Professional Design Services for the Bear Creek Estates Wastewater Treatment Facility Alternatives Analysi

August 30, 2019

P R O P O S A L

WATERWORKS ENGINEERS

COVER LETTER

August 30, 2019

RE: Proposal for Professional Design Services to the San Lorenzo Valley Water District Bear Creek Estates Wastewater Treatment Facility Alternatives Analysis

Dear Mr. Darren Langfield and Distinguished Selection Committee Members:

Water Works Engineers, LLC (Water Works) is pleased to (1) original, three (3) hard copies, and one (1) electronic copy of our Proposal for the Bear Creek Estates Wastewater Treatment Facility Alternatives Analysis proposal. As requested, we have included one original, three copies, and one electronic copy. We have reviewed the information in the RFP, RFI 1, RFI 2, Addendum 1 and plant process schematic.

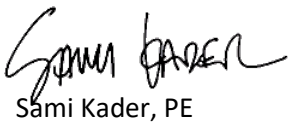
- ✓ **Project Understanding –**We understand the project includes conducting alternative analysis to evaluate three treatment alternatives to ensure compliance with the Bear Creek Estates Wastewater Treatment Facility Waste Discharge Requirements Order No. 00-043. Several alternatives will be analyzed including 1) retrofitting the existing system, 2) replacing the system with a secondary or tertiary treatment system, and 3) consolidation with another agency or purchase by another agency. A technical memorandum will be prepared to summarize each analyzed alternative and the phased approach recommended to meet the nitrogen removal requirement. We will complete the work by the end of 2019 as requested by the District. In our proposal, you will find the following themes that make us confident our team is most qualified to meet your objectives.
- ✓
- ✓ **Work Planning / Communication** – At key milestones in preliminary design phase, we facilitate workshops that presents the District a detailed description of all assumptions and design criteria to be used for the project, ensuring we are all on the same page and have a clear path forward for final design. For every design submittal, we facilitate a design review workshop, ensuring the District stays informed of how design criteria become actual equipment that is accessible, operable and maintainable long term.

- ✓ **Qualifications** – Our proven track record of projects & client references confirms our approach works.
- ✓ **Experienced Team-** we have assembled a **compact and efficient team** with the additional resources of our entire firms to draw from should the project demand. Our approach of a dedicated core team with readily available resources promotes **efficient**, **timely**, **accurate** decision making, which leads to **on-time**, **high-quality**, **within budget** project delivery. We are extremely excited about the opportunity to utilize this approach to assist the District.
- ✓ **Management Team– Joe Riess** our proposed **overall project manager and engineer of record** has a proven track record of successful project delivery for Municipalities across California. Understanding the local community needs will be key to project success, Joe will work closely with our project team, including Cindy Bertsch who is actively providing services from our near-by project sites the Bay Area. Joe will make certain that the project is executed well, having his hands in everything from overall schedule and coordination issues to specific technical assessments.
- ✓ **Commitment** – we commit to you that the individual staff members identified herein as our **core team** are the individuals you will be working with and are **available to begin work immediately**. Success on this project and for the San Lorenzo Valley Water District is a top priority of not only the team members, but all their firms.

If you have any questions or require additional information, please contact Sami Kader at 530-355-7646 or samik@wwengineers.com.

We look forward to the opportunity to make this project a success for you and appreciate your consideration.

Very Truly Yours,
WATER WORKS ENGINEERS, LLC



Sami Kader, PE
Principal-In-Charge
760 Cypress Ave. Suite 201
Redding, CA 96001
530-355-7646
samik@wwengineers.com

PROJECT DESCRIPTION AND APPROACH

Background

San Lorenzo Valley Water District (District) operates the Bear Creek Estates wastewater system. The system includes 1.2 miles of gravity collection sewers, two pump stations and a wastewater treatment facility (WWTF). A Notice of Violation of Wastewater Discharge Permit was issued on April 1, 2016 due to ongoing violations including insufficient nitrogen reduction since 2007 and excess flow over the permitted amount. Several memoranda have been prepared for the District to propose solutions including the following:

- Technical Memorandum No.1 – Collection Systems Inflow and Infiltration Assessment
- Technical Memorandum No.2 – Wastewater Treatment Plant Process Assessment
- 2018 Bear Creek Wastewater Treatment Plant Wastewater Collection and Treatment System Improvements Report

Based on recommendations from these reports, the District has modified the WWTF several times to reduce nitrogen. To date the plant improvements have not significantly improved nitrogen removal. Based on our observations during the site visit and review of previous reports and data, our initial assessment is that the insufficient nitrogen reduction is a treatment process issue, not a collection system issue. As part of a separate effort, the collection system improvements recommended in the July 29, 2016 Collection System Inflow and Infiltration Assessment Memorandum can be implemented in order to reduce the amount of infiltration and inflow (I&I) entering the system and reduce peak flows to the WWTF, however nitrogen removal is associated with nutrient mass loading in the wastewater, which is generally not affected significantly by I&I. Currently, nutrient removal capacity is limiting WWTF performance, not flow capacity.

Objective

The objective of the project is to analyze three wastewater treatment alternatives to determine how to best comply with the Waste Discharge Requirements Order No. 00-043. Per the permit, nitrogen must be reduced by 50% compared to the influent nitrogen and nitrate (as NO_3) in groundwater samples taken from the monitoring wells around the effluent leachfield may not exceed a maximum contaminant level of 45 mg/L.

Approach

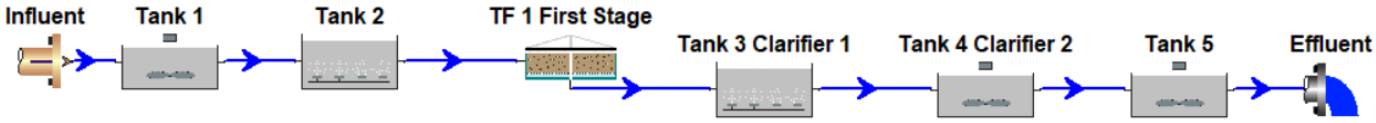
Three alternatives will be analyzed including:

1) retrofitting the existing system,
2) replacing the system with a secondary or tertiary treatment system, and
3) consolidation with or purchase by another agency.

Each alternative is described in more detail below.

Alternative 1 – Retrofit the Existing System

We will analyze the existing system determine if it is cost effective to improve it or if it needs replacement to meet the permit requirements. During preparation of this proposal, we analyzed the existing system using data from *Technical Memorandum 2-Wastewater Treatment Plant Process Assessment* using BioWin, a wastewater treatment process simulator that uses biological, chemical, and physical process models. A sample screenshot from the model is shown below.



The model confirmed that based on process modeling of the existing system, nitrogen would not be expected to be reduced by 50% from the influent value as shown in the previous sampling results. The model will be used to evaluate potential improvements to the existing system to improve treatment performance, such as optimizing aeration (in treatment tanks and through the trickling filters) and recirculation. Any process components that are not necessary will be recommended for removal.

Alternative 2 – Replace the Existing System

Parts of the existing plant have been in service since 1985 and may be nearing the end of useful life. The existing plant has also been retrofitted to resolve treatment issues which can lead to inefficiencies. Therefore, replacing the entire treatment plant with a new package plant will be analyzed. Several different levels of treatment will be considered. A membrane bioreactor (MBR) plant offers tertiary level treatment in a small footprint. Although the permit does not require tertiary treatment, the MBR would provide the District peace of mind of being able to reliably meet the current permit and future permit requirements. However, the MBR costs more than other potential alternatives. A secondary treatment package plant will also be considered to meet current permit requirements at a lower cost than a tertiary treatment alternative.

