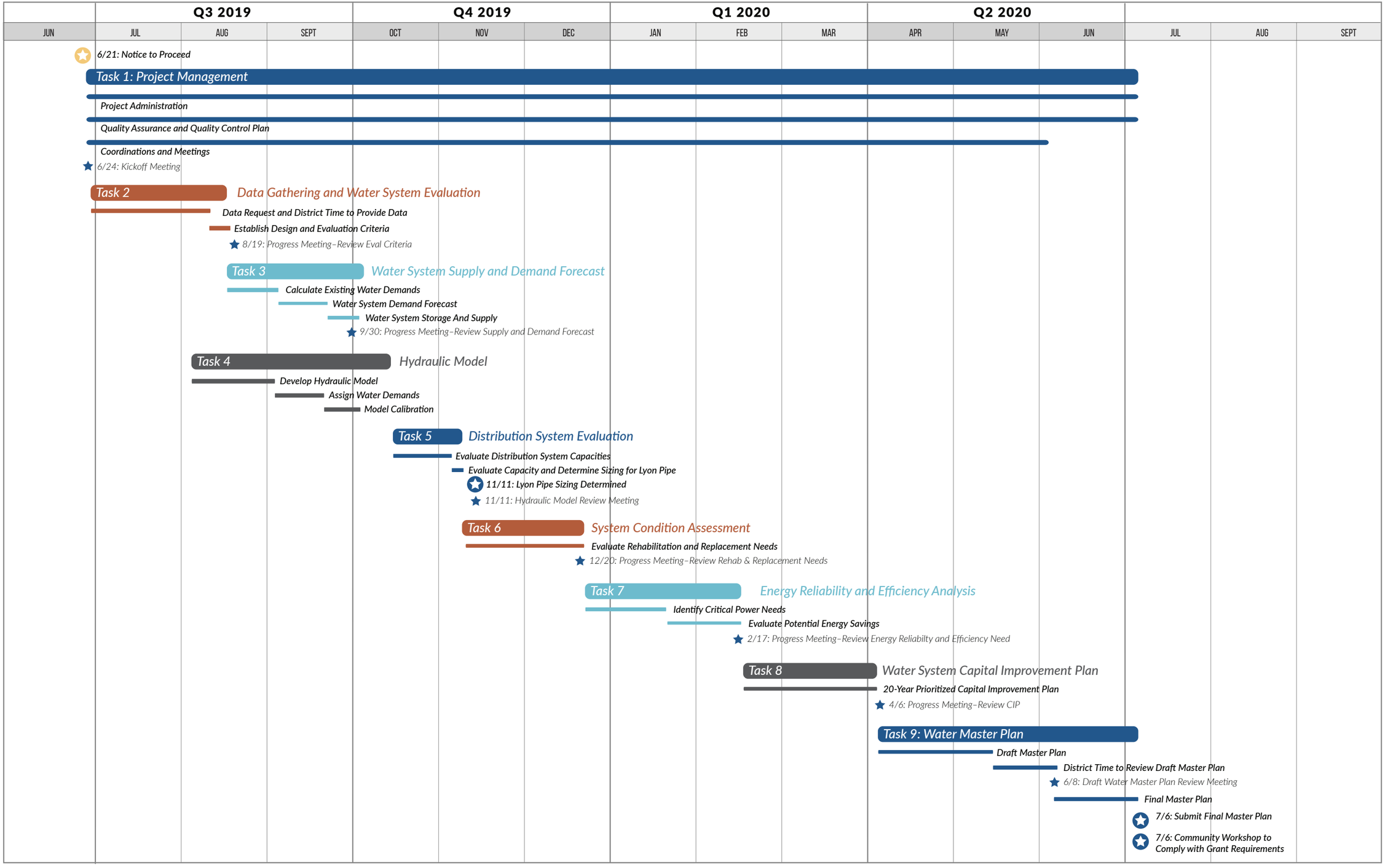
WSC's database driven approach allows efficient production of "Rip and Run" sheets for each CIP project that clearly and concisely present important project information. They will include capacity triggers for relevant projects to enable the District to adaptively manage the CIP and construct facilities as they are needed, rather than on a set timeline.

PROJECT UNDERSTANDING & SCOPE OF WORK

WSC's approach the to District's scope of work is summarized below. Our approach to each task will provide unique benefits that will help the District confidently and efficiently plan for the future reliability of its water system infrastructure.

	TASK 1.0 PROJECT MANAGEMENT	TASK 2.0 DATA GATHERING AND WATER SYSTEM EVALUATION	TASK 3.0 WATER SYSTEM SUPPLY AND DEMAND FORECAST	TASK 4.0 HYDRAULIC MODEL	TASK 5.0 DISTRIBUTION SYSTEM EVALUATION	TASK 6.0 SYSTEM CONDITION ASSESSMENT	TASK 7.0 ENERGY RELIABILITY AND EFFICIENCY ANALYSIS	TASK 8.0 WATER SYSTEM CAPITAL IMPROVEMENT PLAN	TASK 9.0 WATER MASTER PLAN REPORT
WORK EFFORT	• Provide project administration and coordination • Facilitate a kickoff meeting and monthly review meetings • Perform QA/QC • Facilitate a community workshop to comply with grant requirements	• Request and review relevant files • Conduct interviews with District employees • Develop draft evaluation criteria • Develop final criteria from incorporating District input	• Develop spatially allocated existing demand set • Project future demands • Compare supply and production to projected demands • Evaluate current and future storage needs • Recommend supply and storage improvements to meet demands	• Develop hydraulic model from GIS data • Assign spatially allocated demands to model • Plan and coordinate hydrant testing with the District • Steady state calibration • Extended period simulation calibration • Hydraulic model review meeting	• Determine system deficiencies • Identify future improvement projects • Evaluate pipe diameter for Lyon Pipe	• Evaluate pipeline remaining useful life and prioritization needs • Recommend annual budgets for asset rehabilitation and replacement	• Identify critical facilities and recommend locations for emergency power • Evaluate historic energy usage • Recommend operational changes and/or capital improvements to reduce energy consumption	• Prioritize all recommended projects into a 20-year CIP • Develop cost estimates • Determine trigger points for future project implementation	• Prepare Draft Water Master Plan report documenting findings • Address District comments • Prepare Final Water Master Plan • Present Master Plan to Board of Directors and at a Community Workshop
DELIVERABLES	• Meeting agendas and handouts • Meeting summaries • Monthly progress reports	• Data Request Log and updates as needed • Draft and final evaluation criteria	• Demand loading and projection map • Draft list of supply and storage improvements	• Hydraulic model development and calibration TM	• Recommended pipe size for Lyon Pipe and supporting documentation • Preliminary project list	• System asset database including remaining useful life • Phased implementation plan for annual budgets	• List of power supply alternatives • Recommended operational changes to reduce energy	• Draft 20-year CIP • Final 20-year CIP incorporating District's input	• Draft and Final Water Master Plan Report • Electronic project files
BENEFITS	WSC is working on multiple projects for the District and has demonstrated streamlined and effective communication with staff. 	 WSC's strong relationship and experience working with the District means we are up to speed on the distribution system and regional preferences, and can hit the ground running.	WSC will utilize the data and tool set developed for the District's 2015 UWMP to develop consistent supply and demand projections in the WMP. 	 WSC's PM Kirsten understand the nuances of the distribution system through work helping the District develop the GIS System that she will leverage to build an accurate hydraulic model.	WSC's work with the District preparing the USDA Preliminary Engineering Report means we understand many of the District's upcoming projects and the need to determine adequate  sizing for multiple operational scenarios.	WSC will develop multiple asset replacement scenarios  that can be used by the District in setting annual budgets and future rate studies.	 WSC will perform a detailed analysis of operational efficiencies including alternative equipment, optimized pumping controls, and site alternatives for future facilities to decrease energy use.	WSC will build flexibility into the CIP by including capacity trigger points as well as recommended timing for project implementation. 	 WSC will create an easy to read report with key information conveyed in charts, figures, and tables to the maximum extent possible.

PROJECT SCHEDULE



COMPREHENSIVE PLANNING STUDY

CALIFORNIA AMERICAN WATER, MONTEREY COUNTY, CA

WSC developed a Comprehensive Planning Study, which included recommendations for a CIP, customer and demand projections, and an evaluation of alternatives for additional supplies. WSC performed an assessment of the distribution system piping, pumping, and storage capacity to meet current and projected demands, and to ensure it is providing adequate levels of service and reliability.

WSC built and calibrated a hydraulic model with over 600 miles of pipelines and 50 pressure zones to evaluate system capacity and operations. The CIP is based on providing adequate capacity, meeting projected demands and growth, and meeting planning criteria and regulatory requirements. Tasks include identifying system hydraulic deficiencies based on pressures, velocities, headloss, and fire flow guidelines.

Additional work involved developing a prioritized list of operational changes that could defer, or eliminate, the need for capital improvements. The project required taking into account a desalination plant operating for part of the year as another source of water, multiple small pressure zones with considerable elevation changes, and numerous small “pockets” within the larger water system.

