



PARADISE IRRIGATION DISTRICT

6332 Clark Road, Paradise CA 95969 | Phone (530)877-4971 | Fax (530)876-0483

AGENDA

**SPECIAL MEETING
PARADISE IRRIGATION DISTRICT
BOARD OF DIRECTORS
6332 CLARK ROAD, PARADISE, CA 95969**

WEDNESDAY, FEBRUARY 27, 2019 – 10:00 A.M.

1. OPENING
 - a. Call to Order
 - b. Public & Board Members; please silence your cell phones
 - c. Roll Call
2. PUBLIC PARTICIPATION:

Individuals will be given an opportunity to address the Board regarding matters not scheduled on the agenda, although the Board cannot take action on any matter not on the agenda. Comments will be limited to 5 minutes per speaker. Opportunity for public comment on agenda items will be provided at the time they are discussed by the Board with comments limited to 5 minutes per agenda item.
3. NEW BUSINESS:
 - a. Disaster Recovery Program Management Services (Kevin Phillips): Review and consider authorizing the District Manager to execute a professional services agreement with Water Works Engineers subject to legal review for a not to exceed fee of \$1,000,000.00. *Action may be taken.*
4. ADJOURNMENT



PARADISE IRRIGATION DISTRICT

TO: Board of Directors
FROM: Kevin Phillips
DATE: 2/26/2019
RE: Project Manager RFP
02/17/2019 Special Board of Directors Meeting

The District issued a RFP for project management services. We received three proposals back. All three firms had experience and ability to manage the entire scope of post disaster recovery planning and coordination. Staff went through an extensive scoring process. Below are the results of the scoring process based on the RFP requirements.

	APTIM	HARRIS	Water Works
Stability	0.09	0.08	0.10
Personnel	0.24	0.24	0.27
Experience	0.23	0.18	0.24
RFP	0.10	0.09	0.09
Proximity	0.07	0.10	0.09
Cost	0.06	0.07	0.08
	0.78	0.76	0.87

Total Cost of Proposal	
APTIM	\$ 9,197,600
HARRIS	\$ 3,006,681
Water Works	\$ 1,000,000

Staff is recommending selecting Water Works Engineering.

Water Works has demonstrated extensive experience managing capital projects, and also demonstrate capacity to work with district staff, Cal OES and FEMA, and other stakeholders such as the public, Town and County representatives, professional service consultants, designers and engineers, and construction companies.

Water Works demonstrated proficiency in:

- Technical expertise and knowledge related to public water systems, including infrastructure, operations, and administrative systems;
- Ability to work in coordination with District staff, expectations of work and duties to be performed;

- Ability to increase and decrease assigned support staff and expertise quickly and efficiently in accordance to the needs and approval of PID;
- Ability to secure and manage contractors, consultants, and other resources as needed to conceptualize, design, and construct water infrastructure projects;
- Technical expertise and knowledge related to the Federal Stafford Act, the 44 CFR, FEMA PA Policy Procedures, and CDAA requirements including ability to provide expert programmatic and policy advice on Federal and State disaster relief programs;
- Effective communications with FEMA, CAL OES and other grant providers.

The recommended form of motion is:

“I move to award a professional services contract to Waterworks Engineers, LLC for project management for disaster recovery services in the amount not to exceed \$1,000,000, and authorize the District Manager to execute an agreement with consultant subject to legal review.”



P R O P O S A L

**PARADISE IRRIGATION DISTRICT
PROPOSAL FOR DISASTER RECOVERY MANAGEMENT SERVICES**

FEBRUARY 15, 2019



WATERWORKS
E N G I N E E R S

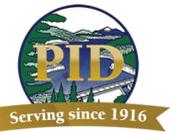


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- Attachment A – Proposal Certification
- Attachment C – Debarment and Suspension Certificate
- Attachment D – Anti-Lobbying Certification
- Review of PID Professional Services Agreement

APPENDIX B – FULL RESUMES

February 15, 2019

Paradise Irrigation District
Kevin Phillips, District Manager
6332 Clark Road
Paradise, CA 95969

RE: Proposal to Provide Disaster Recovery Program Management Services

Dear Mr. Phillips:

Water Works Engineers is pleased to present the attached proposal to provide Disaster Recovery Program Management Services for the Paradise Irrigation District (PID). This proposal will remain valid for 90 days.

Water Works Engineers will primarily serve this project from our offices in Redding (760 Cypress Ave., Suite 210, Redding, CA 96001) and Roseville (2260 Douglas Blvd., Suite 105, Roseville, CA 95661). We have included Ramboll on our team for this project to make available their previous experience on disaster recovery. Ramboll, while a worldwide organization, will serve the project from their office in Sacramento, CA. With Paradise sitting halfway between Redding and Roseville, about 80 miles from each, the vast majority of our team is within 2 hours' drive of Paradise and can be immediately responsive to project needs.

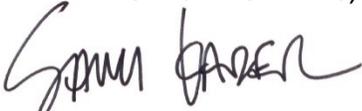
While we are neither a DBE or WBE, our Redding office is located in a Designated Qualified Opportunity Zone. Ramboll's Sacramento office is also located in a Designated Qualified Opportunity Zone. By locating in these zones, both firms support the continuing economic improvement of these areas.

Here in Redding, we experienced the destructive force of wildfire last summer during the Carr Fire. When the Carr Fire struck, the fire behavior and pace of destruction was unprecedented. Just months later we watched in disbelief and dismay as the Camp Fire ravaged Paradise and the surrounding areas. With the utmost respect for those who lost their lives in the fire, and for those who risked their lives to save others, including those PID workers who continued to work throughout the fire, we offer our services to help PID navigate through the recovery of the utility to serve the town from rebuilding forward.

If you have any questions or would like any additional information, please feel free to contact me at 530-355-7646 or email at samik@wwengineers.com. We look forward to the opportunity to work for you.

Very Truly Yours,

WATER WORKS ENGINEERS, LLC



Sami Kader, P.E., Principal-In-Charge



EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Water Works Engineers overall approach to the Paradise Irrigation District is as follows:

1. **Provide the right team.** Provide a focused core program management team who are local, familiar with and familiar to Paradise Irrigation District Staff, Management and Board, and committed to serving Paradise throughout the recovery process and beyond. Have available appropriate technical and disaster recovery experts who can be brought to play when needed.
2. **Integrate with the established PID working group.**
3. Work with Paradise Irrigation District to **define the key goals of the program.** Goal setting will be done in a collaborative manner with District Staff, Management and Board at a program kickoff meeting. Some initial goals to discuss with the District include:
 - a. Define system deficiencies
 - b. Restore full system functionality
 - i. Water pressure and flow
 - ii. Water quality
 - iii. System reliability and resilience
 - c. Maintain and enhance public trust and confidence
4. Within the framework of those goals, take a step-wise approach to **define program needs and identify the most pragmatic, effective and cost-efficient project approaches to addressing those needs.** As the program evolves, define the projects that will carry us forward.
5. With each defined project, **identify appropriate grant funding** opportunities working in conjunction with the appropriate partners from FEMA, CalOES, SWRCB, etc. to ensure that projects are grant eligible and properly structured to be grant fundable.
6. **Identify the most appropriate procurement method for each project.** Procurement methodology will be vetted with both PID Management and Board as well as the appropriate funding agency partner.
7. **Execute each project** with appropriate cost and schedule controls.
8. **Work through the program** step by step, always keeping the program goals in mind.
9. **Periodically revisit program goals** to make sure we are on track with the expectations of all stakeholders.

In order to accomplish this project approach, we have assembled a focused team of the right people for this project. Sami Kader will lead the team as the Program Manager. Mr. Kader has worked with Districts, Cities and water companies throughout the West for the last 24 years helping them define and accomplish their program goals. With broad experience in all phases of program and project implementation, from definition and planning through detailed execution and construction of capital facilities, he has the experience to help see the District through the rebuilding process. He also is local (Redding) and has a positive history with Paradise Irrigation District, at the Staff, Management and Board levels. He has established trust and will build on that trust in the execution of this program. Sami will be joined by Michael Lindquist (former City of Davis Program Manager for their \$90M wastewater program)

A decorative graphic at the bottom of the page. It features a dark blue background with several light blue, wavy lines that create a sense of movement. Above these waves, there are numerous small, light blue bubbles of varying sizes, some with highlights, giving the impression of water or a dynamic environment.

PROJECT APPROACH

PROJECT APPROACH

Water Works Engineers overall approach to providing Recovery Program Management Services is to seamlessly integrate into the established leadership team at Paradise Irrigation District. These include District Management, Operations, Maintenance, Water Quality, and Administrative staff. We see our role in providing Program Management as one of being in full support of the established leadership team, augmenting that team with water system planning, engineering, recovery and project implementation experience and expertise. We have been working with Kevin Philips and Bill Taylor extensively for the last two years and intend to continue the cooperative working relationship with them, as well as the PID Board of Directors, that we have established and build on the trust we have earned.

Key Approach #1 – Staff Continuity

Paradise Irrigation District’s journey to recovery will take time. Having continuity in the core team planning and executing this recovery will be critical to successfully navigating the challenges of the next several years. To help in this, Water Works Engineers will use the following staff as the core of this project team, throughout the project, dedicated to project execution:

Sami Kader, Program Manager has been the Project Manager and Senior Project Engineer for all of the projects Water Works Engineers has done for Paradise Irrigation District to date and will continue to serve the District throughout the recovery process as Program Manager. **Michael Lindquist, Grants Coordinator** served as the Senior Quality Control Engineer for the Reservoir B Replacement project for Paradise Irrigation district and will serve the district as the Grants Coordinator throughout the recovery process. These two project leaders are dedicated to this project throughout the project duration. Both are available to start immediately and focus on this project.

Either Sami, Michael, or both of them will attend every critical meeting required in person, in Paradise, for the duration of the project (we have made some assumptions in our scope about what this might entail). They both live and work within 90 minutes’ drive of Paradise (Sami in Redding and Michael in Roseville). If needed, they can easily be at a meeting at 10:00 am in Paradise when called upon when arriving to work that morning. This approach will keep the work consistent and build upon the trust we have already earned from the Paradise Irrigation District management, staff and Board.

Key Approach #2 – Hit the Ground Running

In order to tackle the issues facing Paradise Irrigation District effectively, we will work with PID management and staff and recommend taking the approach of breaking the problem down into smaller pieces, prioritizing those pieces, and attacking them one at a time. However, we are not starting from scratch. We have been involved with PID before, during and after the Camp Fire and understand some of the major challenges which are being faced. We have considered those issues and have the following initial thoughts regarding how to approach addressing those issues. Of course, these thoughts, and the scoped efforts to address them, will be refined in collaboration with Paradise Irrigation District Staff, Management and Board prior to program execution, but we will hit the ground running:

RETURN SYSTEM FUNCTIONALITY

While through the extensive efforts of PID staff and firefighters), a significant amount of PID infrastructure suffered minimal visible damage, significant issues remain to be addressed:

Reservoir B was destroyed by flying embers. The replacement of this key piece of infrastructure must be expedited. We have been working with PID, CalOES and FEMA to apply for grant funding and work to implement the shovel-ready project that we completed the design of last year.

- a. The thousands of destroyed meters and services have to be removed and replaced
- b. Destroyed and damaged distribution system appurtenances have to be removed and replaced
- c. Damage to the distribution system from being completely drained and refilled needs to be assessed and addressed.

A team, including PID staff and California Water Service Company personnel is already working on this issue with great effort and effect. There may be areas, however, where short-term fixes and work arounds have had to be implemented in order to bring the system back on line as quickly as possible. The work that has been done and the condition of the system needs to be reviewed so that we ensure, in the long run, that the system has been returned to pre-fire conditions.

RESTORE SYSTEM PRESSURE, FLOW AND QUALITY

With the distribution system demands reduced upwards of 90%, understanding how the distribution system will behave under the reduced demand will be critical to returning to the provision of consistent pressure, flow and likely most critically quality of water to the customers of Paradise Irrigation District. To guide the District in making decisions about what operational changes or distribution system configuration changes may be needed to return the system to pre-fire functionality and support the reconstruction of the town, we propose to build a hydraulic model of the system. The system hydraulic modeling will build on the GIS database currently being built and populated by PID field staff and WebSoft Developers, use previous information available from PID, and will be used to understand operating parameters such as system pressures, water age and fire flow under various demand scenarios and investigate possible system improvements to bring these operating parameters back to pre-fire conditions.

ELIMINATE VOC CONTAMINATION

With the destruction/melting of individual services with thermoplastic materials, VOC contamination is a known issue in parts of the system. Determining the extent of the contamination and developing and implementing a plan to decontaminate the system and re-establish public confidence is a major need that Paradise Irrigation District has at this time. We plan to approach this issue with targeted, dense sampling and testing of the water (using our project partner, Entanglement Technologies), guided by system hydraulic modeling. This sampling will identify areas which still need additional flushing, or may need replacement in order to completely rid the system of VOC contamination and bring the water back to compliance with all drinking water standards and meet the expectations of PID customers.

Scope of Work

The following services will be provided by ENGINEER for this project:

SUBTASK 1 – PROGRAM MANAGEMENT

Under this subtask, ENGINEER will work with Paradise Irrigation District to define the key goals of the program. Goal setting will be done in a collaborative workshop manner with District Staff, Management and Board at a **Program Kickoff Meeting**. Following the kickoff meeting, within the framework of those goals, ENGINEER will lay out a step-wise approach to define program needs and identify the most pragmatic, effective and cost-efficient project approaches to addressing those needs. This will be documented in a **Program Implementation Plan** which will be written and submitted to PID for discussion and refinement. Using the Program Implementation Plan, ENGINEER will **identify appropriate grant funding** opportunities working in conjunction with the appropriate partners from FEMA, CalOES, SWRCB, etc. to ensure that projects are grant eligible and properly structured to be grant fundable. Based on the available funding and the requirements of that funding, projects will be planned and implemented. Project implementation will include **grant coordination and administration** as required as well as identification of the most appropriate procurement method for each project, **procurement management for each project**, and execution and close-out of each project which makes up the program. ENGINEER will conduct **quarterly program review meetings** in order to periodically revisit program goals to make sure we are on track with the expectations of all stakeholders.

Also under this subtask will be close support of PID Staff and Management by both the Program Manager and Grants Coordinator from the project team. For the purposes of budgeting for this proposal, it is assumed that both will attend weekly meetings in Paradise for the first 6 months of the project, then monthly for the remaining 30 months of the defined project timeframe. As the program develops, this level of effort can be adjusted as appropriate.

The third part of this task will be the engagement of our team of technical experts, including Brian Crane and the technical experts from Ramboll. We will establish technical advisory panels in consultation with Paradise Irrigation District as project needs arise. Those panels will meet via teleconference. The fee reflects up to ten 2-hour technical advisory panel teleconferences.

The Water Works Engineers Program Manager will also direct the efforts of the Project Engineering team, subconsultants, etc. We will bring the needed resources to bear on the project when they are needed.

Meetings	<ul style="list-style-type: none"> ● Program Kickoff Meeting ● Weekly Recovery Team Meetings (6 months) ● Monthly Recovery Team Meetings (30 months) ● Quarterly Program Review Meetings (12 ea) ● Technical Advisory Panel Teleconferences (10 ea)
Deliverables	<ul style="list-style-type: none"> ● Program Implementation Plan ● Monthly Progress Reports

SUBTASK 2 – DISTRIBUTION SYSTEM MODELING

A steady-state potable water distribution system model will be created using Innovyze’s InfoWater model, a GIS-based platform. This model will be built using the MMS Mobile GIS database currently being developed by WebSoft Developers in conjunction with PID staff. Scenarios will be modeled with the goal of determining how the District can serve water flow, pressure and quality (as measured by water age) to return to pre-fire conditions.

1. Data Collection and Review

Available information from the District including existing water models, GIS models, water production data, unaccounted for water, pump data, water meter billing data, as built information, currently connected services, and distribution system settings. Information will be gathered by meeting at the District office and determining what is available with the assistance of the District.

2. Hydraulic Model Creation

- a. Pipes. The model pipelines will be based on GIS data from MMS Mobile. The GIS data includes the transmission and distribution system pipelines’ diameter and material. The pipelines’ data will be back checked against District as-builts as needed to confirm model set-up in preparation for updating loading demands.
- b. Nodes. Nodes will be placed at pipeline intersections. The node elevations will be created from topographic data using an assumed depth of cover.
- c. Other Features. The WTP, Pump Station 2, Reservoirs A-E, pressure reducing stations and altitude valves will be added to the model as well as inerties.

3. Water Demands and Supply

If available, historic meter data will be used to develop water use factors for residential and commercial land uses. If not, water demand factors will be used from the 2015 Urban Water Management Plan (UWMP) for residential and commercial land uses. Each parcel will be assigned a residential or commercial use per land-use data from <https://www.townofparadisemapping.com> and parcel GIS data from MMS Mobile. The water demand per parcel will be allocated to the model nodes. The projected water use will be checked against historic water production data for validity.