Alternative 3 – Consolidation or Purchase of the System

Other alternatives include consolidation with other Districts or purchase by another agency. We understand the District has explored consolidation with the County, but there has been little interest from the County. Additionally, there are no other wastewater treatment systems near the existing WWTF which would require significantly long pipelines to convey the wastewater.

Technical Memorandum

A technical memorandum will be prepared to describe each analyzed alternative and the phased approach recommended to meet the nitrogen removal requirement. The memorandum will include the estimated capital and operational costs of each alternative. System reliability and ease of operations will be described for each alternative. The draft memorandum will be reviewed with the District before finalizing it.

Quality Control

Cost Control

Cost control starts with a detailed scope of work. The scope developed for each key task will be used to manage the overall schedule and budget. The scope of work is the framework for all project tasks and provides data for subsequent productivity, budget analysis, and team accountability. Defined elements of work and associated budgets are provided to the team who will be responsible for delivering the defined scope within the allocated budget. Monthly check-ins on budget performance provide feedback on project performance and allow for a change of approach, if necessary, to continue to meet budget requirements. Any scope changes would be communicated prior to performing the work.

Quality Assurance/Quality Control

A quality work deliverable is one that meets our contractual requirements with the District and is prepared in

accordance with accepted standards of professional practice. It is the responsibility of Water Works to plan and execute assignments so that quality deliverables are produced to meet those requirements.

Continuous quality control and technical review are key tools in Water Works' project management philosophy. Quality, budget and schedule performance are all optimized when technical issues are identified and resolved as early as possible in the project delivery process. For Quality Control and Technical Review to be effective, they must be integrated into project delivery in a way that is well coordinated and does not negatively impact project delivery. We achieve this optimal performance by engaging Quality Control team at the following milestones.

Water Works Project Team Internal Kick-off Meeting

At this time, the scope is reviewed with the Project Team, the Principal-in-Charge (PIC), and the Quality Control Reviewer (QCR). During the scope review, the PIC and QCR have a first opportunity to provide design insight, relay past company and personal experience, convey Client-specific considerations, and help focus analyses, prior to the development of any project deliverables. During project execution, the Project Team checks back with the Quality Control Reviewer and Principal-in-Charge during critical analyses and sticking points.

Value Engineering

At Water Works, value engineering is part of our QA/QC process, a state of mind, and a continuous process by all working on the project. A project is not a quality project if it is unreasonably expensive to construct, resulting in potential delays to obtain additional funding or in the worst case, project cancelation. We always operate in value-engineering mode, not after 100% design is complete and a cost issue becomes evident. The individual project components are reviewed at preliminary design to identify cost-efficient ways of addressing the need.
Our project team will work with the District during preliminary engineering to understand the project budget and tailor the design from the onset to match it. We create a project cost estimate early in the design process, and update that cost estimate each time a major engineering decision or design change is made to ensure that the cost impacts of that decision are considered before moving forward with the full implementation of that decision. This prevents cost issues from arising too late in the process where design rework and project delays may result.

PRIME CONSULTANT

Water Works Engineers, LLC
1730 S. El Camino Real, Suite 280
San Mateo, CA 94402
Cindy Bertsch, P.E. (650) 389-9166
cindyb@wwengineers.com

Water Works Engineers, LLC (Water Works or WWE) was formed in 2005 by engineers who believed that water and wastewater engineering and consulting could be done a better way by combining the best attributes of large and small firms: ***the technical expertise of a large firm and efficiency and personal attention of a small one***. Our vision was the formation and growth of a new kind of engineering firm, ***a firm built on providing exceptional client service from highly experienced engineers in a "hands-on" highly interactive and enjoyable environment.***

To accomplish our vision, Water Works Engineers and all our teaming partners provide high-level staffing on every project with a ***leaner overall firm structure*** that is focused on delivering high quality work for client-specific needs. ***We focus solely on water, recycled water and wastewater treatment, distribution and collection systems infrastructure.*** This focus makes us efficient, keeps us up to date, and allows us to provide the highest level of service. Our focus and work approach allow us to provide high-quality planning and design products very efficiently. ***We take great pride in the fact that we don't just create documents, we facilitate projects.***

This focus and approach have fueled a consistent increase in our clients and projects, whereby over the past five years and grown from 4 offices and 45 employees with about $10M in revenue to 7 offices and 85 employees with just under $20M in revenue. By focusing exclusively on water and wastewater engineering, Water Works provides **focused expertise** rather than the overall umbrella approach of many civil engineering firms.

Based on our experiences, we strongly believe that ***people execute projects, not firms***. For that reason, the Water Works team is ***committing high quality, senior staff with in-depth experience directly relevant*** to pipeline rehabilitation. The Project team created are experienced professionals who have been directly involved in pipeline assessment, rehabilitation and replacement projects while ***providing long term, reliable, cost effective performance***. Our team of highly experienced professionals brings an extremely practical down to earth attitude to their work and has a ***track record of providing innovative, cost-effective solutions to complex problems.*** The project will be managed by Joe Riess. Joe and the project team have a niche skillset of performing many related projects over the past 10 years.

Sami Kader, PE	Rob Bryant, PE	Joe Riess, PE	Cindy Bertsch, PE
Principal in Charge Redding, CA	QA/QC Scottsdale, AZ	Engineer of Record/Project Manager Redding, CA	Senior Engineer San Mateo, CA

Water Works has no pending bankruptcies, liens, stop payment notices, judgments, lawsuits, foreclosures, nor any similar actions filed or resolved in the past. No client has ever terminated a contract with our firm for breach. We have the financial ability to maintain a staff of regular employees, sub-consultants and sub-contractors adequate to ensure continuous performance of our work.

SUB CONSULTANTS

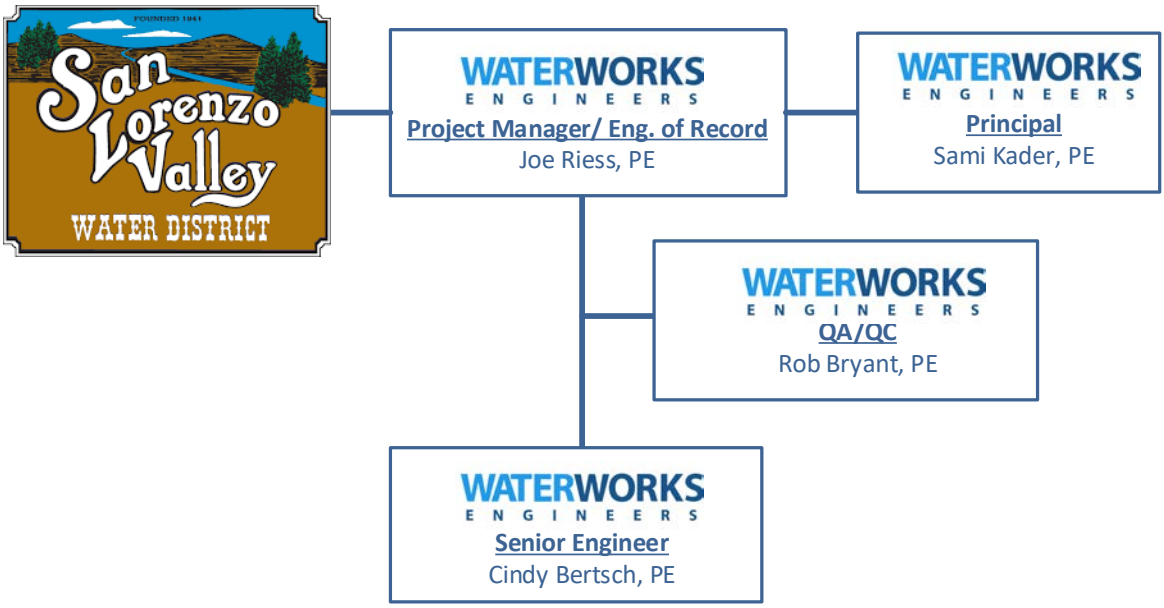
Water Works Engineers will perform all work associated with this project. No subconsultants will be used for this project.