WSC stayed on budget while adapting to changing project conditions and providing necessary information to support CAW’s rate-setting process with the California Public Utilities Commission.

OWNER’S REFERENCE:

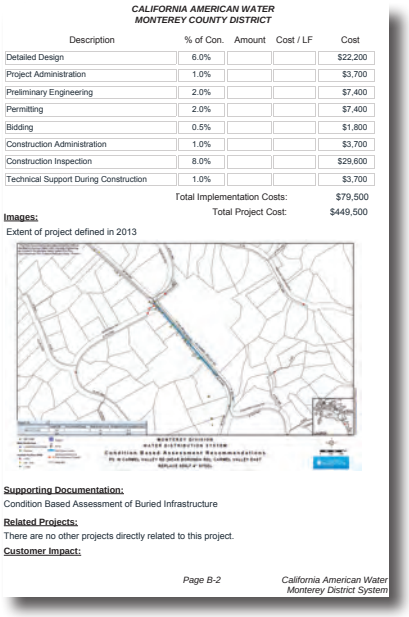
Ms. Candace Coleman, PE
Senior Project Engineer
(916) 568-4216

PROJECT COSTS:

$556,320

PROJECT TEAM:

Jeroen Olthof (Project Manager), Kirsten Plonka (Project Engineer), Spencer Waterman (Supply and Demand), Heather Freed (Staff Engineer)



CALIFORNIA AMERICAN WATER
MONTEREY COUNTY DISTRICT

Description	% of Con.	Amount	Cost / LF	Cost
Detailed Design	6.0%			$22,200
Project Administration	1.0%			$3,700
Preliminary Engineering	2.0%			$7,400
Permitting	2.0%			$7,400
Bidding	0.5%			$1,800
Construction Administration	1.0%			$3,700
Construction Inspection	8.0%			$29,600
Technical Support During Construction	1.0%			$3,700
		Total Implementation Costs:		$79,500
		Total Project Cost:		$449,500

Images:

Extent of project defined in 2013

Supporting Documentation:

Condition Based Assessment of Buried Infrastructure

Related Projects:

There are no other projects directly related to this project.

Customer Impact:

Page B-2 *California American Water Monterey District System*

WATER MASTER PLAN AND CONDITION ASSESSMENT

BIG BEAR CITY COMMUNITY SERVICES DISTRICT, BIG BEAR, CA

WSC developed the District's 2017 Water Master Plan Update. WSC conducted site visits and captured operator knowledge to document and address the maintenance and replacement needs of the current water system. WSC prepared a detailed analysis of the District's infrastructure and conveyance system, considering age and expected useful life. By the completion of the master plan, a comprehensive CIP was developed that will be used to set annual budgets, establish rates and fees, prioritize improvements, and proactively prepare for the future needs of customers.

WSC performed condition assessments on the District's wells, reservoirs, and booster pump stations; and developed a flexible evaluation toolset that will provide a defensible Rehabilitation and Replacement Plan for their water system facilities. WSC recommended an approach for rehabilitation and replacement of aging infrastructure and provided capital project budget recommendations and detailed project cost opinions.

WSC completed the project under budget while maintaining consistent communication with the District throughout the project. WSC was flexible on scope to meet the District's needs, which included expanding their CIP from 10 years to 20 years to meet annual spending goals and recommending a portion of the scope which could be repeated on future projects to save the District money.

OWNER'S REFERENCE:

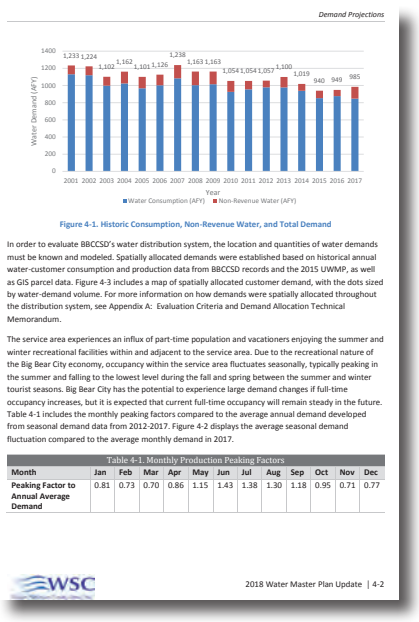
Mr. Jerry Griffith, PE
Water Department Superintendent
(909) 584-4008

PROJECT COSTS:

$183,584

PROJECT TEAM:

Kirsten Plonka (Project Manager), Jeroen Olthof (QA/QC), Dylan Wade (Technical Advisor), Heather Freed (Project Engineer), Spencer Waterman (Supply and Demand)



Demand Projections

Figure 4-1. Historic Consumption, Non-Revenue Water, and Total Demand

In order to evaluate BBCCSD's water distribution system, the location and quantities of water demands must be known and modeled. Spatially allocated demands were established based on historical annual water-customer consumption and production data from BBCCSD records and the 2015 UWMP, as well as GIS parcel data. Figure 4-3 includes a map of spatially allocated customer demand, with the dots sized by water-demand volume. For more information on how demands were spatially allocated throughout the distribution system, see Appendix A: Evaluation Criteria and Demand Allocation Technical Memorandum.

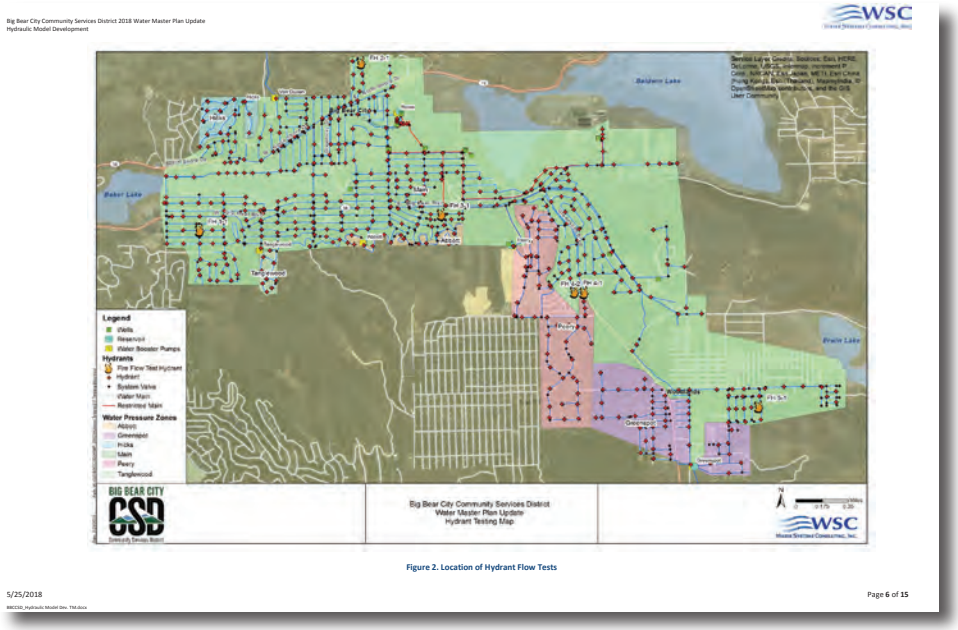
The service area experiences an influx of part-time population and vacationers enjoying the summer and winter recreational facilities within and adjacent to the service area. Due to the recreational nature of the Big Bear City economy, occupancy within the service area fluctuates seasonally, typically peaking in the summer and falling to the lowest level during the fall and spring between the summer and winter tourist seasons. Big Bear City has the potential to experience large demand changes if full-time occupancy increases, but it is expected that current full-time occupancy will remain steady in the future. Table 4-1 includes the monthly peaking factors compared to the average annual demand developed from seasonal demand data from 2012-2017. Figure 4-2 displays the average seasonal demand fluctuation compared to the average monthly demand in 2017.

Table 4-1. Monthly Production Peaking Factors

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Peaking Factor to Annual Average Demand	0.81	0.73	0.70	0.86	1.15	1.43	1.38	1.30	1.18	0.95	0.71	0.77

WSC

2018 Water Master Plan Update | 4-2



Big Bear City Community Services District 2018 Water Master Plan Update
Hydraulic Model Development

WSC

Figure 2. Location of Hydrant Flow Tests

5/25/2018

Page 6 of 15

WSC
Water Systems Consulting, Inc.

WATER MASTER PLAN AND CONDITION BASED ASSESSMENT

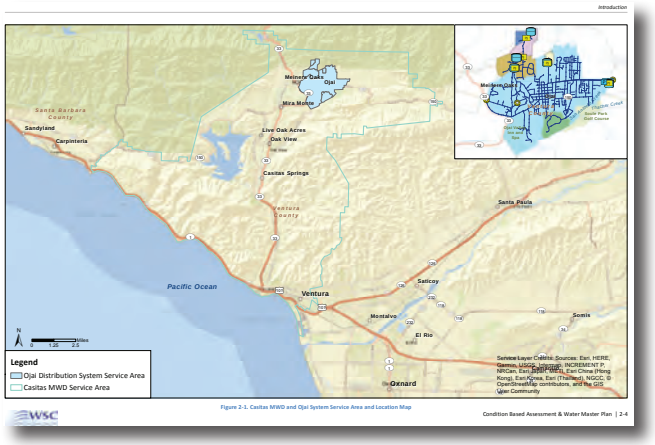
CASITAS MUNICIPAL WATER DISTRICT, OJAI, CA

WSC developed a Condition Based Assessment, Hydraulic Model and Water Master Plan for the recently acquired Ojai system. Through this work, WSC gained an understanding of the District's potable water supply and distribution transmission system which delivers water to approximately 3,000 residential, commercial, and agricultural customers.

