Stantec

2018 Wastewater Master Plan Update
Town of Discovery Bay Community Services District

California

2018

Stantec

Stantec Consulting Services Inc.
3875 Atherton Road
Rocklin, CA 95765

May 30, 2018 2017

Town of Discovery Bay Community Services District

Virgil Koehne
Wastewater Manager

1800 Willow Lake Road
Discovery Bay, California
94505

Reference: 2018 Wastewater Master Plan Update

Dear Mr. Koehne,

At Stantec, we recognize the importance of having a comprehensive planning document for wastewater facilities that identifies cost-effective solutions to comply with future waste discharge requirements and takes into consideration operational reliability. We have a solid understanding of the challenges of your project as the Town of Discovery Bay Community Services District to provide robust and reliable wastewater treatment and the importance of having the Master Plan completed on time and under budget. Throughout our proposal and specifically in the project approach, we outline the distinct advantages the Stantec team will provide to the District. Some of those highlights include:

1. We have relevant experience and knowledge of the Discovery Bay wastewater treatment facilities and sewer collection system having worked for the District on the original Master Plan and follow-up amendments to the Master Plan.
2. We feature experienced professionals for each project component, including process, electrical, mechanical, and SCADA.
3. Our team has worked together on similar projects for more than 15 years and can proceed efficiently and effectively with no learning curve required to successfully complete this project.
4. We have a good working relationship with the District and are currently providing engineering support on critical issues, such as permitting and updating the wastewater treatment plant operations and maintenance manual.
5. Our local team has significant experience having successfully prepared many wastewater master plans that include the same treatment processes and issues regarding flows and loadings that are challenging the District.

Led by **Steve Beck** as the Stantec Project Manager, and with the knowledge of the existing treatment facilities by **Jeff Hauser,** we are well positioned to deliver this master plan update efficiently, effectively, and on schedule. We would be privileged to support this important project for the District.

Please let us know if you have any questions about our proposal.

Sincerely,
Stantec Consulting Services Inc.

Steven T. Beck

Steven L. Beck, PE
Principal-in-Charge | Project Manager
Phone: (916) 773-8100
steven.beck@stantec.com

Part A: Proposer Information

Stantec Consulting Services Inc.
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Part B: Qualifications of the Firm

Communities are fundamental. Whether around the corner or across the globe, they provide a foundation, a sense of place and of belonging. That's why at Stantec, we always design with community in mind.

We care about the communities we serve—because they're our communities too. This allows us to assess what's needed and connect our expertise, to appreciate nuances and envision what's never been considered, so we can collaborate toward a shared success.

We're designers, engineers, scientists, and project managers, innovating together at the intersection of community, creativity, and client relationships. Balancing these priorities results in projects that advance the quality of life in communities across the globe.

The Stantec community unites approximately 22,000 employees working in over 400 locations across six continents. Some of the core services offered by Stantec include:

- Architecture
- Buildings Engineering
- Community Development
- Environmental Services
- Geotechnical Engineering
- Hydropower Consulting
- Management Consulting
- Mining Engineering
- Oil & Gas Engineering
- Power Engineering
- Program Management
- Project Management
- Transportation Infrastructure Engineering
- Water and Wastewater Engineering

Stantec began operating in 1954, and we have continued to grow both through acquisition and organically based on our expertise and quality of work.

Our team of engineers and experts are intimately familiar with Discover Bay's wastewater infrastructure. For the last several years, we have helped with master planning and implementation of key projects to move your goals forward in an efficient and cost effective manner. Our goal is to continue using our expertise and knowledge of your systems to take things to the next level. We consider ourselves to be an extension of your team and are ready to continue the key work of partnering to get things done.

Discovery Bay Wastewater Master Plan

COMPANY:	Town of Discovery Bay Community Service District
POINT PERSON:	Virgil Koehne, Phone: (925) 634-1131, Email: vkoehne@todb.ca.gov
START DATE:	May 2010
END DATE:	March 2016 through Amendment
CONTRACT VALUE:	$212,866

The Town of Discovery Bay Community Services District (TDBCSD) hired Stantec to complete a comprehensive Wastewater Treatment Plant Master Plan to guide the District in making improvements needed to serve the community through buildout. The Master Plan included limited assessment of improvements required to its various collection system pump stations. An initial draft of the Master Plan was completed in October 2011 but was amended to include increased growth projections in February 2013. Subsequently, Amendment 2 and Amendment 2 Update were completed in April 2015 and September 2015, respectively, to evaluate revised improvements needed after new stringent discharge requirements were issued for ammonia and nitrate nitrogen. Amendment 3 was completed in March 2016 to evaluate the rehabilitation or replacement of Plant 1.

The Master Plan included a process-by-process evaluation of existing facilities to identify deficiencies, assess capacity, analyze alternatives for improvement and/or expansion, and develop conceptual layouts and costs for all recommended improvements. A plant hydraulic model was also developed to evaluate the ability to handle future peak flows and recommend any needed improvements. The Master Plan included a final table that included all recommended improvements listed together with priorities, triggers, and estimated costs.

The District has completed construction of most of the recommended improvements, including influent pump station and headworks improvements, a new oxidation ditch and clarifiers, effluent filters, UV disinfection improvements, and expansion of sludge dewatering and drying facilities.

SKF Wastewater Facilities Master Plan

COMPANY:	Selma-Kingsburg Fowler County Sanitation District
POINT PERSON:	Veronica Cazares, District Engineer, Phone: (559) 897-6500, Email: vcazares@skfcsd.org
START DATE:	October 2011
END DATE:	March 2013
CONTRACT VALUE:	$386,000

The Selma Kingsburg Fowler (SKF) County Sanitation District (CSD) owns and operates wastewater treatment and disposal facilities that were initially built in the mid-1970s and expanded in the 1980s into an extended aeration activated sludge system with percolation disposal facilities. The design capacity of the WWTP is 8.0 Mgal/d, including substantial industrial flows. However, over the years, it became apparent that the actual capacity of the treatment and disposal facilities may be less than was intended at the time of design. Specific concerns were raised regarding the hydraulic capacity of the plant (ability to convey water, without reference to level of treatment), the capacity of the activated sludge biological treatment system, and the capacity of the percolation disposal facilities. Additionally, the plant has struggled to keep pace with the amount of residual solids produced.

Stantec was hired to prepare a facilities plan to evaluate each major component of the wastewater treatment and disposal system to determine the existing capacity, existing deficiencies, and recommended improvements needed to restore a future average annual flow capacity of about 8.0 Mgal/d. The plant includes influent pumping, equalization, headworks, nitrifying and denitrifying activated sludge facilities, percolation basins, sludge thickening, aerobic sludge digestion, sludge dewatering, and sludge drying. A prioritized list of all recommended improvements with triggering events and costs was developed.

Midwestern Placer Regional Sewer Project, Wastewater Facilities Plan

COMPANY: City of Lincoln
POINT PERSON: Jennifer Hanson, Public Works Director,
Phone: (916) 434-3248, Email: Jennifer.Hanson@lincoln.gov
START DATE: March 2012
END DATE: May 2015
CONTRACT VALUE: $870,000

The Placer County Sewer Maintenance District No. 1 (SMD1) wastewater treatment plant was operating under a Cease and Desist Order that, in order to comply with the stringent regulations to protect sensitive salmon spawning habitat, required significant upgrades in the level of treatment and/or development of a new location for effluent disposal. Complying with new regulations was made difficult due to several conditions specific to the District, including potable water supply, location, effluent disposal options, and the current level of treatment. Stantec partnered with Placer County and the City of Lincoln to analyze multiple alternatives, including upgrading the existing SMD1 facilities, conveying wastewater from SMD1 to the City of Lincoln's Wastewater Treatment and Reclamation Facility (WWTRF), and regionalizing with both the City of Lincoln and Auburn for treatment and disposal at the Lincoln WWTRF.

Life cycle costs were developed for the three main alternatives using multiple flow scenarios to account for future development in each region–Lincoln, Auburn and SMD1. The analysis concluded that the capital costs for regionalization is marginally more expensive to construct compared to local upgrades, but long-term operation and maintenance (O&M) related costs were lower due to economies of scale associated with operating a single larger treatment facility. Further, advantages of a centralized wastewater treatment and disposal facility included minimizing risk of future regulatory compliance, complying with the local and State Board's policy preference for regionalization, and reducing operational and regulatory driven upgrade costs due to large economies of scale. When the advantages of the Regional Project were considered in conjunction with the long-term compliance and cost risks associated with localized upgrades required of SMD1, it was ultimately recommended to decommission the SMD1 WWTP and replace it with a pump station with equalization basins and 14 miles of HDPE gravity force main to convey wastewater to the City of Lincoln's WWTRF.

The Midwestern Placer Regional Sewer Project was conceived as a means of having a single entity take responsibility for the planning, design, construction, and operation of all regional facilities to be implemented effectively, streamlining the refinement of design criteria and operational logistics. With Stantec's help, the City of Lincoln offered to deliver the Midwestern Placer Regional Sewer Project (the Regional Project) as a Firm Price Offer to SMD1 and the City of Auburn. After the firm price proposal was approved, SMDI and Lincoln entered into a Joint Powers Agreement and hired Stantec to prepare the permitting, preliminary design, and final detailed design for the $77M Regional Project, as well as provide engineering services during construction.

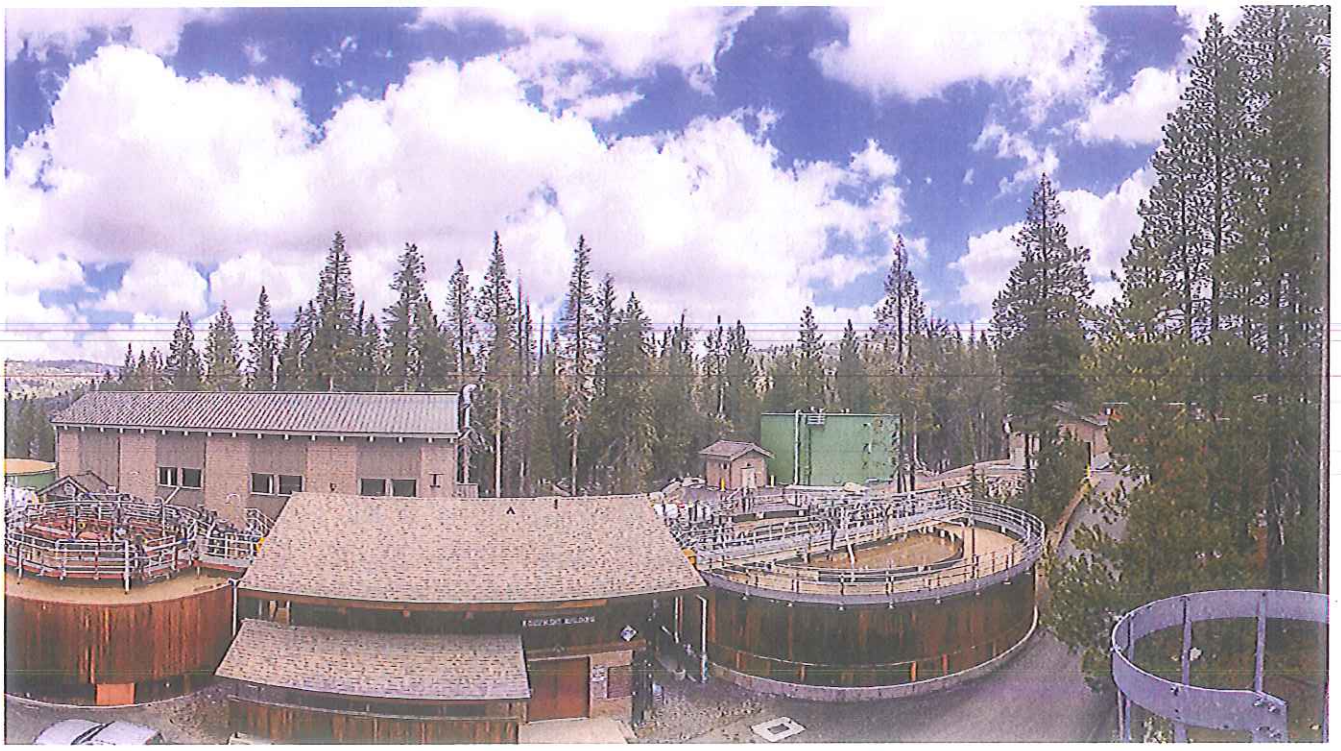
Donner Summit Public Utility District Wastewater Facilities Upgrade and Expansion

COMPANY:	Donner Summit Public Utility District
POINT PERSON:	Tom Skjelstad, Phone: (530) 426-3456, Email: tskjelstad@dspud.com
START DATE:	March 2009
END DATE:	May 2015
CONTRACT VALUE:	$650,000

The Donner Summit Public Utility District provides wastewater treatment services for a community consisting primarily of ski resorts that contribute large seasonal and daily variations in flows and loads. The plant is required to meet stringent discharge requirements, including total nitrogen removal, and Title 22 unrestricted reuse equivalent effluent prior to discharge to the pristine South Yuba River. With the plant in violation of these discharge requirements, Stantec was retained to investigate alternatives; develop, design, and implement improvements; and assist in the permit application.

We completed a facilities plan preforming lifecycle cost analysis of various treatment alternatives and recommended to construct a membrane bioreactor (MBR) process with in-pipe UV disinfection. Disinfection options, including chlorination, ozonation, and in-channel and in-pipe UV disinfection systems, were evaluated. This project was particularly challenging because of the sudden increase in flows and loads during the ski season, which coincides with very low temperatures.

We prepared the preliminary and detailed design, which included procurement pre-selection packages for the MBR and UV disinfection system. GE's LEAPmbr with ZeeWeed membranes and Wedeco LBX Series in-pipe UV disinfection systems were selected and constructed within an architecturally designed building to blend with the surrounding site. We also provided construction management and PLC/SCADA programming.



1,200 manholes, 73 miles of sewers, and two pump stations require creative solutions

Dixon Wastewater Facilities Plan

COMPANY: City of Dixon
POINT PERSON: Joe Leach, Public Works Director, Phone: (707) 678-7031, Email: jleach@ci.dixon.ca.us
START DATE: August 2011
END DATE: January 2014
CONTRACT VALUE: $269,500

With approximately 1,200 manholes, 73 miles of sewers ranging in size from six to 42 inches, and two pump stations, the City of Dixon collection system is a network of piping and mechanical equipment that requires constant attention. Stantec has partnered with the City for more than 20 years to provide wastewater engineering services. We helped prepare the sanitary sewer management plan (SSMP), develop a capital improvements project (CIP) list for citywide projects, and designed several sewer collection system improvement projects to reduce inflow and infiltration (I/I) into the system that resulted in unpermitted discharges at the WWTP.

One of our most recent projects involved teaming with the City to develop an innovative solution to its salinity challenges. Over the course of several years, the Regional Board issued Cease and Desist Orders (C&DO) that required the City to plan and construct improvements to comply with the performance-based effluent concentration limits for chloride and sodium C&DO (e.g. reverse osmosis treatment), control/prevent groundwater degradation, and expand the WWTF (if needed). Stantec prepared a Facilities Plan in 2013 that evaluated several alternatives for wastewater treatment and disposal, including constructing a new salinity control facility (reverse osmosis), installing off-site water blending facilities, and upgrading to a biological treatment process. Comparing the effluent salinity observed from the existing pond system, an activated sludge biological treatment was found to reduce effluent salinity because the pond system loses significant water to the atmosphere (evaporation), thereby significantly increasing the average effluent salinity concentration. The Facilities Plan recommended construction of an activated sludge process and limiting use of effluent percolation ponds to lessen the need for more costly salt removal processes.

Organization Chart

Town of Discovery Bay Community Services District

QA/QC
Akram Botrous, PE

Principal-in-Charge/Project Manager
Steven Beck, PE

Process Engineer
Jeff Hauser, PE

- Executive Summary
- Wastewater Flows & Loads
- Overview of Existing Wastewater Treatment Plant
- Plant Hydraulic Analysis
- Secondary Treatment Facility
- Denitrification Alternatives and Recommendation
- Summary of Improvements

Civil Engineer
Beth Cohen, PE

- Future Land Use
- Collection System
- Influent Pump Station
- Headworks
- Secondary Effluent Pump Station
- Effluent Pump Station, Pipeline, and Diffuser

Electrical Engineer
Long Hoang, PE

- Electrical Requirements
- Stand-by Power

Reuse Engineer
Vijay Sundaram, PE

- Tertiary Filtration
- UV Disinfection
- Effluent Disposal Alternatives

Senior SCADA Specialist
Matt Boring

- SCADA System

Solids Handling Engineer
Leila Sermek, PE

- Solids Handling

Permitting Specialist
Eric Zelgler

- Compliance with Waste Discharge Requirements

Project Manager

Steve L. Beck, PE

Years with Firm: 17

Steve is a recognized leader in wastewater treatment design with more than 33 years of experience. He has been responsible for managing all phases of wastewater treatment projects, including conceptual planning, feasibility studies, all phases of design, and construction management.

Steve is familiar with the needs of the District and the requirements to update the Town's wastewater master plan. He has led the effort on many wastewater projects that give him the opportunity to apply that experience to your needs. In fact, he served as project manager for the City of Lincoln WWTRF, City of Merced WWTF, City of Rio Vista Northwest WWTF, and the Donner Summit Public Utility District WWTP Upgrade and Expansion, to name a few.

We do not anticipate the need for subconsultants on this assignment.

Part C: Qualifications of Personnel

We have identified a group of dedicated professionals who have the right qualifications to complete this assignment for the Town of Discovery Bay. They are experts in their respective fields and have successfully completed similar work for other clients.

Jeff Hauser, PE

Title: Process Engineer, Technical Lead

Years with Firm: 25

Assignment on Project: Lead Engineer for hydraulics, secondary process evaluation and overall review of process analysis by other engineers on the team.

Jeff will lead the technical development of the master plan update. He will be responsible for the hydraulic and process analysis and will coordinate his efforts with the other engineers. He will provide the final edits to the master plan after receiving client comments and independent peer review input.

Akram Botrous, PhD, PE, BCEE

Title: Quality Assurance/Quality Control

Years with Firm: 13

Assignment on Project: Quality assurance and peer review of all work

Akram will not be involved in day to day tasks of the project, but instead will lead the quality assurance and quality control efforts. He will carefully check each section of the work product for accuracy and completeness.