4. Base Model Scenarios

The following scenarios will be analyzed in a steady state model. This projected amount of water used will be compared against actual water use records from the District, if available.

- a. *Pre-Fire Average Day Demand*. Non-vacant parcels using info from <https://www.townofparadisemapping.com> will be used to populate the water demands for this scenario. This will establish baseline modeling behavior of the system and can be validated using historic data.
- b. *Post-Fire Average Day Demand*. Parcels that have had a water service turned on per MMS Mobile GIS data will be used to populate the water demands for this scenario.



Once these two base scenarios have been created, then the scenarios will be operated in an Extended Period Simulation to model water age throughout the system by node. Where significantly longer water ages are observed in the post-fire model as compared to the pre-fire model, physical system improvements or changes to water operation procedures will be explored in the model and recommended to maintain the pre-fire water age at maximum during average day demand. A PID Distribution System Hydraulic Model Memorandum (draft and final) will be prepared to document the model creation and the results of the two base scenarios.

Meetings	<ul style="list-style-type: none"> Hydraulic Model Data Collection Meeting PID Distribution System Hydraulic Model Memorandum Review Meeting
Deliverables	<ul style="list-style-type: none"> Draft and Final PID Distribution System Hydraulic Model Memorandum InfoWater model files and .pdf documentation (not modeling software)

With the establishment of the Base Model, additional model runs can be added to the scope (these have not been included in the base fee with this proposal) which can examine many different system scenarios. This could include:

Partial Build-out Average Day Demand. At a mutually agreed-upon timeframes model runs can be completed using agreed-upon growth rates and growth patterns.

Complete Build-out Average Day Demand, Maximum Day Demand Plus Fire Flow. Water demands throughout the system can be projected through build-out using values from the 2015 UWMP.

SUBTASK 3 – VOC TESTING

Based on observations made and testing that has already been done by PID and SWRCB Division of Drinking Water, ENGINEER will develop a high density VOC data collection plan. This plan will be developed first in a workshop, then in a written plan. Following agreement on the VOC Data Collection Plan, ENGINEER will collect VOC data from the areas of concern identified. Up to 60 samples/10-hr day can be processed, at a total cost of \$60-80/sample. This initial scope is based on a four week mobilization to the site, with a total of up to 1200 samples in order to provide high density testing. We are assuming that PID staff will take the samples and deliver them to the testing van during this sampling period.

Meetings	<ul style="list-style-type: none"> High Density VOC Data Collection Workshop
Deliverables	<ul style="list-style-type: none"> VOC Data Collection Plan VOC Data Mapping Report

Project Schedule

Program Management, as defined in Subtask 1, will be ongoing throughout the 36-month project schedule. Assuming timely support from PID Staff, Baseline Modeling and VOC Testing as defined in Subtask 2 and 3, will be completed within 90 days of Notice to Proceed.

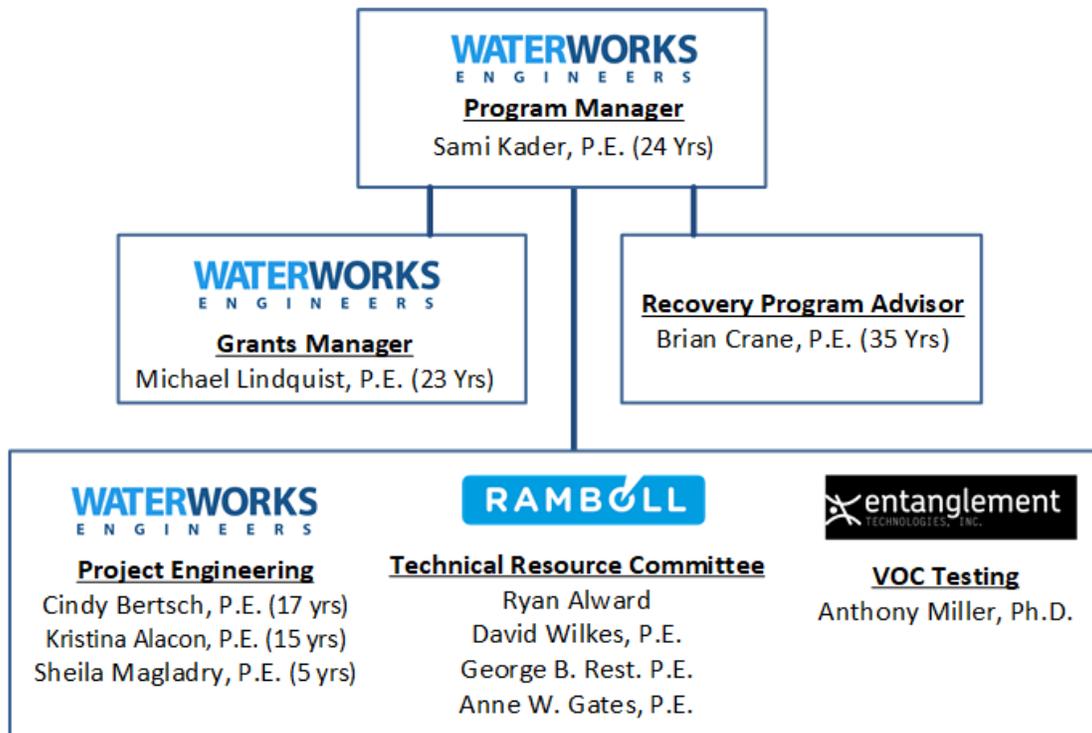


QUALIFICATIONS

QUALIFICATIONS

Project Team Organization

Water Works Engineers has assembled a highly qualified, professional, experienced program and project management and engineering team for this project. We have a core program management team with project engineering, technical advisory and technical specialist team members available to execute the core aspects of the program. Additional technical experts can be added to the team as needed during the execution of the project. The following organizational chart summarizes the team organization.



References

Water Works Engineers has worked for hundreds of clients throughout the Southwestern United States. From small Mutual Water Companies to large Cities and Water Districts, we have had positive working relationships with industry professionals throughout our history. Our past work for Paradise Irrigation District is our best reference, but a few additional references who may be of interest to PID include:

Chuck Aukland	Director of Public Works	City of Redding	530-510-0921 caukland@cityofredding.org
Phil Scott	District Manager	West Bay Sanitary District	650-477-6470 pscott@westbaysanitary.org
Colleen Boak	Senior Engineer, Environmental Utilities	City of Roseville	916-960-3271 cboak@roseville.ca.us

If additional references are desired, they can be made available upon request.

Water Works Engineers

760 Cypress Ave, Suite 210, Redding, CA 96001

Water Works Engineers was formed in 2005 by engineers who believed that water wastewater engineering and consulting could be done a better way, by combining the best attributes of large and small engineering and consulting firms: the technical expertise and resources of large firms and the personal attention to client specific needs of small firms. Our vision was the formation and growth of a new kind of engineering firm, a firm built on providing exceptional client service from highly experienced engineers in a “hands-on” highly interactive and enjoyable environment.

To accomplish our vision, Water Works Engineers provides high-level staffing on every project with a leaner overall firm structure that is focused on delivering high quality work for client-specific needs. Since 2005, we have grown to more than 75 planners, engineers and designers, using targeted recruitments of highly skilled individuals. We focus solely on water and wastewater treatment, distribution and collections infrastructure. This focus makes us efficient, keeps us up to date, and allows us to provide the highest level of service.

Based on our experiences, we strongly believe that **people execute projects, not firms**. For that reason, we are committing high-quality, senior staff with in-depth experience directly relevant to this project. These are experienced professionals who have been directly involved in multiple water system planning, water storage, treatment and pump station evaluations, designs, and construction projects. We are pleased to be teaming with:

- **Brian Crane, P.E.** Former Public Works Director and current Carr Fire Recovery Director for the City of Redding. Brian will be available as a technical expert to assist in navigating the recovery and grant management processes.
- **Ramboll** for Disaster Recovery Engineering expertise
- **Entanglement Technologies** for Water Quality Testing for VOCs

In addition to these initially identified project partners, Water Works Engineers has established long-term working relationships with local Northern California firms who provide a wide variety of specialty services to the water engineering industry, including hazardous waste characterization and remediation (**Remedy Engineering**), geotechnical and geological engineering (**Bajada**), for CEQA/CEQA+/NEPA environmental permitting (**Stantec**), surveying, right of way, etc. Whatever project need arises, we have the in-house technical expertise, or an established project partner who can address the issue.

The core delivery team for the Program Management scope of this project is **Sami Kader** (Program Manager) and **Michael Lindquist** (Grants Coordinator). They are joined by a project engineering team which includes **Cindy Bertsch**, **Kristina Alacon** and **Sheila Magladry**. This team has a proven track record with the Paradise Irrigation District and we look forward to providing continued service.

SAMI KADER, P.E.**Program Manager**

Sami has over 24 years of experience in water and wastewater system planning, design, construction and operations. Sami is a Founder and Principal Engineer of Water Works Engineers and serves as a technical advisor for many major projects for the firm. Sami will be the Program Manager for this project. Sami has built his career on understanding client needs and providing superior client service in every aspect of his work. He is a civil design and construction engineer who has worked as a client service manager, project manager, design manager, project engineer and construction manager for over \$300M of water and wastewater facility projects. For the last 2 years he has been working for Paradise Irrigation District on the Reservoir B Replacement Project, Zone A Pump Station and Pipeline, as well as NPDES renegotiation for the WTP backwash waste discharge and structural assessment of the Magalia Dam outlet piping. He has worked with District Staff and Management to define project needs, establish project budgets and detail the design engineering for the needed improvements so that it meets all expectations for reliable long-term operations. He has also worked with the PID Board to present to them clearly defined project alternatives, detail the pros and cons of each alternative, and facilitate programmatic decision-making regarding project path forward at the Board level in a transparent and unbiased manner. He understands the civic nature of civil engineering and the importance of consensus building and transparency in decision making to the long-term success of every program and project and works with every client to establish good decision making practices and provide all of the information needed for the decision making bodies of each of his client to understand the intricacies of sometimes complex engineering issues and make decisions they can be confident in.

MICHAEL LINDQUIST, P.E.**Grants Manager**

Mr. Lindquist is a civil engineer with 23 years' experience in planning, design, and construction of utilities projects. A majority of his experience has been as a public servant, working for California State Parks, University of California, and City of Davis. He has been the designer of record, construction manager, and overall project/program manager for projects ranging from \$10,000 to \$90M. From 2010-2018, he was the Program Manager for a \$90M wastewater improvement program where he was responsible for creating accurate budget forecasts, securing State and Federal funding assistance, managing engineering, environmental, and financial consultants, overseeing the design and construction of projects, and communicating progress with public officials and customers. Mr. Lindquist has experience navigating the process of approval and funding agencies, such as the State Water Resources Control Board, Corps of Engineers, Office of Historical Preservation, CalTrans, and FEMA. He has been directly responsible for the creation of CEQA (California Environmental Quality Act), CEQA+, and NEPA (National Environmental Policy Act) documents for utility programs and projects. He will work closely with Sami on the execution of this project.

BRIAN CRANE, P.E.

Project Advisor

Mr. Crane is a registered civil engineer with over 35 years of experience, 30 of which were spent serving the public sector, for Caltrans District 2 and the City of Redding. His service in the public sector has given him decades of experience in the planning and implementation of complex civil works improvements programs, including transportation, stormwater, drinking water and wastewater, solid waste, and all facets of Caltrans and City public works. For decades he has navigated a wide variety of project funding, regulatory, technical, managerial and public relations challenges with great successes in project accomplishment and program implementation. Most recently, as a retired annuitant, he is the Director for the Carr Fire Recovery effort for the City of Redding. This position has required close coordination not only with FEMA and CalOES on the grant funding of recovery efforts, but also close coordination with Shasta County (the Carr Fire struck both inside and outside the City limits) and communication with the public. This current role continues his stellar record of public service in Civil Engineering. His experiences with the Carr Fire will be invaluable as guidance for our team in executing this Program Management role for the recovery of PID from the Camp Fire. Mr. Crane is available as an outside consultant to Water Works Engineers on an as-needed basis.

CINDY BERTSCH, P.E.

Lead Project Engineer

Ms. Bertsch is a civil engineer focusing on municipal water and wastewater planning and design. She has over 18 years of experience that includes performing engineering evaluations; preparing technical drawings, specifications, and cost estimates; completing construction services; facilitating permitting; writing master and facility plans; and hydraulic modeling. She has vast experience in water hydraulic modeling, design, and construction. Her modeling expertise includes both steady state and extended period simulation (EPS) for hydraulic and water quality modeling. She has experience with several different modeling software packages including, but not limited to, WaterGEMS, WaterCAD, InfoWater, and EPANet. She also has GIS software experience, which will be useful in the creation of the model runs for PID. Ms. Bertsch led the modeling for master planning projects for the City of Reno, Washoe County, Northstar Community Services District, City of Williams, City of Colusa, City of Live Oak, City of Escalon, Forest Hill Public Utility District, Calaveras County Water District, Christian Valley Water District, and City of Lincoln.

KRISTINA ALACON, P.E.

Project Engineer

Ms. Alacon is a civil engineer with 15 years' experience in planning and design. She has a wide range of project design experience in civil infrastructure, including new and rehabilitation of existing water storage reservoirs, various diameter pipelines, pump stations, and master planning. Her work includes pipeline alignment studies, detailed construction drawings, hydraulic calculations, construction support, utility coordination, and permit acquisition.

SHEILA MAGLADRY, P.E.

Project Engineer

Ms. Magladry is a registered civil engineer with nearly 5 years of experience in large and small civil infrastructure projects, including conceptual and preliminary design reports, construction document creation, engineering services during construction, and environmental inspector services. She has experience writing alternatives analyses, designing treatment plant upgrades, expansions, modifications, and collection and treatment system monitoring. Ms. Magladry also has experience coordinating with multiple local, state and federal agencies.

Ramboll

1201 K Street, Suite 1201, Sacramento, CA 95814

Ramboll is a leading engineering, design and consultancy company founded in Denmark in 1945. The company employs more than 15,000 experts globally. With 300 offices in 35 countries, Ramboll combines local experience with a global knowledgebase constantly striving to achieve inspiring and exacting solutions that make a genuine difference to our clients, the end-users, and society at large. We empathize with clients who are faced with the challenges of securing ample water supplies, treating the water to stringent drinking water standards, and delivering that water through an aging distribution system, all at a reasonable cost. Our team uses this empathy to drive creative, client-focused solutions whether the need be transforming former quarries into reservoirs, reducing chemical and energy costs with advanced treatment technologies, or pioneering new approaches to maintain water quality all the way to the customer's tap. Our industrial water specialists go beyond the meter and provide high-purity water and water-saving techniques that address the needs of industry. By optimizing the use of water and existing water system assets, we find a way to achieve sustainable, affordable solutions.

RYAN ALWARD

Ramboll Resources Manager

Mr. Alward has over 12 years of experience working on California water resources projects. He is a certified hydrogeologist who specializes in water resources planning and groundwater well design. Mr. Alward has worked with both local agencies and the California Department of Water Resources extensively. He has provided services for municipal, agricultural and industrial clients including well design, well construction, developing well rehabilitation programs and water quality monitoring programs. He has also assisted clients with their short-term groundwater substitution transfers by conducting the monitoring and reporting required by DWR for the transfers. Mr. Alward has conducted hydrogeologic evaluations for groundwater management and performed hydrogeologic feasibility studies for water banking and recharge basin projects. He has also assisted clients with aquifer storage recovery well evaluations to evaluate the siting of future ASR wells for pilot studies and groundwater banking. Mr. Alward is also experienced in environmental soil and groundwater sampling methods and CEQA processes. Mr. Alward is Hazardous Waste Operations and Emergency Response (HAZWOPER) certified.

GEORGE REST, P.E.**Drinking Water Planning Specialist**

Mr. Rest is OBG-Ramboll's Drinking Water Practice Leader. He directs large, comprehensive water programs involving multidisciplinary teams of engineers and scientists. These programs have involved water service replacements for large urban areas, emergency response, water quality, emerging contaminants, capital budget planning, final design and operations support. He has 42 years of experience in the water engineering industry and brings a broad perspective on drinking water planning issues to bear on each project which he is involved with.

DAVID WILKES, P.E.**Drinking Water Quality Specialist**

Mr. Wilkes has extensive (35 years') environmental engineering and project management experience. As a nationally-recognized water expert, he is experienced with a variety of water quality issues and advanced water treatment technologies, including low-pressure membranes, ultraviolet disinfection, granular activated carbon, ozonation, high-rate and direct filtration, ion exchange, and advanced oxidation. Mr. Wilkes has been involved in a variety of water treatment and water quality projects, including feasibility studies, pilot testing, design, and construction management for new and the expansion / rehabilitation of water treatment plants ranging from 5 million gallons per day (MGD) to more than 500 MGD. He is also well versed in Safe Drinking Water Act (SDWA) regulatory requirements and has evaluated treatment plants and water systems for compliance with these regulations.