WSC developed documents which included recommendations for a CIP, customer and demand projections, and an evaluation of alternatives for additional supplies. WSC performed an assessment of the distribution system piping, pumping, and storage capacity to meet current and projected demands, and to ensure it is providing adequate levels of service and reliability.

WSC built and calibrated a hydraulic model with approximately 60 miles of pipelines and multiple pressure zones to evaluate system capacity and operations. The CIP is based on providing adequate capacity, meeting projected demands and growth, and meeting planning criteria and regulatory requirements.

The project required assisting the District developing a new GIS to fill the gaps in the considerable amount of data missing. Potential issues highlighted at the time by WSC engineers included disconnected pipes and yet-to-be found under performing equipment. WSC addressed all these issues within the District's GIS system before it pushed forward with building a comprehensive Hydraulic Model in order to ensure the model was as accurate as possible.



OWNER'S REFERENCE:

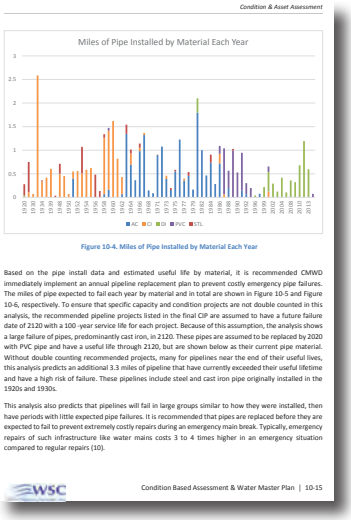
Ms. Lindsay Cao, PE,
Project Manager
(805) 649-2251, ext. 144

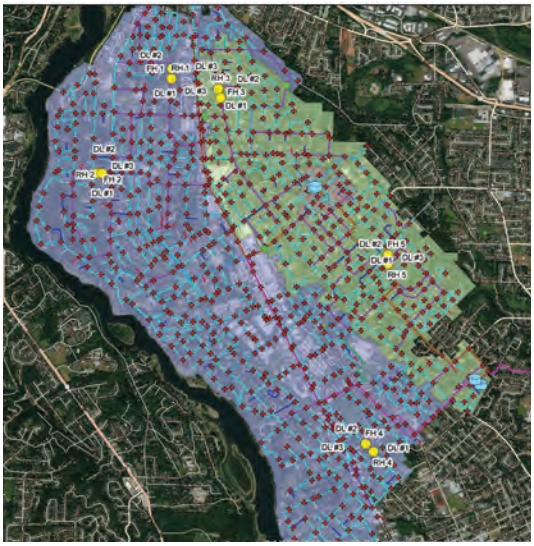
PROJECT COSTS:

$220,968

PROJECT TEAM:

Kirsten Plonka (Project Manager), Joshua Reynolds (Principal in Charge), Jeroen Olthof (Hydraulic Modeling Lead), Spencer Waterman (Planning), Heather Freed (Project Engineer)





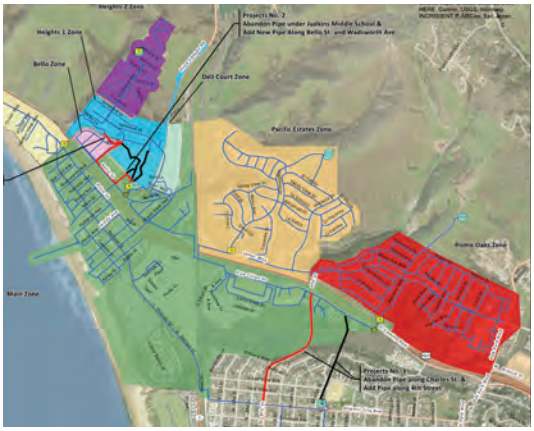
WATER MASTER PLAN UPDATE

OAK LODGE WATER SERVICES DISTRICT, OAK GROVE, OR

WSC is developing a Waster Master Plan Update to address the District's aging infrastructure needs and help District managers plan for future investments to rehabilitate and replace infrastructure as it reaches the end of its useful life. WSC is revising the District's CIP with updated cost estimates to aid with prioritizing improvements. The CIP is designed to provide flexibility for growth while clearly defining improvements and the cost to provide the desired level of service over the next two decades. The update includes developing an accurate hydraulic model of the distribution system. WSC is conducting a seismic risk assessment on the existing water system and preparing a seismic mitigation plan encompassing a 50-year planning horizon.

OTHER INFORMATION:

- **Client Reference:** Mr. Jason Rice, PE, District Engineer, (503) 353-4202
- **Contract Value:** $225,784
- **Key Staff:** Josh Reynolds (Principal in Charge), Kirsten Plonka (Project Engineer), Jeroen Olthof (Hydraulic Modeling Lead), Heather Freed (Hydraulic Modeling), Spencer Waterman (Supply and Demand)



WATER MASTER PLAN AND UWMP

CITY OF PISMO BEACH, CA

The City turned to WSC to prepare both their Water Master Plan Update and their 2015 UWMP Update. Because future water usage and demand projections are needed for both reports, the City saved money by preparing the reports concurrently. The update includes creating a hydraulic model consistent with the current GIS mapping to improve confidence in system changes and expected fire flows. WSC evaluated the condition of aging infrastructure, including booster pump stations, pipelines, storage tanks, and wells that were incorporated into the CIP. The final Master Plan will provide a prioritized project list and detailed cost estimates to replace aging and inadequate infrastructure.

WSC performed an evaluation of the City's drinking water wells, which included an evaluation of plant efficiency, energy intensity trends, energy savings potential, condition of motor, pump, and electrical system, evaluation of draw down and production rates, and included estimates of improvement costs. These results were also incorporated into the City's CIP.

OTHER INFORMATION:

- **Client Reference:** Mr. Benjamin Fine, PE, Public Works Director, (805) 773-7037
- **Contract Value:** $194,790
- **Key Staff:** Joshua Reynolds (Project Manager), Kirsten Plonka (Project Engineer), Spencer Waterman (Staff Planner), Heather Freed (Staff Engineer)

APPENDIX A.

RESUMES

Professional Experience

Ms. Plonka brings more than 15 years of experience in the planning, design, and management of water, wastewater and recycled water systems. She specializes in master planning, including Capital Improvement Plans and budgeting, in addition to project management, hydraulic modeling, feasibility studies, as well as infrastructure and water resource planning studies She is well versed in funding alternatives, regulatory compliance, and public policy development. Her experience includes database development and integration of geographic information systems (GIS) with hydraulic models, recycled water customer databases, and asset databases. She also has experience managing public engineering departments. Her extensive experience in the public sector allows her to approach projects from an owner's perspective and plan and design projects that are implementable and user-friendly.

Professional Project Experience

On Call As-Needed Services, San Lorenzo Valley Municipal Water District, Boulder Creek, CA. Extension-of-Staff Project Manager. Providing as-needed engineering services to the District. Work in the District office weekly to lead multiple projects. As the Owner's Project Manager, writes RFP's, helps with consultant selections, reviews plans and specs, facilitates environmental compliance, provides construction management services, administers contracts, develops schedules and budgets, coordinates with operations, facilitates public meetings such as community workshops and gives regular updates to the General Manager as well as presentations to the Board of Directors. In this role, Ms. Plonka has managed the following projects: Bear Creek Estates Wastewater Treatment Facility Rehabilitation, Bear Creek Road Water Pipeline, Highway 9 Viaduct Water Pipeline, Trout Farm Inn Fire Service, Lompico Pressure Reducing Valves Replacement Project, Lyon Tank Road Landslide Repair Project, Fall Creek Fish Ladder Restoration Project.

San Lorenzo Valley Water District, USDA Funding Support, Boulder Creek, CA. Program Manager. Successfully secured $9M in low interest loans for the District. Determined eligible projects, wrote Preliminary Engineering Report (PER), created detailed project descriptions, developed cost estimates, coordinated environmental requirements for NEPA and CEQA, and completed application package for USDA Loan Program. Worked extensively with the United States Department of Agriculture (USDA) to meet all local and national requirements. Gave public presentations and reports to Board of Directors. Completed work significantly under budget and transitioned to program management/project manager for the five projects in the USDA package. These projects include: Swim Tank, Lyon Water Pipeline, Sequoia Water Pipeline, Hihn Road Water Pipeline, and California Drive Water Pipeline.

California American Water, Comprehensive Planning Study, Monterey District, CA. Project Engineer. Developing a Comprehensive Planning Study (CPS) for California American Water's Monterey District which includes developing recommendations for a CIP, and includes customer and demand projections, an assessment of adequacy of supplies, treatment, and distribution system facilities, and an evaluation of alternatives for developing additional supplies. Updating and calibrating the WaterGEMS hydraulic model. Performing an assessment of the distribution system piping, pumping, and storage capacity to meet current and projected demands, and to ensure it is providing adequate levels of service and reliability. The CIP is based on providing adequate capacity, meeting projected demands and growth, and meeting planning criteria and regulatory requirements.

Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Project Engineer. Preparing a Master Plan Update which will consider future water service commitments and build-out, including both area-specific water quality needs and system operations and maintenance priorities. The project includes constructing a new model from the District's GIS database, hydrant testing, and calibration of the completed model prior to using the model to identify and evaluate system improvements. Supply, demand, and storage data will be analyzed, projections developed, and recommendations made to address system deficiencies. The update includes development of an asset database to capture and track condition data for individual assets within the water system. The final update will include a capital improvement program.

Big Bear City Community Services District, 2017 Water Master Plan Update, Big Bear City, CA. Project Manager. Conducted site visits and leveraged operator knowledge to document and address the maintenance and replacement needs of the current water system. Prepared detailed analysis of the District's infrastructure and conveyance system, as well as considered age and useful life. By the completion of the master plan, a comprehensive CIP will be developed that will be used to set annual budgets, establish rates and fees, prioritize improvements, and proactively prepare for the future needs of customers.

Casitas Municipal Water District, Water Master Plan and Capital Improvement Plan, Ojai, CA. Project Manager. Conducting a condition-based assessment and developing a Water Master Plan for the new owner of the Ojai water system. Tasks include developing opinions of probable cost for recommended projects, and evaluating production and consumption data to develop projections and recommend improvements necessary to maintain a safe and reliable level of service. Developing, calibrating, and utilizing hydraulic model of the system in conjunction with GIS datasets to improve system operations and CIP development. Evaluating the capacity of the existing water system and identifying improvements to meet demands, including fire flow, of the current and future population.

Lake Arrowhead Community Services District, Water and Sewer Master Plan Updates, Lake Arrowhead, CA. Project Engineer. Prepared comprehensive water and sewer master plans. Project included hydraulic modeling of the water and sewer systems using H2OMap and H2OMap Sewer, geographical information system update of the entire system, and development of a capital improvement program.

Eastern Municpal Water District, Water and Sewer Master Plan Updates, Perris, CA. Staff Engineer. Responsible for conversion of existing H2OMAP hydraulic model to InfoWater software, field testing and calibration of hydraulic model, evaluation of pipeline capacity to deliver current and future demands and Capital Improvement Program prioritization.

Golden State Water Company, Water and Sewer Master Plan Updates, Multiple Locations, CA. Staff Engineer. Responsible for coordinating with stakeholders, preparing and conducting a hydrant flow testing plan for model calibration purposes, updating and calibrating the hydraulic model in H2OMap, identifying system deficiencies, creating Capital Improvement Programs, and writing of comprehensive master plan.

Otay Water District, As-Needed Hydraulic Modeling Services, Spring Valley, CA. Project Engineer. Provide as-needed services for computerized hydraulic models to manage the District's potable water distribution, recycled water distribution, and wastewater collection pipe networks. Modeling services will optimize current operations, evaluate potential improvement projects, and allow for planning of future developments.

Professional Experience

Mr. Wade is a professional engineer with more than 20 years of experience leading water infrastructure projects. His extensive experience as a public utility employee enables him to solve problems from an owner's perspective, and he is familiar with local conditions through his prior work with the District. He has served as Resident Engineer/Owner Representative on many large, high profile and multi-jurisdictional water resources projects including design and construction of intake facilities, water treatment plants, and major public works programs. These projects have been tremendous successes and some have won national recognition. He has been responsible for managing numerous projects from initial planning to finished product.

Representative Projects

As-Needed Engineering Services, San Lorenzo Valley Municipal Water District, Boulder Creek, CA. Principal in Charge. Provided support for WSC's project manager on multiple water infrastructure projects. For the district has included: the Bear Creek Estates Wastewater Treatment Facility Rehabilitation; the Bear Creek Road Water Pipeline; the Highway 9 Viaduct Water Pipeline; the Trout Farm Inn Fire Service; the Lompico Pressure Reducing Valves Replacement Project; the Lyon Tank Road Landslide Repair Project; and the Fall Creek Fish Ladder Restoration Project.

USDA Funding Support, San Lorenzo Valley Water District, Boulder Creek, CA. QA/QC. Supported the development of the PER and application package that successfully secured $9 million in USDA low-interest loans for the District. The work was completed significantly under budget and trasntioned to program management for WSC for five projects in the USDA package. The projects included: The Swim Tank and the Lyon, Sequoia, Hihn Road, and California Drive water pipelines.

Cayucos Sustainable Water Project, Cayucos Sanitary District, Cayucos, CA. Program Manager. Provided Program Management services, which include: schedule management; stakeholder outreach coordination; meeting coordination and facilitation; action item/data request/project decision tracking; and sub consultant management, to assist the Cayucos Sanitary District (District) in evaluating and identifying alternatives for the development of a Water Resource Recovery Facility (WRRF) to treat sewage from its collection system and to provide a beneficial use for the treated wastewater. Additionally, completed the Phase 1 initial tasks for the Cayucos Sustainable Water Project. These initial tasks include: project chartering, beneficial use analysis, wastewater characterization, siting analysis, funding and financial strategy, and wastewater collection system evaluation. Currently serving as the Project Manager through the design and contractor procurement process.\

Chevron Tank Farm Service Extension Feasibility Study-Phase 1, San Miguelito Mutual Water Company. Project Manager. Assessed the capacity of the San Miguelito Mutual Water Company's (SMMWC) water and wastewater systems under current and future conditions, including the inclusion of a proposed development at the Chevron Tank Farm. Developed water and wastewater base maps in GIS and conducting an analysis of demand, supply, capacity and storage for SMMWC's existing and projected infrastructure. Developed demand and loading estimates for the current SMMWC service area at build-out. Analyzed the projected water demand and wastewater loading from the proposed development and compared against existing SMMWC demand/loading factors and the capacity of the SMMWC's water and wastewater systems. Prepared a summary Technical Memorandum that describes the existing systems, proposed growth and recommendations completing future phases of the project.

System Energy Plan, Heritage Ranch Community Services District, Heritage Ranch, CA. QA/QC. Developing a System Energy Plan (SEP) for the Heritage Ranch CSD, which includes an assessment of energy efficiency and optimization opportunities in the water and wastewater systems and an assessment of solar PV generation opportunities in the District. Project targets high energy use facilities and will identify cost-effective energy improvement projects. Solar PV assessment includes an evaluation of permitting, grid interconnection requirements, power delivery mechanisms, funding, and overall project economics. Working with PG&E to perform subsidized pump efficiency testing.

Development of Conceptual Alternatives for the Treatment and Disposal of Wastewater, Cayucos Sanitary District. Project Manager. Performed initial data review of the wastewater treatment and disposal studies completed by the Cayucos Sanitation District (District and the City of Morro Bay. Hosted an Alternative Development Workshop with the District General Manager and members of the Board of the Directors to establish criteria for and to develop a preliminary list of conceptual alternatives. Evaluated and developed descriptions for four conceptual wastewater treatment and disposal alternatives that included potential facility locations, collections configurations, level of treatment considerations, O/M and capital cost estimates, disposal options, and key considerations for the future decision making process.

Thousand Oaks Interconnection Projects, California American Water, Thousand Oaks, CA. Technical Advisor. Provided QA/QC review of 60% design plans and specifications for two interconnection projects in the City of Thousand Oaks. The Borchard Road project included the design for more than 300-LF of 8-inch mainline to connect CAW's system to an existing Calleguas Municipal Water District turnout connection. The Gainsborough Road project connected CAW's system to the City of Thousand Oaks' water system. WSC designed 220-LF of 8-inch pipeline and two buried vaults, one for a two-way mag meter and the other for a pressure regulating valve.

San Clemente Dam Removal and Carmel River Reroute Project, California American Water, Monterey, CA. Construction Manager/Project Manager. Project included the re-routing and reconstruction of the Carmel River and removing the San Clemente Dam. This project is the largest dam removal project ever completed in California and required close coordination with Department of Water Resources Division of safety of dams. Project was implemented as a public-private partnership between California American Water, the California Coastal Conservancy, and the National Marine Fisheries Service using the design/build delivery method.

Wastewater Collection System Infrastructure Renewal Strategy, City of San Luis Obispo. QA/QC. Develop a Wastewater Collection System Infrastructure Renewal Strategy that includes; creation of a hydraulic model for the wastewater collection system, evaluation of pipeline capacity to deliver current and future loading, assessment of pipeline condition, and the development of an asset management plan to guide future capital improvement projects. Utilize spatially allocated sewer loads, based on water demands, and an all-pipes model to implement a prioritized manhole data collection strategy that enables the City to focus its surveying efforts to the capacity impacted portions of the collection system. Intersect current wastewater loading with underlying parcel and land use data to develop area based loading factors for use in quantify loading for areas of future growth and densification. Develop a decision algorithm incorporating capacity and condition data to identify highest risk assets and prioritize replacement to limit the City's risk exposure.