PROJECT ORGANIZATION AND TEAM EXPERIENCE

Based on our collective experiences, we strongly believe that people execute projects, not firms. For that reason, Water Works is committing high-quality, senior staff with in-depth recent experience directly relevant to wastewater treatment planning and design. The District can rest assured our design approach provides long-term, reliable, cost-effective performance. Our team will bring the District the best possible combination of personnel experience to provide input on the project assessment when it is needed, while maintaining a lean overall project team make-up. Our team of highly experienced professionals brings an extremely practical and down-to-earth attitude to our projects and has a track record of providing innovative, cost- effective solutions to complex problems.

The strength of the Water Works comes from committing senior staff with in-depth experience directly relevant to this project. A brief bio for our team members can be found on the following page and full resumes can be found in Appendix A of the proposal.

The project organization chart is shown below.



TEAM MEMBER QUALIFICATIONS

SAMI KADER, PE, PRINCIPAL IN CHARGE

Sami is a civil/sanitary design and construction engineer with over twenty years of experience in water, wastewater, and conveyance projects. Sami has built his over 24-year career on understanding client needs and providing superior client service in every aspect of his work. He is a civil/treatment design and construction engineer who has worked as a project manager, design manager, project engineer and construction manager for over $200M of water and wastewater facility projects. His extensive construction management experience provides him with a real-world practical knowledge of the application of design documents and details during construction and provides insight enabling successful construction of water and wastewater facilities with challenging constraints.

ROB BRYANT, PE - QA/QC

Rob has over 19 years of experience in the planning and design of water and wastewater facilities including booster stations, hydraulic analyses, and chemical feed systems. He has served as project manager for civil and environmental engineering projects that have focused on the design and optimization of water/wastewater treatment, storage, pumping, and conveyance facilities. Rob is our in-house expert on the BioWin wastewater treatment software modeling software and is frequently used for QA/QC on our projects involved wastewater process design.

JOE RIESS, PE – ENGINEER OF RECORD/ PROJECT MANAGER

Joe is a water/wastewater process design engineer with over 21 years of experience in large and small civil infrastructure wastewater treatment projects, including feasibility studies, alternatives analyses, and design for treatment plant upgrades, expansions, modifications, and collection and treatment system monitoring. He has specific experience in treatment process selection, closed-conduit and open channel hydraulic modeling, CADD design, GIS/GPS mapping, and other computer applications for designing and optimizing water and wastewater treatment and distribution systems. Typical duties include client interaction, permit review, technical report preparation and review, cost estimate preparation and review, preparation of contract drawings and specifications, contractor interaction, field visits, inspections, engineering services during construction, and QA/QC.

CINDY BERTSCH, PE - SENIOR ENGINEER

Cindy is a civil engineer with 18 years of experience focusing on municipal water and wastewater planning and design. Her experience includes performing engineering evaluations; preparing technical drawings, specifications, and cost estimates; completing construction services; facilitating permitting; writing master and facility plans; and hydraulic modeling. Cindy has worked on many wastewater project designs including secondary and tertiary treatment. The projects included planning, design, permitting, and engineering services during bidding and construction.

PROJECT MANAGEMENT APPROACH

At the core of our project team, and most critical to any project's success, is the Project Manager Joe Riess, PE who will be committed to this project from start to finish and will be the single point of contact for District staff on all project issues. He will work closely with Cindy Bertsch, PE to ensure the technical execution of the work. At Water Works, we believe and insist that our Project Managers have an in-depth involvement in the technical execution of the projects they manage. This significantly differentiates us from other firms, who see Project Management as a strictly administrative function. Joe has the experience, judgment and leadership skills to keep this project on-track and delivered while balancing the expectations and goals of all project participants. His "hands-on" approach to design, attention to details, and exceptional communication skills are what make his projects successful.

Locations

The work will be performed as described under Section 3, Identification of Prime Consultant Section, above.

Coordination with District

Water Works is committed to, and responsible for, coordinating with the District for the information needed to keep the project on schedule.

Schedule Control

As the project progresses, the project schedule is reviewed and updated monthly to reflect current project performance. Schedule performance is reviewed at each project meeting and communicated to the District project manager as needed. When everyone has the same understanding and expectation regarding schedule status and communication is clear and thorough, project delivery will meet District expectations and lead to overall project success.

CURRENT AND PLANNED WORKLOAD

We have the capacity to perform this work per the enclosed schedule in addition to completing our current and planned workload.

UNIQUE QUALIFICATIONS

Our team is unique, because the proposed team has worked together for the last nine years specifically on water and wastewater design projects. We enjoy solving treatment issues that others have not been able to solve.

EXPERIENCE AND PAST PERFORMANCE

The experience of the engineer of record and the firm are described in the following sections.

ENGINEER OF RECORD EXPERIENCE

Joe Riess will be the Engineer of Record for this project. A summary of his recent experience and performance on similar projects is summarized below:

Owner	City of Shasta Lake Jeff Tedder 530-275-7423	Castellina, LLC Glenn Pace 408-782-1669	City of Redding Ryan Bailey 530-224-603
Project Type	Wastewater Tmt. Preliminary Design Final Design Services during Cont.	Wastewater Tmt. Facilities Plan Permit Reports	Biosolids Dewatering Preliminary Design Final Design Construction Mgmt
Project Size	1.3 mgd ADWF	1 mgd AWDF	9.4 mgd ADWF
Project Budget	$1.4M	$103,000	$1.1M
Completed Project Cost	$1.4M (estimated) Note 1	$50,000 (in progress)	$1.1M
Budgeted Schedule	Design: 2 years Construction: 2 years	Planning: 2 yrs	Design: 2 yrs Construction: 1.5 yrs
Total Time to Completion	Design: 2 years Construction: 2 years	In progress	Design: 2 yrs Construction 1.5 yrs
Estimated Construction Cost	$16.7M	$19.6M	$5.6M
Actual Construction Cost	$18.1M	n/a	$5.8M

1. Project is 98% complete and is anticipated to be completed within budget.

FIRM EXPERIENCE

Our firm's experience on three similar wastewater projects is described on the next three pages.