ANNE W. GATES P.E.**Remediation Specialist**

Ms. Gates has been a licensed professional engineer in California since 1987, with over 30 years of experience in consulting engineering related to environmental investigations, feasibility study analyses, civil/environmental design and remediation construction. For both private- and public-sector clients, she provides overall technical management related to site investigation and remediation of contaminated property. She has prepared feasibility studies, engineering evaluations/cost analysis (EE/CA) reports and remedial action plans (RAPs) to analyze and select alternatives for site remediation. The alternatives evaluated in these reports have included innovative technologies, risk management strategies and traditional remedies. For the past 10 years, Anne's environmental engineering work has focused on decommissioning, closure and remediation of sites for the purposes of redevelopment. These projects have included preparation of detailed cost estimates for the design, construction and monitoring of environmental remediation alternatives. She has also provided expert testimony on projects involving environmental investigation, cost recovery and remediation.

Entanglement Technologies

42 Adrian Court, Burlingame, CA 94010

Entanglement Technologies develops the world's most advanced chemical sensors, bringing real-time analysis out of the laboratory and into the field. We make the invisible world of chemicals accessible and actionable with rapid and precise sensing technology. Their AROMA instrument identifies compounds that previously could only be analyzed in laboratories and delivers results in minutes. The sensor specializes in identifying chemicals to identify health hazards in the environment, develop natural resources, and improve safety and security across a range of applications. The high-quality data stream generated by AROMA readily integrates with existing data management software and visualization tools to provide new insights and intelligence for the applications we serve. AROMA's core chemical detection technology uses the same ultra-precise sensing platform that powers the LIGO gravitational wave detector. We are building on research in quantum engineering conducted by Entanglement's cofounders at Caltech and Stanford.

Entanglement Technologies and Ramboll responded to the devastation of the Carr fire through the collaborative deployment of the AROMA-VOC chemical analyzer with a newly developed water analysis front end. This tool was used to perform rapid screening of drinking water within the City of Redding and the City of Centerville in collaboration with their water districts and the California waterboard. Fourteen (14) different samples were analyzed in the field with a maximum 15-minute hold time from sampling to analysis. Samples were collected by Ramboll personnel and presented immediately to Entanglement Technologies for analysis. Measurements were employed to ensure that drinking water concentrations were below the 1 µg/L Maximum Contaminant Level (MCL) established by the State of California for Benzene in drinking water. No concentrations at or above the MCL were detected.

The AROMA analyzer provides real-time, speciated, ultra-trace mobile chemical analysis. AROMA delivers ppt level concentration information with performance that rivals the best laboratory-based chemical analysis techniques in harsh environments and is an extremely valuable tool for mobile surveys, emergency response, and community exposure evaluation. AROMA is based on a combination of optical spectroscopy and a pre-concentration/focusing front end to deliver robust reliable performance. When mounted in the mobile atmospheric analyzer, AROMA collects and analyzes data either automatically or under operator direction. Ancillary data (GPS, windspeed, etc) are collected via onboard instrumentation). AROMA is insensitive to driving conditions and ambient weather except insofar as they impact the local pollution environment. An onboard battery system can provide > 5 hours of stationary operation or the onboard ICE can be used to provide extended endurance measurements.



The Mobile Atmospheric Analyzer houses the AROMA analyzer and provides an extended field capability.

Species	MDL (1500 mL sample)	MDL (100 mL sample)
Benzene	< 2 pptv (0.005 µg/m ³)	< 150 pptv (0.45 µg/m ³)
Toluene	< 3 pptv (0.01 µg/m ³)	< 750 pptv (2.25 µg/m ³)
Ethylbenzene	< 10 pptv (0.05 µg/m ³)	<1500 pptv (6.75 µg/m ³)
Xylenes	< 10 pptv (0.05 µg/m ³)	<1500 pptv (6.75 µg/m ³)
Trichloroethylene	< 10 pptv (0.02 µg/m ³)	< 750 pptv (1.50 µg/m ³)

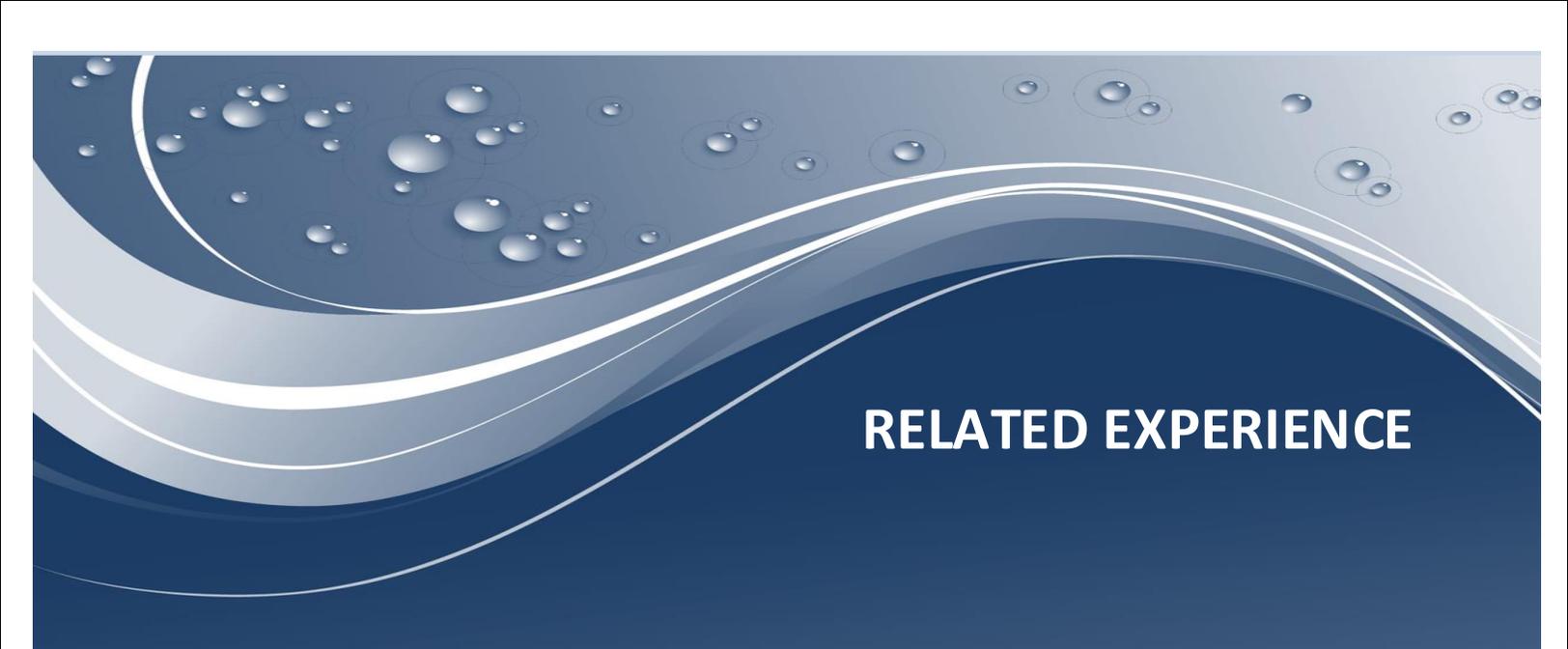
Measurement	
Analysis time	10 Minutes
Sampling Duration	1 Minutes
Calibration	As required by testing protocol
Data Reporting	Attached PC, WAN gateway compatible
Data Format options	json, csv
Global Positioning System	Built In
Sample Volume Range	5-5000 SCC
Sampling Flow Range	5-500 SCCM

Performance of the AROMA analyzer has been verified through side-by-side trials with the Bay Area Air Quality Management District (BAAQMD), the EPA, ESTCP, and the City of Houston’s Mobile Ambient Air Monitoring Laboratory. This has verified AROMA’s performance over a broad range of concentrations and ambient conditions ranging for ambient air to sanitary sewer headspace to soil vapor at Superfund sites.

ANTHONY MILLER, PH.D.

Water Quality Analytics Specialist

Mr. Miller is founder of Entanglement Technologies and an expert in the application of precision laser techniques, precision measurement, and signal processing to the analysis of environmental Hazards. Develops and implements quantitative analytical techniques toxic analysis. Extensive experience in volatile analysis in air, soil, and water. Prior expertise in the quantum mechanical limits of measurements and the role of quantum dynamics in the measurement of small systems. This included quantum limited magnetometry and single atom, strong coupling cavity quantum electrodynamics experiments. Leading expert in cavity ring-down spectroscopy and applications. Provides field analytical services for rapid screening of contaminated sources. Services include indoor air, soil vapor, sanitary sewer headspace, and drinking water screening. Deployments have included BAAQMD, US EPA, City of Houston, ESTCP, and the City of Redding.



RELATED EXPERIENCE



CLIENT

US Army Corps of Engineers,
Philadelphia District

LOCATION

Newark, NJ

KEY FEATURES

Emergency Response to
Superstorm Sandy

Independent cost estimating
and technical support for FEMA
funding

Largest ever temporary
deployment of biosolids
dewatering

Hurricane Sandy Emergency Response at Passaic Valley Sewerage Commission (PVSC)

Oversight of Temporary Sludge Dewatering Mobilization and Operations

In response to Hurricane Sandy devastation, OBG-Ramboll aided emergency response efforts to recover critical infrastructure assets in the metropolitan New York/New Jersey area. Within days of the storm, OBG-Ramboll mobilized a team of engineers to support the U.S. Army Corps of Engineers (USACE), Philadelphia District in its mission to restore operations at the Passaic Valley Sewerage Commission's (PVSC) regional wastewater treatment plant. USACE was designated by the Federal Government to support the Federal Emergency Management Administration (FEMA).

One of the half dozen largest wastewater treatment plants in the country, the PVSC facility serves 1.4 million residents in northern New Jersey, and handles significant sludge quantities generated by New York City. In this hurricane-affected region, the plant was one of 11 high-priority flooded public facilities. More than 200 million gallons of tidal surge had inundated the plant, rendering sludge-handling equipment inoperable.

To support recovery efforts, OBG-Ramboll performed an expedited evaluation of sludge dewatering and disposal options. In less than three days, the Company identified a solution and potential contractors, assisted with contract negotiations, and prepared independent cost estimates for emergency procurements.

Throughout the project, field operations were coordinated with USEPA and New Jersey Department of Environmental Protection representatives. By closely monitoring the emergency response effort, OBG-Ramboll helped PVSC

save more than \$4 million by accelerating demobilization of the dewatering equipment. OBG-Ramboll performed the work under its indefinite delivery contract (IDC) with the Philadelphia District.

OBG-Ramboll's services included:

- Assistance in negotiating an agreement between PVSC and a contractor for the installation and operation of the temporary dewatering facility
- Preparation of a Memorandum on Cost Reasonableness for the temporary sludge dewatering contract as required for emergency contracting by PVSC.
- Preparation of a Memorandum on FEMA Eligibility, to support executive management at PVSC
- Preparation of a Memorandum on Cost Reasonableness for the fast track design/build repairs to the sludge dewatering centrifuge facility, as required for emergency contracting by PVSC.
- Preparation of predictive cost estimates for the dewatering and disposal contract under a range of demobilization schedules. Final cost predicted as low as \$8.3 million for rapid demobilization versus original estimate of \$14.135 million. PVSC immediately instituted rapid demobilization and saved over \$4 million.
- Resident engineering/construction oversight of contractor's set-up and dewatering operations, which involved 10 temporary dewatering centrifuges, control equipment, polymer mixing and aging tanks, lime storage silos, conveyors and power generation equipment and coordinating its installation with PVSC management and operational personnel.
- Support for discussions with the USEPA and NJ Department of Environmental Protection concerning the control of hydrogen sulfide and ammonia which might be generated during the operation of the temporary dewatering plant.
- Review of contractor's pay requests and field changes
- Final walk-through with Passaic Valley Sewerage Commission.



Project Reference

Dan Sirkis USACE, Philadelphia District (215) 313-1153 (M)
Bridget McKenna, PE; Chief Operating Officer, PVSC (978) 817-5976 (O)



COST PROPOSAL



COST PROPOSAL

As stated in the contract terms in the RFP, we propose that the work for this project be performed on a time and materials, not to exceed basis. The following budgets are proposed for the scope definitions and assumptions given in this proposal. Further negotiation of scope included in this contract can, of course, take place prior to contracting. Because of the nature of this work, additions to the scope may be negotiated as the work unfolds and project needs develop. Those additions to the scope will be priced using the same methodology and same rate structure described below.

Project Budgets and Total Fee

		Hours and Fee						
		Subtask 1		Subtask 2		Subtask 3		
		Program Management		Distribution System Modeling		VOC Testing		
		hrs	fee	hrs	fee	hrs	fee	
<i>Water Works Engineers</i>	2019							
Classification	Title	Hourly Rate						
AA	Administrative	\$102	480	\$48,960				
T1	Drafter/Jr. Technician	\$85						
T2	Designer/Sr. Technician	\$115						
T3	Senior Designer	\$141						
I1	Field Inspector	\$137						
I2	Senior Inspector	\$152						
I3	Supervising Inspector	\$170						
E1	Staff Engineer	\$127						
E2	Associate Engineer	\$155		320	\$49,600			
E3	Project Engineer	\$175		120	\$21,000			
E4	Senior Engineer	\$203	1560	\$316,680	120	\$24,360	40	\$8,120
E5	Principal	\$235	1680	\$394,800	18	\$4,230	24	\$5,640
Subconsultants and Expenses								
	WWE Expenses			\$16,000	\$700		\$400	
	Brian Crane			\$8,000				
	Ramboll			\$30,000				
	Entanglement Technologies						\$60,000	
	Subconsultant/Expense Markup	10%		\$5,400	\$70		\$6,040	
Subtask Totals			3720	\$819,840	578	\$99,960	64	\$80,200

Total Not to Exceed Fee (Subtasks 1-3)	
Hours	Fee
4,362	\$1,000,000



RATE SCHEDULE

RATE SCHEDULES

Water Works Engineers

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

Notes:

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

Ramboll

Title	Hourly Rate
Support	\$82
Drafting	\$98
Consultant 1	\$103
Consultant 2	\$120
Consultant 3	\$142
Senior Consultant 1	\$165
Senior Consultant 2	\$180
Managing Consultant	\$215
Senior Managing Consultant	\$255
Principal Consultant	\$275

Notes:

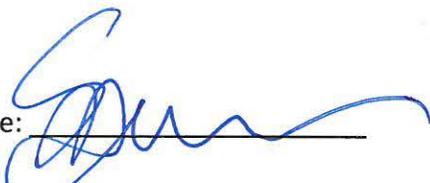
1. A markup of 6% will be added to all project labor for communications charges.
2. A markup of 15% will be applied to all project related Direct Costs and Expenses.
3. Rate effective through December 31, 2019. Subject to annual adjustment.



APPENDIX A
ADDITIONAL REQUIREMENTS

ATTACHMENT A

PROPOSAL CERTIFICATION

Proposers Signature:  Date: 2/15/19

By signing above, I Certify that I have carefully read and fully understand the information contained in this RFP and any addenda thereto; and that I have the capability to successfully undertake and complete the responsibilities and obligations of the Proposal being submitted and have the authority to sign the proposal on behalf of my firm.

ATTACHMENT C

Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion-Lower Tier Covered Transactions

This certification is required by the regulations implementing Executive Orders 12549 and 12689, 2 C.F.R part 180, Debarment and Suspension, and 2 C.F.R. § 200.213.

Copies of the regulations may be obtained by contacting the person to which this proposal is submitted.

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON PAGES TWO AND THREE BELOW)

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals are presently debarred, suspended, proposed for disbarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

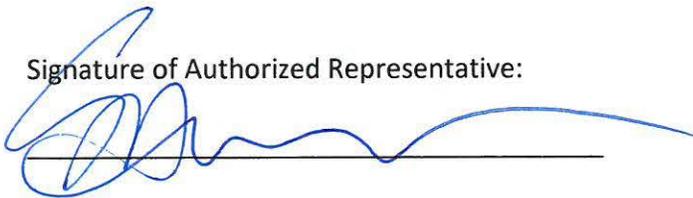
Firm Name:

Water Works Engineers, LLC

Name and Title of Authorized Representative:

Sami Kader, Principal

Signature of Authorized Representative:



Date:

2/15/19

ATTACHMENT D

CERTIFICATION REGARDING LOBBYING

The undersigned [insert name] certifies, to the best of his or her knowledge, that: No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

1. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form- LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. The undersigned shall require that the language of this certification is included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

The contractor certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. § 3801 et seq., apply to this certification and disclosure if any.