Vijay Sundaram, PE

Title: Reuse Engineer

Years with Firm: 12

Assignment on Project: Tertiary treatment process including the filters, UV disinfection, and disposal.

Vijay will lead the efforts involving water reuse challenges. He will draft sections of the plan related to his expertise in filtration, UV disinfection, and disposal. He will review and evaluate the Title 22 validation work by others.

Long Hoang, PE

Title: Electrical Engineer

Years with Firm: 20

Assignment on Project: Electrical evaluation and design

Long will evaluate the existing electrical infrastructure for capacity to support the proposed process facilities. He will draft the electrical section to describe the existing system and any recommendations.

Matt Boring

Title: SCADA Specialist

Years with Firm: 12

Assignment on Project: Evaluation of the plant SCADA and instrumentation.

Matt will be responsible for evaluation of the plant SCADA system and working with Veolia to develop a comprehensive SCADA and instrumentation improvement program.

Beth Cohen, PE

Title: Civil Engineer

Years with Firm: 15

Assignment on Project: Review of future land use, collection system and pump stations, plant headworks, and plant pump stations.

Beth will evaluate the future land use impact on the wastewater facilities based on the updated sphere of influence report. She will analyze the capacity and functional limitations of the collection system pumping stations, influent pump station, and emergency pump station W operations. She will assess the headworks' screening, flow splitting, and odor control reliability. She will also evaluate the secondary effluent pump station

with automatic filter bypass splitting capability, final effluent (export) pump station with emergency bypass options to the sludge lagoons and bypass canal, as well as the outfall pipeline and Old River surface water discharge with in-stream diffusers. The detailed analysis will be summarized into the Wastewater Master Plan within separate chapters that document the existing facility and provide an improvement strategy that accommodates the projected buildout of the community.

Leila Sermek, PE

Title: Solids Handling Engineer

Years with Firm: 12

Assignment on Project: Solids handling, including evaluation of sludge lagoons, dewatering, drying and biosolids disposal or reuse.

Leila will evaluate the solids handling systems for the plant and alternatives for sludge storage, dewatering and disposal or reuse of the biosolids.

Eric Zeigler

Title: Permitting Specialist

Years with Firm: 11

Assignment on Project: NPDES permitting.

Eric will complete the analyses and reports necessary to obtain and maintain compliance with municipal wastewater and stormwater National Pollutant Discharge Elimination System permits.

Our full resumes are included in the appendix.

Part D: Approach

Having completed the existing Master Plan, Stantec is very familiar with the Discovery Bay Wastewater Treatment Plant (Plant 1 and Plant 2) and with the issues that face the District. We believe our experience will allow us to prepare the 2018 Master Plan Update in the most efficient and thorough manner to assure that the District can provide the most cost-effective wastewater service to its customers going forward. We understand that there have been various changes in key criteria and conditions that impact the wastewater treatment facilities since we completed our previous efforts and we are excited to offer a tailored approach for addressing each of the issues and objectives identified by the District in the Request for Proposals (RFP), all as set forth below.

Approach for Key Issues Identified in the RFP

The paragraphs below are arranged according to the six key issues identified in the RFP.

Issue 1: Update Flows and Loads

When the 2013 Master Plan was completed, the average dry weather flow was 1.75 Mgal/d. Plant influent constituent concentrations (2004 to 2007 and 2009 to

2010) had been quite variable and two special monitoring efforts had been completed–one in December 2007 and another in July 2011. Although influent flows at the times of the two special monitoring efforts were nearly the same, average BOD concentrations were quite different at 240 mg/L and 160 mg/L, respectively. Based on these data and per capita BOD projections, an average BOD concentration of 200 mg/L was adopted for the Master Plan. The TKN/BOD ratio was determined to be 0.2, which is typical for domestic wastewater.

Master Plan Amendment 2 was completed in April 2015 to investigate methods of denitrification. As part of this effort, an intensive monitoring campaign was completed during 10 days in January through March 2015. This effort confirmed the previously determined average BOD concentration of 200 mg/L and the TKN/BOD ratio of 0.2.

Since the Master Plan, we understand wastewater flows have declined substantially to an average of about 1.3 Mgal/d, possibly partly due to changed economic conditions, the implementation of water meters, and water conservation. We understand that influent constituent loads have also decreased, but population has not decreased, which implies possible demographic changes or just changes in what people dispose of through the sewer system (possible reduced food disposal through in-sink grinders).

It is important to quantify the "new normal" in Discovery Bay and work with the District to project conditions going forward. As part of this effort, Stantec will analyze daily flows and loads over a five-year period (2013 through early 2018), taking special note of any apparent changes with plant expansion work and modifications in sampling locations or methods. Stantec will identify key peak flow days in the historical record and will request data from the plant SCADA system to quantify peak hour flows on those days. Stantec will also analyze per capita load contributions based on recent population data. Stantec will compare the recent data to the historical data from the previous Master Plan. Additionally, Stantec will compare the trends in Discovery Bay to trends seen in other California communities. For example, Stantec has documented flow and load decreases in Lincoln and Jackson, although there is some evidence now of a partial rebound.

Although it is currently anticipated that historical plant data will be adequate to define wastewater characteristics for the Master Plan update, if our review indicates substantial uncertainties, supplemental monitoring could be suggested to verify key parameters.

Based on the analysis described above, Stantec will establish baseline flows and loads (averages and peaks) for existing conditions. Growth projections will then be used to determine increased flows and loads through District buildout.

Issue 2: Confirm the Method of Denitrification

Amendment 2 and Amendment 2 Update to the previous Master Plan included an investigation of three methods for meeting the District's new (but deferred) permit requirements for effluent ammonia- and nitrite+nitrate-nitrogen concentrations:

- Simultaneous Nitrification and Denitrification (SND). This option was not recommended because it would have required additional oxidation ditch volume, would risk not reliably meeting the new 0.7 mg/L ammonia-n limit, and could cause bulking sludge due to low dissolved oxygen concentrations.
- Denitrification Filters. This option was studied in detail, including pilot testing and a full life-cycle cost analysis. This option was not recommended because it would cost about the same or more than the anoxic basin option when ongoing methanol costs are considered and because it does not have a proven record of producing a 2 NTU turbidity needed for Title 22 compliance. Based on these results, granular media filters that are not suitable for denitrification use were constructed.
- Anoxic Basins. This option was recommended because it did not require carbon addition for denitrification, was similar or lower in cost than denitrification filters, and offered the best performance with regard to meeting all of the permit requirements (nitrogen species and turbidity).

Reconsideration of SND

Since Master Plan Amendment 2 Update was completed, changes in key conditions warrant further evaluation of SND. First, with the reduction in plant flows and loads, it may now be possible to implement SND without building additional oxidation ditch volume. Also, flow equalization ahead of the secondary treatment system is to be investigated (discussed later). If implemented, flow equalization would reduce solids flux on the clarifiers, allowing higher mixed liquor solids concentrations in the oxidation ditches for SND. Finally, Stantec has become aware that the future limit of 0.7 mg/L for ammonia-n could be increased.

The current Discovery Bay Wastewater Treatment Plant NPDES permit (Order R5-2014-0073), which is set to be renewed by February 1, 2019, requires compliance with the 0.7 mg/L limitation on ammonia by December 31, 2023. However, the Regional Water Board policy on ammonia has evolved since adoption of the current Order, which might result in a slight relaxation of the final effluent limitations on ammonia. Further, the Regional Water Board is working on site-specific water quality objectives for ammonia. These site-specific water quality objectives are not likely to be adopted prior to renewal of the current Order; however, indications are that the new

site-specific water quality objectives could be less stringent than the final effluent limitations on ammonia contained in the current Order. Stantec will coordinate with the Regional Board so that the most up-to-date information on ammonia policy can be used for future facility planning.

To safely comply with new ammonia and nitrate limits by December 31, 2023, it would be preferred that construction of new facilities be initiated in early 2022, requiring design in 2021. While it is likely that the new ammonia policy will be established before design of improvements is required, definitive information may not be available for the Master Plan Update. In this case, for the Master Plan, Stantec would evaluate optional improvements for various possible outcomes and would provide the District with a road map for adapting to policy changes as they occur.

Based on the above, Stantec proposes to re-evaluate SND treatment, which could eliminate the need to build anoxic basins ahead of the three oxidation ditches. Denitrification would occur within the oxidation ditches by cycling dissolved oxygen (DO) levels up and down in a controlled manner. It is known that cyclic aeration is much less likely to promote bulking sludge than consistently low DO concentrations. Stantec has direct experience with the benefits of cyclic DO control at Merced and Manteca. Even though cyclic DO is less likely to produce bulking sludge, it is not without risk. Both Merced and Manteca include anoxic selector zones (smaller than anoxic zones sized for full denitrification) ahead of the cyclic DO zones to help with this concern.

It might be appropriate for Discovery Bay to implement cyclic DO control on a test basis to assess ammonia and denitrification performance and impacts on sludge settling characteristics. Although not essential, cyclic DO control can be optimized by use of on-line ammonia and nitrate analyzers to determine the endpoints of the cycle phases and help assess the best high and low DO setpoints.

It is noted that, if desired, to provide higher reliability against sludge bulking, relatively small anoxic selector zones could be added ahead of the oxidation ditches. Perhaps, one central selector could be used at Plant 2.

If the considerations of ammonia policy and further investigations of SND indicate a continuing concern over reliable compliance with an ammonia limit, Stantec will evaluate options for ammonia polishing. One possible option is provision of a common, relatively small, aerobic reactor basin between the oxidation ditches and the clarifier splitter box at Plant 2. A similar feature could be provided at Plant 1, only if necessary. Another, and likely less expensive option, would be a moving bed biofilm reactor (MBBR) for attached growth nitrification of clarified secondary effluent ahead of the filters. This would be a relatively small aerated basin with attached growth media, mostly above grade.

Further Evaluation of the Anoxic Basin Option

In Master Plan Amendment 2, the anoxic basins for denitrification were envisioned to be in-ground basins ahead of each oxidation ditch, allowing for gravity flow of plant influent through the basins. While this still may be the best way to implement anoxic basins, Stantec will evaluate the option of above grade anoxic basins to reduce capital costs due to reduced excavation but increase operational costs due to additional pumping. It would be possible to combine controlled gravity flows of recycled mixed liquor from the oxidation ditches and screened raw sewage into one pumping station for lifting into the above grade anoxic basins. The anoxic basins would then overflow to the oxidation ditches. One centralized anoxic system would be possible at Plant 2. If denitrification at Plant 1 is determined to be needed, a separate system would be required there.

Issue 3: UV Performance at Higher Flows

Since the 2013 Master Plan was completed, the District has installed Trojan UV3000Plus™ UV disinfection system on both UV channels. UV performance issues can be caused by various factors, including subtle changes in water quality, operation/maintenance practices, design, equipment malfunction, and total coliform sampling location and technique. Based on Stantec's experience in validating, designing, and spot-checking numerous UV systems, we have observed the following as the dominant factors:

1. Hydraulics, when and how much water flows through each channel.
2. Sampling and maintenance protocol as related to day-to-day operations.
3. System performance as related to design and equipment performance.

Hydraulics

UV system hydraulics are a key factor in determining the pathogen inactivation across a UV system. As part of the master plan update, Stantec recommends a hydraulics evaluation of the UV system. The option of operating one duty channel versus two duty channels will be evaluated. Operating the system based on two UV channels with a redundant bank in each channel will satisfy the redundancy requirements included in the Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse, National Water Research Institute (NWRI) and American Water Works Association

Research Foundation (AWWARF) UV Guidelines. Influent flow distribution between two channels, and headloss and water level across each channel will be evaluated. As an example, if the influent flow streamlines are not uniform entering the UV channel, then the streamlines will not remain uniform in the channel, potentially resulting in inadequate disinfection of some of the effluent.

Sampling and Maintenance Protocol

Regrowth of pathogen indicators (e.g., Total Coliforms) and false positives of Total Coliform lab results are a common concern for UV system operators throughout California. Regular system maintenance and channel/lamp cleaning improves the overall system performance. Therefore, Stantec will review the District's sampling and maintenance protocol before initiating the system performance evaluation.

System Performance

Moreland Consulting LLC conducted Spot-Check Bioassay testing in 2017 and concluded that the UV system did not meet the UV Guidelines performance requirements and advised for the system to be de-rated. Stantec will observe and review the sample points and sample parameters utilized in the 2017 Spot-Check Bioassay report, which attributed the performance concerns to poor channel flow conditions in the UV system distribution box, i.e., non-uniform hydraulic streamlines. As part of the system hydraulics evaluation, we will evaluate the distribution box and other system components. After the completion of system hydraulics, and review of sampling and maintenance protocol, Stantec will conduct a Spot-Check Bioassay to retest and confirm the system performance based on a testing approach that matches the District operational goals and establishes the system performance at various conditions.

Issue 4: Evaluate Infiltration Discharge

Wastewater discharge by infiltration into groundwater is practiced by numerous wastewater agencies in California and in other states. This method of disposal requires relatively large land areas in locations with permeable soils and without high underlying natural groundwater, typically adjacent to the plant location. The main benefit of infiltration disposal versus surface discharge is that treatment requirements are generally much less onerous.

To assess whether Discovery Bay could practice infiltration disposal, Stantec will review local soil survey maps and reports to assess permeability and depth to groundwater in open areas within five miles of the wastewater treatment plant. If potentially suitable areas are located, Stantec will develop preliminary costs for implementation of this alternative. If this alternative appears to be favorable, Stantec would propose further

studies and field investigations that would be needed to evaluate this option in more detail, all as extra work beyond the scope of this proposal.

Issue 5: Consolidation of Master Plan

Stantec will prepare a single new Master Plan report to incorporate all relevant portions of the existing Master Plan and all new investigations covered by this Master Plan Update. The new Master Plan Report will include at least those 19 Sections set forth in RFP Section 5. We will prepare a draft report for review by the District, followed by a final report incorporating District comments.

Issue 6: SCADA Networking Improvements

After a thorough site evaluation of installed equipment and a review of the new Ignition SCADA application, Stantec will provide a comprehensive master plan that will build on the Town's existing infrastructure. From our brief tour, although contrary to the previous master plan recommendation, we believe that the new PLC platform and SCADA software selections are sound. When completed, the system should serve the towns SCADA needs for many years. The use of Allen Bradley programmable controllers and Inductive Automation Ignition SCADA software application has a history of robust systems and architecture that can be serviced by any number of local integrators. Stantec is well positioned to evaluate and make recommendations to improve/ complete the SCADA system migration from Factory Talk and Serial radios. Our SCADA group has Ignition Certified integrators and Allen Bradley programming experts on staff who not only design SCADA system but routinely develop and deploy them. Our system designs not only work on paper, but in the real-world applications. The Town's use of Ethernet Radios In lieu of Serial Radios is also a solid approach but requires additional expertise. When using Ethernet, the entire SCADA system becomes a part of the overall connected network. Security issues as well as network management practices need to be considered to avoid network overload and throughput issues that often overshadow the positive aspect of the use of Ethernet radios.

Approach for Goals and Objectives Identified in the RFP

In the paragraphs below, our approach for meeting the goals and objectives identified by the District is discussed.

Goal/Objective 1: Identify Needs and Costs for Next 10 Years

It is probably a reasonable assumption that all the growth projected in the Master Plan could occur within the next 10 years. Unless directed otherwise by the District, Stantec will develop a Master Plan Update covering the full projected buildout of Discovery Bay. All issues, goals and objectives will be thoroughly investigated, including consideration of alternative solutions where appropriate, to develop a list of recommended improvements. Like we did in the existing Master Plan, we will summarize all recommended improvements in a table, indicating the trigger for each improvement and the estimated cost.

Goal/Objective 2: Address the Issues Identified in the RFP.

This topic is covered in the previous section.

Goal/Objective 3a: Evaluate Flow Equalization Ahead of the Filters

We understand the present mode of operation involves diversion of peak secondary effluent flows in excess of filter capacity into the sludge lagoons, which creates problems when the algae-laden water from the lagoons must be returned for treatment. Stantec proposes to evaluate two primary options for flow equalization: 1) equalization of secondary effluent, and 2) equalization of raw sewage.

Diversions of excess peak secondary effluent flows to a dedicated equalization basin ahead of the filters would benefit the filters, the UV disinfection system, and the effluent pumping system, and would avoid return of algae-laden water from the sludge lagoons. Equalization of secondary effluent would be the least-cost option because there would be no need to provide mixing or aeration facilities. The equalization tank or basin would be located at Plant 2 and would receive excess peak flows diverted from the filter influent. Both above grade storage tanks (steel for lowest capital cost and concrete for lowest maintenance cost) and earthen basins will be considered, although the practicality of earthen basins would be impacted by high groundwater in the area. Concrete storage tanks could be wholly above grade or partially below grade. Depending on the elevation of the storage facilities, pumping into and/or out of storage would be investigated as needed.

Equalization of raw sewage flows, in addition to the benefits described above, would add stability to the secondary process and avoid sending peak flows through the secondary clarifiers. This would allow higher mixed

liquor solids concentrations in the oxidation ditches, without increasing solids flux on the secondary clarifiers. The higher mixed liquor solids would effectively increase the capacity of the secondary treatment system and/or allow SND for nitrogen removal. Higher capacity of the oxidation ditches at Plant 2 could also be a factor in allowing Plant 1 to remain off-line. The same general concepts for types of storage tanks as described for secondary effluent equalization could be considered for raw sewage equalization.

Two versions of raw sewage equalization could be considered: 1) peak wet weather flow trimming, or 2) full-time equalization. With peak wet weather flow trimming, only excess peak wet weather flows would be diverted to storage, and this would likely occur only during cold winter periods with extreme rainfall. Under this scenario, mixing but limited or no aeration could be provided in open top tanks, without significant concern of odors. With full-time equalization, diurnal peak flows could be diverted to storage, even during dry weather conditions, enhancing secondary process stability at all times. However, having raw sewage in an equalization tank during warm weather would create odor concerns, likely requiring aeration or covering the tank and treating exhaust air for odor control.

In scenarios where Plant 1 would remain in service, one option would be to provide equalization at Plant 1 to serve both plants. Excess peak flows could potentially be diverted from the existing influent pump station discharge, with gravity return flow from storage to the influent pump station. Alternatively, depending on the layout, additional pumps for filling or draining the storage facility could be required. A complication of a centralized equalization facility at Plant 1 is that it would be highly beneficial to screen the raw sewage before storage. This would require new screens. Another option is to pump screened raw sewage to equalization storage after the existing headworks facilities at both plants (if Plant 1 is used). A final option is to provide screened raw sewage equalization storage only at the Plant 2. In this case, it could still be possible to serve both plants by limiting how much influent raw sewage flow is routed to Plant 1. In essence, Plant 1 excess peak raw sewage flows would be sent to Plant 2 for equalization (possibly requiring more screen capacity).