City of Shasta Lake
Wastewater Treatment Facility Upgrade

City of Shasta Lake, CA

Project Type
Wastewater Treatment

Project Timeframe
Studies: 2009-2014
Design: 2015-2017
Construction: 2017-2019

Project Cost
Design: $800K
Construction (Est.): $17M

Team Members
Sami Kader, PIC/QAQC
Joe Riess, Sr. Project Engineer
Rob Bryant, Sr. Project Engineer
Jeremy Kellogg, Structural Engineer
Sheila Magladry, Staff Engineer
Craig Worrall, Lead CADD Designer

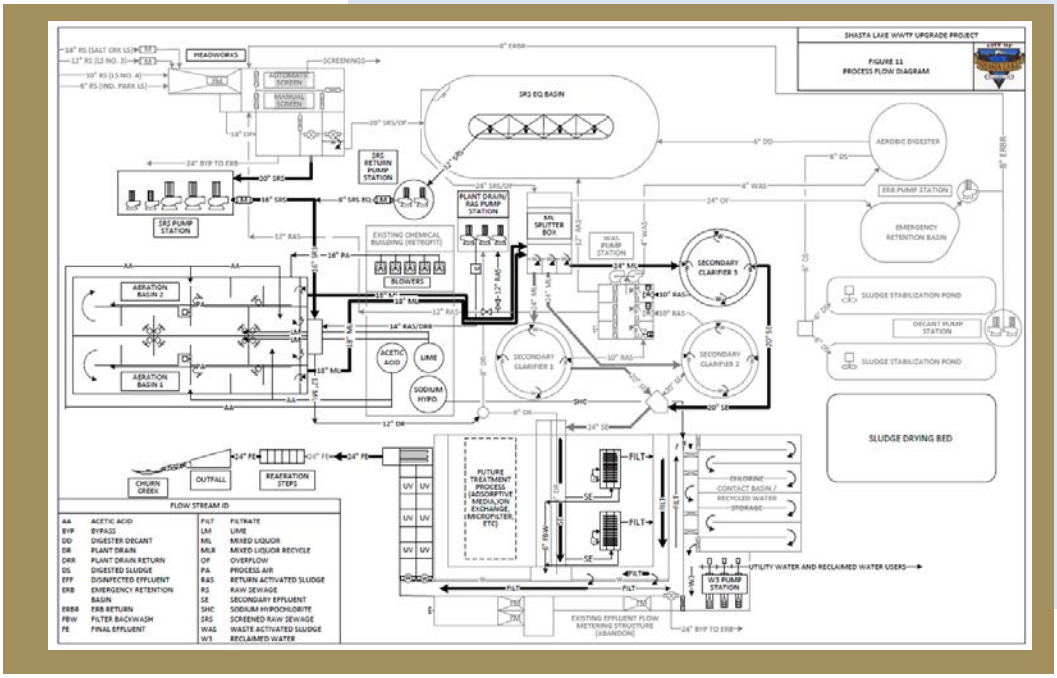
Project References
Jeff Tedder, City Engineer
City of Shasta Lake
1650 Stanton Drive
Shasta Lake, CA 96019
(530) 275-7423

Tom Chism,
WWTP Superintendent
(530) 275-7448

The City of Shasta Lake's WWTP currently serves a population of approximately 10,000 people, through approximately 3,650 Single Family Equivalent Connections (SFECs). The average dry weather flow (ADWF) into the plant is approximately 0.8 mgd, with peak flows approaching 4.5 mgd. The WWTP was upgraded and expanded in 1995 to provide an ADWF of 1.3 mgd. The treatment process train consists of mechanical screening, oxidation ditch, secondary clarifiers, traveling bridge filters and chlorine contact disinfection. Effluent is reused in the summer months and discharged to Churn Creek in the winter months. Limitations on Churn Creek dilution credits has led to limitation on new connections and permit compliance issues with the existing discharge.

Water Works completed the following studies to move the system towards permit compliance and work to allow more new connections: 1) An Effluent Discharge Study, 2) An Effluent Mixing Zone Study, 3) a Reasonable Potential Analysis and 4) Design Definition Report for WWTP Upgrades that would enable the City to meet its future "end of pipe" discharge permit. WWE and the City worked through the permitting and funding application process and then moved to the Final Design stage. Final design was completed on the following facility Upgrades to achieve year-round "end of pipe" discharge to Churn Creek.

1. Headworks Upgrade
2. Screened Raw Sewage Equalization
3. Aeration Basins
4. RAS, WAS and Plant Drain PS Improvements
5. Additional Secondary Clarifier
6. Cloth Filtration System
7. UV Disinfection
8. Re-Aeration and Cooling Cascade
9. Sludge Drying Beds
10. New Engine Generator and Electrical Upgrades
11. New SCADA System



Kukio WWTP Condition Assessment And Rehabilitation Project Hawaii Water Service Company

Kona, Hawaii

Project Type
Wastewater Treatment

Project Timeframe
Study: 2017

Project Construction Cost
$4 Million

Team Members
Sami Kader, P.E., PM/Project Engineer
Joe Riess, P.E., QC
Sheila Magladry, E.I.T, Staff Engineer

Project Reference
Thomas Venus
Hawaii Water Service Project Manager
(808) 315-0014

David Kadowaki
WWTP Plant Manager
(808) 987-5043

Hawaii Water Service operates a Class 2 secondary treatment plant treating an average flow of 0.05 MGD from the community of Kukio near Kona, Hawaii. The packaged treatment, installed in 2002, includes an equalization basin, three moving bed reactors (MBR - a hybrid design of a moving bed bioreactor and a rotating biological contactor), primary and secondary clarifiers, an aerobic digester and sludge bagger, and percolation ponds.

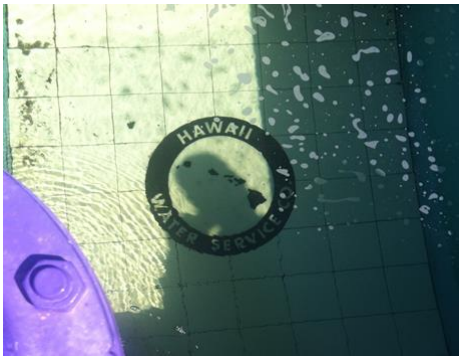
Due to integral component failure of the packaged treatment elements, Water Works Engineers performed a condition assessment of the entire plant. The condition assessment involved a thorough review of available historical data including process flow diagrams, influent flow data, and as-built drawings. The condition assessment was completed following a site visit where a thorough asset catalog was completed, including a photo diary and equipment tagging. Each asset was assigned a life expectancy prediction which was evaluated from an assessment of criticality, performance, and condition. The critical assets determined by the life expectancy prediction were prioritized for rehabilitation.

Water Works Engineers provided engineering support for the critical asset rehabilitation project. Most importantly the secondary treatment system required immediate repair, including media replacement, sludge transfer pump replacement, and treatment train repair. Water Works solicited the original supplier who was able to provide aftermarket services to repair the discontinued treatment trains. Water Works Engineers assisted in providing an open line of communication between the client and the manufacturer, and well as accurate cost estimate information to complete the rehabilitation project, and assistance in construction sequencing.

Lastly, Water Works Engineers completed a preliminary design report for a future improvements project for the treatment plant. The improvements project recommended increasing equalization volume and replacing the failing secondary treatment process in stages to maximize the value of the rehabilitated trains, while also ensuring continued operation of the treatment plant.