Signature of Contractor's Authorized Official:



Name and Title of contractor's Authorized Official:

Sami Kader, Principal

Date: 2/15/19



Review of PID Professional Services Agreement

Water Works Engineers has reviewed Paradise Irrigation District's proposed Professional Services Agreement, is able to meet all requirements of that Agreement, and takes no exceptions to any of the provisions of that Agreement.



**APPENDIX B
FULL RESUMES**

SAMI KADER, P.E.

Principal-in-Charge, Project Manager



Education

M.S. – Civil/Environmental Eng.
University of Washington (1995)
B.S. - Civil Engineering,
University of CA at Davis (1993)

Experience

22 years

Registration

Registered Civil Engineer
Arizona - 35250
California - C56653
Hawaii -14033

Memberships

AWWA
CWEA

Mr. Kader is a civil/sanitary design and construction engineer with 22 years of experience in water, wastewater, and conveyance projects. He has worked as a project manager, design manager and project engineer for large and small design projects as well as a resident engineer for large and small construction projects. His extensive construction administration experience provides him with a real world practical knowledge of the application of design documents and details during construction and provides insight in the creation of constructible, practical designs which accomplish the intended engineering function with efficiency in both construction and operation. Sami's construction administration experience also provides him with a background in claims avoidance and assists in creating plans and specifications which will minimize confusion and claims (and therefore controlling overall project costs) during bidding and construction.

REPRESENTATIVE PROJECT EXPERIENCE

Paradise Irrigation District Zone A Pump Station, Transmission Main and Reservoir B Replacement – Paradise, CA (Design) Mr. Kader is the Project Manager for the Paradise Irrigation District for the Zone A Pump Station, Transmission Main, and Reservoir B Replacement Project. The existing system supplies potable water to 26,000 people through a single transmission line (built in 1955) from the WTP to the distribution system through a “pinch point”, Reservoir B - a lined earthen reservoir with a floating cover. The earthen reservoir has raised reliability, maintenance and operation, as well as water quality issues. Improvements include Reservoir B replacement with two 145-foot diameter, 2.3 MG bolted steel tanks; new Zone A pump station capable of pumping 2,800 gpm; and a new 16-inch diameter Zone A transmission main that is 2 miles long, connecting Zone A Pump Station to distribution Zone A.

Golden State Water Company Southern Well No. 6 Manganese Treatment Gardena, CA (Design/Build) Mr. Kader was the Principal in charge for the planning, design of a new Mn Treatment Facility that includes, 1,000 gpm ATEC Pressure Filter System, 40,000-gallon Backwash Tank, New aqueous ammonia and fluoride injection point and 110-gpm Decant Pump Station (Backwash recycle).

City of Oceanside – Robert A. Weese Water Filtration Plant, Chemical Facilities Upgrades Design-Build Project – Vista, CA (Design-Build) Mr. Kader provided QA/QC on the replacement and upgrade of 7 chemical feed systems at the 25-mgd surface water treatment facility. The design-build project includes the design, permitting, construction, and start-up of the following chemical feed systems, aluminum sulfate, aqueous ammonia, sodium hydroxide, sodium hypochlorite, sulfuric acid, anionic polymer, and cationic polymer. Each chemical facility includes the design and construction of the chemical truck delivery system, chemical tanks, secondary containment, feed pumps, and the associated piping, valves, and controls.

City of Redding Well 12 Arsenic/Manganese/Iron Treatment System – Redding, CA (Design) Well 12 has arsenic levels as high as 12 ug/L, manganese levels approximately 130 ug/L and iron levels approximately 100 ug/L. The well is a primary producer (3100 gpm) for the City's Enterprise Wellfield, a critical part of the water supply portfolio for the City, especially during drought conditions. WATERWORKS was hired to determine the optimal approach for arsenic and manganese removal so that this well could serve as a blending source for overall primary MCL arsenic compliance in the wellfield as well as a manganese- and iron-free source to reduce the overall mass loading of manganese and iron to the system to address ongoing secondary MCL compliance issues and customer



manganese complaints. Mr. Kader served as Project Manager for the planning, bench testing, conceptual and final design of a manganese greensand filtration system.

Lehigh Cement Process Water Treatment Plant – Cupertino, CA (Design) Mr. Kader provided QA/QC on the design of a process water treatment plant treating industrial waste in partnership with the treatment equipment supplier to deliver project design and bid documents on a rapid timeline in order to meet regulatory requirements.

Albuquerque Bernalillo County Water Utility Authority Ferric Chloride Station Safety Improvements – Albuquerque, NM (Design) Mr. Kader is the Principal in Charge on the design of multiple improvements to ABCWUA's Station 70, ferric chloride railcar unloading and transfer station.

Soda Bay Water System Improvements Phase 2, Lake County Sanitation District 0 Lakeport, CA (Design) Design of upgrades to the 0.5 mgd WTP. Improvements included new raw water pumps and vacuum priming pump, filter effluent pumps, backwash pump, high service pumps, clarified backwash return pump, ozone feed system, Trident Unit repairs, dissolved air flotation unit, and sludge dewatering system including pond modifications, homogenization tank, and screw press. Mr. Kader provided QA/QC on this project.

California Water Service Company Dominguez Treatment Facilities Project – Carson and Long Beach, CA (Study/Design/CM) Mr. Kader was the Principal in Charge on this project that included preliminary engineering analysis and design as well as services during construction to bring Well 275-01 and 294-01 back into operation while meeting CWSC's water quality goals including color, odor, sulfide and methane removal from the groundwater and the reduction of total trihalomethanes in the finished water. The facility improvements at Well 275-01 (800-gpm) and 294-01 (1,200-gpm) utilize the following process train: basket strainers, air stripping, gas scrubbers, booster pumps, ion exchange and disinfection through chloramination.

California Water Service Company, S. San Francisco Station 1 WTP Upgrade – South San Francisco, CA (Design) Mr. Kader provided QA/QC on this project that entailed increasing the capacity and treatment capability of the plant. The project will upgrade the WTP to treat a well flow of 1,600 gpm from six wells. The upgrade project will allow the plant to produce water that meets regulations without needing to blend the treated water with San Francisco Public Utilities Commission water. The plant will still blend water between wells to address contaminants such as nitrate, arsenic, chromium 6, and volatile organic carbon contaminants.

California Water Service Company, Hawthorne WTP - Hawthorne, CA, (Design) The Hawthorne WTP treats groundwater to water quality standards. Mr. Kader managed the design/ build project to improve and to restart the existing WTP. The contaminants of concern included color, methane, TOC/DOC, ammonia, iron, and manganese. The project design and construction schedule was accelerated and was completed in approximately 16 weeks.

California Water Service Company, Northwest Bakersfield WTP – Bakersfield, CA, (Study) The Northwest Bakersfield Water Treatment Plant (NWBWTP) is an 8-mgd direct filtration plant which uses in-pipe coagulation (dosing polyaluminum chloride in the intake pipeline) and Pall Microza membrane microfiltration to treat raw surface water for drinking water. Mr. Kader oversaw this study to examine possible alternatives to increase the reliable plant operating capacity back to the original design of 8-mgd.

California Water Service Company, Chromium 6 Study, (Study) Mr. Kader oversaw this study that developed a comparison of viable treatment technologies and associated costs to meet the potential California Department of Public Health Maximum Contaminant Levels for Chromium 6.

Pasatiempo Golf Club Recycled Water Project – Santa Cruz, CA (Assessment/Design/SDC) Mr. Kader was the Sr. Project Engineer that provided an alternative feasibility study and pilot testing, Water Works then performed detailed design and ongoing construction support for the filtration and disinfection treatment systems for the

Pasatiempo Golf Club Tertiary Recycled Water System. This facility is designed to initially filter up to 320 gpm instantaneous flow of secondary effluent from the Scotts Valley WWTP Effluent Pipeline to tertiary standards, with the possibility of peak flow treatment up to 700-gpm to take advantage of available secondary effluent during peak flow time periods.

City of Ceres Blaker Well 32 Filter Rehabilitation – Ceres, CA (Design) Mr. Kader was the Principal in charge of the design for retrofit of existing manganese dioxide pressure filtration system for manganese arsenic removal, with failed underdrain system. Evaluated different media options, and recommended replacing media with Greensand due to lower cost and backwash rates. The design included a static mixer for chemical mixing, and a new underdrain system including concrete fill, reuse of existing inlet header, and owner-purchased nozzles (2.9 mgd).

City of Ceres Blaker Well 32 Improvements Project – Ceres, CA (Design) Mr. Kader was the Principal in Charge of the preliminary design report to evaluate backwash recovery, solids handling, chemical feed and various other improvements at existing groundwater treatment plant for manganese and arsenic. Mr. Kader managed final design of recommended facilities, including new metal building for chemical storage and feed, backwash recovery tank and pumps, chemical feed system and site improvements (2.9 mgd).

Trinity Center Mutual Water Company WTF - Trinity Center, CA (Design) Mr. Kader managed the preliminary and final design. The project consisted of a new 300 gpm WTP to replace the non-functional sand filter with direct pressure filters in metal building, new gaseous chlorine feed system, backwash recovery system, controls, emergency generator, and 429 kgal welded steel water storage tank. Prepared permit applications to Trinity County (Special Use Permit) and monthly reimbursement claims to the State. Funding source was combination of SRF (grant and loan) and Proposition 50 (grant) through CDPH.

City of Shasta Lake Water Treatment Residuals Feasibility Analysis - Shasta Lake, CA (Study) Mr. Kader was the Principal in Charge of this study that evaluated continued use of the Dewatering Ponds, which would require a Title 27 compliant lining and leachate monitoring system, in addition to elimination of the discharge of any dewatering liquids from the site (via land application). In addition, Water Works Engineers is evaluating the construction of a dewatering facility on the grounds of the WTP, which would allow the City to eliminate the operation and maintenance of the dewatering ponds on a separate site.

City of Montague, WTP Improvements – Montague, CA (Design) Mr. Kader was the Principal in Charge of this project to analyze treatment process alternatives and comparative cost to benefit analyses for 1 mgd surface water treatment plant improvements required to reduce disinfection byproduct formation, reduce finished water taste and odor, and improve plant reliability. The City's source water presents several challenges including high pH and alkalinity, dissolved organic carbon, and algal growth. The project team is in the development of multiple treatment process alternatives, and comparing them with respect to capital costs, operating costs, ability to meet regulatory demands and project goals, and ease of operation.

California Water Company Lucerne Water Treatment Plant Upgrade Project - Lucerne, CA (Design) Mr. Kader managed the design upgrade of a 1-mgd Water Treatment Plant from dual-media pressure filtration, carbon absorption and chlorine disinfection to microfiltration and ultraviolet disinfection. Included upgrades to various ancillary WTP systems including chemical storage and feed, pretreatment chemical addition and mixing, pre-screening, backwash settling and solids dewatering systems.

City of Aurora Water Treatment System Design for Iron, Manganese and Arsenic Removal Aurora, OR (Design) Mr. Kader was the Principal in charge of QA/QC of a new 500-gpm greensand filtration system for the removal of arsenic, iron and manganese. IT uses oxidized naturally occurring iron for the coagulation of arsenic and subsequent filtration of arsenic with the greensand filter. Manganese is removed using greensand adsorption onto manganese oxide.

Redway Community Services District Water Treatment Plant Improvements – Redway, CA Mr. Kader was the Principal in Charge of the design and construction administration of the upgrade of the existing water treatment plant with new raw water pumps, filter valve replacement and automation, backwash water supply tank and pumps, piping modifications, and new finished water pumps. Included strategic phasing of equipment demolition with critical tie-ins to keep facility operational during construction. Provided construction management and oversight for inspection and coordination between owner, contractor and State of California as the funding agency (0.65 mgd).

City of Redding Foothill Water Treatment Plant - Redding, CA (Design) Mr. Kader managed the engineering of multiple improvements to the City of Redding's Foothill Water Treatment Plant (32-mgd), including Filter rehabilitation, new underdrains, air scour improvements, and new media. Filter to waste, backwash and air scour control valve replacements. Installation of a Recapture Pump Station to recycle plant drainage and Replacement of chlorine solution piping and chemical injectors.

City of Willits WTP Improvements – Willits, CA (Design) Mr. Kader supervised the preparation of 60% plans and specifications for improvements to a 2 mgd existing surface water treatment plant that was violating water quality standards for combined effluent turbidity due to fluctuating source water quality and inadequate pretreatment performance. The improvements included the addition of a solids contact upflow clarifier for pretreatment, an additional 1 mgd packaged Trident Microfloc unit, a pH adjustment chemical feed system (CO₂ and Lime), and a new SCADA system.

North Lakeport Water Supply – Lakeport, CA (Study) Mr. Kader conducted a study of the North Lakeport Water System to determine best approach to expansion of the system by 300%+ over the next 10-20 years. Design of short-term system improvements to prevent growth moratorium. Improvements include GWUDI well for water supply (lake bank filtration) and 1-mgd (expandable to 4-mgd) microfiltration/GAC/UV surface water treatment plant. Mr. Kader also authored a capacity analysis and a preliminary engineering study for the upgrade of the ozone generation and feed system and rapid mixing at North Lakeport's existing 2 mgd surface water treatment plant (Trident Microfloc system).

Walker River Paiute Tribe Arsenic Removal Water Treatment Plant - Schurz, NV (Design, CM, Start-up and Operations Support) Mr. Kader managed engineering planning, design and construction administration services for the construction of a 700-gpm coagulation/microfiltration (C/MF) for arsenic removal. 100-ug/L arsenic in raw water. Treatment process included pre-chlorination, ferric chloride addition, microfiltration, sodium hydroxide for pH control, post-chlorination for disinfection and finished water pumping. Backwash treatment included lamella clarification, recycle of supernatant and disposal of sludge to sewer ponds.

Longley Lane Water Treatment Plant - Washoe County, NV (Design, CM, Start-up and Operations support) Mr. Kader managed engineering planning, design and construction administration services of a 4-mgd expandable to 6-mgd microfiltration water treatment plant for meeting SWTR regulations and providing coagulation/microfiltration for arsenic removal. Treatment process includes pH adjustment with CO₂, ferric chloride feed, microfiltration, sodium hypochlorite and sodium hydroxide feed, chlorine contact tank, finished water pumping, backwash recovery, solids dewatering with plate and frame filter press.

Fallon Paiute Shoshone Tribe Arsenic Removal WTP, Fallon, NV (Design, SDC, Start-up and Operations Support) Mr. Kader managed the design, provided construction administration, start-up and operations support for a 0.5-mgd WTP using coagulation/microfiltration (C/MF) for arsenic removal. 100-ug/L arsenic in raw water. Treatment process includes pH adjustment with CO₂, ferric chloride and sodium hypochlorite addition, microfiltration, CO₂ stripping, and backwash treatment consisting of lamella plate clarification and filter-bottom roll-off container dewatering (0.5-mgd).

Indian Health Service (IHS) Ground Water Treatment Projects: The Yerington Paiute Tribe, NV was granted funds from EPA to design and construct a new water treatment plant to reduce arsenic (11-23 µg/L) and uranium (20-47 µg/L) concentrations below their respective MCLs of 10 µg/L and 30 µg/L. The WATERWORKS engineering team designed a new 200 gpm water treatment plant to remove uranium with ion exchange and on-site resin regeneration and to remove arsenic with adsorption media. pH adjustment will be required with CO₂ to optimize arsenic removal.

Sierra Army Depot, Iron, Manganese and Uranium Removal Design-Build Project - Herlong, CA (Design) Mr. Kader was the Principal in Charge of this design of one uranium removal and two green sand filter facilities with backwash reclaim tanks for each facility, Sodium Bisulfate injection system and surface wash booster pumps and a .5-mile-long raw water pipeline from Well 9 to Well 5. A new 2,400 square-foot water treatment building at Well 5 to treat water from both Wells 5 and 9 with greensand filters for iron and manganese removal, backwash recovery (99% efficient) and control systems. A new 2,400 square-foot water treatment building at Well 8 to treat water from Well 8 with greensand filters and side-stream anion exchange (uranium removal), backwash recovery and control systems. Installation for variable frequency drives at Well 8 and 5 to reduce the size of the standby generators required. Retrofit of the base control system for the water storage and distribution system with a new SCADA system.

Spring Valley WTP Upgrade and Clearwell Tank Project – Spring Valley, CA (Design) Mr. Kader managed the design upgrade and expansion of the 280 gpm surface water treatment plant consisting of raw water well pumps, slow sand filters, chlorine contact chamber, two clearwells and a booster pump station. Improvements were made to the WTP's reliability, water quality and water quality monitoring and reporting capabilities. Ongoing coordination with the local CDPH office was key to the project success.

Arizona Water Company Arroyo Vista Water Storage Tank and Booster Pump Station, - Phoenix, AZ (Design) Mr. Kader provided engineering planning, design and construction administration services for the construction of a new 500,000-gallon welded steel water storage tank, a 3200-gpm capacity booster pump station, a chlorine gas storage and feed facility and all appurtenant facilities, including flow control facilities in the water distribution system.