Stantec will discuss all the relevant equalization options and prepare appropriate cost evaluations to select the overall most cost-effective means of equalization.

Goal/Objective 3b: DAF System for Lagoon Return Flows

If the sludge lagoons are to remain in service and are to continue to receive peak flow diversions and stormwater, it may be necessary to provide a DAF system to remove algae from the return flow to prevent adverse impacts of the algae on downstream treatment systems. Stantec will evaluate the cost of this option compared to options that would effectively minimize or eliminate the need for return of algae-laden water from the sludge lagoons (flow equalization, stormwater diversion, etc.).

Goal/Objective 3c: Stormwater Collection Basin

Currently stormwater from Plant 2 is routed to the sludge lagoons, which, along with other flows, creates problems with return of algae-laden return flows. Stantec will investigate separation of stormwater and provision of a stormwater retention basin. The stormwater retention basin would be sized to capture all of the stormwater flows at Plant 2 and prevent stormwater discharges off-site.

Goal/Objective 3d: Plant Drain Pump Station

Stantec will develop a conceptual layout and evaluate the cost and benefits of a plant drain pump station at Plant 2 to receive all of the various drainage flows for pumping to the plant headworks, instead of into the oxidation ditches, as is currently practiced.

Goal/Objective 3e: Drain Systems for All Basins

Stantec will evaluate the best means for providing drain systems at all process basins. It likely would not be cost-effective to provide one centralized drainage pumping system, as that would require extensive deep piping from the bottoms of all process basins. Instead, the most cost-effective method, is likely to provide for the use of portable drain pumping equipment at each basin independently, or in localized groups. A trailer-mounted self-priming pump system may be the best solution, although submersible pumps may also be considered in certain cases. The drain pumping systems would discharge to adjacent basins or to the plant headworks through existing or new piping systems. We will develop a conceptual layout and cost for the recommended plan, considering any alternatives as may be appropriate.

Goal/Objective 3f: Return Pump Station for Plant 1 Emergency Storage Basin

Stantec would consider options of a below-grade submersible pump system and a surface-mounted self-priming pump system for return of flows diverted to the emergency storage basin at Plant 1. In both cases, means for preventing ragging or intake of other large

and damaging solids into the pumps would have to be considered. Intake screening and/or use of chopper pumps could be considered. Stantec would develop a conceptual layout and cost for the best option.

Goal/Objective 3g: Drain System for Plant 1 Clarifier Lift Stations

Stantec will develop a conceptual plan and cost estimate for the apparent best method for providing drainage pumping at each of these facilities. Pros and cons will be assessed to evaluate overall cost-effectiveness.

Goal/Objective 3h: Clarifier Launder Covers

Stantec will work with launder cover manufactures to determine the cost of retrofitting these features. The benefits of the launder covers will be discussed and evaluated to allow an informed decision by the District on the cost-effectiveness of these potential improvements.

Goal/Objective 3i: Closed Grating to Reduce Algae Growth

Stantec will coordinate with operations staff to identify all the locations where this is a concern and to assess the benefits of providing closed covers. We will develop benefits and costs for each installation to allow an informed decision by the District on the cost-effectiveness of these potential improvements.

Goal/Objective 3j: Upgrading 110v Power Outlets

Stantec will coordinate with operations staff to identify outlet locations for replacement, removal and additions. As part of this effort, load analysis of existing panelboards will be documented.

Goal/Objective 3k: Upgrading 220v Power Outlets

Stantec will coordinate with operations staff to identify outlet locations for replacement, removal and additions. As part of this effort, load analysis of existing panelboards will be documented.

Goal/Objective 3l: Replacement of Belt Filter Press No. 1

Stantec will coordinate with operations staff and the manufacturer to assess the current condition, operational issues, remaining useful life (if any), and maintenance costs for Belt Filter Press No. 1. The benefits and costs of replacing this unit will be determined and discussed to allow an informed decision on possible replacement.

Goal/Objective 3m: Extension of Reclaimed Water Pipe to Marina Road

Stantec will develop the proposed route, features, and costs for this pipeline. The potential uses, benefits, and costs will be discussed to allow the District to decide on whether to construct this pipeline.

Goal/Objective 3n: Water Filling Station for Reclaimed Water

Stantec will coordinate with District staff to determine the best location and layout for a reclaimed water filling station. The potential uses, benefits and costs will be discussed to allow the District to decide on whether to construct the filling station.

Evaluation of Secondary Process Capacity and Use of Plant 1

Although not identified specifically as an issue, goal, or objective in the RFP, Stantec will include in the Master Plan an evaluation of the secondary process capacities of Plants 1 and 2 based on the updated flow and load projections. Consideration will be given to capacities for handling peak flows and loads in cold winter months as well as to capacities for handling average flows and loads in warm weather conditions. Evaluations of the District's ability to take oxidation ditches and clarifiers out of service for maintenance or repair will be included.

The objective of this analysis is to clarify what facilities must be operated under various scenarios to assure reliable plant performance in compliance with regulatory requirements. This investigation will provide the District with valuable information on the future role of Plant 1 and will guide the decision making process on possible improvements to be implemented at Plant 1.

Optional Additional Consideration of Eliminating Sludge Lagoons

Although not identified specifically as an issue, goal, or objective in the RFP, Stantec proposes as an optional value-added service to evaluate the possible elimination of the sludge lagoons.

In other tasks discussed above, issues associated with return flows from the lagoons and possible means for reducing flows to the lagoons have been identified. Under this optional task, the relevant analyses would be taken to the ultimate level of lagoon elimination.

We believe additional aerobic digestion volume, probably to be located in a portion of the sludge lagoons, could be provided to more fully stabilize the solids, reduce the mass of solids, and meet vector attraction reduction and, for much of the year, Class B pathogen reduction requirements for beneficial reuse of the biosolids. Additional pathogen reduction would be provided by subsequent drying. Although some storage volume could be incorporated into the expanded aerobic digestion facilities to allow periodic operation of the dewatering and drying facilities, the general plan would be to dewater and dry solids more continuously on a year-round basis, eliminating the need for storage in the sludge lagoons.

It may be determined that, during the winter months, not all of the solids could be processed through the active solar dryers. Dewatered solids that could not be processed through the active solar dryers in the winter could be stored in asphalt spreading areas. Solids in the spreading basins would be air dried and would meet vector attraction reduction requirements at least for Class B, and likely Class A, pathogen reduction requirements for agricultural use. If desired, stockpiled solids could also be processed through the active solar dryers in the summer to assure meeting Class A pathogen reduction.

Elimination of the sludge lagoons would eliminate all concerns of algae laden water being returned through the treatment plant, would eliminate aesthetic issues associated with the lagoons, and would make most of the lagoon lands available for other uses, not associated with solids handling.

Optional Additional Consideration of Biosolids Disposal Options

Although not identified specifically as an issue, goal, or objective in the RFP, Stantec proposes as an optional value-added service to evaluate biosolids disposal options.

Stantec understands that the historical practice of spreading dried biosolids on District lands was terminated in favor of landfill disposal when the Regional Board indicated the need for groundwater monitoring and for beneficial agricultural reuse of the biosolids. Under new State law, however, landfill disposal of biosolids is to be banned.

Since the District's biosolids are likely to meet Class A pathogen reduction requirements, there will be many possible alternatives for beneficial reuse. If it is found, under certain conditions, that it is cost effective to export Class B biosolids (for example, if not fully dried to meet Class A requirements), there are also options for handling these solids.

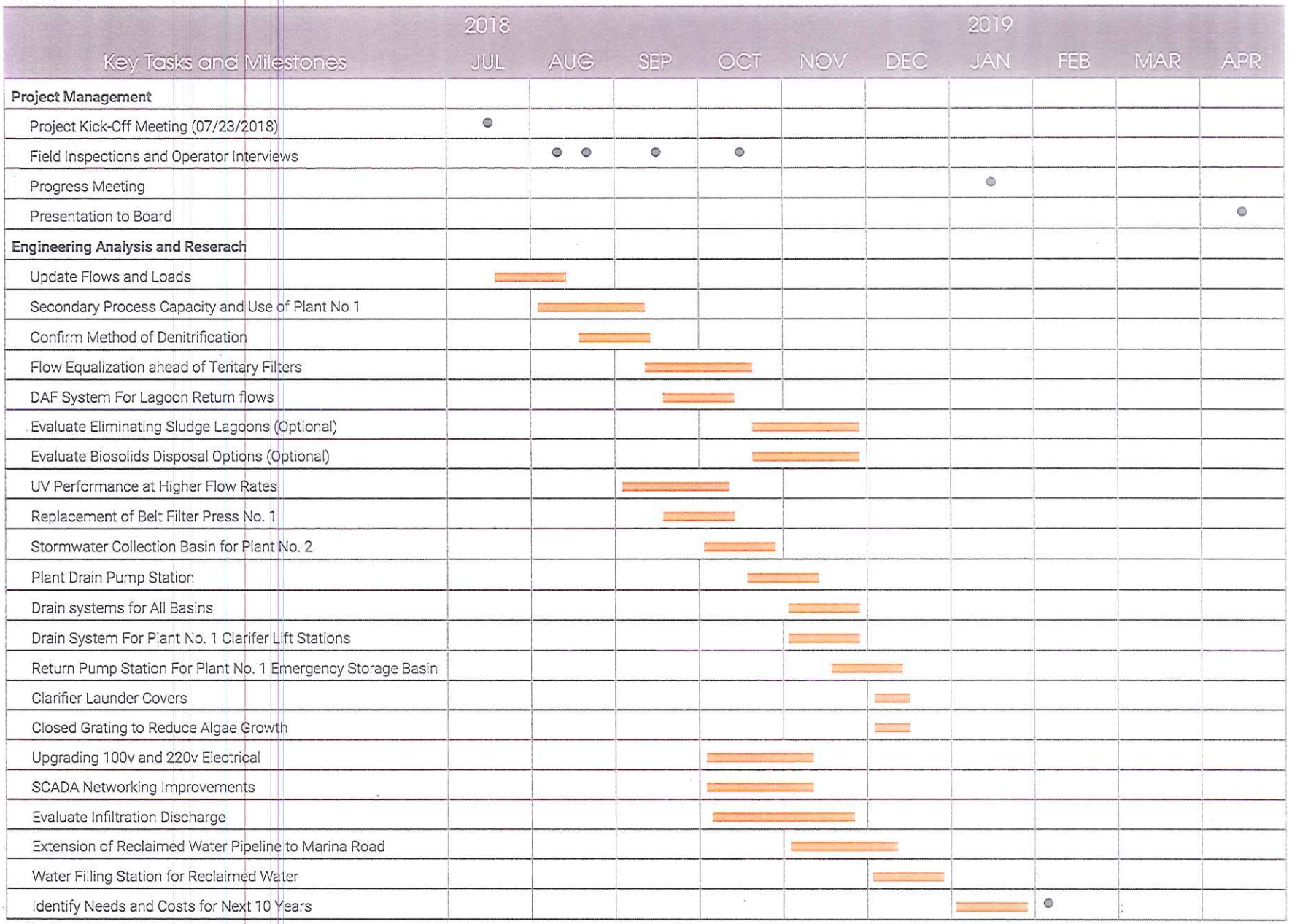
We will evaluate beneficial reuse of biosolids on District-owned lands, possibly including areas currently occupied by the sludge lagoons (if the lagoons are eliminated). The need and cost for groundwater monitoring will be included in the evaluation. Although the District could conduct its own farming operations (for example growing a fodder crop), it is likely that it would be more cost-effective to have a contract farm operator.

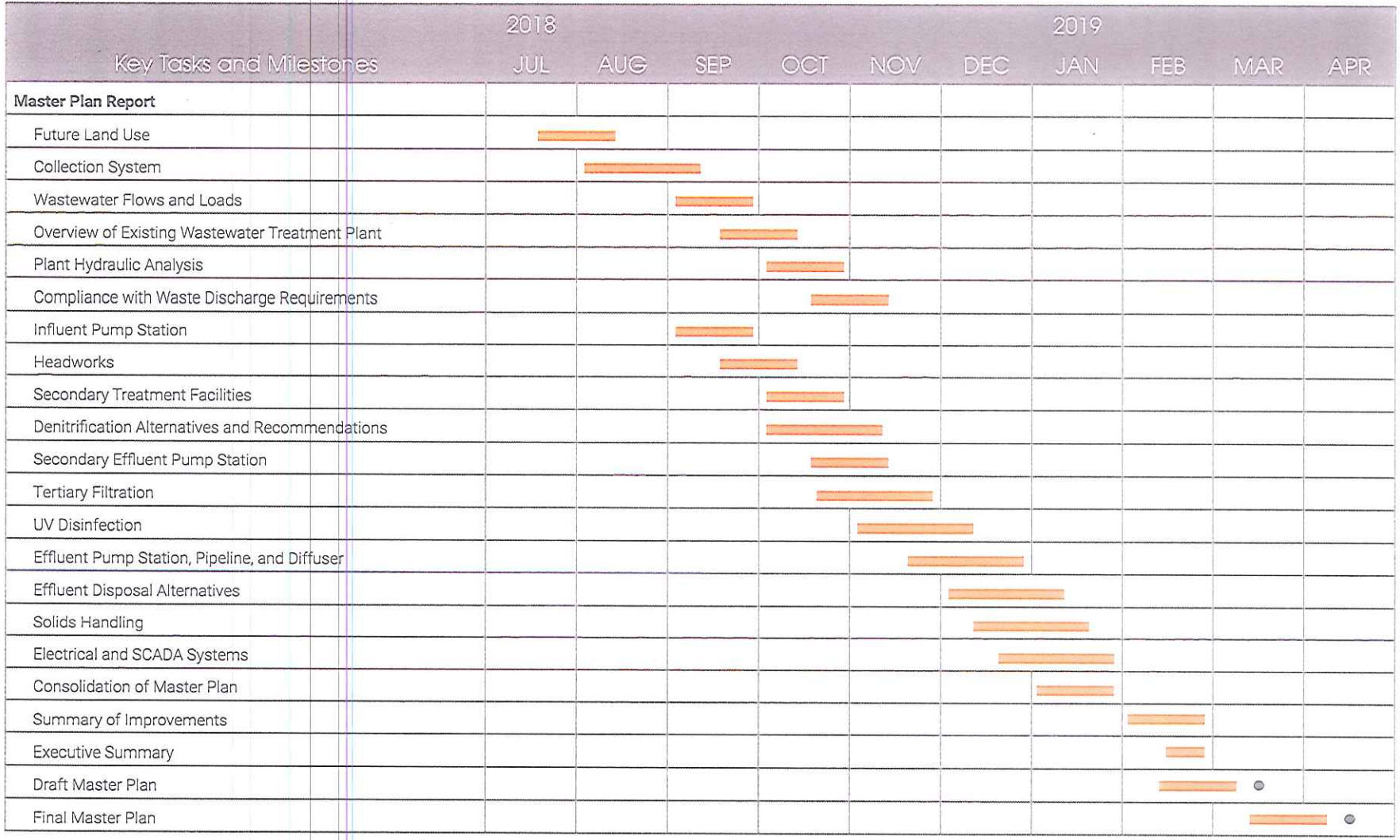
Stantec will also evaluate options for export of biosolids by contractors for beneficial reuse on lands not owned by the District. Both Class A and Class B options would be considered as appropriate. It is noted that some contract operators can accept Class B biosolids and process them further to produce Class A biosolids.

We will develop capital, operation and maintenance, and total present-worth costs for all options to assist the District in determining the most cost-effective means of beneficial reuse of the biosolids.

The following graphic outlines our proposed project schedule with identified major milestones from the Part 1 - Scope of work.

Schedule


2018
2019
Key Tasks and Milestones
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
Project Management
Project Kick-Off Meeting (07/23/2018)
Field Inspections and Operator Interviews
Progress Meeting
Presentation to Board
Engineering Analysis and Reserach
Update Flows and Loads
Secondary Process Capacity and Use of Plant No 1
Confirm Method of Denitrification
Flow Equalization ahead of Teritary Filters
DAF System For Lagoon Return flows
Evaluate Eliminating Sludge Lagoons (Optional)
Evaluate Biosolids Disposal Options (Optional)
UV Performance at Higher Flow Rates
Replacement of Belt Filter Press No. 1
Stormwater Collection Basin for Plant No. 2
Plant Drain Pump Station
Drain systems for All Basins
Drain System For Plant No. 1 Clarifer Lift Stations
Return Pump Station For Plant No. 1 Emergency Storage Basin
Clarifier Launder Covers
Closed Grating to Reduce Algae Growth
Upgrading 100v and 220v Electrical
SCADA Networking Improvements
Evaluate Infiltration Discharge
Extension of Reclaimed Water Pipeline to Marina Road
Water Filling Station for Reclaimed Water
Identify Needs and Costs for Next 10 Years


2018
2019
Key Tasks and Milestones
JUL
AUG
SEP
OCT
NOV
DEC
JAN
FEB
MAR
APR
Master Plan Report
Future Land Use
Collection System
Wastewater Flows and Loads
Overview of Existing Wastewater Treatment Plant
Plant Hydraulic Analysis
Compliance with Waste Discharge Requirements
Influent Pump Station
Headworks
Secondary Treatment Facilities
Denitrification Alternatives and Recommendations
Secondary Effluent Pump Station
Tertiary Filtration
UV Disinfection
Effluent Pump Station, Pipeline, and Diffuser
Effluent Disposal Alternatives
Solids Handling
Electrical and SCADA Systems
Consolidation of Master Plan
Summary of Improvements
Executive Summary
Draft Master Plan
Final Master Plan

Part E: Ability to Meet Requirements

Stantec has been a partner with Discovery Bay many times over the years. We have reviewed your proposed RFP/ contract terms and believe that, should we be selected for this assignment, we will be able to conclude a mutually satisfactory contract with you.

Upon notice to proceed, our risk management team will file an insurance document naming Discovery Bay. We have the necessary coverage required by the Town.

Part F: Fee Proposal

As directed in the RFP, the fee proposal was submitted in a separate sealed envelope.