Professional Experience

Mr. Olthof brings 25 years of experience in planning, design, and management of water and wastewater infrastructure. He specializes in comprehensive master planning, feasibility studies, hydraulic modeling of pipe networks, and infrastructure condition assessments. His experience includes database development and integration of geographic information systems (GIS) with hydraulic models, recycled water customer databases, and asset databases. He has developed and maintained custom databases to track recycled water customers and generate reports for regulatory agencies and other stakeholders. He has also developed condition assessment programs and decision algorithms to support capital improvement planning and maintenance optimization.

Representative Projects

Comprehensive Planning Study, Californai American Water, Monterey District, CA. Project Manager. Developed, calibrated and used a hydraulic model to support the condition and capacity evaluation as part of a new Water Master Plan. Tasks included developing recommendations for a CIP, customer and demand projects, and an evaluation of alternatives for additional supplies. Assessed the distribution piping, pumping, and storage capacity to meet current and projected demands, and to ensure it is providing adequate levels of service and reliability. Built and calibrated a hydraulic model with over 600 miles of pipelines and 50 pressure zones to evaluate system capacity and operations. The CIP is based on providing adequate capacity, meeting projected demands and growth, and meeting planning criteria and regulatory requirements. Tasks include identifying system hydraulic deficiencies based on pressures, velocities, headloss, and fire flow guidelines.

Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Hydraulic Modeling Lead. Preparing a Master Plan Update considers future water service commitments and build-out, including area-specific water quality needs and system operations and maintenance priorities. The project includes constructing a new model from the GIS database, hydrant testing, and calibration of the completed model prior to using it to identify and evaluate system improvements. Supply, demand, and storage data will be analyzed, projections developed, and recommendations made to address system deficiencies. The update includes development of an asset database to capture and track condition data for individual assets within the water system. The final update will include a CIP.

Water Master Plan and Capital Improvement Plan, Casitas Municipal Water District, Ojai, CA. Hydraulic Analysis Lead. Conducting a condition-based assessment and developing a Water Master Plan for the new owner of the Ojai water system. Tasks include developing opinions of probable cost for recommended projects, and evaluating production and consumption data to develop projections and recommend improvements necessary to maintain a safe and reliable level of service. Developing, calibrating, and utilizing hydraulic model of the system in conjunction with GIS datasets to improve system operations and CIP development. Evaluating the capacity of the existing water system and identifying improvements to meet demands, including fire flow, of the current and future population.

2018 Water Master Plan, City of Victorville, Victorville, CA. Hydraulic Analysis Lead. Preparing a master plan that will address both hydraulic capacity deficiencies and rehabilitation and replacement needs driven by aging infrastructure. The project includes hydraulic modeling using InfoWater to evaluate capacity limitations, planning-level estimates of required capital spending each year based on system inventory and expected remaining useful life values, and a comprehensive 10-year Capital Improvement Plan.

Waster Master Plan and Condition Assessment, Big Bear City Community Services District Big Bear, CA. QA/QC. Provided oversight for the 2017 Water Master Plan Update and comprehensive CIP. Performed condition assessments on wells, reservoirs, and booster pump stations; and developed a flexible evaluation toolset that will provide a defensible Rehabilitation and Replacement Plan for their water system facilities. Recommended an approach for rehabilitation and replacement of aging infrastructure and provided capital project budget recommendations and detailed project cost opinions. The project was completed under budget while maintaining consistent communication with the District throughout the project. Expanded the CIP from 10 years to 20 years to meet annual spending goals and recommending a portion of the scope which could be repeated to save costs.

California American Water, Ambler Park Water System Master Plan, Monterey, CA. **Project Manager.** Provided a facilities plan for the Ambler Park water system, which includes three wells, one water treatment plant, eight pressure zones, 10 miles of water pipeline in sizes ranging from 2 inches to 8 inches in diameter, seven remote water storage tanks, one hydro-pneumatic tank, five pumping stations, and three pressure regulating valves (PRVs). A hydraulic model of the system was developed using EPANET.

Water System Master Plan Update, City of Healdsburg, Healdsburg, CA. Task Manager. Updated the City's water system master plan (population 11,000) to include new sources of water, new distribution facilities, and growth. Items addressed in the master plan update include: current and projected water use and water use characteristics; adequacy of the City's three well field sources, particularly considering the present seasonal restrictions due to surface water influence; treatment required to meet current and foreseeable water quality regulations; adequacy of the existing storage capacity within the distribution system; adequacy of the primary transmission mains within the distribution system; adequacy of the booster and pressure-reducing valve stations that control the transfer of water between the city's many pressure zones; and evaluation and modeling of the distribution system.

Water System Master Plan, City of Reedley, Reedley, CA. Project Engineer. Prepared a master plan for the City's water system (population 25,000), which included: (1) determining projected water supply and demand requirements; (2) developing potable water planning criteria for modeling and evaluation of the infrastructure; (3) evaluating water supply alternatives (new groundwater wells and new regional surface water supply); (4) updating the existing hydraulic model (H2OMap Water) to include demand projections; (5) identifying deficiencies in pumping capacity, storage capacity, or pipeline sizing; (6) developing a capital improvement program, which included estimated operations and maintenance (O&M) costs, estimated construction cost, and staffing needs for the recommended projects; (7) determining preferred locations and how much additional storage capacity is needed to meet the current and future water demands; and (8) participating in public presentations.

Ebbetts Pass Water Master Plan, Calaveras County Water District, San Andreas, CA. **Project Engineer.** Developed a water facility master plan for the Ebbetts Pass water service area, which consists of 15 pressure zones with numerous subzones, 17 water storage tanks, 10 pumping stations, over 40 miles of transmission mains, and over 100 pressure reducing stations. The master plan addresses existing and projected future demands, future water supply sources, existing and known future regulatory requirements, limitations to the current treatment process and capacity, and alternative treatment processes. The project also involved hydraulic modeling of the system was performed using H2OMap, 20-year life-cycle cost analysis, and preparation of a financial plan to fund the construction of a phased capital improvements program and to replace facilities due to age or new regulations.

Professional Experience

Ms. Freed is a Professional Engineer with experience in the hydraulic modeling and mater planning of water and wastewater treatment and distribution systems. She has experience developing Urban Water Management Plans, evaluating various hydraulic measures including headloss through pipes, hydraulic jumps, and groundwater pumping. Her knowledge also includes groundwater contamination, water chemistry and water quality measurements, physio-chemical and biological water and wastewater treatment, and climate change and energy intensity analysis.

Representative Projects

2018 Comprehensive Planning Study and Condition Based Assessment, California American Water, Monterey District, Monterey County, CA. Engineering Support. Updating the California American Water Monterey County water distribution system Comprehensive Planning Study. Building calibrating a hydraulic model with over 600 miles of pipelines and 50 pressure zones to evaluate system capacity and operations. Evaluating system condition based on asset data and site inspection reports. Developing a comprehensive CIP list for future rate studies.

Water Master Plan Update, Oak Lodge Water Services District, Oak Grove, OR. Staff Engineer. Preparing a Master Plan Update which will consider future water service commitments and build-out, including both area-specific water quality needs and system operations and maintenance priorities. The project includes constructing a new model from the District's GIS database, hydrant testing, and calibration of the completed model prior to using the model to identify and evaluate system improvements. Supply, demand, and storage data will be analyzed, projections developed, and recommendations made to address system deficiencies. The update includes development of an asset database to capture and track condition data for individual assets within the water system. The final update will include a capital improvement program.

2017 Water Master Plan Update, Big Bear City Community Services District, Big Bear City, CA. Staff Engineer. Preparing a detailed analysis of the District's infrastructure that will result in a Master Plan which includes a comprehensive Capital Improvement Program. WSC is performing infrastructure condition assessments, developing a defensible Rehabilitation and Replacement Plan, and identifying high-priority projects.

Ojai System Condition Based Assessment and Water Master Plan, Casitas Municipal Water District, Ojai, CA. Staff Engineer. Conducting a condition-based assessment and developing a Water Master Plan for the new owner of the Ojai water system. Tasks include developing opinions of probable cost for recommended projects, and evaluating production and consumption data to develop projections and recommend improvements necessary to maintain a safe and reliable level of service. Developing, calibrating, and utilizing hydraulic model of the system in conjunction with GIS datasets to improve system operations and CIP development. Evaluating the capacity of the existing water system and identifying improvements to meet demands, including fire flow, of the current and future population.

2015 Water Master Plan Update, City of Pismo Beach, Pismo Beach, CA. Staff Engineer. Creating and calibrating an all-pipes, spatially allocated demand hydraulic model of the City's water distribution system using Bentley's WaterGEMS software. Utilizing the hydraulic model to evaluate capacity limitations for current and future buildout scenarios and opportunities to optimize operations. Developing condition based-replacement plans for aging infrastructure and an updated CIP project list to prepare the City for budget planning.

Professional Experience

Mr. Reynolds has 18 years of experience in water master planning, pipeline design, hydraulic analysis, and pump station design and analysis. His experience allows him to identify and analyze initial project concepts, and see the project through to completion.