City of Folsom Plan Area Zone 4 and 5 Booster Pump Station – Folsom, CA (Design) Water Works Engineers provided design services for the Folsom Plan Area Zone 4 & 5 Booster Pump Station. The project included design of a 2MGD triplex pump station for Zone 5 with provisions to increase to 4 MGD at build-out and a 1MGD triplex pump station for Zone 4 with provisions to increase to 3 MGD at build-out. Site improvements included MCC, SCADA and re-chlorination, as well as the two parallel pump sets all inside a CMU building.

City of Folsom Plan Area Zone 4 and 5 Booster Pump Station – Folsom, CA (Design) Water Works Engineers provided design services for the Folsom Plan Area Zone 4 & 5 Booster Pump Station. The project included design of a 2MGD triplex pump station for Zone 5 with provisions to increase to 4 MGD at build-out and a 1MGD triplex pump station for Zone 4 with provisions to increase to 3 MGD at build-out. Site improvements included MCC, SCADA and re-chlorination, as well as the two parallel pump sets all inside a CMU building.

San Jose Water Company Franciscan Pump Station Replacement – San Jose CA (Design/SDC) Water Works Engineer designed and assisted with engineering services during construction the replacement of the Franciscan Way Pump Station for San Jose Water Company. The project consisted of two new 30-HP vertical line shaft submersible pumps with a 425-gpm @ 198-ft TDH design point; NEMA 3R outdoor electrical, instrumentation and controls enclosure with portable generator connection; soft starters and surge tanks for transient control/dampening; and site civil, structural and mechanical to locate new facilities within existing site while limiting real estate needed so client could sell remaining property for future residential development. Mr. Kader was the Principal in Charge on this project.

San Jose Water Company Vickery Avenue Reservoir Replacement Project, Saratoga, CA (Design/CPS) Mr. Kader was the Principal in Charge and QA/QC for the preliminary design alternatives analysis; life-cycle cost comparison of alternate tank materials, planning, design, plans and specifications, bidding assistance, and construction phase services for replacement of existing earthen dam reservoir with two new pre-stressed concrete tanks, including:

- ✓ 2 MG partially buried AWWA D110 Type I prestressed concrete tank.
- ✓ 5.8 MG partially buried AWWA D110 Type I prestressed concrete tank.
- ✓ Booster Pump Station– 2,400 GPM, Vertical Turbine Pumps, Back-up power, chemical feed.
- ✓ Site design to minimize material off-haul and eliminate landslide potential
- ✓ Phased construction while maintaining 2MG operational volume of existing reservoir.
- ✓

San Jose Water Company Overlook Reservoir & Pump Station Design – San Jose, CA (Design/CM) Mr. Kader provided QA/QC for the preliminary design alternatives analysis; life-cycle cost comparison of alternate tank materials, planning, design, plans and specifications, bidding assistance, and construction phase services for replacement of existing concrete reservoir with a new pre-stressed concrete tank and booster pump station, including:

- ✓ Approximately 2 MG partially buried AWWA D110 Type I pre-stressed concrete tank.
- ✓ Booster Pump Station– dual 400 GPM @ 300' TDH, submersible pumps and controls.
- ✓ Site design to minimize material off-haul and eliminate landslide potential
- ✓ Pre-purchased pumps and controls to support phased construction of pump station ahead of tank.
- ✓ Demolition specifications for removal of existing residential home on proposed tank site.
- ✓ Redesign of roadway and drainage to meet stringent post construction stormwater requirements.

San Jose Water Company McKean Road Reservoir & Pipeline Design - Saratoga, CA (Design) Mr. Kader provided QA/QC for the preliminary and final civil, mechanical, and structural design; environmental permitting; geotechnical analysis; surveying; and electrical design for a 1-MG steel tank to alleviate existing storage deficit; preliminary planning for a second 1-MG steel tank to meet potential future growth demand; 3,300-lf of 16" ductile iron and PVC pipeline to connect to existing system. Pipeline design included a 200-lf pipe bridge and 70-lf vehicular bridge to cross existing waterways; pipe material selection to support extended asset useful life in wet and corrosive environment; steep slope construction in rocky conditions; and multi-agency environmental and construction permitting services.

Cachuma Operation and Maintenance Board, Lake Cachuma Emergency Pump Station, Santa Barbara, CA (Design/Build) Drought conditions have caused Lake Cachuma, which supplies water for the communities of Santa Barbara, Goleta, Montecito, Carpinteria and the Santa Ynez Valley, to drop to historically low levels. Mr. Kader managed the design of an emergency 45-mgd floating pump station and 3500-ft of HDPE pipeline to convey water from the lower section of the lake to the intake tower.

Elsinore Valley Municipal Water District – Skymeadows Booster Pump Station Design– Corona, CA (Design/SDC) Mr. Kader was the Principal in Charge on the modifications to the existing Skymeadows Booster Pump Station (potable water booster pump station owned and operated by EVMWD) from 150-gpm to a minimum 650-gpm to provide additional fire flows to a small community located in the mountains west of Lake Elsinore, Ca. The water will be pumped from the suction side of the booster pump station at a system pressure of 150-psi to the discharge side of 600-psi. The existing, approximately 1,300-LF 4-inch suction header will be paralleled or replaced with a 4-inch or 6-inch suction header. The existing approximately 14,000-ft of 6-inch discharge piping will be conditioned assessed for continued future use or potential replacement/rehabilitation. Survey, environmental and surge analysis services will be completed to augment the project design effort.

Elsinore Valley Municipal Water District – Flagler Well Conversion Pipeline Project – Corona, CA (Design/SDC) Mr. Kader was the Principal in Charge for the Flagler Well Conversion Pipeline Project. The project consists of

converting two agricultural wells to potable use through the design of a booster pump station, disinfection facility and high-pressure water pipeline that will connect to the Temescal Valley Pipeline (TVP) which operates at a pressure of approximately 400 psi. The project is currently in the preliminary design phase and a preliminary design report is in the process of being prepared which will analyze potential sites for the booster pump station, equipment sizing, pipeline specifications and various disinfection options.

Calaveras County Water District Ebbetts Pass WS Reach A Pipeline Replacement Project – Arnold, CA (Design)

Mr. Kader was the Principal in Charge and QA/QC on the preliminary design, design and construction phase assistance for replacement of 18,000 LF of potable water transmission main for the Calaveras County Water District Ebbetts Pass Water System in Arnold, CA. The project included replacement of 10"-12" cement lined and coated steel pipe with 16" DIP. The alignment had an elevation change of over 500', resulting in operating pressures over 275 PSI for a majority of the alignment. Work included environmental, geotechnical, hydraulic modeling, route study, right-of-way, permitting, easements, pressure reducing station mechanical design and miscellaneous appurtenances.

Lewiston Community Services District Raw Water Pipeline - Lewiston, CA (Planning, Design, CM)

Mr. Kader was the Principal in Charge and QA/QC of 2,700 LF of 6" DIP and FPVC to replace existing parallel line in extremely deteriorated condition. Project was funded under prop. 84 and compliance with CDPH funding requirements. Project also included new 300-gpm raw water pump station and new infiltration gallery on the banks of the Trinity River. Extreme environmental constraints required detailed specifications to ensure Contractor mitigated potential fish hatchery disturbance.

Loma Rica Water Company Water Tank Replacement and Well Construction Project, Loma Rica, CA (Planning/Design/SDC)

Water Works Engineers worked with the Loma Rica Water Company and SWRCB to produce an engineering report and construction plans & specifications as part of the State Water Resources Control Board Drinking Water State Revolving Fund (DWSRF) Financial Assistance Application. This included the following items:

- 40,000-gal bolted steel tank
- Seismic flexible expansion joints
- Backup groundwater source (new well)
- Associated piping, pumps, electrical instrumentation, and cellular autodialer/alarm system

California Water Service Company, Crystal Springs Reservoir – Hillsborough, CA (Study)

The existing Crystal Springs Reservoir is planned to be demolished. Mr. Kader was the Principal in Charge of this study for a new partially buried 2.4-million-gallon concrete reservoir that would be constructed in the same footprint of the existing reservoir. Water Works Engineers was engaged to prepare a pre-design report with drawings for the concrete tank. The structural requirements of the tank were also analyzed.

Technical Papers

“Regionalization of Biosolids Treatment and Dewatering for the City of Redding”, CWEA Northern Regional Training Conference, September 2011

“Arsenic Removal in a Multi-Contaminant Environment, Four Case Studies, Four Treatment Alternatives” AWWA Intermountain Section Annual Conference, September, 2011

“Uranium Removal in a Multi-Contaminant Groundwater Source” AWWA Inorganic Contaminants Workshop, March, 2010

“Replacing Failing Infrastructure Just in Time – The Jenny Creek Sewer Line Project” CWEA Northern Regional Training Conference, September, 2009

“Blending Considerations for Optimizing Water Quality (a non-treatment strategy for water quality compliance)” USEPA Small Drinking Water Systems Workshop, August, 2009

“Implementation of Advanced Water Treatment (MF/UV/AOP) for a rural water system on a small site with challenging source water and limited resources” AWWA CA-NV Spring Conference, April 2009

“Replacement of an Above-Ground Sewer in an Environmentally Sensitive Area” CWEA Northern Regional Training Conference, September 2008

“Design and Performance of C/MF for Arsenic Removal in Central Nevada” AWWA Inorganic Contaminants Workshop, Albuquerque, NM, January 2008

“Performance of Coagulation/Microfiltration for Arsenic Removal – a Review of 21 Months of Operations” AWWA CA-NV Fall Conference, October, 2006

“Managing the Impact of Arsenic Residuals on Wastewater Systems” California Water Environment Association, Northern Regional Training Conference, Redding, CA, September 2005

“Operation of Coagulation/Microfiltration for Arsenic Treatment – an Update from the Fallon Paiute-Shoshone Tribe Arsenic WTP” AWWA CA-NV Spring Conference, Industry Hills, CA, April, 2005 and APWA – NV Spring Conference, Mesquite, NV, April, 2005

“Implementation of Coagulation/Microfiltration for Arsenic Removal-A case study at the Fallon Paiute Shoshone Tribe Arsenic Removal WTP” AWWA Membrane Technology Conference, Phoenix, AZ, March 2005 (Poster Session)

“Coagulation/Microfiltration for Arsenic Treatment – A case study at the Fallon Paiute Shoshone Tribe Arsenic Removal WTP” AWWA CA-NV Fall Conference, Sacramento, CA, October, 2004

MICHAEL LINDQUIST, PE

Senior Engineer / Project Manager



Education

M.S. Civil and Environmental
Engr. UC Davis
B.S. – Civil Engineering
University of California at Davis

Experience

23 years

Registration

Registered Civil Engineer
California - C56714

Mr. Lindquist is a civil engineer with 23 years' experience in planning, design, and construction of utilities projects. A majority of his experience has been as a public servant, working for California State Parks, University of California, and City of Davis. He has been the designer of record, construction manager, and overall project/program manager for projects ranging from \$10,000 to \$90M. For the last eight years he led a \$90M wastewater improvement program where he was responsible for creating accurate budget forecasts, securing State and Federal funding assistance, managing engineering, environmental, and financial consultants, overseeing the design and construction of projects, and communicating progress with public officials and customers.

Mr. Lindquist has experience navigating the process of approval and funding agencies, such as the State Water Resources Control Board, Corps of Engineers, Office of Historical Preservation, CalTrans, and FEMA. He has been directly responsible for the creation of CEQA (California Environmental Quality Act), CEQA+, and NEPA (National Environmental Policy Act) documents for utility programs and projects.

Representative Project Experience

Ojai Water Pipeline Replacement - Casitas Municipal Water District, Ojai CA. Mr. Lindquist was the design manager for the replacement of approximately 4700 feet of aging cast iron water mains through the downtown business district of Ojai. He was responsible for arranging and coordinating surveying, geotechnical investigations, and CalTrans permitting (the pipeline was located within State Highway 150). The project included a trenchless crossing of a large flood control channel and crossing contamination plumes from abandoned gas stations.

Paradise Irrigation District Water System Improvements – Paradise CA (Quality Control) Mr. Lindquist was responsible for providing quality control of the \$11M water supply improvements project's construction documents (plans and specifications). The improvements include new booster pump station, 2 mile transmission main, and two 2.3 million gallon water storage tanks. His reviews also focus on constructability of the project and ensuring staff operational needs are incorporated into the designs.

Sewer Rate Study – City of Davis, CA (Utility Management) Mr. Lindquist led the City's Proposition 218 sewer rate study. The study included creating an accurate 5-year budget forecast of operations, capital, and debt financing expenditures and an analysis of different rate structures and customer classes. The comprehensive study reports greatly reduced opposition to the adoption of the new rates and provided the utility with an adequate and stable revenue source for the subsequent five years.

UC Davis Water Main Replacements – Davis, CA (Design/Construction) Mr. Lindquist prepared the plans and specifications for water main replacement projects throughout campus. Utilizing field staff repair records and corrosion investigation, water mains at higher risk of failure were identified and prioritized for replacement. Existing ductile iron pipe was replaced with PVC C900 pipes and new service connections installed. Replacements were also coordinated with the campus water supply master plan and pipes upsized if necessary.



Wastewater Improvements Program – City of Davis, CA (Program Management/Design/Construction) Mr. Lindquist was the City employee with overall responsibility for the City's \$90M Wastewater Improvements Program. His primary responsibility was to ensure the City's performance, budget, and schedule goals were met or exceeded. He led a City hired consultant team and managed a design-build engineer/contractor team. The program improved/rehabilitated plant facilities and design/constructed new secondary and tertiary treatment, solids handling, disinfection systems, as well as necessary ancillary facilities, such as an upgraded electrical distribution system. Additionally, Mr. Lindquist was responsible for creating the environmental clearance documents (CEQA and NEPA), geotechnical investigation, land acquisition, external agency permitting, securing State Revolving Fund financing, and commissioning of the new facilities. When completed, the City had essentially a brand new 6 MGD modern wastewater treatment plant. Some of the specific components of the program were:

Rehabilitation of Headworks and Primary Clarifiers. The City's 45-year old facilities were upgraded and rehabilitated to ensure many more decades of service. New dry-pit submersible pumps and controls were installed to better match existing and future flow variability and to save energy. The existing single moving-screen was replaced with two bar screens and compactor to improve solids removal and provide redundancy. The clarifier flights and chains were replaced and corroded concrete was repaired, prepared, and coated. An ultrasonic transducer was installed to measure sludge blanket thickness and better control sludge pumping rates. Additional slide gates were installed to provide for more flexible operations.

Conversion from Gas to Liquid Chlorine. Eliminating the use of gas chlorine was a priority for plant operations staff. A new chemical storage facility for sodium hypochlorite and sodium bisulfate consisting of 8000 gallon tanks and a new liquid chemical feed/control system was constructed.

Upgrade of Plant Electrical System. New 12kV switch gear and a central power distribution building was constructed. The existing in-plant 2400V distribution system and distributed step-down transformers were replaced with a more traditional 480V distribution system. All switchgear and MCC's included monitoring devices connected to SCADA. A new 2MW backup diesel generator and closed-transition automatic transfer switch was installed.

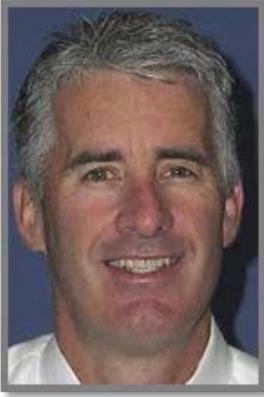
New Secondary Treatment Process. The existing pond and overland flow treatment process was replaced with a 6MGD conventional activated sludge process. The new process included a 3 million gallon secondary reactor, high-speed turbo blowers, two RAS pumping stations, four clarifiers, scum collection system, and extensive instrumentation and control.

New Tertiary Treatment. A major impetus of the plant improvements was an NPDES permit requirement of adding tertiary treatment. New disk filters were constructed to provide reliable and cost-effective treatment to meet Title 22 requirements.

New Solids Handling Process. The new treatment process produced over double the solids of the old process and required the design and construction of solids thickening using rotary drum thickeners (RDTs), and dewatering using screw presses. Spiral conveyors are used to convey dewatered sludge to a new covered solids solar drying bed. Two 100,000 gallon bolted steel tanks for the storage of digested sludge provided a buffer between the digesters and dewatering equipment allowing more flexibility for operations staff to process solids. The system mechanical equipment included high pressure hose pumps, polymer storage area, and Polyblend units for chemical dosing.

Anaerobic Digester Rehabilitation. The existing anaerobic digesters were rehabilitated to ensure decades more of reliable service and upgraded to increase capacity and gas production for use in a cogen system. Rehabilitation included extensive preparation of metal and concrete surfaces for new coatings, replacement of corroded underground piping and valves, and replacement of a gas mixing system with a center mounted mechanical mixer.