Pukalani Wastewater Treatment Plant
Hawaii Water Service Company

Maui, Hawaii



Project Type
Recycled Water

Project Construction Cost
$4 M

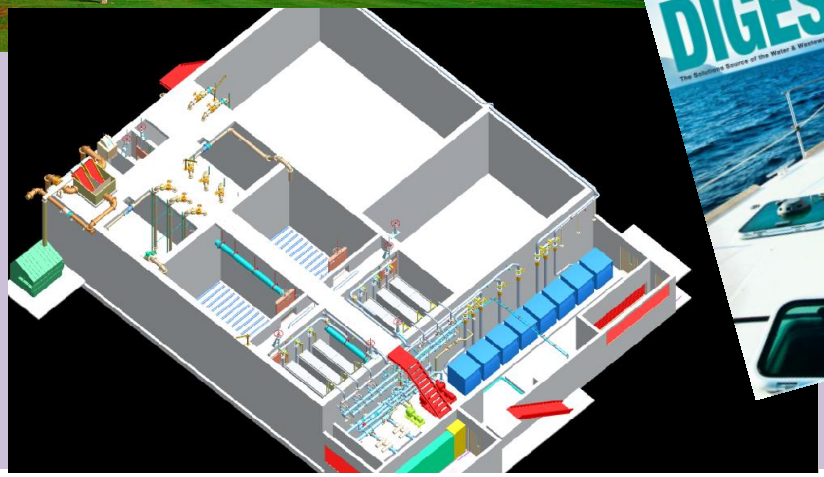
Project Timeframe
Design: 2009
Construction: 2009/2010
Start-up and Operational Support 2010/2011

Project Reference
Gary Vallado
Manager of Wastewater Systems
California Water Service
gvalladao@calwater.com
323-374-6878 (cell)

Water Works Engineers designed a replacement of the Pukalani WWTP, upgrading an existing extended-aeration activated sludge process which had reached the end of its useful life with a new membrane bioreactor (MBR)/UV disinfection process. The new MBR/UV process produces Hawaii R-1 (equivalent of California Title 22 Tertiary 2.2 recycled water) for use in irrigating the Pukalani Country Club golf course. The MBR facility is designed for an initial phase of 0.2 mgd average day flow and will be expandable to 0.8 mgd. The structures constructed under the initial phase are sized for 0.4 mgd and the expansion from 0.2 mgd will only require the addition of membrane cartridges and minor equipment.

The treatment process includes fine (3mm) influent screens, an equalization basin, anoxic and aerobic zones configured for biological nutrient removal (BNR), membrane basins with Kubota RW-400 flat plate submerged membrane units, process air system using positive displacement blowers, an inline ultra-violet disinfection system, a non-potable water system and a waste-activated sludge (WAS) storage basin. Effluent is stored in the existing 2.0 MG pond and pumped to the adjacent golf course for reuse. The WAS produced is dewatered using a belt filter press and transported to a composting site for reclamation. The facility operates under a 45-dbA property line noise limit and has special design features to contain the noise from the blowers and other equipment during operation.

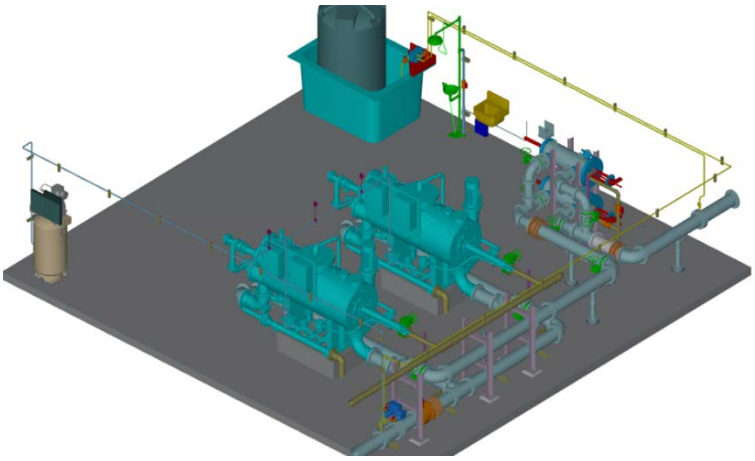
Water Works Engineers was responsible for coordinating the procurement of the MBR system and associated equipment from Enviroquip Inc. (now Ovivo), performing all design of the facilities, obtaining permits from the Hawaii Department of Health (HDOH) and Maui County Building Department, and providing construction oversight, testing and start-up services for the facility.



FIRM'S LOCAL EXPERIENCE

We have completed many projects in the Santa Cruz Mountains from La Honda in San Mateo County to the Highway 17 corridor. Specifically, in Santa Cruz County, we have completed the following project.

PASATIEMPO GOLF CLUB TERTIARY RECYCLED WATER SYSTEM TERTIARY FILTRATION FACILITY DESIGN AND PERMITTING, SANTA CRUZ, CA



Following completion of an alternative feasibility study and pilot testing, Water Works performed detailed design and ongoing construction support for the filtration and disinfection treatment systems for the Pasatiempo Golf Club Tertiary Recycled Water System. This facility is designed to initially filter up to 320 gpm instantaneous flow of secondary effluent from the Scotts Valley WWTP Effluent Pipeline to tertiary standards, with the possibility of peak flow treatment up to 700-gpm in order to take advantage of available secondary effluent during peak flow time periods. This will provide 100-135 ac-ft/year of recycled water to be blended with on-site well and potable water sources to optimize irrigation quality and drastically reduce potable water use on the golf course, providing considerable cost savings. The project is anticipated to start operation in August/September 2017.

The filtration facility consists of 50-micron automatic backwash strainers (Amiad SAF-4500) and 20-micron cartridge filters (Amiad AMF-370K). The units were selected and sized based on the performance observed during previous pilot testing performed by Water Works Engineers. An anticipated 5% backwash flow will be returned to sewer. Filter cartridges are anticipated, based on backwash frequency observed in pilot testing, to last for 10 years. Disinfection will be accomplished using the on-site storage tank and the addition of sodium hypochlorite.

Water Works Engineers worked with both the Regional Water Quality Control Board and the Division of Drinking Water Recycled Water Unit in the development and approval of the Title 22 Engineering Report and Recycled Water Permit for the project. Water Works maintains a positive working relationship and strong reputation with permitting agencies throughout the state.

Project Timeframe
November 2015-December 2017

Team Members
Sami Kader, Sr. Project Engineer
Cindy Bertsch, Project Engineer

Project References

Justin Mandon
Golf Course Superintendent
Pasatiempo Golf Club
408-930-3345

D. Scott Hoyt
General Manager
Pasatiempo Golf Club
831-459-9175

EXCEPTIONS TO RFP

Water Works Engineers takes no exceptions to this RFP.

CONTRACTUAL SCOPE OF SERVICES

TASK 1 - DATA COLLECTION

ENGINEER will prepare a data request for information needed for the analysis. ENGINEER will review previous memorandums, waste discharge requirements, plant as-builts, and plant data.

TASK 2 - ALTERNATIVES ANALYSIS

ENGINEER will provide an Alternatives Analysis Technical Memorandum that includes, at a minimum, the following:

1) Project Location
   a) Map of Existing Service Area
   b) Map of Project Location
   c) Location of Nearby Utilities (if any)
2) Problem Description
   a) Existing Process Flow Diagram
   b) System Flows and Loads
   c) Project Objectives
3) Alternative Solutions
   a) Alternative Descriptions
      i) Alternative 1 – Retrofit the Existing System
      ii) Alternative 2 – Replace the Existing System
      iii) Alternative 3 – Consolidation or Purchase
   b) Comparison and Selection of Preferred Alternative
4) Preferred Alternative Description
   a) Process Description / Process Flow Diagram
   b) Waste Disposal
   c) Major Equipment Description
   d) Facility Layout/General Equipment Arrangement
5) Preliminary Cost Estimate

A draft of the Technical Memorandum will be presented to the CLIENT at a review meeting. The CLIENT will have a two-week review period to provide additional comments. The memorandum will be finalizing using comments received.