Appendix: Resumes

Steven L. Beck PE

Senior Principal

Steve is a recognized leader in wastewater treatment planning and design with over 33 years of experience. He has been responsible for managing all phases of wastewater treatment projects including conceptual planning, master planning, feasibility studies, preliminary design, final design, and construction management. Steve served as the project manager and/or principal-in-charge for the Discovery Bay Wastewater Master Plan, Selma Kingsburg Fowler (SKF) WWTP Facility Plan, City of Dixon WWTF Improvements Project, Mid-Western Placer Regional Sewer Project, Lincoln WWTRF Phases 1 and 2 Project, and the Donner Summit Public Utility District WWTP Upgrade and Expansion.

EDUCATION

MS, Civil Engineering, California State University, Fresno, California, 1990

BS, Civil Engineering, California State University, Sacramento, California, 1985

BS, Construction Management, California State University, Fresno, California, 1980

REGISTRATIONS

Professional Engineer #43799, State of California

Professional Engineer #14588, State of Nevada

MEMBERSHIPS

Member, California Water Environment Association

Member, Water Environment Federation

Member, American Society of Civil Engineers

PROJECT EXPERIENCE

Wastewater Treatment

Town of Discovery Bay Community Services District Wastewater Master Plan (Principal-in-Charge)
Project included evaluation of existing facilities, analysis of alternatives, and development of a recommended plan of improvements for the wastewater treatment plants, including influent pump station, headworks, secondary process with oxidation ditches, future denitrification facilities, future effluent filtration, UV disinfection, and export pump station.

Selma-Kingsburg-Fowler County Sanitation District Wastewater Treatment Plant Facilities Plan (Principal-in-Charge)
Project included Wastewater Treatment Plant Facilities Plan needed to guide the District through the planned improvement and expansion of the wastewater treatment plant from 4.5 to 8.0 mgd. The plant includes influent pumping, equalization, headworks, nitrifying and denitrifying activated sludge facilities, percolation basins, sludge thickening, aerobic sludge digestion, sludge dewatering, and sludge drying. The Facilities Plan included projections of flows and loads, assessment of regulatory requirements, analysis of every unit process to assess current capacity, needs for improvements, and alternatives for improvement and expansion. A prioritized list of all recommended improvements with triggering events and costs was developed.

** denotes projects completed with other firms*

Steven L. Beck PE

Senior Principal

City of Dixon Wastewater Treatment Facility Improvements Project, Dixon, California (Principal-in-Charge)
This $25 million project included conversion of a facultative pond plant into an extended aeration activated sludge plant with a new self-cleaning pump station, headworks with mechanical screening, dual train oxidation ditch, secondary clarifiers, RAS pump station, blower building, sludge stabilization ponds, vactor truck receiving station, operations and laboratory building, and 12,000 lineal feet of 12-inch diameter potable water pipeline from the City to the WWTF. Engineering services included a Master Plan, Preliminary Engineering Report, design, and construction management of the project.

Mid-Western Placer Regional Sewer Project, Placer County, California (Principal-in-Charge)
This $77 million regional project consolidated wastewater treatment for the City of Lincoln and northern Placer County. The project included a new sewage lift station with emergency storage basins, 15 miles of pipeline, and expansion of the City of Lincoln Wastewater Treatment and Reclamation Facility (WWTRF). The WWTRF expansion includes new influent pumps, new headworks screen, oxidation ditch, secondary clarifier, RAS/WAS pump station, tertiary filters, chemical feed facilities, odor control, and effluent pumps. Engineering services included a Master Plan, Preliminary Engineering Report, design, and support services during construction.

Donner Summit Public Utility District Wastewater Facilities Upgrade and Expansion, Soda Springs, California (Principal-in-Charge and Project Manager)
This $21 million project included equalization storage, headworks, a membrane bioreactor system with advanced biological nitrogen removal facilities, disinfection, and effluent storage and spray irrigation disposal facilities. The project implemented biomass augmentation through ammonia addition during low load periods to enhance nitrification, carbon addition to enhance denitrification and on demand reactor heating during extremely cold temperatures. Engineering services included a Facility Plan, Preliminary Engineering Report, design, and construction management.

City of Merced Wastewater Treatment Facility Phase IV Upgrade & Expansion Project, Merced, California (Principal-In-Charge and Project Manager)
This 12 mgd upgrade and expansion to the existing wastewater treatment facility included new headworks with influent pumps, screens and grit removal equipment, secondary treatment process improvements for simultaneous nitrification/denitrification, new blower for aeration basins, rehabilitation of primary and secondary clarifiers, primary effluent equalization basin, tertiary pump station, tertiary flocculation basins and filters, UV disinfection system, outfall with cascading aerator, chemical building and storage facility, standby generator, plant water pump station, and improvements to existing operations building. Engineering services included a Facilities Plan, Preliminary Engineering Report, design, and support services during construction.

Steven L. Beck PE

Senior Principal

City of Merced WWTF Phase V Solids Handling Upgrade, Merced, California (Principal-in-Charge and Project Manager)
This $33 million expansion and upgrade included significant modifications to the existing solids handling system at the wastewater treatment facility to comply with updated WDRs by abandoning existing earthen lined solids drying beds and installing mechanical dewatering systems; including the addition of centrifuges and active solar driers to produce Class A biosolids. This project also included a centrate pump station and equalization tank, rehabilitation of two anaerobic digesters, digester gas holder, two natural gas hot water boilers that can run on digester gas, bolted steel solids holding tank, a new primary clarifier with a coupled scum and sludge pump station and a new septage receiving station.

Miners Ranch Water Treatment Plant, Oroville, California (Principal-in-Charge)
This $24M progressive design-build project required WTP improvements to expand treatment capacity from 14 mgd to 21 mgd. The improvements include modifications to the raw water pump station with a new feed pump and in-line jet mixing system, addition of new adsorption clarifiers for pretreatment, addition of deep bed sand filters with new air scour system, new 2 million gallon clearwell, new solids handling facilities with centrifuge for dewatering, addition of a new backwash water and high service pump stations, and addition of new chlorine gas scrubber.

City of Woodlake Wastewater Treatment Facility Upgrade and Expansion, Woodlake, California (Principal-In-Charge and Project Manager)
This $14 million wastewater treatment facility project replaced an existing pond plant. The new facilities included headworks screening, influent pump station, two oxidation ditches with anoxic basins for nitrogen removal, two secondary clarifiers, return activated sludge and scum pump stations, solids stabilization lagoons, percolation ponds, standby generator and an operations building.

City of Dinuba Wastewater Reclamation Facility (WWRF) Phase 1 Improvements Project, Dinuba, California (Principal-in-Charge and Project Manager)
This $7 million improvement project involved design of upgraded facilities including headworks screens, influent pumps, primary clarifier and primary sludge pump station rehabilitation, aeration basin improvements, new aerobic digester, and solids dewatering facility with screw press.

Reno-Stead Solids Pumping Station, Reno, Nevada (Project Manager)
This $1.6 million project replaced the existing solids handling facilities with a new pump station equipped with three progressive cavity pumps for transferring waste activated sludge and raw wastewater to the Truckee Meadows Water Reclamation Facility regional wastewater treatment plant.

Steven L. Beck PE

Senior Principal

Reno-Stead Water Reclamation Facility 2.0 Mgal/d Expansion, Reno, Nevada (Principal-In-Charge)
This capacity expansion project included a headworks with screening and grit removal equipment, biofilter for odor control, extended activated sludge aeration and anoxic basins for nitrification/ denitrification, secondary clarifiers, sand filtration and pressure membrane filtration, disinfection with sodium hypochlorite and a parallel UV disinfection system. The project also included pilot testing of ozone coupled with biological activated carbon (BAC) for advanced treatment of the effluent for indirect potable water reuse.

City of Rio Vista Wastewater System Master Plan, WWTP Expansion, and Northwest WWTP Design Development, Rio Vista, California (Project Manager)
This $30 million new membrane bioreactor (MBR)plant includes an influent pump station, headworks, standby generator, emergency storage basin, MBR process, blower building, ultraviolet (UV) disinfection, effluent pump station, outfall pipeline, and diffuser into the Sacramento River. Solids handling included belt filter presses and active solar drying.

City of Lathrop Consolidated Treatment Facility Phase I, Lathrop, California (Principal-In-Charge)
This project upgraded an existing membrane bioreactor (MBR) plant designed for full Title 22 reclamation from 0.75 mgd to 1.0 mgd. Upgrades included new headworks with screening, grit removal and pumping, an emergency storage basin, new membranes for MBRs, a standby generator, and solids dewatering facilities.

City of Lincoln Wastewater Treatment and Reclamation Project, Lincoln, California (Project Manager)
This $56 million Title 22 tertiary treatment plant included an influent pump station and headworks, oxidation ditches with anoxic basins, secondary clarifiers, return active sludge pump station, maturation/ filter feed pump station, and maturation ponds. The tertiary treatment facilities included dissolved air flotation system, chemical coagulation, flocculation, filtration, ultraviolet (UV) disinfection, effluent re-aeration for surface water discharge, and effluent pump station. The project also included solids handling facilities with solids holding tank, solids pump station and dewatering facility with centrifuges.

South Truckee Meadows Water Reclamation Facility Expansion Project, Washoe County, Nevada (Project Manager)
This $17 million project provided new secondary and tertiary wastewater treatment facilities including oxidation ditches, secondary clarifiers, return activated sludge (RAS) pump station, tertiary filters, chlorine contact basins, and a chemical building.

Wastewater Treatment Plant Expansion, Lindsay, California (Project Manager)
This $4 million expansion project included a new oxidation ditch, secondary clarifier, headworks improvements, screening structure and standby generator.

Water Pollution Control Facility Sludge Drying Bed Project, Hayward, California (Project Manager)
This $2 million expansion project provided approximately 6 acres of asphalt solar beds with decanting pump station.

Steven L. Beck PE

Senior Principal

City of Visalia Water Conservation Plant Digester Project, Visalia, California (Project Engineer for design)
This project includes a digester, boiler building and modifications to an existing ferric chloride storage and feed facility.

City of Visalia Water Conservation Plant, Trickling Filters Upgrade Project, Visalia, California (Project Engineer)
This $4 million plant upgrade included design and construction of new plastic media and distributors for four trickling filters, and rehabilitation of the filter recirculation pump station.

City of Bakersfield Wastewater Treatment Plant No. 3 Expansion, Bakersfield, California (Project Engineer)
This $14 million plant included primary clarifiers, trickling filters, secondary clarifier, digesters, and odor control facility.

City of Tulare Water Pollution Control Facilities Expansion Project, Tulare, California (Project Engineer)
This $11 million plant expansion included primary sedimentation basins, activated biofilters, aeration basins, secondary sedimentation basins, and biosolids facilities with gravity belt thickener.

Wastewater Treatment Plant Improvement Project, Lindsay, California (Project Engineer)
Design and construction. This 1.24 mgd plant upgrade included rehabilitation of an oxidation ditch and return activated sludge pump station.

Fresno-Clovis Regional Wastewater Treatment Plant 68 mgd Expansion (Project Engineer)
Responsible for design of four 140 foot-diameter primary clarifiers, sludge pumping station, and flow splitting structure.

Sewer Collection Master Planning

Wastewater Collection System Master Plan, Woodlake, California (Principal in Charge)
Project included a Wastewater Collection System Master Plan for the City of Woodlake. Hydraulic modeling of the system to assess available capacity and identify deficiencies was completed for the plan. Steve's team used the PC-SWMM software platform for hydraulic modeling of the system. The City's system includes approximately 20 miles of pipelines ranging in size from 4-inch to 18-inch diameter constructed of a variety of materials. Steve and his team are also assisted the City with a condition assessment of its collection system infrastructure. The results of both the capacity and condition assessments will be used to prioritize projects in both capital improvement and repair and replacement programs.

Steven L. Beck PE

Senior Principal

Wastewater Collection, Treatment, and Disposal Facilities Assessment and Master Planning, Grass Valley, California (Principal in Charge)
Project included a Wastewater Collection, Treatment, and Disposal Facilities Master Plan for the City of Grass Valley. Challenges included severe system inflow and infiltration into a collection system with portions dating back to the late 1800's. The system includes approximately 65 miles of 4-inch to 30-inch diameter pipelines of various materials. Our work involves targeted wet weather flow monitoring, development of a sewer system model utilizing PC-SWMM software, itemization of system assets and addition to the system asset management, and condition and capacity assessment of the wastewater treatment plant and collection system. The results of the plan were used to identify and prioritize projects to address deficiencies and develop a Wastewater System Capital Improvement Program (CIP).

Collection System Capacity Evaluation, Discovery Bay, California (Principal in Charge)
The Town of Discovery Bay CSD collection system was modeled by Stantec using Innovyze InfoWorks software. Collection system pipelines with a diameter of 8 inches and larger were modeled, along with 11 of the District's 15 active lift stations. The model simulation of the existing system under 10-yr, 6-hr design storm conditions predicted a peak hour flow of 4.35 million gallons a day (Mgal/d) at the wastewater treatment plant (WWTP). (In comparison, dry weather peak hour flow at the WWTP was simulated at 1.93 Mgal/d.) Segments of the existing system deemed to be deficient based on the hydraulic analysis were identified and tabulated.

Sewer Master Plan Update, Merced, California (Principal in Charge)
In 2007 Stantec completed a Sewer Master Plan for the City of Merced. In 2013, the City requested Stantec prepare an update to the 2007 Master Plan to take into account changes in their land use plan arising from the Merced Vision 2030 General Plan, adopted by the City Council on January 3, 2012. Steve served as the Principal-in-Charge for the 2007 Master Plan and for the current update effort. The updated CIP generated from the current Master Planning recommendations include new infrastructure to service the North Merced area, as well as a repair and replacement program for the existing collection system based on an assessment of facility age and condition.

Placer County SMD 1, Trunk Capacity Analyses, Placer County, California (Principal in Charge)
From 2007 through 2010 collection system capacity analyses were performed by Stantec on the trunk collection system which conveys flows from residential, commercial and industrial users within the Placer County Sewer Maintenance District 1 (SMD 1) service area, just north of the City of Auburn. In 2013, Stantec was asked to update the model for the SMD 1 system to account for proposed development projects within the service area. The capacity analyses conducted by Stantec identified capital improvements necessary to serve up to approximately 18,000 EDUs. Three separate sewer studies were conducted, two on the Highway 49 Trunk portion of the system and one on the DeWitt Trunk. Mike Urban (MOUSE) software was the platform used to develop the system model and run model simulations. Steve served as the Principal-in-Charge for these evaluations.

Steven L. Beck PE

Senior Principal

Reno/Sparks/Washoe County Regional Wastewater Facilities Design Phases I and II Project, Multiple Sites, Nevada (Project Engineer)
This planning and preliminary design effort addressed a number of outstanding issues identified in the Regional Wastewater Facilities Master Plan. Responsibilities included assisting in the development of a regional wastewater program, regulatory requirements for both the Truckee Meadows Water Reclamation Facility (TMWRF) and the South Truckee Meadows Water Reclamation Facility (STMWRF), water reuse and seasonal discharge opportunities, facilities evaluations for improvement and expansion for both the TMWRF and the STMWRF.

Dinuba Water Reclamation Facility Master Plan (Project Engineer)
This Master Plan for the City of Dinuba, CA provided a phased program for new facilities to accommodate growth and meet future discharge requirements through the year 2015. The proposed improvements include modifying the existing trickling filter/ aerated pond facility to an activated sludge extended aeration treatment plant.

Construction Management
Woodland Wastewater Treatment Plant Improvements, Stage I, Phase 3 Project, Woodland, California (Resident Engineer)
This project included a new screening washer/compactor at the headworks, new mechanical equipment for two existing secondary clarifiers, chlorination/dechlorination system improvements, pond erosion protection, and other miscellaneous improvements throughout the plant.

Madera Wastewater Treatment Plant Expansion Project, Madera, California (Resident Engineer)
This $6 million expansion project included a new primary sedimentation basin and trickling filter pump station to treat 6.7 mgd.

Steven L. Beck PE

Senior Principal

Jeffrey Hauser PE

Senior Process Engineer

Stantec

Jeff has more than 39 years of municipal wastewater treatment plant planning and design experience. Jeff was co-founder in 1993 and Chief Process Engineer of ECO:LOGIC Engineering, which was acquired by Stantec in 2010. From 1978 to 1993, Jeff was Project Engineer and Project Manager with Dewante and Stowell Engineers.

Jeff has planned and designed numerous wastewater treatment facilities of various complexities, including systems requiring advanced treatment (nutrient removal and membrane filtration) for reclamation and reuse or for discharge into environmentally sensitive surface waters. In addition to completing his own planning studies and designs, Jeff is frequently responsible for critical review and value engineering of studies and designs by others. He has developed a high level of expertise in wastewater process modeling and simulation, which he employs on virtually every wastewater treatment plant study and design. Jeff is known for his attention to technical details and is adept at all phases of project development, from facilities/master planning to detailed "nuts and bolts" design and services during construction.

EDUCATION

MS, Environmental Engineering, University of California, Davis, California, 1978

BS, Civil/Environmental Engineering (Summa cum laude), University of California, Irvine, California, 1977

REGISTRATIONS

Professional Engineer #31744, State of California

Professional Engineer #12321, State of Nevada

Professional Engineer #32348, State of South Carolina

PROJECT EXPERIENCE

Wastewater Treatment

Town of Discovery Bay Community Services District (Project Engineer)
Master Plan for wastewater treatment plant expansion. Project included evaluation of existing facilities, analysis of alternatives, and development of a recommended plan of improvements for this plant, including influent pump station, headworks, secondary process with oxidation ditches, future denitrification facilities, future effluent filtration, UV disinfection, and export pump station.

** denotes projects completed with other firms*

Jeffrey Hauser PE

Senior Process Engineer

Selma-Kingsburg-Fowler County Sanitation District, Kingsburg, California (Project Engineer)
Jeff had primary responsibility for preparation of a Wastewater Treatment Plant Facilities Plan needed to guide the District through the planned improvement and expansion of this wastewater treatment plant from 4.5 to 8.0 Mgal/d. The plant includes influent pumping, equalization, headworks, nitrifying and denitrifying activated sludge facilities, percolation basins, sludge thickening, aerobic sludge digestion, sludge dewatering, and sludge drying. The Facilities Plan included projections of flows and loads, assessment of regulatory requirements, analysis of every unit process to assess current capacity, needs for improvements, and alternatives for improvement and expansion. A prioritized list of all recommended improvements with triggering events and costs was developed.