BRIAN CRANE, P.E.

Mr. Crane is a registered civil engineer with over 35 years of experience, 30 of which were spent serving the public sector, for Caltrans District 2 and the City of Redding. His service in the public sector has given him decades of experience in the planning and implementation of complex civil works improvements programs, including transportation, stormwater, drinking water and wastewater, solid waste, and all facets of Caltrans and City public works. For decades he has navigated a wide variety of project funding, regulatory, technical, managerial and public relations challenges with great successes in project accomplishment and program implementation. Most recently, as a retired annuitant, he is the Director for the Carr Fire Recovery effort for the City of Redding. This position has required close coordination not only with FEMA and CalOES on the grant funding of recovery efforts, but also close coordination with Shasta County (the Carr Fire struck both inside and outside the City limits) and communication with the public. This current role continues his stellar record of public service in Civil Engineering.

Project Role

Project Manager/Senior Engineer

Years of Experience

35

Education

BS, Major:
Civil Engineering,
University of CA, Davis,
California, 1984

Registration

Professional Engineer (Civil):
California C41968

City of Redding

June 2008 to Present

Director – Carr Fire Recovery – 08/2018 through Present

- Lead over the City’s Carr Fire Recovery efforts including Debris Removal for 267 residential properties, Residential Rebuild Program, Watershed Management, Individual Assistance, Public Assistance (City infrastructure rebuild) and Public Relations

Acting Assistant City Manager/Public Works Director – 07/2017 through 06/2018

- Assistant Manager support to the City Manager
- Public Works Director (see below)

Public Works Director – 6/2009 through 06/2018

- Managing lead over:
 - City’s Water, Wastewater and Storm Drain Utilities (from 2010)
 - City’s Transportation Services - Streets, Bus Authority, Airports (since 2008)
 - City’s Solid Waste Services (from 2016)
 - City’s Engineering Program (from 2008)

California Department of Transportation - District 2, Redding, CA

July 1989 to May 2008

District Director – 12/2008 to 06/2008 and 01/2002 to 10/2002 (Acting)

- Managing lead over Caltrans’ \$200 million (plus/minus) and approximate 750 employee program in the seven northeastern counties in California (District 2)

District 2 Deputy Director – Planning and Local Assistance Program - 09/01 to 12/02

- Managing lead for Caltrans’ Planning and Local Agency assistance programs in District 2

Other Positions:

District 2 Deputy Director – Project Coordination - 06/99 to 09/01

Project Manager – 10/94 to 6/99

Construction Engineer Shasta County Area - 08/92 to 10/94

Construction Resident Engineer - 06/91 to 08/92

Design Project Engineer - 07/89 to 08/92

CINDY BERTSCH, P.E.

Senior Project Engineer



Education

M.S. – Civil/Environmental Eng.
University of CA, Davis (2001)
B.S. - Civil Engineering,
University of CA at Davis (2000)

Experience

18 years

Registration

Registered Civil Engineer
California - C65385
Nevada - 18151
SWPPP QSP

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

REPRESENTATIVE PROJECT EXPERIENCE

Emergency Planning, Response, and Recovery

Ms. Bertsch is active in the emergency planning field for water and wastewater infrastructure. She is a member of InfraGard, a public private partnership between the FBI and private industry looking at best practices for the water and wastewater industry to protect infrastructure and operations from natural and man-made disasters. She is a California Office of Emergency Services Safety Assessment Program (SAP) Evaluator that can be deployed by the state to act as a temporary building inspector after disasters to assess the safety of buildings and infrastructure. She is an active member of the Community Emergency Response Team (CERT), South County Amateur Radio Emergency Services, County of San Mateo Health Emergency Preparedness, and Red Cross. She has assisted in disaster recovery including in Butte County in response to the Camp Fire.

Potable Water Planning Projects

City of Reno and Washoe County Truckee Meadows Service Area/Future Service Area Water, Wastewater, and Flood Management Facility Plan - Reno and Washoe County, NV (Planning) Ms. Bertsch was the Project Engineer that projected water, wastewater and reclaimed water infrastructure needs for the 2030 and 2095 planning horizons. She managed GIS analysis of the traffic analysis zone land use data for each planning area. She coordinated the work of several engineers, completed the project under budget, and met the tight schedule.

City of Lincoln Water Distribution System Capital Improvement Plan - Lincoln, CA (Planning) Ms. Bertsch was the project manager that studied a portion of the City's distribution system including analyzing leak detection results, fire flow capability, and maintenance records to recommend a prioritized capital improvement plan to remedy issues with potable water distribution system.

City of Live Oak Water Master Plan and Urban Water Management Plan - Live Oak, CA (Planning) Ms. Bertsch managed the overall project, managed the GIS analysis of existing and planned land use, completed hydraulic modeling using WaterGEMS with AutoCAD, recommended modifications to existing infrastructure, and developed a layout of future infrastructure.

Nevada Irrigation District Lincoln Area Water Treatment Plant Site Study- Lincoln, CA (Planning) Ms. Bertsch was the Project Engineer that evaluated locations to site water infrastructure including raw water storage and conveyance, treatment facilities, and treated water storage and conveyance.

City of Colusa Water Master Plan -Colusa, CA (Planning) Ms. Bertsch was the Project Engineer that managed the GIS analysis of existing and planned land use, completed the hydraulic model including calibration using fire flow testing, recommended modifications to existing infrastructure, and developed a layout of future infrastructure.

City of Escalon Water Master Plan - Escalon, CA (Planning) Ms. Bertsch was the Project Engineer that managed the GIS analysis of existing and planned land use, completed the hydraulic model, recommended modifications to existing infrastructure, and developed a layout of future infrastructure.

Foresthill Public Utility District Water Master Plan - Foresthill, CA (Planning) Ms. Bertsch was the Project Engineer that created the water distribution model for current and future demands using WaterCAD. She recommended modifications to existing infrastructure and developed a layout of future infrastructure.

Christian Valley Park Community Services District - Christian Valley, CA (Planning) Ms. Bertsch was the Project Engineer that modeled the District's water distribution system for current and future demands using a WaterCAD model.

Calaveras County Water District - Copper Cove Water Distribution Model -Copper Cove, CA (Planning) Ms. Bertsch was the Project Engineer that evaluated Copper Cove's water distribution system for current and future demands using WaterCAD.

San Joaquin County Water Projects, San Joaquin County - CA (Planning) Ms. Bertsch was the Project Engineer that provided alternatives to improve water quality at eight different sites to meet water quality standards.

Sun City Tehama - Tehama, CA (Planning) Ms. Bertsch was the Project Engineer that projected potable water demands for a new community of 3,700 homes.

Alpine Springs Community Water District Source Water Assessment - Alpine Springs, CA (Permitting) Ms. Bertsch was the Project Engineer that evaluated the District's water system including springs and horizontal wells according to DHS guidelines.

2010 Urban Water Management Plans (UWMPs), Tracy, CA; Burlingame, CA; San Bruno, CA; Coalinga, CA (Planning) Ms. Bertsch was the Project Engineer/Manager that prepared 2010 UWMPs for Tracy, Burlingame, and San Bruno that included analyzing multiple surface water supplies and groundwater. The UWMPs included conservation requirements from the 2009 Water Conservation Act. Ms. Bertsch reviewed and assisted with the preparation of the 2010 Coalinga UWMP.

San Bruno Transit Corridors Water Supply Assessment (WSA) - San Bruno, CA (Planning) Ms. Bertsch was the Project Engineer that prepared a SB 610 complaint WSA to evaluate whether water supplies were sufficient to meet the proposed project demand over the next 20 years in addition to the water demands projected from the city's planned and existing land uses.

Water Planning for Sustainable Development - Northern California (Planning) Ms. Bertsch was the Project Engineer that forecasted water demands for a sustainable California development using models developed by the American Water Works Association Research Foundation for indoor water use and the University of California Cooperative Extension and the California Department of Water Resources for outdoor water use.

Mountain House Community Services District - Mountain House, CA (Permitting) Ms. Bertsch was the Project Engineer that completed the Mountain House Community Services District Source Water Assessment.

City of Millbrae Water Tank Project - Millbrae, CA (Planning) Ms. Bertsch was the project manager for the water tank planning project. The purpose of this project is to start the implementation of these projects as described in the Master Plan. Improvements will be confirmed using an InfoWater model. Improvements are needed to replace infrastructure at the end of its life and provide more emergency supply/storage for each of the city's four zones.

KRISTINA-MARIE PERALTA ALACON, P.E.

Senior Project Engineer



Education

B.S. – Civil Engineering
University of the Pacific,
Stockton, CA

Experience

15

Registration

Registered Civil Engineer
California - C70952

Ms. Alacon is a civil engineer with 15 years' experience in planning and design. She has a wide range of project design experience in civil infrastructure, including new and rehabilitation of existing water storage reservoirs, various diameter pipelines, pump stations, and master planning. Her work includes pipeline alignment studies, detailed construction drawings, hydraulic calculations, construction support, utility coordination, and permit acquisition.

Representative Project Experience

Paradise Irrigation District Zone A Pump Station, Transmission Main and Reservoir B Replacement – Paradise, CA (Design) Ms. Alacon is a senior engineer on the Paradise Irrigation District for the Zone A Pump Station, Transmission Main, and Reservoir B Replacement Project. The existing system supplies potable water to 26,000 people through a single transmission line (built in 1955) from the WTP to the distribution system through a “pinch point”, Reservoir B - a lined earthen reservoir with a floating cover. The earthen reservoir has raised reliability, maintenance and operation, as well as water quality issues. Improvements include Reservoir B replacement with two 145-foot diameter, 2.3 MG bolted steel tanks; new Zone A pump station capable of pumping 2,800 gpm; and a new 16-inch diameter Zone A transmission main that is 2 miles long, connecting Zone A Pump Station to distribution Zone A.

City of Folsom Plan Area Zone 4 and 5 Booster Pump Station – Folsom, CA (Design/CM) Ms. Alacon provided design services for the Folsom Plan Area Zone 4 & 5 Booster Pump Station. The project included design of a 2MGD triplex pump station for Zone 5 with provisions to increase to 4 MGD at build-out and a 1MGD triplex pump station for Zone 4 with provisions to increase to 3 MGD at build-out. Site improvements included MCC, SCADA and re-chlorination, as well as the two parallel pump sets all inside a CMU building.

San Jose Water Company McKean Road Reservoir & Pipeline Design - Saratoga, CA (Design) Ms. Alacon assisted in the preliminary and final civil, mechanical, and structural design, which includes environmental permitting; geotechnical analysis; surveying; and electrical design for: • a 1-MG steel tank now to address pressure zone storage deficit; • planning for a second 1-MG steel tank to meet future growth demands.

Trinity Knolls Mutual Water Company Water Supply, Storage and Distribution Upgrade Project – Trinity Knolls, CA (Design) Ms. Alacon provided design services for the replacement of one and the retrofit of the water storage tanks, distribution system and two new wells for Trinity Knolls Mutual Water Company. The project also included permitting and utility coordination and the use of trenchless pipe installation.

Clear Lake Oaks County Water District Water Distribution – Clear Lake, CA (Design) Ms. Alacon provided design services for the installation of an intertie for an additional water service area to and existing water district. This intertie included a pressure sustaining valve station that would function during different phases of infrastructure development. Developing communication with other parts of the existing system and improvements to existing infrastructure were also a part of this project.

Calaveras County Water District Ebbetts Pass WS Reach 3A Pipeline Replacement - Murphy's, CA (Design) Ms. Alacon is providing preliminary design, design and construction phase assistance for replacement of 18,000 LF of potable water transmission main for the Calaveras County Water District Ebbetts Pass Water System in Arnold,

CA. The project included replacement of 10"-12" cement lined and coated steel pipe with 16" DIP. The alignment had an elevation change of over 500', resulting in operating pressures over 275 PSI for a majority of the alignment. Work included environmental, geotechnical, hydraulic modeling, route study, right-of-way, permitting, easements, pressure reducing station mechanical design and miscellaneous appurtenances.

California American Water Company Security Park Drive SCWA Interconnection Project – Sacramento County, CA (Design) California American Water's existing Security Park water system consisted of a single source of supply (an existing well), an at-ground storage tank, and a hydropneumatic tank system. Ms. Alacon was a project/design engineer for the SCWA Interconnection provides a second source of supply and an increase in available fire flow. The SCWA interconnection includes a 12-inch pipeline from the Sacramento County Water Agency (SCWA)'s 24-inch water main on Douglas Road. The project also includes design of a valve and meter vault to house the meter equipment required by SCWA. Hydraulic water modeling of the Security Park System was used to identify the best system connection point and confirm the pipeline size. The modeling included minimal calibration of the model as well as some connectivity verification. Bentley's WaterCAD software was used to execute the steady state simulations for this project.

City of Benicia Kearny Street PRV Station – Benicia, CA (Design) Ms. Alacon was a project/design engineer for a pressure reducing valve station for Waters End Subdivision. The subdivision was experiencing high pressures due to their low elevation relative to the pressure zone it is served by. The project included site alternative evaluation and consideration for future in-line power generation.

City of Brentwood Non-Potable Water Distribution System - Phase II and Water Systems Connection/Regulating Projects – Brentwood, CA (Design) Ms. Alacon was a project engineer for design of 1.5 miles of a 12-inch non-potable water distribution main and a parallel 20-inch potable water distribution main. Project tasks included existing utility reconnaissance, coordination with EBMUD and UPRR, and preparation of construction.

City of Tracy Holly Sugar Sports Complex – Tracy, CA (Design) Ms. Alacon was a project engineer of a 500 gpm irrigation pump station/storage pond system for the development of a regional sports complex located on a 166-acre property. She also helped with the design of a 105 gpm sewer pump station. The overall project includes the construction of 20 fields (eight soccer fields and 12 baseball fields), four parking lots, Tracy Boulevard widening (main access road), and utilities. Also includes the design of a Class I bikeway to connect pedestrians/bicyclists traversing from Larch Road to the sports complex.

Solano Transportation Authority Interstate 80/680/12 Interchange PS&E – Fairfield, CA (Design) Ms. Alacon assisted in the design of the North Bay Aqueduct utility relocation as part of this interchange reconstruction project for the Solano Transportation Authority. The existing raw water mains were 30-inch and 39-inch in diameter. The overall project estimated at over \$1B, centers on a series of interchanges and encompasses improvements to local facilities, existing truck scales, I-680, and SR 12 (East and West).

City of Fairfield Martin Hill Reservoir Rehabilitation Project – Fairfield, CA (Design) Ms. Alacon was a project engineer for the design of the rehabilitation of above ground 2.7 MG welded steel reservoir. Rehabilitation included the removal and replacement of loose grout and/or felt below tank base ring, removal of existing roof vents, and installation of City supplied roof vents. Also included was the installation of interior tank mixing system, installation of new access hatch covers for the inlet/outlet pit, removal of existing and installation of new staff gage, and installation of new common valve vault including a motorized control valve.

SHEILA MAGLADRY, P.E.
ASSOCIATE ENGINEER



Education

B.S. – Environmental Engineering
Cal Poly,
San Luis Obispo, CA

Experience

5

Registration

Registered Civil Engineer
California - 89764

Ms. Magladry is a registered civil engineer with nearly 5 years of experience in large and small civil infrastructure projects, including conceptual and preliminary design reports, construction document creation, engineering services during construction, and environmental inspector services. She has experience writing alternatives analyses, designing treatment plant upgrades, expansions, modifications, and collection and treatment system monitoring. Typical duties include engineering services during construction, engineering design, client interaction, permit review, technical report preparation and review, cost estimate preparation and review, preparation of contract drawings and specifications, contractor interaction, field visits and inspections. Ms. Magladry also has experience coordinating with multiple local, state and federal agencies.

Representative Project Experience

Water and Wastewater Treatment Facility Collection/Distribution Projects

City of Roseville West Tank and Pump Station Project – Roseville, CA 2018 (Final Design) Ms. Magladry participated in the final design of the storage tanks and pump station project for City of Roseville. She focused on the pump station mechanical arrangement and the crew facility design. She also focused on mechanical design review for the storage tank facility which is designed to have a variety of operational sequences.

San Jose Water Idylwild Pump Station Replacement and Tank Project – Los Gatos, CA 2018 (Final Design) Ms. Magladry participated in the final design of the replacement pump station and new storage tank facility for San Jose Water in Los Gatos. She provided alternative comparison analysis for various site access alternatives. She provided mechanical design review for the existing pump station bypass plan and the new pump station design. She also provided civil and mechanical review for the site design and the storage tank layout and adjoining facilities.

Oak Run Elementary School Well Replacement Project – Oak Run, CA 2018 (Preliminary Design and Bidding Services) Ms. Magladry completed the preliminary design for the Oak Run Well Replacement project for Oak Run Elementary School which included multiple well siting selections, well house redesign, and construction sequencing services. She aided in the bidding process and coordinated project milestones with the Region and State Water Quality Resource Control Boards.