Meetings	• Draft Technical Memorandum Review Meeting at District (PM and Senior Engineer in person) • Final Technical Memorandum Review Meeting at District (PM and Senior Engineer in person)
Deliverables	• Draft and Final Technical Memorandums (4 hardcopies plus pdf via email)

TASK 3 - PROJECT MANAGEMENT

ENGINEER will monitor and track the project budget and schedule to ensure that all deadlines are met and that the project budget is not exceeded. ENGINEER will coordinate with the project team to address items such as project schedule, project budget, and current issues of concern. The following will be performed under this subtask:

1) Project Kickoff Meeting
   a) ENGINEER introductions to CLIENT staff

b) Familiarize ENGINEER with all project facilities
c) Gather operational data
d) Agree on Project Objectives
e) Agree on Project Components

2) Project Communication and Control
   a) Coordination of all project team activities
   b) Communication of project progress and issues to CLIENT staff
   c) Project schedule maintenance and control of project tasks to keep project schedule on track
   d) Cost tracking of all engineering activities and active cost control of fees.
3) Quality Assurance/Quality Control
   a) Implement Quality Assurance/ Quality Control Policy

Meetings	• Project Kickoff Meeting at District's Office (PM and Senior Engineer in person)
Deliverables	• Monthly Invoices (by email)

TOTAL PROFESSIONAL FEE AND FEE SCHEDULES

The fee, schedule, and rate schedule are included below.

Water Works Engineers Fee Estimate

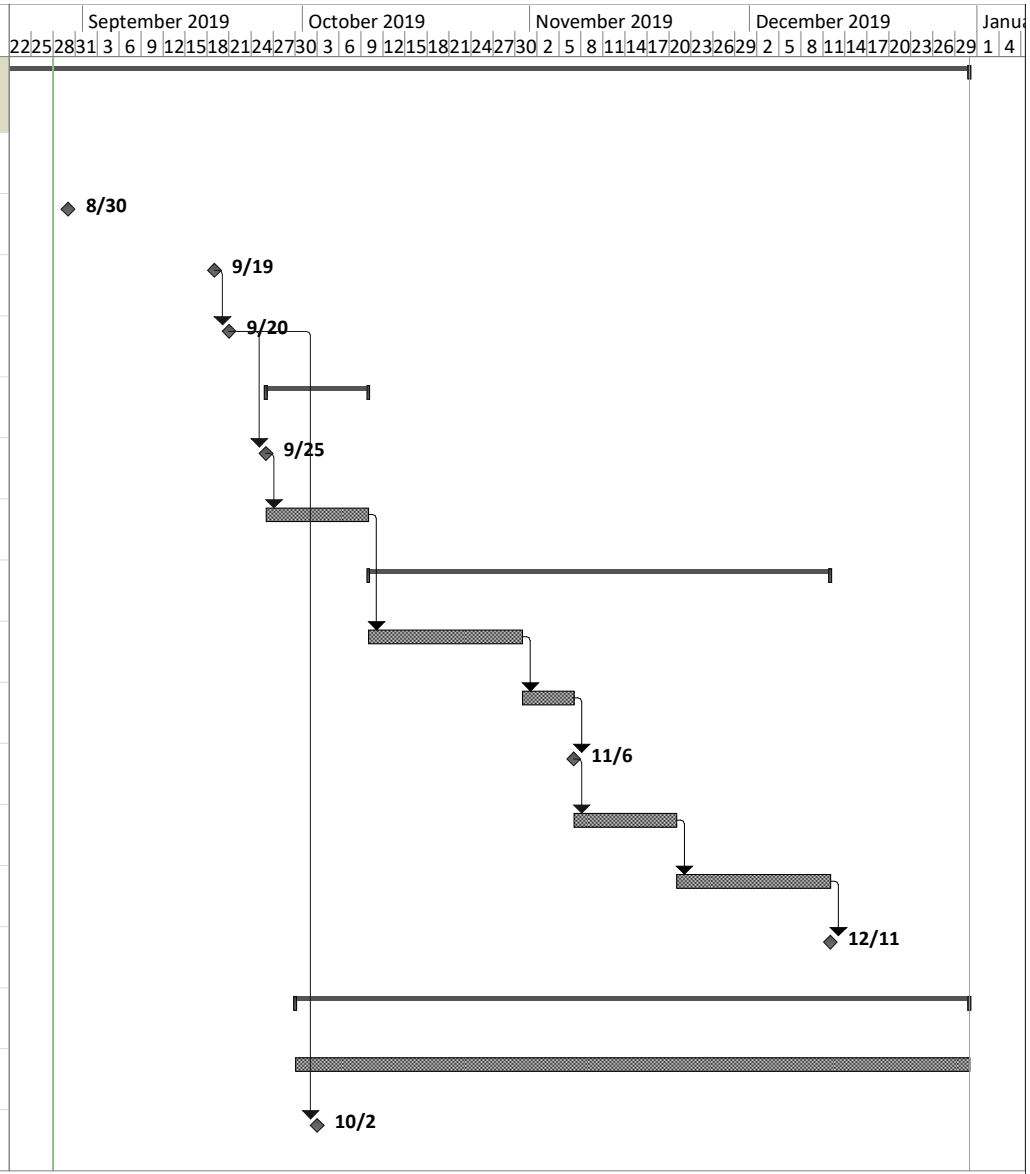
Client	San Lorenzo Valley Water District
Project	Bear Creek Estates WWTF Alt. Analysis
Date	8/28/2019

Hours and Fee

			Task 1		Task 2		Task 3	
		Year	2019		2019		2019	
			Data Collection		Alternatives Analysis		Project Management	
Water Works Engineers		**2019**	hrs	fee	hrs	fee	hrs	fee
Classification	**Title**	**Hourly Rate**						
AA	Administrative	$102	2	$204	2	$204		
E4	Senior Project Engineer (Cindy)	$203	16	$3,248	100	$20,300		
E4	Engineer of Record/ Project Manager (Joe)	$203	4	$812	30	$6,090	10	$2,030
E5	QA/QC (Rob)	$235			4	$940	8	$1,880
E5	Principal Engineer (Sami)	$235					2	$470
Expenses								
	WWE Expenses					$1,500		$700
Subconsultant/Expense Markup		10%		$0		$150		$70
		Subtask Totals	*22*	*$4,264*	*136*	*$29,184*	*20*	*$5,150*