Representative Projects

Water Master Plan, City of Pismo Beach, City of Pismo Beach, CA. Project Engineer. Developed and calibrated a water model for the city's water distribution system. The water system is comprised of 7 pressure zones and over 277,000 LF of pipeline. The model was used to prepare a comprehensive master plan, with detailed recommendations for zone consolidation, water storage, water supply, and distribution system capital improvements, and a CIP to serve current and 20-year build-out needs.

Water Master Plan, City of Paso Robles, Paso Robles, CA. Project Manager. Update included a survey of capacity limitations to anticipate expected growth along the outskirts of the existing infrastructure. Analysis of the aging pipeline detailed needs for replacement or rehabilitation of the distribution system to avoid failure in the future. A Capital Improvement Plan was created and needs identified in the system analysis for the City to act upon.

Water District Master Plan Update, Victorville Water District, Victorville, CA. QA/QC. Preparing an update to the District's drinking water production and distribution system master plan. Work includes minor updates to existing water InfoWater hydraulic model, identifying and evaluating system improvements, preforming a water quality evaluation, developing a capacity-driven Capital Improvement Plan, and developing a Rehabilitation and Replacement Plan. Work also includes preparing a recycled water master plan for the SCLA area located within the District's boundary and a SCADA master plan.

Water System Master Plan, City of Arroyo Grande, Arroyo Grande, CA. Project Manager. Developing a master plan for the City's drinking water production and distribution system. Work includes development of an updated hydraulic model using WaterGEMS software, and application of GIS datasets to conduct a risk-based condition assessment of the water distribution system to recommend prioritized improvements.

Utility Master Plan Update, City of Santa Maria, Santa Maria, CA. Project Manager. Preparing a Master Plan Update to assess the capacity of the City's water and wastewater collection system, and developing a prioritized, risk-based capital improvement plan for the utilities. The plan update includes development of a new water model in InfoWater and a sewer collection system model in SeewerGEMS. The models were loading using actual spatially allocated water consumption data.

North Apple Valley Water System Improvement Plan, Apple Valley Ranchos Water Company, Town of Apple Valley, CA. QA/QC Engineer. Evaluated the capability and reliability of AVRWC's Bell Mountain and Stoddard Pressure Zones in north Apple Valley, which currently have low customer demands and high fire flow requirements. Spatially allocated existing demands, performed hydraulic analysis of the existing system using AVRWC's hydraulic model in InfoWater, evaluated multiple system level alternatives for each pressure zone, including changing the HGL; and developed a CIP to improve the existing system. Recommended revised pressure zone boundaries and performed a preliminary parcel screening to identify potential tank and booster stations sites needed to serve the study area as demands increase.

Water Master Plan, City of Guadalupe, City of Guadalupe, CA. Project Engineer. Prepared a comprehensive water master plan for the City of Guadalupe, including water modeling of the distribution system. The plan included detailed recommendations for water storage and distribution system capital improvements, and a capital improvements program to serve current and 20-year build-out needs.

Comprehensive Planning Study, Descanso Community Water District. Project Manager. Performed a comprehensive analysis of the Descanso Community Water District's water system. Investigated and evaluated integrated treatment systems for the removal of iron, manganese and radon at the District's two production wells. Reviewed demand projections, supply availability, water quality data, and production records to develop a 20 year CIP plan for the District.

Water and Wastewater Master Plans, San Miguel Community Services District, San Miguel, CA. Project Engineer. Created a sewage collection system spreadsheet model of the San Miguel Community Services District collection system. Used the spreadsheet to make recommendations for improvements to the existing sewage collection system. Prepared a comprehensive water master plan for the community of San Miguel, including water modeling of the distribution system. The plan included detailed recommendations for water storage and distribution system capital improvements, and a capital improvements program to serve current and 20-year build-out needs.

City of San Luis Obispo, Capacity and Connection Fee Study, San Luis Obispo, CA. Project Manager. Performed a pump station life cycle energy cost and savings analysis to update their 2013 water and sewer impact fees development data. Evaluate the energy cost associated to the City lift stations and catchment cost savings from reduced sewer inflow and infiltration reduction. Developed unit hydrographs for 10 year 24-hour storm event to model program and infrastructure renewal strategy.

City of Paso Robles, Preliminary Design of Sewer Extensions to the Airport Area, Paso Robles, CA. Project Manager. Project includes expanding service in the airport area in a cost effectiveness while reducing both construction and maintenance risks and associated costs. Recommended project include new gravity and force main sewers, updates to existing lift station and an addition of a new lift station. Analyzed d/D and flow loads of sewer to determine size, depth and slope of sewer mains for different alternatives. Prepared Technical Memo to illustrate potential projects and alignments, upgrades to existing lift stations, cost estimates of each alternative and recommendations of viable alternative. Prepared preliminary sewer main alignment and profile along with site layout of lift stations.

CSA 10A Water Tanks, County of San Luis Obispo, Cayucos, CA. Project Manager. Providing comprehensive design services for a new 210,000 gallon water storage tank and the connection to the existing water system, and the demolition and replacement of the existing 210,000 gallon water storage tank. The water system's hydraulic model is being used to evaluate water age for each project phase to determine if additional system storage will impact water quality. Conducted a water quality impact evaluation to guide the mitigation of increases in DBP formation.

Wilshire Country Club Golf Course, Irrigation Water Alternatives Analysis, Los Angeles, CA. Project Manager. Evaluated several alternative sources for irrigation water including development of on-site irrigation wells with wellhead treatment systems, on-site satellite wastewater treatment to produce reclaimed water, and connection to the City of Los Angeles recycled water system. The proposed wells and reverse osmosis treatment system were found to be the lowest cost alternative and the country club is proceeding with drilling on-site wells to evaluate water quality and production capacity prior to initiating the treatment, storage, and distribution system design phase.

Professional Experience

Mr. Waterman is a planner with an emphasis on water resources planning and water use efficiency. His experience includes development of water master plans, wastewater master plans, recycled water master plans, grant funding applications, water use efficiency and conservation services, and state water law compliance documents including Urban Water Management Plans, AB 1420 Self-Certification Statement materials, and California Urban Water Conservation Council Best Management Practices reports. His planning related experience includes urban redevelopment plans, specific plans, general plans, the CEQA process, ordinance writing, and building permit review.

Representative Projects

2015 UWMP, San Lorenzo Valley Water District, Boulder Creek, CA. Program Manager. Collaborated with District staff to prepare and complete the 2015 UWMP assessing water supply and demand needs. Updated water supply and demand projections through 2045 based on changes since the 2010 UWMP including shifting demand patterns and new supplemental supply opportunities. New requirements were addressed, such as distribution system losses reporting as part of demand and digital submittal

Soquel Creek Water District, 2015 Urban Water Management Plan, Soquel, CA . Project Manager. Updated water supply and demand projections through 2045 based on changes since the 2010 UWMP including shifting demand patterns and new supplemental supply opportunities. New requirements were addressed, such as distribution system losses reporting as part of demand and digital submittal. Voluntary analysis of energy intensity in water deliveries and climate change impacts were completed.

Comprehensive Planning Study, California American Water, Monterey County, CA. Staff Planner. Developed customer and demand projections; assessed adequacy of supplies, treatment, and distribution system facilities; and evaluated alternatives for developing additional supplies. Additional work involved developing a prioritized list of operational changes that could defer, or eliminate, the need for capital improvements. The project required taking into account a desalination plant operating for part of the year as another source of water, multiple small pressure zones with considerable elevation changes.

Water Master Plan, Casitas Municipal Water District, Ojai, CA. Staff Planner. Conducted a supply and demand analysis which included data gathering and updating GIS shapefiles. Project included customer and demand projections, and an evaluation of alternatives for additional supplies. WSC performed an assessment of the distribution system piping, pumping, and storage capacity to meet current and projected demands, and to ensure it is providing adequate levels of service and reliability.

Water Master Plan, City of Victorville, Victorville, CA. Staff Planner. Preparing a master plan to address hydraulic capacity deficiencies and rehabilitation and replacement needs driven by aging infrastructure. The project includes hydraulic modeling using InfoWater to evaluate capacity limitations, estimates of required capital spending each year based on system inventory and expected remaining useful life values, and a 10-year CIP.

Water Master Plan Update, City of Paso Robles, Paso Robles, CA. Staff Planner. Contributing author for the 2014 Water Master Plan Update. Used GIS to spatially allocate demands for current and future timeframes through buildout for incorporation into a hydraulic model. Developed land use demand factors based on current development and projected land use of each parcel and development at buildout.

City of Santa Maria, Utilities Master Plan Update, Santa Maria, CA. Staff Planner. Contributing author for the 2012 Utilities Master Plan Update. Developed spatially allocated demands for current and future demands through buildout using GIS for incorporation into a hydraulic model. Developed land use demand factors based on current development and projected land use and zoning of each parcel at buildout.

City of Victorville, On-Call Water Modeling, Victorville, CA. Staff Planner. Providing staff support services for hydraulic water modeling and development planning. GIS and data management to support GIS based InfoWater modeling to help the City make informed decisions regarding potential changes to the system. GIS support for preparing Feasibility Studies and Water Supply Assessments as needed to support the City's review and conditioning of proposed development projects.