West Bay Sanitary District Water Reclamation Facility at Sharon Heights Golf and Country Club– Menlo Park, CA 2018 (Final Design and Engineering Services During Construction) Ms. Magladry participated in the final design of the Design-Build water reclamation facility, pump station and transmission main project for West Bay Sanitary District’s first recycled water facility. She focused on the hydraulic design of the transmission main, the influent pump station, the headworks/screening facility including emergency plant bypass provisions, and the dual-stage odor control facility. She compiled the construction specifications and adjudicated final review comments. She also performed engineering services during construction including submittal reviews and coordination with equipment providers.

City of Shasta Lake Wastewater Treatment Plant Upgrade – City of Shasta Lake, CA 2017-2018 (Preliminary and Final Design, Engineering Services During Construction) Ms. Magladry participated in the preliminary and final design of the City of Shasta Lake wastewater treatment upgrade project to meet Title 22 recycled water goals. She

focused on the UV disinfection and recycled water basin design, re-aeration structure, outfall structure, sludge drying bed, emergency retention facilities and overall plant yard piping coordination. She completed the hydraulic analysis of the upgrade project and as analyzed opportunities for Value Engineering during the preliminary design process. She performed engineering services during construction including by-weekly construction meetings, submittal reviews, and request for information responses. She maintained effective communication between the client, engineer, contractor, and construction manager to ensure a productive and accurate construction project.

Paradise Irrigation District Reservoir B Replacement, Zone A Pump Station and Transmission Main Project – Paradise, CA 2017-2018 (Conceptual, Preliminary and Final Design) Ms. Magladry completed the conceptual, preliminary and final design of the Paradise Irrigation District distribution system upgrade project, focusing on the plant supply potable water hydraulics, water system storage requirements, pump station design, transmission main hydraulics, and water storage tank selection and design. She presented various design stages to the client and during public board meetings.

Hawaii Water Service Kukio Condition Assessment, Critical Asset Repair Project, and Preliminary Design – Kukio, HI 2018 (Preliminary Design) Ms. Magladry participated in the condition assessment of the Kukio WWTP and completed an effective end-of-life assessment for every asset within the plant operation. She coordinated the replacement of critical equipment within a concise timeframe to remedy existing operational issues while ensuring continued plant operation. She completed the preliminary design for the WWTP upgrade, including critical infrastructure repair recommendations, equipment replacement, initial upgrades to continue streamline operation, and recommended upgrades to improve overall operation and maintenance requirements.

Pasatiempo Golf Club Recycled Water Project – Santa Cruz, CA 2017 (Engineering Service During Construction) Ms. Magladry provided engineering services during construction and final design modifications for the Pasatiempo Golf Course Recycled Water Project. She focused on the design of the filter feed pump station, including pump selection, hydraulic modeling, and contract drawing revisions. She provided engineering services during construction including submittal reviews and change order requests and information requests.

Layton Lift Station Replacement Project – Redding, CA 2017 (Engineering Services During Construction) Ms. Magladry observed the start-up and project close out of the Layton Lift Station Replacement Project. She completed the redesign of the gas supply pipeline for the pump station standby generator, and observed all start-up activities including pump baseline testing, lift station start-up, and sewer main tie-in. She kept detailed daily observation reports and photos logs of the final months of the project and provided engineering assistance to the project manager for requests for change and information.

Kyburz Pump Station Improvements Project – San Jose, CA 2016 (Final Design and Services During Construction) Ms. Magladry completed the construction documents for the Kyburz pump station improvements project. The project included replacing an existing pump station with a new pump station and pressure tank within a compact site and repurposing existing site structures to minimize site disturbance. She worked closely with multiple pump manufactures to specify the appropriate pump type for the unique system requirements, as well as ensured all concerns were addressed to provide a final design which met the city and Home Owners Association standards. She provided services during construction to ensure a cohesive design implementation.

City of Redding Clear Creek WWTP Biosolids Dewatering and Handling Facility – Redding, CA 2015 (Design) Ms. Magladry performed resident engineer activities overseeing construction activities during the erection of the Biosolids Dewatering Building which included mechanical dewatering equipment, truck loading facilities, and ancillary systems (e.g. polymer feed systems, utility water, HVAC, odor control). She oversaw the project to completion by coordinating employee training, startup activities, and contractor finishing activities.

Stillwater Diffuser Replacement Project – Redding, CA 2016 (Design) Ms. Magladry completed the submittal documents for the diffuser replacement project at the Stillwater WWTF. This project included the replacement of three aeration basin air diffusers and isolation valves. Construction sequencing was coordinated to complete the replacement project while allowing the plant to continue operation. She worked closely with the plant operators and the diffuser system manufacturer to provide a cohesive system.

Rotary International Rural Water Treatment Education and Installation – Taveuni, Fiji 2014 (Environmental Engineer) Ms. Magladry was a co-leader in a two-week long training and implementation course in rural water treatment in Fiji. The class involved Fijian locals and taught water treatment techniques and instructed facility construction. She led a team in the construction of 8 slow sand filters, 4 spring boxes, and 1 engineered wetland. This project provided multiple communities access to clean drinking water.

Master Planning Analysis and Condition Assessments

Redway Community Service District Master Plan Update and Effluent Pumping Analysis – Redway, CA 2018 (Wastewater Treatment Plant Upgrade Alternatives and Hydraulic Analysis) Ms. Magladry completed the master plan update and effluent pumping analysis for Redway Community Service District. The discharge permit required an analysis of the current biosolids management program, including solids digestion, dewatering and disposal upgrade alternatives and effluent pump capacity and improvement analysis. She completed a hydraulic analysis of the effluent pipeline and determined the most cost-effective solution for improving the current solids handling process.

Kukio Wastewater Treatment Plant Condition Assessment – Kukio, HI 2017 (Condition Assessment) Ms. Magladry participated in the on-site condition assessment of the Kukio Wastewater Treatment Plant focusing on the calculation of the estimated end of life of each of the plant’s assets, determining the replacement priority of the critical assets, and recommending upgrade alternatives. She completed a photo diary log for each asset complete with new equipment tags, naming convention and a description for each asset

Los Ranchos Wastewater Treatment Plant Upgrade – Apple Valley, CA 2017 (Preliminary Design) Ms. Magladry completed the preliminary design for the Los Ranchos wastewater treatment plant upgrade from a secondary treatment to a recycled water facility. She focused on filter and disinfection alternatives, solids handling alternatives, pipeline solutions, and designing a Title 22 compliant facility. She completed a preliminary design memorandum to review the project goals including an annual recycled water balance to determine the required annual storage/discharge volume for recycled water and the effects on potable water offset predictions. She assisted in communicating with public regulation agencies.

Roseville Digester Structural Condition and Associated Projects Report – Roseville, CA 2017 (Conceptual Design Report) Ms. Magladry completed the structural condition report for the digester rehabilitation project. She focused on the design of the digester overflow piping reconfiguration, the roof drain repair, the safe roof access design, and the new manway design associated with the concrete dome interior recoating project. She compared two access alternatives for the interior recoating and repairs to provide alternatives to the client for future repair projects.

Anderson Springs STEM System Project – Lake County, CA 2016 (Preliminary Design) Ms. Magladry completed the preliminary design for the Anderson Springs STEP (Septic Tank Effluent Pump) system wastewater conveyance project. The project proposed converting a community wide septic system to a STEP conveyance system for wastewater treatment at a nearby treatment facility. She worked closely with the Lake County Planning Department and the regional water quality control board to provide a feasible wastewater treatment solution to mitigate the fecal contamination of Anderson Creek caused by the septic systems in the area.

Oak Run Elementary School Well Replacement Project – Oak Run, CA 2016 (Conceptual Design) Ms. Magladry completed the conceptual design report for the Oak Run Elementary School Water System well replacement project. The project included relocating a well to avoid contaminant issues from nearby sewer lines and leach fields, and replacing the pressurized storage tank, as well as tying into existing pretreatment systems. She worked closely with the Shasta County Environmental Health Department, Department of Drinking Water, and the Department of Water Resources regional offices to complete the conceptual design report.

Environmental Inspector Experience

Palo Alto Community Medical Facility – Palo Alto, CA 2014 (Environmental Inspector) Ms. Magladry performed onsite air monitoring for dust particulates and soil sampling during the construction of the Palo Alto Community Medical Facility. She coordinated with construction crews to ensure proper dust suppression procedures to prevent the spread of contaminated soils from the site.

Oakland Community School District – Oakland, CA 2014 (Environmental Inspector) Ms. Magladry performed soil gas monitoring duties at Oakland Community School District. The gas monitoring was required due to the school's expansion project disturbing contaminated soils. She also performed soil sampling on excavated soils.

Groundwater Monitoring Projects – Various, CA 2013 (Environmental Inspector) Ms. Magladry performed groundwater monitoring duties and report generating for various sites requiring quarterly groundwater monitoring reports.

Environmental Site Assessment Phase 1 Reports – Various, CA 2013 (Environmental Inspector) Ms. Magladry performed Environmental Site Assessments at various locations for Phase 1 reports. She documented historical records and determined the potential of site contamination from historical activities and nearby contamination events.

RYAN ALWARD

Hydrogeologist - US Water Resources

Ryan Alward has over 12 years of experience working on California water resources projects. He is a certified hydrogeologist who specializes in water resources planning and groundwater well design.

Mr. Alward has worked with both local agencies and the California Department of Water Resources on Sustainable Groundwater Management Act (SGMA) projects. He was a co-author of the Alternative Submittal to a Groundwater Sustainability Plan (GSP) for the Sutter Subbasin. He also assisted DWR with a describing basin boundary changes for the Bulletin-118 update.

He has provided services for municipal, agricultural and industrial clients including well design, well construction, developing well rehabilitation programs and water quality monitoring programs. He has also assisted clients with their short-term groundwater substitution transfers by conducting the monitoring and reporting required by DWR for the transfers.

Mr. Alward has conducted hydrogeologic evaluations for groundwater management and performed hydrogeologic feasibility studies for water banking and recharge basin projects. He has also assisted clients with aquifer storage recovery well evaluations to evaluate the siting of future ASR wells for pilot studies and groundwater banking.

Mr. Alward is also experienced in environmental soil and groundwater sampling methods and CEQA processes. Mr. Alward is Hazardous Waste Operations and Emergency Response (HAZWOPER) certified.

PROJECTS

South Y Extraction Well Suitability Investigation, South Tahoe Public Utility District, South Lake Tahoe, CA. Prepared a work plan and lead evaluation of the Lukins Brothers No. 4 well with regard to PCE contamination. The South Y Area has had detections of PCE since the 1980's and GEI evaluated the concentrations at the well to provide alternatives to STPUD for removal of PCE in the future. GEI conducted water quality sampling, aquifer testing, video survey and dynamic water quality sampling at discrete depths while the well was pumping. Supervised the field work and communication with the contractors and STPUD.



CONTACT INFORMATION

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Sacramento, CA 95814
United States of America

PCE Distribution in Soil and Groundwater, Tahoe Keys Property Owners Association, South Lake Tahoe, CA. Gathered historical PCE data through a data search at the Lahontan Regional Water Quality Control Board. Data were also gathered from STPUD, Lukins Brothers Water Company and Tahoe Keys POA Water Department and compiled with the Regional Board data to create a regional distribution of PCE in the groundwater and soil at the South Y Area from the early 1980's through present day. The report is being used to assess the best alternatives to assist with the cleanup and to slow the migration of PCE to the north towards Lake Tahoe.

Conjunctive Use Program, Sutter Extension Water District, Yuba City, CA. Supervised the construction, development, aquifer testing, water quality sampling, and geophysical evaluations for two agricultural supply wells. In addition, gathered data and performed aquifer test analyses along with participating in the hydrogeological analyses for both agricultural supply wells. Also wrote the well completion report for both wells.

Groundwater Recharge Feasibility, Sacramento County Water Agency, Sacramento, CA. Performed water quality sampling and percolation basin testing to assess the feasibility of constructing a recharge basin and potential impacts of recharged surface water on the groundwater. Water quality analyses included stable isotope and radiogenic constituents to find signatures of different surface water sources.

Califia Well No. 3 Construction, Califia Farms, Bakersfield, CA. Conducted well siting study and designed and supervised the drilling and construction of a 1,200-foot-deep water supply well for Califia Farms beverage manufacturing plant. The well will be the sole water supply for the manufacturing of Califia Farms beverages. Wrote a hydrogeologic report supporting the siting of the well and created the technical specifications and bid packages.

Water Supply Well Replacement, Fair Oaks Water District, Fair Oaks, CA. Performed well construction oversight, production well testing and water quality sampling. Performed NPDES and Low Threat Discharge permit monitoring and reporting.

Well Rehabilitation Assistance, California-American Water Company, Sacramento, CA. Participated in the assessment, development and implementation of well rehab recommendations. Performed packer testing, aquifer testing, water quality sampling, video surveys, deviation surveys, liner installation, discrete point source sampling, chemical cleaning and report preparation for six municipal supply wells. These rehabilitations restored over 3,000 gallons per minute of source capacity to the California American Water distribution systems.

Monterey Well Rehabilitation Assistance, California-American Water Company, Monterey, CA. Performed project management, technical analysis and field inspections for six municipal supply wells in 2012. Management tasks included preparing bid schedules and cost estimates for contractors and corresponding with the client, contractors and staff to facilitate team communication. Technical assistance included supervision of well cleaning methods and discharge to surface water following NPDES discharge permits. Aquifer tests and analyses were also performed to properly choose replacement well pumps and motors.

Sutter Subbasin Alternative Submittal to a Groundwater Sustainability Plan, Sutter County, CA. Served as part of the team that wrote an Alternative Submittal that was submitted to the California Department of Water Resources on behalf of Sutter County and Stakeholders to show that the Sutter Subbasin is operating within its sustainable yield and should not be required to produce a Groundwater Sustainability Plan as part of the Sustainable Groundwater Management Act. Produced the geologic cross-sections and the hydrogeologic conceptual model and developed the minimum thresholds and measurable objectives for the six sustainability indicators to show sustainability.

Sustainable Groundwater Management Program Support, California Department of Water Resources, Statewide, CA. Assisted DWR with development of basin boundary descriptions for Bulletin 118 groundwater basins in California. Working with GEI programmers and DWR staff. Participated in the development of a web-based data management and mapping tool to streamline the

process for writing the basin boundary descriptions in a consistent format and with sufficient detail required for implementation of California's SGMA.

Sustainable Groundwater Management Program Support, California Department of Water Resources, Statewide, CA. Assisted DWR with the development of the SGMA Portal and SGMA Reporting System which included using knowledge of local agencies and the Act and the Emergency GSP Regulations to work with GEI programmers and DWR during the development of DWR SGMA public websites and web-tools.

Evaluation of Restoration and Recharge Within the Butte County Groundwater Subbasins, Butte County, CA. Reviewed DWR well drilling logs and created geologic cross-sections to assist with determining best locations within Butte County for groundwater recharge. Evaluated the groundwater levels in the primary aquifers to assess connectivity.

Conjunctive Use Project, Butte Water District, Gridley, CA. Performed test hole logging, e-log interpretation, final monitoring well design and construction oversight for three nested monitoring wells that were constructed to a maximum depth of 600 feet. Supervised the logging, construction, development, aquifer testing and analysis, water quality sampling, and geophysical evaluations for two 20-inch diameter water supply wells to about 600 feet. Also wrote the well completion reports for both wells.

Hydrogeologic Investigation, San Juan Water District, Sacramento, CA. Conducted a hydrogeologic investigation using well-logs, historical data and geology to select potential well sites. Presented project for funding approval to the Engineering Committee and Board of Directors. Prepared plans and specifications. Logged the test holes. Observed and documented construction of a 2-inch diameter monitoring well construction with annular seals to separate aquifers. Collected water quality samples for Title 22 analysis. Prepared preliminary well design. Prepared a Mitigated Negative Declaration for construction of the new well.

The Stanford University gap project - Qualifying existing data for developing hydrogeological models and uncertainty quantification Three water agencies in California (Butte County, San Luis Obispo County, Indian Wells Valley Water District) State of California (DWR, SWRCB) Danish MUDP, Denmark

The Stanford University gap project - Qualifying existing data for developing hydrogeological models and uncertainty quantification.

CAREER

2018-Present **Hydrogeologist, Rambøll US Corp.**

2006-2018 **Hydrogeologist, GEI Consultants, Inc.**

2004-2006 **Teaching Associate, California State University, Chico**

EDUCATION

2000-2004 **B.S., Geology**, California State University, Chico

PROFESSIONAL ORGANIZATIONS

Groundwater Resources Association of California

American Water Works Association

Association of California Water Agencies

Norther California Water Association

ANNE W GATES, P.E.