Tasks 1-3	
Hours	**Fee**
178	$38,598

ID	Task Name	Duration	Start	Finish
1	**Bear Creek Estates WWTF Alternatives Analysis**	**105 days**	**Tue 8/6/19**	**Mon 12/30/19**
2	**Site Visit**	0 days	Tue 8/6/19	Tue 8/6/19
3	**Proposals Due**	0 days	Fri 8/30/19	Fri 8/30/19
4	**Board of Directors Approval**	0 days	Thu 9/19/19	Thu 9/19/19
5	**Notice to Proceed (Signed Agreement)**	**0 days**	**Fri 9/20/19**	**Fri 9/20/19**
6	**Task 1 - Data Collection**	**10 days**	**Wed 9/25/19**	**Wed 10/9/19**
7	Issue Request for Information	0 days	Wed 9/25/19	Wed 9/25/19
8	Review Documents and Information	10 days	Thu 9/26/19	Wed 10/9/19
9	**Task 2 - Alternatives Analysis**	**45 days**	**Thu 10/10/19**	**Wed 12/11/19**
10	Analyze Alternatives	15 days	Thu 10/10/19	Wed 10/30/19
11	Prepare Draft TM	5 days	Thu 10/31/19	Wed 11/6/19
12	Draft TM Review Meeting	0 days	Wed 11/6/19	Wed 11/6/19
13	District Review Period	10 days	Thu 11/7/19	Wed 11/20/19
14	Finalize TM	15 days	Thu 11/21/19	Wed 12/11/19
15	Final TM Review Meeting	0 days	Wed 12/11/19	Wed 12/11/19
16	**Task 3 - Project Management**	**66 days**	**Mon 9/30/19**	**Mon 12/30/19**
17	Monthly Invoice and Summary	66 days	Mon 9/30/19	Mon 12/30/19
18	Project Kick-Off Meeting	0 days	Wed 10/2/19	Wed 10/2/19



Water Works rates are as shown in the following table.

Classification	Title	Hourly Rate
AA	Administrative	$102
E1	Staff Engineer	$127
E2	Associate Engineer	$155
E3	Project / Structural Engineer	$175
E4	Senior Project Engineer / Manager	$203
E5	Principal Engineer	$235
I1	Field Inspector	$137
I2	Senior Inspector	$152
I3	Supervising Inspector	$170
T1	CADD Tech 1	$85
T2	CADD Tech 2	$115
T3	CADD Tech 3	$141

Notes:

1. A markup of 10% will be applied to all project related Direct Costs and Expenses.
2. An additional premium of 25% will be added to the above rates for Expert Witness and Testimony Services.
3. Rate effective through December 31, 2019. A 3% increase will be added for any services performed in each year thereafter.

APPENDIX 1 - RESUMES

SAMI KADER, P.E.

Principal-in-Charge, Project Manager

Education	Experience	Registration	Memberships
M.S. – Civil/Environmental Eng. University of Washington (1995) B.S. - Civil Engineering, University of CA at Davis (1993)	23 years	Registered Civil Engineer Arizona - 35250 California - C56653 Hawaii -14033	AWWA CWEA

REPRESENTATIVE PROJECT EXPERIENCE

Wastewater Treatment Infrastructure

Hawaii Water Service Kukio Condition Assessment, Critical Asset Repair Project, and Preliminary Design – Kukio, HI 2018 (Condition Assessment/Preliminary Design) Condition assessment of the Kukio WWTP and completed an effective end-of-life assessment for every asset within the plant operation.

Redway Community Services District WWTP Biosolids Master Plan (Master Plan) Updated the Biosolids Master Plan required by the Regional Water Quality Control Board and to comply with applicable portions of 40 CFR57, 258 and 503 General Waste Discharge Requirements.

Sharon Heights Golf Club Water Reclamation Facility (WRF) - Menlo Park, CA (Design/Permitting) The project involved the design and construction of a MBR plant at the Sharon Heights Golf Club that produces Title 22 recycled water for use on the landscaping

City of Shasta Lake Wastewater Treatment Plant Final Design – Shasta Lake, CA (Planning/Design) Mr. Kader was the Project Manager that oversaw the preliminary and final design of upgrades to the existing wastewater treatment plant that included a new influent pump station.

City of Redding Stillwater Wastewater Treatment Plant Phase 1A/1B Expansion Project - Redding, CA (Design/CM) Mr. Kader was the Principal in Charge of the expansion design from 13.5 to 17.0-mgd PHF. Expansion of the headworks. Addition of two 80-foot diameter secondary clarifiers and associated scum and RAS/WAS pump stations. Addition of two traveling bridge filters. Conversion of the existing 6.2 MG emergency storage ponds to lined secondary effluent equalization basins.

City of Redding Clear Creek WWTP Biolsolids Dewatering and Handling Facility – Redding, CA (Design) Mr. Kader was the Project Manager overseeing the Biosolids Dewatering Building design, complete with mechanical dewatering equipment, truck loading facilities, and all ancillary systems (e.g. polymer feed systems, utility water, HVAC, odor control. Design includes a Trucked Waste Receiving Station, integrated into the Biosolids Dewatering Facility and sharing truck routes.

City of Redding Stillwater Wastewater Treatment Plant Phase 1C Expansion Project Redding, CA (Design) Mr. Kader was the Principal in Charge of the Hydraulic modeling of the future WAS transfer pump station. Design of the future WAS holding tank and jet mixing system. Selection of progressing cavity pumps, mixing pump, and jet header and nozzles. Analysis of potential modes of operation for WAS transfer and the impacts on plant operations. Preparation of construction specifications for the facility.
EQ permitting.

JOE RIESS, P.E.

Senior Project Engineer/Project Manager

Education
M.S. – Civil/Env. Engineering
UC Davis (2001/Honors)
B.S. – Env. Resources Engineering,
Humboldt State Univ. (1998/Honors)

Experience
21 years

Registration
Registered Civil Engineer
California - C66413

REPRESENTATIVE PROJECT EXPERIENCE

Wastewater Treatment and Infrastructure

City of Shasta Lake WWTP Upgrade-City of Shasta Lake, CA (Design, SDC) Mr. Riess was the lead process engineer for the design of retrofit tertiary filters, ultraviolet disinfection and recycled water systems at the City's existing WWTP (1.3 mgd ADWF, 5 mgd PDF). The design included the conversion of traveling bridge filters to in-tank inside-out cloth media filters (Westech SuperDisc) and dual-channel ultraviolet disinfection (Wedeco Duron) systems. Mr. Riess also was responsible for managing the design of the sludge drying beds, cascade re-aeration system, and other ancillary systems.

City of Redding Clear Creek WWTP Biosolids Dewatering and Handling Facility – Redding, CA (Planning/Design/CM) Mr. Riess was the lead process engineer and Construction Manager for the City's new Biosolids Dewatering Building. The project included new centrifuge dewatering equipment, shaftless screw conveyors, truck loading facilities, and all ancillary systems (e.g. sludge feed pumps, polymer feed systems, HVAC, odor control, etc.). Mr. Riess was the Construction Manager and part-time onsite representative for the City.

Olivehurst Public Utilities District WWTP Upgrade and Expansion – Olivehurst, CA (Planning/Design) Mr. Riess was the Lead Process Engineer and assistant design manager for WWTP expansion from 1.8 to 3.0 mgd ADWF. The project included California Toxics Rule compliance and the following new processes: fine screens, grit chambers, influent pump station, oxidation ditch, secondary clarifier, RAS/WAS pump station, filter influent pump station, cloth media filters, UV disinfection channels, re-aeration basin, chemical storage and feed, effluent pumps and outfall structure (3 mgd).

Tahoe-Truckee Sanitation Agency Water Reclamation Plant expansion and Upgrade – Truckee, CA (Planning/Design/SDC) Mr. Riess was the Lead Process Engineer and Project Manager for advanced WWTP expansion from 7.4 to 9.6 mgd. The project included new primary clarifier, primary effluent flow splitting structure, high-purity oxygen activated sludge basin, liquid oxygen storage, secondary clarifier, sludge flow splitting, tertiary filters, biological nitrogen removal, biological odor control, and centrifuge solids dewatering (9.6 mgd).