Donner Summit Public Utility District Wastewater Treatment Plant (Process Engineer and Principal Investigator)
Studies and design of improvements and expansion of this plant, including flow equalization, a four-stage nitrogen removal membrane bioreactor system, UV disinfection, effluent storage, seasonal surface discharge, seasonal irrigation reuse, aerobic sludge digestion and dewatering. Nitrogen removal is a particular challenge because of highly variable flows and loads and cold temperatures in this resort community. The project includes biomass augmentation through ammonia addition during low load periods to enhance nitrification, carbon addition to enhance denitrification and reactor heating when needed because of extreme cold temperatures. Extensive steady state and long-term dynamic process simulations were completed to develop and confirm the biological process design. Jeff developed an advanced predictive feed-forward and feedback control scheme to optimize carbon feeding to both pre- and post-anoxic basins and to control mixed liquor recirculation. Jeff was also the Project Manager and Primary Designer of a previous expansion of this plant, including advanced treatment, sludge handling, and disposal facilities.

** denotes projects completed with other firms*

Jeffrey Hauser PE

Senior Process Engineer

City of Merced Wastewater Treatment Plant (Process Engineer and Principal Designer)
Secondary treatment improvements to provide nitrification and denitrification for 12 MGD (expandable to 16 and 20 MGD) and sidestream equalization and return flow timing facilities to mitigate the impacts of the sidestreams on the mainstream process. Project design involved extensive wastewater characterization as well as steady state and dynamic process simulation studies. Jeff also had primary oversight responsibility for all aspects of this $80 million project. The project includes a new headworks, modifications to existing clarifiers and reactor basins, primary effluent equalization basin, tertiary effluent pump station, tertiary filters and UV disinfection system. Plans for future addition of anaerobic digesters, centrifuge sludge dewatering, centrate equalization and active solar drying to produce Class A biosolids were completed also.

City of Lincoln Wastewater Treatment Plant (Principal Engineer)
Jeff was responsible for process and detailed design quality control on 4.2 MGD tertiary wastewater treatment plant and subsequent expansion to 5.9 MGD. Jeff was also responsible for studies of staged expansion from 5.9 to 8.0 MGD. The project includes an influent pump station, headworks, oxidation ditch system with provisions for nitrogen removal, maturation ponds, dissolved air floatation, coagulation, flocculation, filtration, UV disinfection, centrifuge sludge dewatering, and effluent storage and reclamation facilities.

City of Dinuba Wastewater Treatment Plant, Dinuba, California (Project Engineer)
Jeff was responsible for the preliminary design for two plant expansion projects. The first expansion to 3.0 Mgal/d included improvements to the headworks, primary clarifier, and aeration basin as well as a new aerobic digester, screw press dewatering system, and solar drying area. The second expansion to 3.64 Mgal/d included additional headworks improvements, a new nitrifying and denitrifying activated sludge system, revised and new aerobic digestion facilities, and expansion of sludge dewatering and solar drying facilities.

Wastewater Treatment Plant Energy Optimization Projects, Various Cities, California (Project Engineer)
Process analyses and simulations to verify capacity and determine aeration requirements for new energy-efficient aeration systems for the Cities of Barstow, Manteca, Oxnard, and San Buenaventura and for the Selma-Kingsburg-Fowler (SKF) County Sanitation District. Jeff was also responsible for design of new fine bubble aeration systems for Manteca and SKF.

** denotes projects completed with other firms*

Jeffrey Hauser PE

Senior Process Engineer

City of Reno, Reno Stead Water Reclamation Facility Expansion (Process Engineer)
Two plant expansion projects, increasing capacity from 1 to 2 and 2 to 4 MGD. Included in one or both projects were a new headworks, nitrification and denitrification reactors, secondary clarifiers, conventional sand filtration and pressure membrane filtration, disinfection with sodium hypochlorite and a parallel UV disinfection system. Ozone treatment coupled with biological activated carbon (BAC) and UV disinfection to produce effluent that is potentially suitable for aquifer storage and reuse was investigated, leading to pilot testing of these technologies under the supervision of Stantec.

City of Lathrop Wastewater Treatment Facilities (Process Engineer and Design Engineer)
Studies and detail design for three wastewater treatment facilities. Projects included two membrane bioreactor plants (one new and one expansion with a permitted capacity of 6.0 MGD) with nitrification, denitrification, and UV disinfection, as well as the upgrade of an industrial wastewater treatment facility to increase aeration capacity. All of the effluent is reused for crop and/or landscape irrigation.

City of Rio Vista Northwest Wastewater Treatment Facility (Principal Engineer)
Process and detail design on this new 1.0 MGD facility, expandable to 2.0 MGD. This project included an influent pump station, headworks, a membrane bioreactor process designed to provide nitrification and denitrification, UV disinfection, effluent pump station, and outfall and diffuser to and in the Sacramento River. Solids handling facilities included belt filter presses and active solar drying beds to produce Class A biosolids. The project also included an operations building with a water quality laboratory and a new City corporation yard and maintenance facility.

City of Brentwood Wastewater Treatment Plant Expansion (Manager and Principal Engineer)
Study of expansion of this plant from 5 to 7.5 MGD, with provisions for subsequent expansion to 10 MGD. Recommended plant improvements include anoxic basins and oxidation ditches to provide nitrification and denitrification, sand filtration, UV disinfection, sludge dewatering and active solar drying to produce Class A biosolids. Effluent is partially reused for landscape irrigation.

** denotes projects completed with other firms*

Jeffrey Hauser PE

Senior Process Engineer

Grass Valley Wastewater Treatment Plant (Manager and Primary Design Engineer)
A number of studies and designs all related to the systematic upgrade and expansion of the wastewater treatment plant. Jeff completed major design efforts in 1992 and 1999 for a total of approximately $17 million in improvements. Included in the projects were new headworks facilities with grit removal and screening, primary clarification expansion, a new activated sludge system with nitrification and denitrification, secondary clarifiers and return sludge pumping facilities, filters, chlorination and dechlorination systems, equalization and pumpback facilities, a cascade aerator, a gravity belt thickener, new operations building and laboratory, and related improvements.

Kirkwood Meadows Public Utilities District Wastewater Treatment Plant (Manager and Primary Design Engineer)
Expansion of the wastewater treatment plant. This project included a very challenging retrofit of a new membrane bioreactor system with nitrogen and phosphorous removal into existing basins and buildings. Additional plant features designed include an influent pump station, equalization facilities, aerobic digestion and centrifuge sludge dewatering.

City of Woodland Wastewater Treatment Plant (Manager and Primary Design Engineer)
Improvement and expansion of the wastewater treatment plant, including two projects. The first project included a 130-foot secondary clarifier with spiral scraper, return and waste sludge pumping facilities, major modifications to the chlorine and sulfur dioxide feed systems for expansion and fire code compliance, a chlorine contact basin expansion, and other improvements. The second project involved pre-design of a subsequent plant expansion, including influent pumping, grit removal, oxidation ditches, secondary clarifiers, return sludge pumping, chlorine contact basin, effluent pumping and piping, and related work. Effluent filtration and ultraviolet disinfection were evaluated as options.

Mountain House Community Services District Wastewater Treatment and Disposal Facilities (Manager and Primary Design Engineer)
Planning and design of new wastewater treatment and disposal facilities. Efforts included the planning and pre-design of an ultimate 6 mgd Title 22 tertiary treatment plant with influent pumping, screening, grit removal, sequencing batch reactors (SBRs), filters, chlorination and dechlorination facilities, belt filter press sludge dewatering and lime stabilization. Final design completed on an initial phase of plant construction with pond treatment followed by dissolved air floatation, coagulation, flocculation, filtration, storage reservoirs and irrigation facilities.

** denotes projects completed with other firms*

Jeffrey Hauser PE

Senior Process Engineer

Cache Creek Indian Bingo and Casino Wastewater Treatment and Disposal Facilities (Manager and Primary Design Engineer)
New wastewater treatment and disposal facilities. This was a fast-track $4 million dollar project with a duration of only 7 months from the beginning of design to startup. The project included a high-lift raw sewage pump station, a custom-designed (not a manufacturer package) sequencing batch reactor system including nitrogen removal, equalization facilities, disinfection, aerobic digestion, sludge dewatering, a 70-foot high earth fill dam for effluent storage, and spray irrigation disposal facilities. Jeff completed a subsequent design to double plant capacity two years later.

City of Ceres
Responsible for studies and preliminary design of various wastewater reclamation facilities for the City of Ceres, including effluent filters and review of oxidation ditch and secondary clarifier.

National Park Service Wastewater Treatment and Disposal and Sludge Handling Facilities (Engineer)
Design of wastewater treatment and disposal and sludge handling facilities at Yosemite National Park and Sequoia National Park. Both plants include extended aeration activated sludge, aerobic sludge digestion, and sludge dewatering beds. The Wawona plant in Yosemite provides tertiary treatment for complete wastewater reclamation and golf course irrigation. The project included the design by Jeff of the golf course irrigation system. At Sequoia, Jeff's design provides for winter-time leachfield disposal and summertime spray irrigation of forest area with wastewater effluent.

Roseville Wastewater Treatment Plant (Manager and senior design engineer)
Design of 12 mgd effluent filtration facilities.

Lake County Southeast and Northwest Wastewater Treatment Plant Expansions (Engineer)
Facilities Plan Studies for the expansion of the Lake County Southeast and Northwest Wastewater Treatment Plants. Both plants involve oxidation ditch treatment, winter storage and effluent disposal by spray irrigation of pasturelands. Extensively studied biosolids (sludge) treatment, disposal and/or reuse options for both of these plants. Engineer on the design of interim improvements at the Northwest Plant.

Calaveras County Water District Copper Cove Wastewater Treatment Plant (Project Engineer)
Predesign of an expansion and upgrade of the wastewater treatment plant for the Calaveras County Water District. The project included full wastewater reclamation for golf course irrigation as well as a septage receiving station and joint dewatering and lime treatment of septage and waste activated sludge. A full-scale pilot study of the septage and sludge dewatering and lime treatment system was completed.

Nevada City Wastewater Treatment Plant (Manager and Senior Design Engineer)
Study and design of improvements to the wastewater treatment plant, including two sequencing batch reactors to provide nitrogen and phosphorus removal, sludge dewatering facilities, and conversion of existing anaerobic digester to an aerobic digester.

** denotes projects completed with other firms*

Jeffrey Hauser PE

Senior Process Engineer

Wastewater Treatment Plant Operation and Maintenance Manuals (Manager and primary author)
Operation and maintenance manuals for many wastewater treatment plants, ranging from complex advanced treatment and reclamation systems to simple pond treatment and land disposal.

Wastewater Reclamation and Reuse
City of Dinuba Wastewater Reclamation Facility (WWRF) Phase 1 Improvements Project, Dinuba, California (Design Engineer)

Wastewater
Sierra Lakes County Water District (Project Manager)
Infiltration and inflow studies.

City of Auburn (Project Engineer)
Infiltration and inflow study.

City of Stockton and Northeast area of the Sacramento Regional County Sanitation District (Project Engineer)
Studies of equalization storage for peak wet weather flow management in collection systems. Analyses included computer modeling of transient flow conditions in the trunk sewer system.

City of Sacramento McKinley Park Combined Sewage Storage Facility , California (Project Engineer)
Jeff was responsible for developing layouts and analyzing various structural concepts and cleaning methods for a new eight-MG underground storage facility to be constructed beneath sports fields in McKinley Park for the purpose of mitigating combined sewer overflows during storm events.

Stormwater Management
Caltrans Lake Tahoe Storm Water Small-Scale Pilot Treatment Project (Project Manager)
Multi-year investigation of potential treatment technologies for meeting strict numerical discharge limits (including turbidity and nutrients) for storm water discharges from Caltrans roadways and other facilities in the Lake Tahoe Basin. A new pilot treatment building was constructed and various alternative treatment systems were developed and tested. Treatment systems ranged from simple non-mechanized sedimentation and/or slow-rate filtration systems to mechanized systems with high-rate coagulation, flocculation, sedimentation, filtration, and ion exchange. Various alternative filter media and alternative chemical coagulants were tested.

Construction Management
Wastewater Treatment Plant Construction (Construction Management and Inspection)
Project Manager for construction management and inspection of wastewater treatment plant construction for the Cities of Grass Valley and Nevada City, the Donner Summit Public Utility District, and the Cache Creek Indian Bingo and Casino.

** denotes projects completed with other firms*

Akram Botrous Ph.D., PE, BCEE

Senior Process Engineer

Stantec

Akram has more than 25 years of wastewater treatment research and design experience. His areas of expertise include secondary treatment process design, biological nutrient removal, and membrane bioreactors (MBR). He has hands-on experience with BioWin process modeling, hydraulic profiles, water CAD modeling, process optimization, troubleshooting, capacity assessment, and pilot studies. He also has experience with detailed design of wastewater treatment plants, specification writing, and engineering services during construction.

Akram has published several papers and spoke in conferences on latest development in wastewater engineering. He is the primary author of the sixth edition of the primary treatment chapter of the Manual of Practice No. 8 (MOP8)

EDUCATION

Ph.D., Environmental Engineering, University of Nebraska, Lincoln, Nebraska, 2003

MS, Sanitary Engineering, IHE, Delft, Netherlands, 1999

BS, Civil Engineering, Cairo University, Cairo, Egypt, 1992

REGISTRATIONS

Professional Engineer #68781, State of California

MEMBERSHIPS

Member, American Academy of Environmental Engineers & Scientists

Member, Water Environment Federation

PROJECT EXPERIENCE

Wastewater Treatment

City of Merced Wastewater Simultaneous Nitrification Denitrification and Aeration System Upgrade, Merced, California (Project Engineer) Akram provided engineering to upgrade the 12 MGD treatment plant to reliably meet a nitrate level of 10 mg/L without demolishing the existing diffusers or baffles. The aerobic reactors were modified to promote simultaneous nitrification and denitrification (SND) using the SymBio® process. A dissolved oxygen meter, air flow meter and air flow control valve were provided to each aeration zone to allow independent dissolved oxygen control.

** denotes projects completed with other firms*

Akram Botrous Ph.D., PE, BCEE

Senior Process Engineer

City of Lincoln Wastewater Treatment and Reclamation Facility (WWTRF) Expansion Plan, Lincoln, California (Lead Process Engineer)
Akram was the lead process engineer for planning, design, and support during construction of the expansion of this treatment facility for the City of Lincoln. This $90 million regional project will consolidate wastewater treatment for the City of Lincoln and Placer County SMD-1 service areas, as encouraged by Regional Board policy. The project includes a new local lift station, 15-miles of pipeline, and expansion of the Lincoln treatment plant with new headworks screening, oxidation ditches, secondary clarifiers, RAS/WAS pump station, deep bed sand filters, chemical facilities, odor control, effluent disposal pumps, and reclamation piping and pumps. Akram is responsible for preparation of contract drawings, specifications, and cost estimates for the secondary treatment including the oxidation ditch, the secondary clarifier, and the RAS pump station.

City of Dixon Wastewater Treatment Plant Expansion Projects, Dixon, California (Process and Design Engineer)
Akram provided planning, process, and detailed design; and services during construction for the secondary treatment process. This $25 million project included converting a pond plant into an extended aeration activated sludge plant with a new self-cleaning pump station, headworks, dual train oxidation ditch and clarifiers, percolation pond improvements, screw press mechanical solids dewatering facilities, operations and laboratory building, and miscellaneous site appurtenances.

City of Dinuba Wastewater Reclamation Facility (WWRF) Phase 1 Improvements Project, Dinuba, California (Design Engineer)
Akram provided design services for this $10 million improvements project that modified an existing facility. Improvements were made to the headworks, influent pump station, and primary and secondary treatment; and a new aerobic digester was added.

Donner Summit Public Utility District Wastewater Facilities Upgrade and Expansion, Soda Springs, California (Process and Design Engineer)
Akram provided process and design engineering for improvement and expansion of the membrane bioreactor system with a four-stage reactor configuration for advanced biological nitrogen removal. Nitrogen removal is a challenge for this resort community in particular because of highly variable flows and loads and cold temperatures. The project included biomass augmentation through ammonia addition during low load periods to enhance nitrification, carbon addition to enhance denitrification, and reactor heating when needed because of extreme cold temperatures.

Wastewater Characterization, Multiple Cities, California
Akram provided intensive monitoring for wastewater characterization for the City of Merced in 2005, City of Dinuba in 2008, and City of Lathrop in 2009.

Aeration Studies, Barstow and Richmond, California (Project Engineer)
Akram provided process modeling services for activated sludge systems to determine biological oxygen demands and airflows required and recommend blowers.

** denotes projects completed with other firms*

Akram Botrous Ph.D., PE, BCEE

Senior Process Engineer

Pilot Plant Study*, Lincoln, Nebraska (Research Assistant)
Akram conducted pilot testing of side-stream nitrification using fluidized-bed reactor.

City of Merced WWTF Phase V Solids Handling Upgrade, Merced, California (Design Engineer)
Akram designed the primary treatment upgrades and decant equalization for the $33 million expansion and upgrade project. Improvements included significant modifications to the existing solids handling system to comply with updated WDRs by abandoning existing earthen lined solids drying beds and installing centrifuges and active solar driers to produce Class A biosolids.

San Andreas Wastewater Treatment Plant Upgrade Project, San Andreas, California (Design Engineer)
Akram was responsible for process and detailed design for secondary treatment as part of the 0.35 MGD activated sludge system, designed to reliably achieve nitrification downstream of the existing trickling filter plant.

City of Los Banos Wastewater Treatment Plant Expansion and Upgrade - Phase II, Los Banos, California (Project Engineer)
Akram performed the hydraulic calculations and prepared contract drawings and specifications for the pump station. The project included new headworks and influent pump station design and miscellaneous improvements to the existing pond treatment system.

City of Woodlake Wastewater Treatment Facility Upgrade and Expansion, Woodlake, California (Design Engineer)
Akram was responsible for process design and detailed design of secondary treatment facilities (ditches, clarifiers, RAS pump station, and scum pump station) for a 1.3 MGD activated sludge process. This $15 million wastewater treatment facility replaced an existing pond plant with new facilities including headworks screening, influent pump station, two oxidation ditches with anoxic basins for nitrogen removal, two secondary clarifiers, return activated sludge and scum pump stations, solids stabilization lagoons, percolation ponds, standby generator, and operations building.

City of Williams Wastewater Treatment Plant Improvements (2009), Williams, California (Design Engineer)
Akram was responsible for process design and preparation of contract drawings, specifications, and cost estimates for the secondary treatment processes. The 0.5 MGD activated sludge process was part of the overall $9 million project that upgraded an existing pond treatment system to an extended aeration, activated sludge treatment plant with cloth media filtration, UV disinfection, reaeration, and other supporting facilities.