City of Arroyo Grande, On-Call Engineering Services. Staff Planner. Provided as-needed research and analysis support for engineering services for the City of Arroyo Grande. Research, development of materials, and coordination with other agencies regarding water supply and demand data to inform water resources management actions. Developed monthly Water Status Updates presented by City Staff to the City Council.

Northern Cities Management Area Technical Group, Engineering Services, San Luis Obispo County, CA. Staff Planner. Provided as-needed research and analysis support for engineering services for the five participating agencies. Research, development of materials, and coordination with Northern Cities agencies and funding agencies for SLO County IRWM funding applications. Research and analysis of water supply and demand data to inform water resources management actions.

County of San Luis Obispo, Energy and Water Manager, San Luis Obispo, CA. Staff Planner. Developing, administering, and coordinating energy and water management programs for County owned and leased facilities. Activities include data management, utility billing analysis, coordination with water utilities, review of water savings audits and projects, and monthly drought response reporting.

Santa Barbara County Water Agency, Long Term Supplemental Water Supply Alternatives Report. Staff Planner. Identified and evaluated potential supplemental surface water supply alternatives for the Agency. Investigated potential opportunities to increase surface water storage through expansion of existing dams or construction of new reservoirs. Utilized GIS software to develop reservoir inundation mapping and estimate capacities of various potential reservoir expansion alternatives. Developed planning level cost estimates for proposed supplemental water supply alternatives.

Apple Valley Ranchos Water Company, North Apple Valley Water System Improvement Plan, Town of Apple Valley, CA. Staff Planner. Evaluated the capability and reliability of the water distribution system to meet current and projected demands and fire flow requirements. Developed spatially allocated existing and projected demands and performed a preliminary parcel screening to identify potential tank and booster stations sites needed to serve the study area as demands increase. Developed land use demand factors based on current demands in the service area, compared industrial land use demand factors for several other water utilities in California, and applied them to the projected land use of each parcel at buildout to generate spatially allocated demands at buildout.

Park Water Company, Compton East Reservoir Study, Compton, CA. Staff Planner. Analysis of conceptual alternatives for the addition of a storage reservoir and booster station. Utilization of GIS to screen vacant parcels to identify potential reservoir sites for evaluation based on various screening criteria including: amenability of local planning and permitting jurisdictions, minimum site size, and distance from existing infrastructure.

Professional Experience

Ms. Westberg is a mechanical engineer and Certified Energy Manager, with more than 11 years of experience working in both the water industry and electric industry. Her experience includes program and project management, water, wastewater and recycled water planning and design, life-cycle cost analysis and funding support, energy efficiency analysis and optimization, and renewable energy planning. Her most recent experience has been focused on the water-energy nexus, integrating energy and climate considerations into water,wastewater, and recycled water planning.

Representative Projects

Water System Master Plan, City of Arroyo Grande, Arroyo Grande, CA. Staff Engineer. Assisted with developing a Master Plan for the City's drinking water production and distribution system. Work included a condition assessment of the water distribution system, a condition assessment of the City's groundwater wells, an evaluation of energy usage of pumping facilities and energy efficiency opportunities, and a prioritized risk-based CIP. Performed engineering cost estimating for recommended capital projects.

Utility Master Plan Update, City of Santa Maria, Santa Maria, CA. Project Engineer. Preparing a Master Plan Update to assess the capacity of the City's water and wastewater collection system, and developing a prioritized, risk-based Capital Improvement Plan for the utilities. The plan update includes development of a new water model in InfoWater and a sewer collection system model in SewerGEMS. Performing supply capacity and storage analysis and lift station capacity analysis. Assisting with preparation of CIP to meet 5-year, 10-year, and Buildout needs.

System Energy Plan, Heritage Ranch Community Services District, Heritage Ranch, CA. Project Manager. Developed a System Energy Plan (SEP) for the Heritage Ranch CSD, which includes an assessment of energy efficiency and optimization opportunities in the water and wastewater systems and an assessment of solar PV generation opportunities in the District. Project targeted high energy use facilities and identified cost-effective energy improvement projects. Solar PV assessment included an evaluation of permitting, grid interconnection requirements, power delivery mechanisms, funding, and overall project economics. Worked with PG&E to perform subsidized pump efficiency testing.

2015 Urban Water Management Plan, Soquel Creek Water District, Soquel, CA . Project Engineer. Developing voluntary analysis of energy intensity in water deliveries and climate change impacts to support 2015 UWMP.

County of San Luis Obispo, Energy and Water Manager, 2014 - Present, San Luis Obispo, CA. Project Manager. Developing, administering, and coordinating energy and water management programs for County owned and leased facilities. Activities include data management, utility billing analysis, coordination with electric, gas and water utilities, review of energy and water savings audits and projects, and oversight of PG&E's Sustainable Solutions Turnkey (SST) program.

City of Pismo Beach, Well Condition Assessment, Pismo Beach, CA. Project Manager. Performed an evaluation of the City's two drinking water production wells, Well #5 and Well #23. The project included an evaluation of specific capacity, well performance, plant efficiency, energy intensity trends, energy savings potential, condition of motor, pump, and electrical system, and improvement costs. WSC coordinated with PG&E to obtain baseline data and subsidized pump testing.

California American Water, Energy Use Study for the Sacramento and Monterey County Districts, Sacramento and Monterey, CA. Project Engineer. Performed an analysis of operational optimization and energy efficiency opportunities to reduce energy usage, as well as an assessment of renewable generation potential from solar PV and inconduit hydropower. Analyzed control strategy for the Arden service area in Sacramento to improve controls to allow a reduction in system operating pressure, identified energy efficiency opportunities for the highest energy consuming wells and booster stations in Monterey, and identified cost-effective solar PV projects in Sacramento and Monterey.

City of Big Bear Lake Department of Water and Power, Request for Proposal for Design-Build Division Well Solar Project, Big Bear Lake, CA. Project Manager. Developed Request for Proposal (RFP) for a design-build solar PV project to offset energy usage of four (4) water production wells.

County of San Luis Obispo, Energy Watch – Facility Inventory and Database Project, San Luis Obispo, CA. Project Manager. Developed an interim data management system that will allow the County to assemble the comprehensive facility inventory. Phase 1 of the project focused on coordination with energy utilities and County departments on data sources, data collection and validation for a specified set of pilot facilities, and development of an interim data management system, an MS Access database. Phase 2 of the project is focused on expanding the number of facilities in the database, including facilities not currently tracked in Utility Manager, creating custom uploads that integrate with Energy Star Portfolio Manager, and training for County staff.

North Apple Valley Water System Improvement Plan, Apple Valley Ranchos Water Company, Town of Apple Valley, CA. Project Engineer. Project involved evaluation of the capability and reliability of AVRWC's Bell Mountain and Stoddard Pressure Zones in north Apple Valley, which currently have low customer demands and high fire flow requirements. Assisted with development of Capital Improvement Plan to improve the existing system and prepared engineering cost opinions.

California American Water Company, Sacramento, Monterey County, Ventura County and Los Angeles County Districts 2010 Urban Water Management Plans, Various Cities, CA. Staff Engineer. Developed the demand management measures analysis for the UWMPs, to fulfill the requirements of the Urban Water Management Planning Act. Prepared an optional energy evaluation and evaluated climate change mitigation and adaptation strategies.

City of Pismo Beach, Five Cities Lift Station Replacement, Pismo Beach, CA. Project Engineer. Preparing design plans and specifications for the upgrade to the City's Five Cities Lift Station and forcemain. Project includes lift station alternatives analysis, pump selection, design of new submersible duplex lift station with a design flow of 625 gpm, and design of new 2,200-LF forcemain. Coordinating with PG&E to obtain energy efficiency incentives. Managing geotechnical, environmental and surveying work. Applied for and obtained $1.9M in low-interest loans from the State Water Resources Control Board Clean Water SRF Program to fund project construction, which included $700,000 in loan forgiveness from the Green Reserve Program.

City of San Luis Obispo, Recycled Water System Assessment, San Luis Obispo, CA. Project Engineer. Assisted with assessment of the recycled water pump station including evaluation of steady-state hydraulics, pump station controls, header and valve configuration and energy use. Worked with PG&E to leverage energy efficiency incentive programs. Developed design documents to modify system controls, reconfigure pump control valves, and add bladder-style hydropneumatic tanks to improve stability an operational efficiency.

Professional Experience

Ms. Tichenor, WSC Vice President and Strategic Communications Director, brings 22 years of strategic planning and communications experience in the water and wastewater. She focuses on the value of effective water communications and is an advocate, creator, and supporter of branding and messaging that advance clean water programs, projects, agencies / organizations, and initiatives. She is a Strategic Communications Project Manager on some of the West Coast's most innovative recycled water and advanced water treatment programs, and has guided long-standing regional clean water agencies in rebranding initiatives. Her communications expertise includes training technical staff in relational and resonant visual communications. She has assessed stakeholder and community interests and tailored communications and brands to reach very unique and diverse communities across the Western U.S. Ms. Tichenor has been actively involved in industry-leading professional organizations, is a frequent presenter on water communications best practices, and is an Association of Clean Water Agencies Board Member and Chair of Education Committee.