Castellina Water and Wastewater Facility Plans – Madera County, CA (study) Mr. Riess prepared conceptual-level water and wastewater facility plans for a proposed 3,072-unit development in Madera County, CA. The proposed water system included two new groundwater wells, two 550,000-gallon water storage tanks, and booster pump station. The proposed wastewater system included influent pumping, emergency storage and equalization, membrane bioreactor (MBR) treatment, ultraviolet disinfection, recycled water storage and pumping, and biosolids treatment. Phasing plans for each system were developed for system beginning with zero connections up through buildout.

Washington Water Service Rosario WWTP Condition Assessment, Orcas Island, WA (study) Mr. Riess reviewed design and permit documentation and conducted a site assessment for a lagoon wastewater treatment system on Orcas Island. A condition assessment report with recommended near-term and long-term improvements was prepared with cost estimates for capital planning.

ROB BRYANT, PE
Project Manager/Engineer

Education	Experience	Registration	Memberships
B.S. - Civil Engineering, South Dakota School of Mines and Technology (2000)	18 years	Registered Civil Engineer Arizona - 42726 Texas- 104022	ASCE AWRA AWWA

Representative Project Experience

City of Phoenix 91st Ave WWTP Job Order Contracting, Design, Construction Administration and Inspection Services, and As Needed Assistance (Project Manager) Mr. Bryant served as project manager to provide engineering services associated with project management, design and construction administration in support of the JOC program at the 91st Avenue WWTP. As needed process assistance was also provided.

Provo City Water Reclamation Facility Master Plan, Provo, UT (Study) (QA/QC) Mr. Bryant served as QA/QC for the study, which included the evaluation of the hydraulic and treatment capacity of the facility, and completion of a condition assessment for all treatment related equipment and structures. Work performed included the development of comprehensive models for both the liquid stream and solids stream (Biowin modeling of their existing anaerobic digesters) process trains. Both models were calibrated using hydraulic stress tests to verify their accuracy in predicting plant performance. The treatment process evaluation included the development of process models for each unit process at the facility. A sampling and analysis plan was developed to obtain the operational performance data necessary to calibrate the models. Process unit stress testing was also conducted to assess the accuracy of model predictions and verify the process unit performance.

City of Prescott Airport, WRF Expansion Phase 1 (Project Manager) Mr. Bryant served as project manager to develop the design of a new 3.75 mgd WRF to address future growth and increased influent strength. Process design included analysis of influent wastewater flows and loadings, equalization options, and expansion/phasing plan for all phases ranging from 3.75 to 15 mgd treatment capacity.

Palo Verde Nuclear Generation Station (PVNGS), Sewage Treatment (Project Manager)
Mr. Bryant was the project manager to provide treatment alternatives evaluation and detailed design services for a replacement sewage treatment facility for PVNGS domestic wastewater

City of Goodyear – Process and Evaluation and Condition Assessment for the Corgett WRF and Rainbow Valley WRF (Project Manager)
Mr. Bryant acted as the Project Manager to perform expedited process and condition assessments for two of the City of Goodyear water reclamation facilities to assist City management to identify high priority projects an confirm the associated budgets within a five year planning horizon. WaterWorks staff conducted field inspections, data analysis, and review of record drawings. They then developed a list of improvements with assigned priorities and ranking. The work was closely reviewed with plant and engineering staff.

Shasta Lake WWTP Final Design (Project Manager)
Since 2008, Water Works Engineers (WWE) has worked with the City of Shasta Lake to thoroughly investigate effluent disposal alternatives (Effluent Discharge Study, Mixing Zone Study, Tierra Oaks Reclaimed Pipeline Route Study and Economic Feasibility Analysis). Through this work, WWE has worked with the City through significant coordination with the Redding office of the Central Valley Regional Water Quality Control Board (RWQCB), National Marine Fisheries Service (NMFS, also known as NOAA Fisheries), the Redding office of California's Department of Fish and Game (CDFG), and the United States Bureau of Reclamation (USBR). We have, together, built consensus behind this project, which will provide Shasta Lake with a more secure future in effluent disposal

CINDY BERTSCH, P.E.

Senior Project Engineer

Education	Experience	Registration
M.S. – Civil/Environmental Eng.	18 years	Registered Civil Engineer
University of CA, Davis (2001)		California - C65385
B.S. - Civil Engineering,		Nevada - 18151
University of CA at Davis (2000)		SWPPP QSP

Ms. Bertsch is a civil engineer focusing on municipal water and wastewater planning and design. She has over 18 years of experience that includes performing engineering evaluations; preparing technical drawings, specifications, and cost estimates; completing construction services; facilitating permitting; writing master and facility plans; and hydraulic modeling.

REPRESENTATIVE PROJECT EXPERIENCE

City of Shasta Lake Wastewater Treatment Facility Upgrade - City of Shasta Lake, CA (Design) Ms. Bertsch was the Project Engineer that analyzed historical data to determine future loading trends for flows and loads. Ms. Bertsch investigated disinfection alternatives for the upgraded plant including ozone and disinfection. Ms. Bertsch also compared filtration alternative including membrane filtration, deep bed filtration and denitrifying filters.

Penn Valley Wastewater Treatment Plant Antidegradation Evaluation Workplan and BPTC Workplan - Penn Valley, CA (Study) Ms. Bertsch was the Project Engineer that evaluated treatment technologies for the wastewater treatment plant to meet waste discharge requirements and potential fate of contaminants through the system.

Pasatiempo Golf Club- Santa Cruz, CA (Design/Permitting) Ms. Bertsch assisted with the design of the treatment system located at the golf course. She updated the Pasatiempo Golf Club's Title 22 Engineering Report for Treatment, Distribution and Use of tertiary recycled water to reflect the treatment being added at the Club. The treatment includes scalping secondary recycled water from the Scotts Valley WWTP and treating it to a tertiary level to use on the golf club.

Sharon Heights Golf Club Water Reclamation Facility (WRF) - Menlo Park, CA (Design/Permitting) The project involved the design and construction of a MBR plant at the Sharon Heights Golf Club that produces Title 22 recycled water for use on the landscaping. Influent for the plant is pumped from a new pump station and forcemain to the plant. Ms. Bertsch assisted with the civil and yard piping design. She also assisted with permitting the WRF and pipeline including complying with the ISMND, writing the Title 22 WRF engineering report, and assisting with the SWPPP, Caltrans encroachment permit, and County and City encroachment permits.

City of Redding Stillwater WWTP Filter Underdrain Replacement - City of Redding, CA (Design) Ms. Bertsch was project manager for the preparation of plans and specifications to repair and renovate traveling bridge filters 1 and 2.

NOV from Regional Water Quality Control Board - Redwood City, CA (Report) Ms. Bertsch served as the Project Engineer for the engineering services for assistance with the County of San Mateo by developing a technical report to respond to a Notice of Violation of the SSS-WDR from the Regional Water Quality Control Board. Services included the following Reviewed the NOV and Sanitary Sewer Collection System Compliance Evaluation Inspection documents with particular emphasis on violation findings. Compared the violation findings to the County Sewer System Management Plan (SSMP) and prepared a Draft technical report in accordance with NOV requirements that defined County corrective actions in response to each violation finding and an implementation schedule.