** denotes projects completed with other firms*

Akram Botrous Ph.D., PE, BCEE

Senior Process Engineer

City of Live Oak Wastewater Treatment Plant Improvements Project, Live Oak, California (Design Engineer)
Akram was responsible for process design, preparation of contract drawings, specifications, and cost estimates for the secondary treatment including a selector, two oxidation ditches, two secondary clarifiers, and a RAS/WAS pump station. The $17 million project upgraded an existing pond treatment system to a 1.4 MGD activated sludge treatment plant with cloth media filtration and UV disinfection.

City of Lathrop Consolidated Treatment Facility Phase I, Lathrop, California (Process and Design Engineer)
Akram conducted a capacity assessment for the City's existing MBR plant and concluded that the membranes are the bottleneck that restricts the capacity of the plant, and that the MBR plant can be expanded from 0.75 mgd to 1.0 MGD without building more reactor basins. The resulting project includes upgrades to the headworks screens and grit removal as well as biological process and membrane basins modifications, which complies with Title 22 unrestricted recycled water reuse requirements.

Facility Planning

Donner Summit Public Utility District (DSPUD) Treatment Alternatives and Facilities Plan, Soda Springs, California (Project Engineer)
Akram provided process engineering for the feasibility studies and facility plans to expand and upgrade the plant, including advanced biological nitrogen removal facilities. Nitrogen removal is a challenge for this resort community in particular because of highly variable flows and loads and cold temperatures. The studies evaluated biomass augmentation through ammonia addition during low load periods to enhance nitrification, and carbon addition to enhance denitrification. Treatment options analyzed included integrated fixed film activated sludge (IFAS), biological aerated filters (BAF), and membrane bioreactors (MBR).

City of Brentwood Wastewater Treatment Plant Expansion - Design Services, Brentwood, California (Project Engineer)
Akram prepared a study to determine the upgrades necessary to expand the plant's capacity from 5 to 7.5 MGD, and 7.5 to 10 MGD. He evaluated the headworks, influent pump station, effluent filtration, and ultraviolet disinfection.

Wastewater Plant Capacity Study, Sea Ranch, California (Project Engineer)
Akram evaluated the feasibility of abandonment of the Sea Ranch North WWTP and pumping its raw sewage to the aerated ponds at Gualala Community Services District (GCSD) WWTP for treatment and subsequent reuse on the golf links.

** denotes projects completed with other firms*

Akram Botrous Ph.D., PE, BCEE

Senior Process Engineer

Valley Springs Wastewater Treatment Alternatives Analysis, Valley Springs, California
Akram evaluated wastewater treatment and disposal options. The existing wastewater facilities included near-capacity aerated ponds and the site has a flooding risk.

Tuolumne Utilities District WWTP Evaluation, Sonora, California (Project Engineer)
Akram provided an overall conditions assessment for all unit processes at this trickling filter WWTP.

Newman Wastewater Treatment Alternatives Analysis, Newman, California (Project Engineer)
Akram evaluated short- and long-term expansion alternatives to Newman's aerated pond WWTP.

** denotes projects completed with other firms*

Akram Botrous Ph.D., PE, BCEE
Senior Process Engineer

PUBLICATIONS

Chapter 10 – Primary Treatment, Manual of Practice No. 8. Design of Municipal Wastewater Treatment Plants, 6th edition. Water Environment Federation (WEF), 2017.

Botrous, A. An Accurate Method to Estimate Energy Savings with More Efficient Blowers: Case Studies. California Water Environment Association (CWEA), 2014.

Botrous, A. Donner Summit PUD Wastewater Treatment Process Selection. Nevada Water Environment Association (NWEA), 2013.

Botrous, A., Hauser J., Beck S., Slagter C., Osmer B. Think you have a PlugPlow reactor? Think again!. Water Environment and Technology (WEF), 2010.

Botrous A., Hauser J., Knapp T., Beck S., and Molina H. Wastewater Characterization Study for Nitrogen Removal in Merced, California. Annual Conference of the Water Environment Federation, WEFTEC, 2009.

Botrous A., Dahab M., and Surampalli R. Feasibility analysis of side-stream nitrification of anaerobic sludge decant using fluidized-bed fixed-film reactors. 1st IWA-ASPIRE Conference, Singapore, 2005.

Botrous A., Dahab M., Mihăltz P. Nitrification of high-strength ammonium wastewater by a fluidized-bed reactor. Wat. Sci. Tech. 49 (5 6), 65 – 71, 2004.

Botrous A., Dahab M., Mihăltz P., and Surampalli R. Pilot-scale fluidized-bed reactor for nitrification of biosolids decant. Annual Conference of the Water Environment Federation, 2003.

Botrous A., Dahab M., Mihăltz P. Sidestream treatment of sludge dewatering decant: pilot-scale testing and feasibility analysis. IWA Conference on Design Operation and Costs of Large Wastewater Treatment Plants, Prague, Czech Republic, 2003.

Botrous A., El-Hattab I., and Dahab, M. Design of wastewater collection networks using dynamic programming optimization technique. ASCE National Conference on Environmental and Pipeline Engineering, 2000.

Vijay Sundaram PE

Senior Process Engineer, Advanced Treatment and Water Reuse

Stantec

Vijay has over 15 years of experience in the process development, design, commissioning, and optimization of advanced water and wastewater treatment processes. Vijay specializes in process design, predictive process modeling, cost-benefit analysis, performance evaluation, and process optimization. His experience includes membrane and granular media filtration, UV disinfection, ozonation, advanced oxidation process (AOP), biofiltration, GAC adsorption, ion exchange (IX), and reverse osmosis (RO). Vijay was process engineer in charge of the developing and implementing ozone-BAC treatment technology for the removal of emerging contaminants including pharmaceuticals, flame retardants and NDMA for various effluent management alternatives in the State of Nevada.

Vijay is a recognized leader in water reuse with extensive experience advancing water reuse, including potable reuse, by developing and demonstrating treatment technologies (such as Ozonation-Biological Filtration); working with communities to achieve cost-effective water sustainability; and assisting policy makers with development of water regulations. Based on this experience, he served as the Chair for the Water Environment Federation's Water Reuse Roadmap publication in 2017.

EDUCATION

Master of Science, Environmental Engineering (Water Quality), University of Cincinnati, Cincinnati, Ohio, 2004

B.Tech., Chemical Engineering, University of Madras, Chennai, India, 2001

REGISTRATIONS

Professional Engineer #75468, State of California

Registered Civil Engineer #020562, State of Nevada

MEMBERSHIPS

Past Chair, Engineering and Research Committee, California Water Environment Association

Reviewer, Water Environment Research Foundation

Member, Water Reuse Committee, Water Environment Federation

Member, California Water Environment Association

PROJECT EXPERIENCE

Town of Discovery Bay Community Services District Wastewater Master Plan, Discovery Bay, California (Process Engineer)
Vijay led the evaluation of various tertiary filtration alternatives including sand filtration, and disk filtration. He also evaluated the feasibility of side-stream reverse osmosis (RO) treatment for salinity control.

AquaAzul UV System Validation Testing, Lincoln, CA (Project Manager/Technical Lead)
Vijay is leading the UV System validation testing of AquaAzul open channel UV System at Lincoln WWTRF in California. The testing is being performed per NWRI UV Guidelines. Vijay is working closely with California Division of Drinking Water (DDW) on this validation.

City of Merced WWTF UV Disinfection System Check Point Bioassay (Process Engineer)
Vijay conducted check bioassay on the City of Merced WWTF TrojanUV disinfection System. He conducted the field testing and supported the check point bioassay report preparation.

** denotes projects completed with other firms*

Vijay Sundaram PE

Senior Process Engineer, Advanced Treatment and Water Reuse

SKF Wastewater Treatment Plant Facility Plan, Kingsburg, California (Project Engineer)
Vijay analyzed previous studies performed by the district with regards to effluent reuse and evaluated various potential reuse opportunities and associated benefits and treatment requirements.

City of Dixon WWTP 2011 Facility Plan, Dixon, California (Process Engineer)
Evaluated salt removal and concentrate management processes including reverse osmosis (RO), electrodialysis reversal (EDR), The primary goal of the project was to broadly assess methodologies to comply with effluent salinity limitations. nanofiltration (NF), and vibratory shear enhanced separation process (VSEP). Feed sources considered were WWTP effluent, groundwater, and drinking water supply. Developed life-cycle cost estimate of salt removal and concentrate management facilities.

Donner Summit Public Utility District (DSPUD) Treatment Alternatives and Facilities Plan, Donner Summit, California (Process Engineer)
Evaluated ozone as one of the disinfection alternatives. Investigated the bromate formation potential of DSPUD filtered effluent. Prepared preliminary ozonation system design criteria, site layout and cost estimate.

Disinfection/Oxidation Treatment Process Selection, Sacramento, California (Process Engineer)
Vijay evaluated this 181 MGD ozonation system with peak flows of approximately 400 MGD for disinfection and contaminant oxidation. He developed planning-level ozonation system layouts and life-cycle cost estimates based on various overall process alternatives; and analyzed merits and limitations of chlorine, UV, and ozone.

Reno-Stead Water Reclamation Facility (RSWRF) 4 MGD Expansion, Reno, Nevada (Project Manager)
The RSWRF 4 MGD Expansion Project includes adding mechanical components to the Headworks, two new aeration basins with a common wall, new blowers, two new secondary clarifiers, a new return activated sludge (RAS) pump station, a new scum pump station, tertiary filtration, and disinfection processes.

The Water Reuse Roadmap, Alexandria, Virginia (Chair)
Vijay served as the Task Force Chair and a contributing author for the publication, which is intended for water planners, regulators, practitioners, and nonprofit agencies involved in water/wastewater management. The publication provides an overview on all types and aspects of water reuse via frameworks, case studies, things to consider, and current trends. The Roadmap is a practical resource for holistically evaluating water reuse opportunities and implementing projects.

Fresno-Clovis Regional Water Reclamation Facility Headworks Odor Control System, Fresno, California (Project Manager)
Vijay provided permitting (including monitoring), technology selection, and preliminary and detailed design of the new system. The team designed a new odor control system for the headworks handling a peak flow of 160 MGD and average annual flow of 80 MGD. Biological and chemical adsorption odor control processes were selected to replace the existing aging and high maintenance chemical odor control scrubbers.

** denotes projects completed with other firms*

Vijay Sundaram PE

Senior Process Engineer, Advanced Treatment and Water Reuse

Greater Reno Area Effluent Disposal Analysis, Reno, Nevada (Project Engineer)
Vijay investigated effluent quality and other regulatory requirements implemented by various states for effluent reuse (e.g., indirect potable reuse, via aquifer storage and recovery). He performed extensive review of literature on advanced treatment processes, groundwater recharge projects, water reuse, and impacts of EDCs and PPCPs on public health and the environment. Vijay recommended effluent quality for various reuse applications, including control of effluent induced mobilization of natural soil and aquifer contaminants like arsenic, and developed an advanced treatment process train meeting those objectives.

City of Dixon Wastewater Treatment Facility Improvements Project - Envision Certification, Dixon, California (Water Sustainability Consultant)
Vijay served as the technical lead for the ENVISION certification for the City of Dixon Wastewater Treatment Facility Improvements Project. The project received ENVISION Silver award.

Santa Paula Chloride Reduction Evaluation, Santa Paula, California (Process Engineer)
Vijay performed an evaluation of side-stream treatment methodologies to comply with effluent chloride limitation. He evaluated chloride removal and concentrate management processes including reverse osmosis, electrodialysis reversal, and vibratory shear enhanced separation process; and developed life-cycle cost estimates of chloride removal and concentrate management facilities.

Pilot Study of Advanced Treatment Processes for Contaminants of Emerging Concern, Reno, Nevada (Project Manager/Process Engineer-In-Charge)
Vijay developed and implemented a 10.7 gpm filtration (membrane or granular media) ozone-biologically active carbon (O3-BAC) advanced treatment train for various reuse alternatives for the City of Reno and State of Nevada. The two-year demonstration was conducted to determine the effectiveness of ozone-BAC in removing endocrine disrupting chemicals (EDCs), pharmaceuticals, personal care products, and other contaminants of emerging concern (CECs). Process design variables studied included: 1) the optimum ozone dosage for CEC removal; 2) bromate mitigation using hydrogen peroxide and ammonia; 3) startup, monitoring, and control of BAC; 4) effect of membrane and sand filtration processes on ozone-BAC performance; and 5) wastewater disinfection using ozonation. He conducted a comprehensive energy consumption analysis on Ozone-BAC and reverse osmosis-based treatment processes.

Salinity and Boron Source Control and Minimization of Evaporative Loss, Dixon, California (Process Engineer)
Vijay evaluated the impact of the city-wide softener exchange program, industrial discharges, and revised sewer billing methods on WWTP influent salinity. He investigated various strategies to minimize salinity increase during effluent disposal via percolation/evaporation basins, as well as investigated the contribution from natural and various commercial sources of boron to the WWTP influent boron levels.

** denotes projects completed with other firms*

Vijay Sundaram PE

Senior Process Engineer, Advanced Treatment and Water Reuse

PUBLICATIONS

Need More Water? Think Ozone-BAC For 'One Water' Resolution, WATER ONLINE, 2017.

Developments in Water Reuse: Reaching for The Ozone, Water and Wastewater International, 2017.

Redefining Fresh Water – Introducing a cost-effective nonproprietary process for removing all water contaminants. Public Works Magazine, 2013.

Conference Presentation: Reliable Removal of NDMA under Field Conditions. Nevada Water Environment Association, 2014.

Conference Presentation: Cost Effective Strategies for Reducing Emerging Contaminant Release to Natural Environment. Pacific Northwest Clean Water Association Annual Conference, 2014.

Removal of NDMA to Less Than 0.28 ng/L under Field Conditions. Proceedings of 87th WEFTEC, 2014.

Advanced Treatment Process for Pharmaceuticals, Endocrine Disruptors, and Flame Retardants Removal. Water Environment Research, Vol. 86 (2), 2014.

Advanced Treatment Process for Microconstituents Removal. The NEWEA Journal, 2012.

Conference Presentation: Reducing the Cost of NDMA Compliance. CWEA 84th Annual Conference, 2012.

Conference Presentation: Title 22 Coliform Compliance for WWTPs with Granular Media Filtration Considering Ozonation. CWEA 84th Annual Conference, 2012.

Conference Presentation: Sustainable Water Reuse Practices. CWEA 83rd Annual Conference, 2011.

It's All Water: Demonstration Of An Innovative Treatment Technology For Water Banking In Nevada. Q3 July Silver State Water Environment News, 2010.

Arsenic Sorption on TiO2 Nanoparticles: Size and Crystallinity Effects. Water Research, 2010.

Energy Efficient Advanced Treatment Process for Microconstituents Removal. Proceedings of 83rd WEFTEC, 2010.

Field Evaluation of MF-Ozone-BAC Process Train for Removal of Microconstituents from Wastewater Effluent. Proceedings of 24th Annual WateReuse Symposium, 2009.

Cost Effectiveness and Environmental Benefits of Combined Ozonation-UV System for Water Reclamation and Surface Water Discharge. Proceedings of 81st WEFTEC, 2008.

Long V. Hoang PE

Electrical Engineer

Stantec

Long Hoang has 23 years of diverse experience providing electrical engineering services for public and private projects. His work includes preparing plans, specifications, and opinion of probable costs for the design of normal, emergency, and uninterruptible power systems including load and fault current analysis, protective device coordination studies and arc-flash hazard analysis, lighting and instrumentation and controls.

EDUCATION

BS, Electrical and Electronic Engineering, California State University, Sacramento, Sacramento, California, 1995

REGISTRATIONS

Professional Engineer #E16474, State of California 9/30/2011

Professional Engineer #019006, State of Nevada 2008

PROJECT EXPERIENCE

Truckee Meadows Water Reclamation Facility Septage Receiving Facility, Reno, Nevada (Electrical Engineer)
Electrical engineer for a new septage receiving facility incorporating new electrical service, motor control center, power, control and lighting for screening unit and controls for card lock billing system for the receiving of septage at the Reno Water Reclamation Facility.

City of Reno Sewer Lift Station Replacement Project, Reno, Nevada (Electrical Engineer)
Electrical Engineer for the replacement of four sewer lift pump stations. Each submersible duplex pump station required new electrical service and control panels as well as standby generator connections. The project also included developing a master PLC and SCADA programs for the City's entire pump station system as well as evaluation of the City's existing radio telemetry system for alternatives to improve communication between the pump stations and operation center.

** denotes projects completed with other firms*

Long V. Hoang PE

Electrical Engineer

Donner Summit Public Utility District Wastewater Facilities Upgrade and Expansion, Soda Springs, California (Electrical Engineer)
Electrical Engineer for this $24M project including upgrading and expanding an existing wastewater treatment facility located in the high Sierra Mountain ski resort community of Soda Springs. Areas of responsibility include preparing electrical and instrumentation and controls contract drawings, specifications, calculations, cost estimates, and providing bidding and engineering services during construction for the 1.27 Mgal/day PDF treatment and disposal facility. The project included designing a new main switchboard, two paralleled emergency generator sets, and motor control centers at two new buildings as well as modifying existing building electrical services to support a new welded steel equalization tank, headworks with parallel 2mm perforated drum screen, reactor basin aeration system improvements, membrane bioreactors (MBRs), wastewater heating via boilers and heat exchangers, UV disinfection, external ammonia and alkalinity control, effluent land disposal expansion, and miscellaneous site upgrades.

City of Lincoln Wastewater Treatment and Reclamation Facility Phase 1 and Phase 2 Expansion Project, Lincoln, California (Electrical Engineer)
Electrical Engineer for the Phase 1 and Phase 2 expansion project at the City of Lincoln Wastewater Treatment and Reclamation Facility. The project involves electrical power and controls to support the new treatment facilities, including new 12kV-480V transformer, switchboard, MCC, and emergency standby generator. Stantec will also provide PLC programming and SCADA development to incorporate the new facilities into the existing plant's automation system.