Representative Projects

Chino Basin Program, Inland Empire Utilities Agency, Ontario, CA. Project Manager of Strategic Communications. Leading strategic communications support over the next two years for this unprecedented regional water treatment, storage and recharge program. The program is receiving state-wide attention for its innovative water exchange from arid Southern CA to Northern for Delta and salmon habitat protection. The $385 million program includes a network of regional infrastructure improvements and requires complex stakeholder agreements. WSC work includes assessment and review of technical details and coordination with multiple internal departments, meeting facilitation, stakeholder strategy and communications, workshop material and presentation development, and website development underway now. Media outreach includes national magazines and newspapers. WSC led the brand development for the program, including establishing key messaging and brand guidelines that reach a broad and diverse stakeholder and community base.

On-Call Strategic Communications, San Elijo Joint Powers Authority, Cardiff by the Sea, CA. Project Manager. Providing on-call communications and outreach support to San Elijo Joint Powers Authority (SEJPA), a progressive wastewater and recycled water provider that serves multiple coastal communities. With a vision for renewed outreach, education, and an improved brand message and design, SEJPA began working with WSC to support a brand refresh, website and new brand guidelines. Additional tasks include an update of messaging and design of annual reports, content and design for construction and facility signage, and press releases announcing partnerships and milestones, policy presentations, recycled water outreach, as well as physical facility signs incorporating the new brand.

Utilities Department Strategic Plan, City of San Luis Obispo, San Luis Obispo, CA. Strategic Planning Facilitator. The City of San Luis Obispo's Utilities Department is currently updating the its Strategic Plan to achieve future goals, supporting its mission for stewardship and service to the community. The effort includes assessing the needs of the nine sections within the Department, including water, wastewater, water resources, and business operations, to define future needs, goals and initiatives for the future. Support has included: staff interviews, research and assessment of other leading Strategic Plans by recognized Utilities of the Future, communications and a strategic planning workshop with the Department's managers. As a result of the efforts, the Department will have a clear vision, and working framework to achieve performance goals and measure results.

Replenish Big Bear, Big Bear Area Regional Wastewater Agency, Big Bear Lake, CA, Communications & Outreach Lead. Leading communications and outreach efforts for four agencies within the Big Bear Valley to implement and gain funding for a regional One Water solution. Facilitated stakeholder interviews, assessed audiences and impacted communities, and led the messaging, branding and development of an infographic, including targeted pieces for funding acquisition at the federal level. The Replenish Big Bear brand has received wide community acceptance. WSC was lead developer of the program website, as well as all supporting outreach material.

Central Coast Blue, Multiple Agencies, Pismo Beach, CA. Communications Project Manager. Led a rebranding effort and communications strategy for a $30 million program that included the participation of five separate agencies. Identified key messages that resonated with stakeholders, community members, and regulatory agencies to build support for the project. The phased workplan included: community and stakeholder research, website update and messaging, content development, design, and implementation; renaming the program; developing and implementing a new logo and brand package; development of City Council presentations; messaging support for press releases; and educational posters, brochures and more for advanced water treatment demonstration facility and grand opening event.

North Pleasant Valley Desalter Rebranding and Outreach, City of Camarillo, CA. Project Manager. Facilitating the design of a new project brand and outreach communications strategy for the North Pleasant Valley Desalter to raise community awareness and support. The project includes a full rebrand including new project name and logo, targeted messaging, a custom website, and strategic community and stakeholder outreach efforts in advance of construction of a new desalter facility. WSC supported efforts to obtain grant funding and raise awareness of the project through targeted educational materials for groups including the U.S. Bureau of Reclamation.

California Water and Environment Association, One Water Workshop at CWEA's 2017 Conference. Palm Springs, CA. Facilitator. Led and organized a panel discussion followed by an interactive table discussion to expand understanding of One Water as part of the 2017 annual conference program. Provided direction on the event, coordinated content of supporting material, facilitated the workshop, and provided hands-on training for participants.

Lake Oswego-Tigard Water Partnership Technical Writer / Outreach Support. Worked with multiple stakeholders toward the end of the approval efforts, especially in development of West Linn Council presentations and briefing documents to support decision making on the land use approval for the Lake Oswego – Tigard Water Treatment Plant Expansion located in West Linn. Developed the content and graphics for a 25+ page technical benefits highlight book and accompanying presentation material for policy makers.

Texas Legislative Water Outreach Workshop. Lead Developer. Led the creation of an annual legislative workshop for Texas representatives and staff. The workshop supported education on critical statewide water related issues, including reuse, funding, and water quality. Organized presentations by local and national experts to address critical topics. Created outreach, invites, brand, and interest in the event. The full-day workshop that drew more than 100 attendees in the first year.

Chambers Creek Regional Wastewater Treatment Plant Public Outreach Brief. Technical Writer / Outreach Coach. Conducted research, developed content, and brainstormed conceptual graphics for a 40-page brief summarizing the benefits of a notable wastewater treatment plant upgrade. Four chapters of concise copy and visuals summarize how the project balances environmental, economic, and regulatory goals to benefit the community for decades.

CONTACT

111 North Market Street
San Jose, CA 95113

Business Phone and E-Fax:
(408) 785-6419

ONLINE

Expectwsc.com

WSC
WATER SYSTEMS CONSULTING, INC.

MEMO

TO: Engineering Committee

From: District Manager

Subject: Lompico Water Assessment District Project Reorganization

Date: June 6, 2019

Recommendation

It is recommended that the Engineering Committee review and discuss this memo and recommend to the full Board of Directors, project reorganization for the Lompico Assessment District.

Background

On June 1, 2016 the Lompico County Water District consolidated with the San Lorenzo Valley Water District. As part of the consolidation an Assessment District was formed (AD 2016-01) to fund several facility improvement projects required as part of the consolidation. The projects were developed in 2014 and cost estimates were prepared at that time by the District. The assessment District Engineering report was completed in 2016 when new estimates were developed for the projects. The table below shows project estimates that were completed in 2014, 2016 and current 2019 actual costs and estimates. As you can see project estimates in 2014 were greater than the 2016 estimates used for the assessment District. The District is moving forward with construction of these projects with cost estimates for projects that are 5 years old. In addition to outdated cost estimates, construction costs have skyrocketed with the booming economy and lack of contractor availability.

Project	2014	2016	2019
Bolted Steel Water Tanks	835,000	682,000	2,177,000
Refurbish Mill Creek WTP	110,000	105,000	
Service Line & Meter Replacements	660,000	862,500	240,938
Distribution System Interconnection	515,000	301,000	
SCADA System	315,000	441,000	19,540
Replace Existing PRV	375,000	358,000	502,190
Other Expenses			22,621
	$ 2,810,000	$ 2,749,500	2,962,289

As the District moves forward in replacing the bolted steel tanks, significant cost increases are seen in current engineering estimates. The three Bolted steel tank

replacement projects are being estimated at $2.17 million dollars. Actual construction costs will not be known until bidding of said projects.

The Assessment District provides $2.75 million dollars for construction costs of the projects listed. With current cost estimates the Assessment District funds will not cover construction costs of the projects. To facilitate construction, staff is recommending modifications in construction of the projects as follows:

Service lines

The assessment district provides funding for the replacement of all 500 Lompico water service lines and water meters. To date the water meters have been changed out and 37 service lines have been replaced at a total of $240,938. To reduce costs to the assessment District it is recommended that the remaining 463 service lines be changed out by district staff on a case by case basis and to be charged to the District's Operations Department.

Mill Creek Water Treatment Plant

The assessment District provides $105,000 for the refurbishment of the Mill Creek Water Treatment Plant which provided water treatment for Lompico Creek. Due to lack of water supply in Lompico and operating the system as a zone the District will not be using Lompico Creek as a water supply and therefore will not need to upgrade the Water Treatment Plant. Staff recommends transferring these funds to the bolted steel water tank projects.

Distribution System Interconnection

The Assessment District provides $301,000 for the upgrade of the distribution system providing inlet flow to the Lompico Booster. With increases in cost to other projects, funds in the assessment district are not available. It is recommended that this project be removed from the assessment District and added to the District's Capitol Improvement Project list and ranked as a high priority. It is estimated that this project cost would be approximately $500,000.

The District is moving forward on completing the projects outlined in the Lompico Assessment District. As projects are being designed and constructed it is apparent that the $2.75 million dollars in the Assessment District will be insufficient to cover the listed projects, the Bolted Steel Tank Projects being the bulk of the expenditures. These numbers are estimates and staff will be working with consultants trying to lower costs.

Lompico County Water District was consolidated with SLVWD and operation of Lompico has changed from a stand-alone water system to pressure zones within SLVWD. Many assets such as land and equipment are no longer needed for Lompico and it is recommended that these assets are surplused as soon as possible, since they have no beneficial use to the District and are becoming problematic with vandalism, trespassing and dumping of garbage. The sale of unneeded assets has the potential of generating

an estimated $500,000 that could be used to offset costs for assessment district projects.