City of Dixon Wastewater Treatment Facility Improvements Project, Dixon, California (Electrical Engineer)
Electrical Engineer for the City of Dixon Wastewater Treatment Facility Improvements Project. The project involves construction of new secondary treatment facilities to replace the existing pond treatment with a nitrifying/denitrifying activated sludge process. New facilities include influent pump station, headworks with mechanical screening and flow measurement, equalization basins, clarifiers, and upgraded pumping capacities throughout the plant. The electrical design include a new 3000A main service switchboard, motor control centers, paralleled emergency generators, and new underground power distribution system. Responsibilities include preparation of electrical and instrumentation and controls construction documents, plans and specifications, calculations, cost estimates, and construction support services.

** denotes projects completed with other firms*

Long V. Hoang PE

Electrical Engineer

Mid-Western Placer Regional Sewer Project, Placer County, California (Electrical Engineer)
Long prepared the electrical and instrumentation and controls contract drawings, specifications, calculations, cost estimates, and construction support services. The project included a new booster pump station with three 450hp pumps and 18-pulse variable frequency drives at the existing SMD1 treatment plant including a new electrical building with a 3000A main switchboard and 1500kW emergency generator designed to support the new pump station and existing plant loads. The project also expanded the existing City of Lincoln Wastewater Treatment and Reclamation Facility to include a new motor control center, PLC, and modifications to the existing electrical and controls systems for new influent pumps, headworks screen, oxidation ditch, secondary clarifier, RAS/WAS pump station, deep bed sand filters, chemical feed facilities, odor control, and effluent disposal pumps.

Truckee Meadows Water Reclamation Facility Headworks Improvements Project, Reno, Nevada (Electrical Engineer)
Electrical Engineer as part of design team for a major headworks improvement project at the TMWRF wastewater treatment plant in Reno. The project included two new 40 MGD inclined mechanical bar screens, biological odor control, and modification to the existing motor control centers, DCS based control system and power distribution system. The facility included new LED light fixtures to illuminate the below ground structure. The screens are over 47 feet long, and successfully carry solids from a deep influent wet well to the surface for disposal.

Lathrop Consolidated Treatment Facility 1.0MGD Expansion, Lathrop, California (Electrical Engineer)
Electrical Engineer for the preparation of electrical and instrumentation and controls construction documents, plans, and specifications for the expansion of the existing water recycling plant from 0.75 Mgal/d to 1.0 Mgal/d. The project includes modifying the existing service switchboards, adding two new outdoor rated motor control centers, and modification to the existing controls system to support a new grit removal system, influent pumps, membrane bioreactor facilities consisting of anoxic zones, aerated zones, and membrane filters, ultraviolet disinfection facilities, aeration blowers, emergency storage basin pump station, chemical feed facilities, and solids handling facilities consisting of belt filter presses.

Truckee Meadows Water Reclamation Facility Headworks Improvements Project, Reno, Nevada (Electrical Engineer)
Electrical Engineer as part of design team for a major headworks improvement project at the TMWRF wastewater treatment plant in Reno. The project included two new 40 MGD inclined mechanical bar screens, biological odor control, and modification to the existing motor control centers, DCS based control system and power distribution system. The facility included new LED light fixtures to illuminate the below ground structure. The screens are over 47 feet long, and successfully carry solids from a deep influent wet well to the surface for disposal.

** denotes projects completed with other firms*

Matt Boring

Senior SCADA Specialist

Stantec

Matt has over 25 years of experience in electrical system design engineering including complex design of SCADA and electrical systems specific to the water and wastewater industry. Matt has been responsible for installation and maintenance of various SCADA systems and is experienced in working with contractors during startup and testing of new systems. Matt joined Stantec in 2006 following five years with A T.E.E.M. Electrical Engineering as a field manager. Prior to A T.E.E.M., Matt served as SCADA technician, electrician and system mechanic for El Dorado Irrigation District (EID).

EDUCATION

Cosumnes River Community College, Sacramento, California, 2001

PROJECT EXPERIENCE

Wastewater Treatment

City of Angels Spray Field Improvements
Matt designed the electrical, instrumentation and control system for City's new Ultraviolet Disinfection system. The project included integration with the existing plant's electrical and Allen Bradley control system. He provided engineering services as well as electrical inspection during construction, and was responsible for the management of startup and testing and integration of the Wonderware HMI.

City of Jackson WWTP - 2013 Improvements, Jackson, California
Matt designed and installed an entry level SCADA system complete with new PLC control panels and instrumentation. The system was designed with the intent of expansion over the next several years. Initial cost for the complete turnkey system was approximately $50,000. Since inception, Stantec has provided improvements that include flow paced filter coagulant feed and rapid mixing.

City of Angels WWTP Improvements, Angels Camp, California
Matt designed the electrical, instrumentation and control system for the City's new Ultraviolet Disinfection system. Project included integration with existing plant electrical and control system. Matt provided engineering services as well as electrical inspection during construction, and was responsible for the management of startup, as well as the testing and integration of the Wonderware HMI.

City of Reno 2015 SCADA Improvements
Acted as lead designer, construction manager and inspector for the electrical and instrumentation upgrade of thirty of the City's sewage lift stations. The new $1.2 million system replaced Motorola MOSCAD controllers and serial radio network. The new system is comprised of Allen Bradley controller connected by Cellular routers and was completed in house by Stantec SCADA staff. System is built on an enterprise Inductive Automation Mission Critical Ignition system spanning the City Hall and Corporation yard, system includes a completely redundant system with backup SMS alarm and Voice modems.

** denotes projects completed with other firms*

Matt Boring

Senior SCADA Specialist

Midwestern Placer Regional Sewer Project, Lincoln, California
Matt provided instrumentation and SCADA system design for this multi-faceted $19 million regionalization project, which included a 29.5 MGD pump station, conveyance pipeline with odor control facility and an expansion of the City of Lincoln Wastewater Treatment and Reclamation Facility. Matt He was responsible for engineering services during construction for all instrumentation and SCADA portions of the project. He was also responsible for managing PLC control programming for the Allen Bradley control system and all Wonderware SCADA integration. Project scope has since been modified to include a complete SCADA system upgrade to the Inductive Automations Ignition SCADA application which included approximately

City of Woodlake 2010 Phase 1 Wastewater Treatment Facility Improvements
Acted as the peer design reviewer and electrical and instrumentation inspector for the City's WWTF improvements project. Matt was also responsible for startup and testing activities as well as overseeing the SCADA system development and installation. The project utilized Inductive Automations Ignition SCADA application which included a complete Mission Critical redundant system.

City of Live Oak WWTP 2007 Upgrade
Currently serving as electrical inspector and SCADA installation manager for a $17.7 million tertiary wastewater treatment plant upgrade project at the City's existing aerated pond treatment plant. The plant improvements include influent flow mechanical screening, extended air activated sludge (nitrification) secondary treatment, flow equalization, cloth disk tertiary filters, UV light disinfection, effluent pumping, integrated Wonder Ware SCADA system upgrade and improvements that include several off site facilities.

City of Auburn Wastewater Treatment Facility 2009 Improvements
Acted as the lead designer and electrical and instrumentation inspector for the electrical design of the $4.5 Million improvements project consisting of a new UV disinfection system, RAS pump station, SCADA and electrical system modifications and oxidation ditch energy efficiency improvements as well as a new secondary clarifier. Matt also preformed Field and factory testing as well as startup services for the project.. Matt is responsible for managing the PLC programming and SCADA system. SCADA system was converted from Data Flow to Inductive Automations Ignition application program as a part of the WWTRF expansion. System included the integration of three Allen Bradly PLC's connected by a Ethernet fiber network. integration.This project is currently under construction and is in the start up stage of the new UV disinfection system.

** denotes projects completed with other firms*

Matt Boring

Senior SCADA Specialist

City of Colusa WWTP – 2007 Improvements
Served as Electrical Inspector and start up coordinator for the electrical facilities for a new $15.3 million tertiary wastewater treatment plant that replaced the City's existing pond treatment system. The new plant included influent pumping, mechanical screening, extended air activated sludge (nitrification) secondary treatment, flow equalization, cloth disk tertiary filters, UV light disinfection, effluent pumping, aerated lagoon sludge storage, Managed and commissioned the installation of the Wonder Ware SCADA system.

City of Woodland WWTP Expansion Project
Served as electrical designer collecting all field data for the electrical design. During construction Matt acted as electrical inspector on the $27 million 2005-2007 City of Woodland WWTP Expansion. The project involved construction of a new oxidation ditch, secondary clarifiers, new cloth media filtration, and UV light disinfection. Managed the upgrade of the Cities Intellutsion ifix SCADA System.

City of Lincoln Wastewater Treatment and Reclamation Facility
Served as associate electrical inspector on the $60 million City of Lincoln Wastewater Treatment and Reclamation Facility. Performed all witness and field testing for the electrical system including startup of the Cities Wonderware SCADA system.

** denotes projects completed with other firms*

Beth Cohen PE

Design Engineer

Stantec

Beth has 15 years of design and planning experience in a wide-range of water and wastewater projects. Areas of specialty include wastewater treatment and conveyance system master planning, and detailed wastewater treatment process design.

EDUCATION

BS, Environmental Engineering, Oregon State University, Corvallis, Oregon, 2003

REGISTRATIONS

Professional Engineer #70184, State of California

PROJECT EXPERIENCE

Wastewater

Operation and Maintenance Manual for Discovery Bay WWTPs and Sewer Conveyance Pump Stations, Discovery Bay, California (Project Manager)

Beth provided updated operation and maintenance manual to act as a critical reference and training source for of information for operations staff, to maintain compliance with NPDES permit. The project also includes preparation of an interactive online manual to provide a living document that can be effortlessly customized and updated as often as desired and instantly shared with all staff, which reduces risks of outdated information and danger of not having immediate access to important information.

Fresno Clovis RWRF Headworks Odor Control Upgrade, Fresno, California (Design Manager)

This $10M project includes the design of a new odor control system for the Regional Water Reclamation Facility headworks, currently treating an average flow rate of 80 MGD. The best solution to an updated air permit and aging infrastructure that requires significant maintenance and upkeep was to replace the units with a new odor control system. Biological and chemical adsorption odor control processes were selected for implementation. The new facilities include an 8 train biotrickling filter system with three 125-hp blowers, designed to handle 66,000 cfm, and a single granular activated carbon filter with coupled blowers that can handle 33,000 cfm. Responsible for detailed design of the odor control system.

** denotes projects completed with other firms*

Beth Cohen PE

Design Engineer

Sonoma County Water Agency OCSD WWTF Reclaimed Water Project, Sonoma County, California
The Town of Occidental is operating under a permit that requires complete elimination of summertime discharge to the existing surface water disposal point. The reclaimed water project will be done in three phases: an alternative analysis, basis of design report, and detailed design. The project investigated alternative treatment processes that can achieve high levels of nitrogen removal for continued surface water discharge and upgrades necessary to comply with unrestricted reuse regulated by Title 22. The evaluation resulted in the recommendation of a new membrane bioreactor (MBR) plant and a 16,000-feet long reclaimed water pipeline that sends final effluent to a storage reservoir for ultimate vineyard irrigation.

City of Lincoln Phase I Reclamation Project, Lincoln, California (Design Manager)
The City of Lincoln began treating wastewater from surrounding regional communities, through its Title 22 compliant WWTF. Increased flow rates associated with the Regional Project necessitated modification to the off-site reclamation facilities for final effluent disposal. This project improved the reclaimed water booster pump station, installed 7000-feet of new 18-inch diameter pressurized distribution piping, and converted several miles of existing sewer piping into reclaimed water force mains.

Donner Summit Public Utility District Wastewater Facilities Upgrade and Expansion, Soda Springs, California (Design Engineer)
Beth prepared contract drawings, specifications, cost estimates, and providing bidding and engineering services during construction for the 1.27 MGD PDF treatment and disposal facility. The $24 million project upgraded and expanded an existing wastewater treatment facility located in the high Sierra Mountain ski resort community of Soda Springs. Improvements included a new welded steel equalization tank, headworks with parallel 2mm perforated drum screen, reactor basin aeration system improvements, membrane bioreactors (MBRs), wastewater heating via boilers and heat exchangers, UV disinfection, external ammonia and alkalinity control, effluent land disposal expansion, and miscellaneous site upgrades.

** denotes projects completed with other firms*

Beth Cohen PE

Design Engineer

Wastewater Treatment

City of Madera WWTP Rehabilitation Project, Madera, California (Project Manager)
Due to lack of funding and inadequate access to standby equipment, much of the existing treatment facilities were not properly maintained. The deferred maintenance caused system wide outages that impacted reliability and performance of the WWTP. After building a trusted relationship with the chief plant operator, the City asked for our help to mitigate the critical infrastructure failures. Stantec designed the Phase I Rehabilitation project to restore operation to three primary clarifiers (repairing concrete and coating channels, installing new sludge and scum collectors, and replacing primary sludge and scum pumps), overhaul the anaerobic digesters (new sludge mixing systems, new sludge and gas valves, coating the tanks and roofs, and refurbishing a heat exchanger), repairing the corroded centrate drain line with a new cured in place pipe (CIPP) and installing a new plant water well with hydropneumatic tank. The project also included planning studies to document recommended WWTP staffing levels and critical operations policy.

City of Lincoln Phase 1 and 2 Wastewater Treatment and Reclamation Facility Expansion Project, Lincoln, California (Project Engineer)
It was determined that the existing WWTRF capacity is over-commended and additional facilities must be available quickly (ahead of recent development) to maintain permit compliance. Responsible for expanding the pumping and screening capacity by designing a new submersible centrifugal pump and perforated plate screen, as well as designing a new vortex grit removal system with coupled self-priming pump and classifier.

City of Dixon Wastewater Treatment Facility Improvements Project, Dixon, California (Design Manager)
Beth was responsible for the planning, design, and services during construction for the vactor receiving station, maintenance building, headworks, site piping and grading, and hydraulic profile, cost estimating, detailed drawings and specifications, and quality control coordination between project team members and stakeholders. This $25M project converted a pond plant into an extended aeration activated sludge plant with a new self-cleaning pump station, headworks, dual train oxidation ditch and clarifiers, percolation pond improvements, screw press mechanical solids dewatering facilities, operations and laboratory building, and miscellaneous site appurtenances.

Mid-Western Placer Regional Sewer Project, Placer County, California (Project Engineer)
Beth was responsible for preparing contract drawings, specifications, and cost estimates for yard piping, cathodic protection, civil sitework, effluent pump station, and reclamation pump station. She also provided quality control and engineering advisory for the headworks, influent pump station, biofilter, and chemical feed facilities. This $90 million regional project consolidated wastewater treatment for the City of Lincoln and Placer County SMD-1 service areas, as encouraged by Regional Board policy. The project includes a new local lift station, 15 mile pipeline, and expansion of the Lincoln treatment plant with new headworks screening, oxidation ditches, secondary clarifiers, RAS/WAS pump station, deep bed sand filters, chemical facilities, odor control, effluent disposal pumps, and reclamation piping and pumps.

** denotes projects completed with other firms*

Beth Cohen PE

Design Engineer

City of Auburn Wastewater Treatment Plant Improvements Project (Project Engineer)
Beth was responsible for overall design of the $4.5 Million improvements project. Areas of responsibility include preparing contract drawings, specifications, cost estimates, and providing bidding and engineering services during construction for the 6 Mgal/day capacity plant. The project consists of an oxidation ditch energy efficiency improvement, a new secondary clarifier, high capacity energy efficient screw pump RAS pumping station, deep bed sand filter modifications, a new UV disinfection system, submersible pump plan drain pumping station, chemical feed and storage modifications, a new maintenance building, lime feed and storage addition, SCADA and electrical system modifications.

City of Merced Wastewater Treatment Facility Phase V Solids Handling Project (Design Engineer)
This $33 million expansion and upgrade included significant modifications to the existing solids handling system at the wastewater treatment facility to comply with updated WDRs by abandoning existing earthen lined solids drying beds and installing mechanical dewatering systems; including the addition of centrifuges and active solar driers to produce Class A biosolids. The project included a centrate pump station and equalization tank, two anaerobic primary digesters, digester gas holder, two natural gas hot water boilers that can run on digester gas, bolted steel solids holding tank, a new primary clarifier with a coupled scum and sludge pump station. Beth was responsible for designing the septage receiving and stormwater acceptance plants, stormwater detention basin, 100-year levee improvements, wildlife management pumping station design, biosolids land application fodder crop pump station, influent junction structure remediation, and solids handling building mechanical detail design coordination, solids drying facility active solar driers, and civil sitework and yard piping. She was responsible for the Federal Emergency Management Agency (FEMA) levee certification, including interior drainage plan modeling, updating the levee operation and maintenance manual, and packaging all associated provisions for the conditional letter of map revision (CLOMR). Additionally, Beth prepared the associated construction cost estimates, technical specifications, and was responsible for bidding and engineering services during construction.

** denotes projects completed with other firms*

Leila Sermek P.E.

Biosolids Process Engineer

Stantec

Leila has sixteen years of experience in planning, designing, and evaluating processes for water and wastewater treatment, biosolids and residuals handling, as well as in the planning and design of water distribution and wastewater collection systems. She specializes in treatment process development, process modeling and design, performance evaluation, operation, trouble-shooting, and cost-benefit analysis. Her expertise includes hydraulic modeling, pumping station design, biosolids handling facilities design including treatment, dewatering and drying, and design of biological wastewater treatment facilities, pond treatment systems, and storage and equalization facilities. Leila was lead process design engineer for the Miners Ranch WTP and Merced WWTF Phase V Solids Handling Upgrade Project. On both projects she was responsible for the solids handling process design and development of mechanical drawings for the solids handling building, solids holding tank, sludge pumping system, and chemical feed facilities.

EDUCATION

B.S., Civil Engineering, University at Zagreb, Zagreb, Croatia, 2002

M.S. Civil Engineering, University at Buffalo, Buffalo, New York, 2007

REGISTRATIONS

Professional Engineer #74320, State of California

MEMBERSHIPS

Member, Biosolids Committee, California Water Environment Association

PROJECT EXPERIENCE

Water Treatment

Miners Ranch Water Treatment Plant (WTP) Improvement Project, South Feather Water and Power Agency, Oroville, California (Process Engineer)

Project includes alternative evaluation and design of Miners Ranch Water Treatment Plant. The project components include raw water pumping, pre-treatment using Trident settlers, dual media gravity filtration system, water disinfection, clearwell, residuals handling, and supporting facilities. This $20 million improvements project was split into two phases. The first phase included process alternatives evaluation and the second phase included design-build phase of the project. Responsibilities included hydraulic modeling of the entire water treatment plant, alternative evaluation and design of the residuals handling facilities, design of high service pump station, modifications to the existing backwash pump station, modifications to the existing chemical feed facilities including alum and polymer feed systems, site paving and grading. Additional responsibilities included assisting in clearwell design, design of yard piping, and miscellaneous yard structures.

** denotes projects completed with other firms*

Leila Sermek P.E.

Biosolids Process Engineer

Biosolids Assessment, Management, and Facilities

City of Merced WWTF Phase V Solids Handling Upgrade, Merced, California (Main Process Engineer)
Designed solids handling system for City of Merced WWTF including retrofitting the existing anaerobic digesters, designing the solids holding tank, solids feed pump station, dewatering facility, polymer storage and feed system, and sludge cake conveyance. Performed hydraulic calculations for sludge conveyance system and developed process performance analysis for active solar drying system. Prepared construction documents, including specifications and drawings for the solids holding tank, gas holding system, solids feed pump station, solids dewatering and conveying facility, and polymer system, and prepared procurement documents for the dewatering centrifuges.

City of Lathrop Consolidated Treatment Facility 1.0 MGD Expansion Project, Lathrop, California (Process Engineer)
Designed solids handling facilities for City of Lathrop Consolidated Treatment Facility including adding new dewatering belt filter press, modifications to the sludge pumping facilities, and retrofitting the existing pressate pump station. Performed hydraulic calculations for sludge conveyance system and developed solids mass balance calculations that include sludge production from the Consolidated Treatment Facility and Crossroads Treatment Facility. Prepared construction documents, including specifications and drawings for the solids feed pumps, dewatering belt filter press including polymer system, and pressate pump station.

City of Dinuba Wastewater Reclamation Facility (WWTF) Phase I Improvement Project, Dinuba, California (Process Engineer)
The solids handling facilities included design of new aerobic digester, supernatant pump station, solids feed pump station and sludge dewatering facilities. The responsibilities included design of the aerobic digester, digester decant system, and supernatant pump station. Assisted in selection of equipment for sludge dewatering and preparation of procurement documents for dewatering screw press. Prepared construction documents and specifications for the facilities improvements.

City of Dixon Wastewater Treatment Facility Improvements, Dixon, California (Process Engineer)
Project included preliminary design and cost estimate for new 1.92 Mgal/day wastewater treatment facilities including new headwork, influent pump station, secondary treatment facilities for biological nutrient removal, solids handling facilities, equalization / emergency storage basin, laboratory / controls building and miscellaneous yard structures as well as modifications to the existing effluent percolation ponds. Responsibilities include analysis of different solids handling options. Options evaluated are sludge storage / stabilization lagoon and mechanical dewatering using either screw press or belt filter press. Mechanical dewatering option was also evaluated in combination with conventional drying beds. Additional tasks include developing the life cycle cost analysis of all the solids handling options and preliminary cost estimate for the option that includes dewatering screw press combined with the conventional drying bed.

** denotes projects completed with other firms*

Leila Sermek P.E.

Biosolids Process Engineer

Occidental County Sanitation District WWTF Reclaimed Water Project, Sonoma County Water Agency, Occidental, California (Process Engineer)
With design average annual flow of only 0.036 Mgal/d and extremely limited space the transition of non-compliant pond wastewater treatment facility to Membrane Bioreactor Activated Sludge plant created solids handling challenges. The solids handling alternatives evaluated included use of existing settling pond as sludge storage / stabilization lagoon and use of dewatering tubes and dewatering boxes. Prepared solids mass balance calculations, preliminary facilities sizing, and life cycle cost analysis.

City of Woodlake Wastewater Treatment Facility Upgrade and Expansion, Woodlake, California (Process Engineer)
Designed sludge storage/holding lagoons for long term sludge treatment and storage. Developed design procedures for dense graded asphalt lining system to provide impermeable and hard surface for basin bottom. Prepared design drawings and specifications.

San Andreas Sanitary District Digester Upgrade Alternative Analysis , San Andreas, California (Project Engineer)
Study included evaluation of the four digester upgrade alternatives. The alternatives evaluated are replacement of the existing anaerobic digester with new aerobic digester, replacement of the existing anaerobic digester with a new anaerobic digester with sufficient capacity to treat primary and waste activated sludge, upgrade of the existing anaerobic digester to threat the primary sludge with new aerobic digester for waste activated sludge, and upgrade of the existing anaerobic digester and addition of gravity thickener for waste activated sludge.

** denotes projects completed with other firms*

Eric Zeigler

Project Manager/Senior Environmental Scientist

Stantec

Eric has more than 25 years of experience managing projects involving wastewater analysis and permitting, stormwater monitoring and management, industrial pretreatment, and related environmental studies. He has extensive experience completing the analyses and reports necessary to obtain and maintain compliance with municipal wastewater and stormwater National Pollutant Discharge Elimination System (NPDES) permits. Special analyses completed in the course of wastewater permitting include determination and use of water-effect ratios for metals, small stream acute and chronic dilution/mixing zone studies, metals translator studies, and novel approaches to analyzing data often overlooked by regulatory agencies. Eric works closely with a team of wastewater engineers, environmental scientists, and wastewater treatment plant operators to provide integrated project solutions. Eric's stormwater experience includes the development and implementations of programs to comply with statewide general stormwater NPDES permits as well as individual NPDES permits. He has developed stormwater pollution prevention plans (SWPPPs) for industrial and municipal facilities, and prepared technical data reports as required for compliance with NPDES permits. Eric's industrial pretreatment experience includes the development and implementation of pretreatment program elements in compliance with the National Pretreatment Program. Examples of program elements developed include technically based local discharge limitations, enforcement response plans, and industrial discharge permits.

EDUCATION

BS, Environmental and Resource Sciences, University of California, Davis, Davis, California, 1993

MEMBERSHIPS

Member, California Stormwater Quality Association

Member, California Water Environment Association

PROJECT EXPERIENCE

Assessment, Permitting and Compliance

Bear Valley Water District Engineering Services, Bear Valley, California (Senior Environmental Scientist)
Eric developed a pollution prevention plan for several constituents of concern. He identified potential sources and recommended reduction measures that should be implemented within the service area. This effort was conducted in response to Regional Water Quality Control Board Waste Discharge Requirements and California Water Code Section 13263.3(d)(3) requirements.

City of Jackson Pollution Prevention Plan, Jackson, California (Senior Environmental Scientist)
Eric developed a pollution prevention plan for several constituents of concern. He identified potential sources and recommended reduction measures that should be implemented within the service area. This effort was conducted in response to Regional Water Quality Control Board Waste Discharge Requirements and California Water Code Section 13263.3(d)(3) requirements.

Donner Summit Public Utility District Pollution Prevention Plan, Soda Springs, California (Senior Environmental Scientist)
Eric developed a pollution prevention plan for several constituents of concern. He identified potential sources and recommended reduction measures that should be implemented within the service area. This effort was conducted in response to Regional Water Quality Control Board Waste Discharge Requirements and California Water Code Section 13263.3(d)(3) requirements.

** denotes projects completed with other firms*

Eric Zeigler

Project Manager/Senior Environmental Scientist

City of Lincoln Initial Investigative Toxicity Reduction Evaluation (TRE) Work Plan, Lincoln, California (Senior Environmental Scientist)
Eric developed an NPDES permit-required TRE Work Plan in accordance with USEPA guidance that outlines procedures for identifying and reducing or eliminating sources of effluent toxicity.

Selma-Kingsburg-Fowler County Sanitation District Industrial Pretreatment Program Review and Update, Kingsburg, California (Senior Environmental Scientist)
Eric assisted the District in a comprehensive review and update of its Industrial Pretreatment Program. His tasks included a review of the District's business inventory, evaluation of existing local limits, evaluation of current billing structure, update of the District's Enforcement Response Plan, review of their Sewer Use Ordinance, development of a pretreatment manual, and staff training.

City of Newman Pretreatment Program Assistance, California (Project Manager)
Eric assisted the City in responding to the required actions identified in a Pretreatment Compliance Inspection Report from the Regional Water Quality Control Board. His tasks included providing guidance on the development of slug discharge control plans, update of the City's industrial user discharge permit template, determination of appropriate enforcement actions, development of a comprehensive Enforcement Response Plan, and evaluation and update of existing local discharge limits.

City of Merced Pretreatment Local Limits Evaluation, Merced, California (Project Manager/Senior Environmental Scientist)
Eric assisted the City in responding to Regional Water Quality Control Board (RWQCB) comments related to the City's 2007 proposed local limits report. His tasks included drafting a response letter for submittal to the RWQCB, development of an ongoing local limits monitoring program consistent with EPA guidance, and conducting a technical evaluation of existing and proposed pretreatment local limits.

City of Jackson Initial Investigative Toxicity Reduction Evaluation (TRE) Work Plan, Jackson, California (Senior Environmental Scientist)
Eric developed the NPDES permit-required TRE Work Plan in accordance with USEPA guidance that outlines procedures for identifying and reducing or eliminating sources of effluent toxicity.

Salinity Evaluation and Minimization Plan, Kirkwood Meadows Public Utility District (Senior Environmental Scientist)
Eric developed a Salinity Evaluation and Minimization Plan to address sources of salinity at the wastewater treatment facility, as required by the District's Waste Discharge Requirements. The Plan was prepared to meet the requirements outlined in California Water Code Section 13263.3(d)(3).

** denotes projects completed with other firms*

Eric Zeigler

Project Manager/Senior Environmental Scientist

Tuolumne Utilities District Pollution Prevention Plan, Sonora, California (Senior Environmental Scientist)
Eric developed a pollution prevention plan for ten constituents of concern. He identified potential sources and recommended reduction measures that should be implemented within the service area. This effort was conducted in response to RWQCB Waste Discharge Requirements and California Water Code Section 13263.3(d)(3) requirements.

San Andreas Sanitary District Report of Waste Discharge, San Andreas, California (Senior Environmental Scientist)
Eric produced Report of Waste Discharge for renewal of the District's NPDES permit. The report included the implementation of an effluent and receiving water quality monitoring program, compilation and analysis of water quality data, effluent and receiving water compliance evaluations, reasonable potential analysis and the development of water quality based effluent limits following State Implementation Plan (SIP) guidance.

City of Woodland Industrial Pretreatment Program, Woodland, California (Senior Environmental Scientist)
Eric developed an Industrial Pretreatment Program Administrative Procedures Handbook for the City and developed industrial discharge local limits. He issued industrial discharge permits, conducted industrial user inspections, produced annual reports for submittal to the Regional Water Board, and trained City staff.

City of Lincoln Industrial Pretreatment Program, Lincoln, California (Senior Environmental Scientist)
Eric is currently developing a new Industrial Pretreatment Program for the City in accordance with federal regulations (40 CFR 403). The program includes development of 1) industrial user identification, evaluation, and classification procedures, 2) industrial discharger permitting procedures, 3) compliance monitoring activities, 4) self-monitoring practices, 5) local limits in accordance with EPA Local Limits Guidance, 6) enforcement response plan, 7) data management and reporting practices, 8) staffing, organization, and budget, and 9) draft ordinances.

Monitoring and Evaluation

San Andreas Sanitary District Effluent and Receiving Water Characterization Study, San Andreas, California (Project Manager)
Eric developed and implemented an NPDES permit-required wastewater treatment plant effluent and river monitoring program for California Toxics Rule constituents and other constituents of concern to the Central Valley. He developed a detailed Sampling and Analysis Plan, conducted representative water quality monitoring using "clean" sampling techniques, and produced a technical report for submittal to the Regional Water Board.

** denotes projects completed with other firms*

Eric Zeigler

Project Manager/Senior Environmental Scientist

Regulatory Negotiation

City of Auburn Aluminum Toxicity Study, Auburn, California (Project Manager/Senior Environmental Scientist)
Eric developed and implemented an aluminum toxicity study for WWTP effluent discharges to Auburn Ravine. The study involved conducting site-specific studies in both the effluent and the receiving water following many of the principals described in the Interim Guidance on Determination and use of Water-Effect Ratios for metals, USEPA, 1994. The results of this study were used to develop site-specific water quality objectives for aluminum, and to demonstrate that there was no reasonable potential for the WWTP effluent to cause or contribute to the exceedance of the aluminum site-specific water quality objectives for the protection of aquatic life. As a result of this study and negotiations with the Regional Water Board, the City's NPDES permit was amended to remove effluent limitations on aluminum for the protection of aquatic life

San Andreas Sanitary District Sewer System Management Plan, San Andreas, California (Senior Environmental Scientist)
Eric developed the SSMP Development Plan and Schedule to address the required elements of the Statewide Waste Discharge Requirements for Wastewater Collection Agencies. Developed the Goal and Organization required elements of the SSMP.

City of Lincoln Copper Water-Effect Ratio Study, Lincoln, California (Project Manager)
Eric developed and implemented the Copper Water-Effect Ratio Study for wastewater treatment plant effluent discharges to the Auburn Ravine. The study was conducted in accordance with Streamlined Water-Effect Ration Procedures for Discharges of Copper, USEPA, 2001. The results of the study were used to develop a water-effect ratio and site-specific water quality objective for copper, and to determine reasonable potential to cause or contribute to the exceedance of the site-specific water quality objective.

Town of Discovery Bay Report of Waste Discharge, Discovery Bay, California (Project Manager)
Eric produced the Report of Waste Discharge for renewal of a Wastewater Treatment Facility NPDES permit. The report included the compilation and analysis of water quality data, effluent and receiving water compliance evaluations, reasonable potential analysis and the development of water quality based effluent limits following State Implementation Plan (SIP) guidance. Eric negotiated the final NPDES permit with the Regional Water Board.

City of Lincoln Report of Waste Discharge, Lincoln, California (Project Manager)
Eric produced the Report of Waste Discharge for renewal of a Wastewater Treatment Facility NPDES permit. The report included the compilation and analysis of water quality data, effluent and receiving water compliance evaluations, reasonable potential analysis and the development of water quality based effluent limits following State Implementation Plan (SIP) guidance. Eric negotiated the final NPDES permit with the Regional Water Board.

** denotes projects completed with other firms*

Eric Zeigler

Project Manager/Senior Environmental Scientist

City of Angels Camp, Feasibility Study for Achieving Compliance with Wastewater Permit Requirements, Angels Camp, California (Senior Environmental Scientist)
Eric developed the Angels Creek Mixing Zone Study Work Plan and implemented dilution and mixing zone field study. The study included creating a fluorescent dye injected simulated effluent discharge to Angels Creek and monitoring the mixing of the simulated effluent with the creek and determining the edges of the acute and chronic mixing zones using specialized metering equipment. The results of this study were used to reopen and amend the City's existing Order to include appropriate effluent limitations based on dilution credits. Following the construction of a multi-port, cross-stream diffuser, Eric conducted a confirmation field study was and produced a technical report for submittal to the Regional Water Board.

City of Rio Vista Beach WWTP Report of Waste Discharge, Rio Vista, California (Senior Environmental Scientist)
Eric produced the Report of Waste Discharge for renewal of a Wastewater Treatment Facility NPDES permit. The report included the compilation and analysis of water quality data, effluent and receiving water compliance evaluations, reasonable potential analysis and the development of water quality based effluent limits following State Implementation Plan (SIP) guidance. Eric negotiated final NPDES permit with the Regional Water Board.

City of Auburn Copper Water-Effect Ratio Study, Auburn, California (Senior Environmental Scientist)
Eric developed and implemented the Copper Water-Effect Ratio Study for wastewater treatment plant effluent discharges to Auburn Ravine. The study was conducted in accordance with Streamlined Water-Effect Ration Procedures for Discharges of Copper, USEPA, 2001. The results of the study were used to develop a water-effect ratio and site-specific water quality objective for copper, and to determine reasonable potential to cause or contribute to the exceedance of the site-specific water quality. As a result of this study, the City's NPDES no longer contains effluent limitations on copper.

San Andreas Sanitary District Copper Water-Effect Ratio Study, San Andreas, California (Senior Environmental Scientist)
Eric developed and implemented the Copper Water-Effect Ratio Study for wastewater treatment plant effluent discharges to the North Fork Calaveras River. The study was conducted in accordance with Streamlined Water-Effect Ration Procedures for Discharges of Copper, USEPA, 2001. The results of the study were used to develop a water-effect ratio and site-specific water quality objective for copper, and to determine reasonable potential to cause or contribute to the exceedance of the site-specific water quality.

** denotes projects completed with other firms*

Eric Zeigler

Project Manager/Senior Environmental Scientist

San Andreas Sanitary District Report of Waste Discharge, San Andreas, California (Project Manager)
Eric produced the Report of Waste Discharge for renewal of Wastewater Treatment Facility NPDES permit. The report included the compilation and analysis of water quality data, effluent and receiving water compliance evaluations, reasonable potential analysis and the development of water quality based effluent limits following State Implementation Plan (SIP) guidance. Eric negotiated final NPDES permit with the Regional Water Board.

Donner Summit Public Utility District Wastewater Facilities Upgrade and Expansion, Soda Springs, California (Senior Environmental Scientist)
Eric produced the Report of Waste Discharge for renewal of a Wastewater Treatment Facility NPDES permit. The report included the compilation and analysis of water quality data, effluent and receiving water compliance evaluations, reasonable potential analysis and the development of water quality based effluent limits following State Implementation Plan (SIP) guidance. Eric negotiated the final NPDES permit with the Regional Water Board. The adopted NPDES permit includes provisions for effluent recycling via snowmaking at a nearby ski area.

Bear Valley Water District Mixing Zone/Dilution Study, Bear Valley, California (Senior Environmental Scientist)
Eric developed the Bloods Creek Mixing Zone/Dilution Study Work Plan and implemented the dilution and mixing zone field study. The study included creating a fluorescent dye injected simulated effluent discharge to Bloods Creek and monitoring the mixing of the simulated effluent with the creek and determining the edges of the acute and chronic mixing zones using specialized metering equipment. A final report was submitted to the Regional Water Board along with a request to reopen and amend the District's existing Order to include appropriate achievable effluent limitations based on dilution credits identified by the study.

Stormwater Management
City of Auburn Industrial Stormwater Assistance, Auburn, California (Senior Environmental Scientist)
Eric developed Stormwater Pollution Prevention Plans for City Wastewater Treatment Plant, Corporation Yard, and Municipal Airport. He implemented stormwater monitoring and reporting requirements for City industrial facilities consistent with NPDES statewide general permit for discharges of stormwater associated with industrial activities. Eric also assisted with the preparation of annual data reports for submittal to the State Water Board's Storm Water Multiple Application and Reporting Tracking System (SMARTS) website.

** denotes projects completed with other firms*

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