Senior Managing Consultant

Anne Gates has been a licensed professional engineer in California since 1987, with over 30 years of experience in consulting engineering related to environmental investigations, feasibility study analyses, civil/environmental design and remediation construction. For both private- and public-sector clients, she provides overall technical management related to site investigation and remediation of contaminated property. She has prepared feasibility studies, engineering evaluations/cost analysis (EE/CA) reports and remedial action plans (RAPs) to analyze and select alternatives for site remediation. The alternatives evaluated in these reports have included innovative technologies, risk management strategies and traditional remedies. For the past 10 years, Anne's environmental engineering work has focused on decommissioning, closure and remediation of sites for the purposes of redevelopment. These projects have included preparation of detailed cost estimates for the design, construction and monitoring of environmental remediation alternatives. She has also provided expert testimony on projects involving environmental investigation, cost recovery and remediation.



CONTACT INFORMATION

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2200 Powell Street
Suite 700
Emeryville, CA 94608
United States of America

YEARS IN RAMBOLL ENVIRON

25

EDUCATION

1988

MS, Civil Engineering (Oceans and Hydraulics)

University of California, Berkeley, California

1984

BS, Civil Engineering

Stanford University, Stanford, California

COURSES/CERTIFICATIONS

Professional Engineer - Washington

Professional Engineer - Hawaii

Professional Engineer - California

Professional Engineer - Alaska (retired status)

REUSE/REDEVELOPMENT/SITE CLOSURE PROJECT EXAMPLES

HGST, San Jose

- Since 2005, assisted HGST with closure and decommissioning of portions of their industrial facility. Specifically, prepared the environmental documentation related to decommissioning and closure of 143 acres of former industrial property designated for

mixed use redevelopment. Also provided oversight with regards to building demolition and remediation of contaminated soil and soil gas.

Confidential Client, Fremont

- Managed a preliminary study of facility closure alternatives for the roughly 130-acre New United Motors Manufacturing, Inc. (NUMMI) facility located 45500 Fremont Boulevard in Fremont, California (the "site" or the "facility"). Provided preliminary information on the relative costs and benefits of three different scenarios for closing the facility and preparing the property for sale. Also completed an analysis of local and state regulations regarding closure and decommissioning of industrial operations and the cost to comply with these regulations during industrial decommissioning/closure.

San Quentin Prison

- Assisted the State of California in preparation of a study of alternatives for redevelopment of the roughly 200-acre San Quentin Prison. Responsible for identifying the redevelopment issues and costs related to facility closure and decommissioning assuming different land use scenarios.

Bay Area Research and Extension Center (BAREC) in Santa Clara

- Assisted the State of California in investigating and remediating a former pesticide research and testing facility in Santa Clara, California. The 17-acre parcel was slated for redevelopment into single- and multi- family homes and a small park. Responsibilities included preparation of a Site Characterization Report and Remedial Action Workplan to obtain site closure from DTSC.

Mission Bay in San Francisco

- Assisted with Catellus's redevelopment of the one of the largest "Brownfields" developments in Northern California.
- Analyzed different remediation scenarios for petroleum hydrocarbons in soil and ground water and the potential impact of these remedies on future development activities.
- In addition, provided technical assistance with respect to risk communication and environmental risk management procedures to be performed during site redevelopment and construction.

City of Emeryville, Emeryvillage Project

- Successfully negotiated site closure with the California RWQCB for a former industrial site that was contaminated with petroleum hydrocarbons and VOCs in soil and ground water.
- Integral to negotiating this site closure was communication of potential environmental risks and risk management procedures to be followed during construction and redevelopment.

Bay Street, Emeryville

- Worked closely with a private developer, the City of Emeryville Redevelopment Agency and the California DTSC to negotiate closure and redevelopment of a 20-acre former industrial site contaminated with heavy metals, benzene and pesticides /PCBs.
- Closure of the site was contingent upon implementation of deed restrictions and a risk management plan and Anne worked closely with the relevant agencies and the private developer to finalize the risk management plan and obtain site closure.
- Implemented the risk management plan during site construction and development activities. Additional contamination was found during development and Anne worked closely with the developer and DTSC to ensure the additional contamination was remediated. She is currently working with the developer on several cost recovery actions with respect to the additional contamination that was identified during development.

VAPOR INTRUSION PROJECTS

- Completed design and installation of a vapor mitigation system under an existing building in South San Francisco.
- Provided vapor mitigation system plans and specifications for several new residential and commercial developments in Santa Clara County, Alameda County, Los Angeles County and Santa Ana.
- Prepared standard vapor mitigation plans and specifications for a developer for implementation at a Superfund site undergoing redevelopment in Sacramento, California.
- Managed and provided technical oversight for a former dry cleaning facility in San Leandro, California. In response to a request from the California Department of Toxic Substances Control (DTSC), project involved determination of the nature and extent of impacts from former dry cleaning operation and an assessment of potential vapor intrusion risks.
- Currently providing oversight on an investigation related to vapor intrusion risks to a residential home from a former dry cleaning facility in Santa Clara, California.
- Completed an investigation to address releases from a former dry cleaning operation in Solano County, California.
- Managed the investigation and remediation of a large US Navy Laundry and dry cleaning site in Aiea, Hawaii that had been impacted by PCE and Stoddard solvent.

LITIGATION EXPERIENCE

Ms. Gates experience has provided litigation support in cases involving the responsibility, extent and remediation costs of soil and ground water contamination, consistency of remedial investigations and remedial/removal actions with the NCP, and Superfund cost allocation. Representative project examples are as follows:

- Served as an expert witness (included deposition and trial testimony) for Valley Industrial Services in Ameripride Services, Inc. versus Valley Industrial Services, Inc., US District Court, Eastern District of California, 2011 to March 2012. The case involved an assessment of the source of impacts from a wastewater system operated by a former dry cleaner and industrial laundry.
- Served as an expert witness (included deposition and trial testimony) for Chevron USA in Panetta versus Chevron USA, Superior Court of California, San Joaquin County, 2010 to present. The case involves an assessment of the source of hydrocarbon impacts to property owned by the Panetta family.
- Served as an expert witness (included deposition and pending trial testimony) for Chevron USA, in GCM Air Group versus Chevron USA, US District Court, Nevada, 2007 to present. The case involves an assessment of Chevron remediation activities at a site in Incline Village, Nevada.
- Served as an expert witness (included deposition and pending trial testimony) for Universal Paragon Corp. versus Ingersoll-Rand- US District Court, Northern District, 2006 to present. The case involves environmental remediation costs related to redevelopment of property in San Francisco, California.
- Served as an expert witness (included deposition and trial testimony) for Bay Street Partners versus Kemper Surplus Lines- US District Court, Northern District in 2004. The case involved environmental remediation and cost allocation related to redevelopment of property in Emeryville, California.

- Prepared and evaluated the potential cost differentials related to the presence of residual contamination associated with a condemnation valuation of a property acquired by the NAPA County Flood Control District.
- Provided litigation support regarding the extent and source of petroleum releases at a site adjacent to San Diego Bay.
- Provided litigation support regarding the extent and source of contamination and the allocation of remedial costs among various PRPs at a former foundry and wood-stove manufacturing site in Alameda County, California
- Prepared a cost allocation analysis for litigation involving remediation of hydrocarbons at the San Francisco airport.
- Prepared a cost analysis of various cleanup alternatives for cadmium contaminated ground water at a State NPL site in South Carolina.

CAREER

1992-1998

Manager of remediation and design engineering, Ogden Environmental and Energy Services Company, Honolulu and San Francisco offices.

Managed numerous hazardous waste and petroleum hydrocarbon investigation and remediation projects in California, Alaska, Hawaii and Guam.

Provided technical management for environmental engineering and remedial design projects on a \$210 million dollar CLEAN Contract with the US Navy in Hawaii.

1988-1992

Senior Associate at ENVIRON International Corporation, Emeryville, California.

1984-1987

Associate Engineer, McGill-Martin-Self, Orinda, California.

Designed and managed land development projects. Performed hydraulic and hydrogeologic analysis of floods, landslides, and land development projects. Designed and implemented grading, drainage, and erosion control plans for various engineering projects. Conducted numerous investigations on the causes and remediation measures for seepage in hillsides and various types of engineering excavations. Audited and assessed residential developments for compliance with building codes and other regulations.

PUBLICATIONS

Comparison of Modeled to Estimated Emission Rates at Active Hazardous Waste Landfill (with D. Suder and C. Schmidt). 1990. Presented at the Air and Waste Management Association, annual conference.

Estimation of Hydraulic Conductivity for a Tidally-Influenced Unconfined Aquifer (with Jeff Cotter). Presented at 1993 Joint CSCE-ASCE National Conference on Environmental Engineering, July, 1993.

George B. Rest, PE

Senior Vice President

TECHNICAL EXPERTISE

Water and Wastewater Master Planning
Capital Improvement Plan Development
Water treatment / water quality

PROJECT ASSIGNMENT

Water System Recovery Planning

YEARS OF EXPERIENCE

With OBG: 42

With Other Firms: 0

EDUCATION

MS/1983/Sanitary Engineering; Syracuse University

BS/1975/Civil Engineering; Union College

PROFESSIONAL REGISTRATIONS

Professional Engineer: NJ, NY, VA, MD, NC, MI, DC, DE, WV, KY, OH, TN, RI, KS

PROFESSIONAL AFFILIATIONS

National Director of the American Water Works Association (AWWA) (2008-2011)

American Concrete Institute, Committee 371, author of Guide for Analysis, Design, and Construction of Concrete-Pedestal Water Towers (ACI 371 R98)

AWARDS

George Warren Fuller Award, AWWA

Mr. Rest is OBG-Ramboll's Drinking Water Practice Leader. He directs large, comprehensive water programs involving multidisciplinary teams of engineers and scientists. These programs have involved water service replacements for large urban areas, emergency response, water quality, emerging contaminants, capital budget planning, final design and operations support.

REPRESENTATIVE PROJECTS

US Army Corps of Engineers/Passaic Valley Sewerage Commission, Superstorm Sandy Response, Newark, NJ, Program Manager –

Managed the emergency response after Superstorm Sandy inundated the 220 MGD WWTP serving Newark, NJ area. Coordinated with PVSC, USACE, FEMA, USEPA and NJDEP to implement a fast track installation of temporary sludge dewatering, the largest such operation ever attempted. Dewatering facilities were in service in two weeks. Also developed independent cost estimates for fast-track implementation of permanent facilities to support emergency procurements by PVSC and FEMA funding.

DC Water, Washington DC, Project Officer –

Directed planning, design and construction activities for over \$600 million of linear and vertical assets, including 18,000 water service line replacements, rehabilitation of 96" Blue Plains Influent Sewer, renewal and replacement of approximately 40 major water, sewer and pumping station assets, program management for the water distribution system, and ongoing support for the sewer program management contract. Met consent decree requirements for approximately 4,000 lead service line replacements per year for 4 consecutive years. Comprehensive services included managing private and public side replacements, tap water sampling, distribution of GAC filters, and management of customer "hot line".

Providence Water Supply Board, Providence RI, Project Officer -

Directed water distribution system water quality improvements, including developing a custom water quality model that predicts the concentration of disinfection by-products at every

compliance site. Modeling used source-trace feature to identify the percentage of water at each location that passed through each water storage facility. Results demonstrated that Utility could meet DBP levels at 90% lower cost than via the construction of advanced water treatment plant improvements.

Providence Water Supply Board, Providence RI, Project Officer – Directed facility planning and pilot studies to assess alternative strategies for upgrading a 90-year old 144 MGD WTP, using triple bottom line type models and pair-wise comparisons to consider life cycle costs and a variety of non-cost factors. Workshops engaged regulators, academic experts and cross functional team from utility to reach consensus decisions.

Washington Suburban Sanitary Commission, Planning Studies and Design, Laurel, MD, Project Officer - Directed business case analysis under the utility's Asset Management Program. Business case analyses included engineering development of alternatives and utilization of WERF SIMPLE business case spreadsheet tools to assess triple bottom line (i.e., economic, environmental, and societal) scoring of risk reduction, projected benefits, and life cycle cost. Directed studies and designs for over \$200 million of municipal water/wastewater facilities including upgrades to 285 MGD WTP, 72 MGD WTP, 10 MG of elevated storage, Total Water Management Study, Peak Demand Management Study, 42" Water Transmission Main Routing, forensic analysis of WTP failures, and ongoing value engineering for cost effective alternatives to comply with Potomac WFP Consent Decree.

23 Communities in Southeastern Michigan, Alternative Water Supply Study, Project Officer – Directed study for consortium of 23 communities in suburban Detroit area, that are currently served by Detroit Water and Sewer Department (DWSD). Study assessed the cost and return on investment for the communities to develop independent water source of supplies, treatment, and transmission systems. Used triple bottom line type evaluations to compare alternative strategies. Results indicated a reasonable return period, leading to favorable renegotiation of their wholesale contracts by DWSD.

Tennessee Duck River Development Agency, Duck River Comprehensive Regional Water Supply Plan, Shelbyville, TN, Project Officer – Conducted a three phase study to concurrently address four key subject areas: water quality and capacity, reliability and

permitting, financial and funding, and community impacts and public outreach. The regional plan addressed a water shortage in a five-county regional that is served by the Duck River, one of the most biologically diverse rivers in North America, with seven threatened and endangered aquatic species. Project achieved consensus in all four study areas using decision support tools, cost models, six open workshops, three community meetings, and the engagement of diverse stakeholder groups.

Bluegrass Area Development District, Water System Regionalization Feasibility Study, Lexington, KY, Project Officer – Directed the evaluation of alternative water supplies for 17 communities in central KY, representing a population of approximately 700,000. Project required extensive use of public workshops and meetings to develop input and support on public/political levels. Developed cost model and decision support model to address qualitative and quantitative evaluation criteria (adequate supply capacity, raw/finished water quality, cost, implementability, and flexibility). Bluegrass Water Supply Commission was formed and \$250 million program completed on time and under budget.

U.S. Army Corps of Engineers, New York District, West Point Wastewater Treatment Plant, U.S. Army Garrison West Point, NY, Project Officer – Director in Joint Venture to provide comprehensive investigation, design, engineering, permitting, and project management services for a \$70 million, advanced wastewater treatment plant (WWTP) at the U.S. Military Academy (USMA) at U.S. Army Garrison West Point.

Stafford County, Water and Sewer System Master Plan, VA, Project Officer – Directed comprehensive master planning studies for fast growing county in suburban Washington DC. Master Plan includes water demand and sewage forecasts, integration of planning and zoning revisions, safe yield analyses, asset condition assessments for WWTPs and WTPs and improvement to sewer collection and water distribution systems to meet projected growth. Scope included new hydraulic models to assess water and sewer facility needs, water quality assessment, permitting issues, and development of financing scenarios.

David R. Wilkes, PE, BCEE

Senior Division Officer / Senior Vice President

TECHNICAL EXPERTISE

Project management
Water quality and treatment
Water distribution, transmission, and storage
Advanced water treatment technologies

PROJECT ASSIGNMENT

YEARS OF EXPERIENCE

With OBG: 5
With other firms: 30

EDUCATION

MS/1983/Environmental Health Engineering;
University of Texas at Austin
BS/1981/Civil Engineering; North Carolina
State University

PROFESSIONAL REGISTRATIONS

Professional Engineer: VA, NY, FL
Civil Engineer: CA

PROFESSIONAL CERTIFICATIONS

Board Certified Environmental Engineer
(BCEE), American Academy of Environmental
Engineering

PROFESSIONAL AFFILIATIONS

American Water Works Association (AWWA),
Former Chair of Standards Council,
Previous Chair of National Water Treatment
Design and Construction Committee and
Trustee of Engineering & Construction
Division

Mr. Wilkes has extensive environmental engineering and project management experience. As a nationally-recognized water expert, he is experienced with a variety of water quality issues and advanced water treatment technologies, including low-pressure membranes, ultraviolet disinfection, granular activated carbon, ozonation, high-rate and direct filtration, ion exchange, and advanced oxidation. Mr. Wilkes has been involved in a variety of water treatment and water quality projects, including feasibility studies, pilot testing, design, and construction management for new and the expansion / rehabilitation of water treatment plants ranging from 5 mgd to more than 500 mgd. He is also well versed in Safe Drinking Water Act (SDWA) regulatory requirements and has evaluated treatment plants and water systems for compliance with these regulations.

REPRESENTATIVE PROJECTS

Providence Water Supply Board, Pretreatment Pilot Study, Scituate, RI, Project Officer – Performed a comprehensive pilot study to evaluate a wide range of advanced treatment processes for the 144-mgd Philip J. Holton Water Purification Plant. The study included a preliminary life-cycle cost and feasibility assessment to characterize a wide range of potential treatment options to reduce disinfection by-products and remove manganese from the raw water. Following an initial screening of treatment processes, a series of bench tests were performed to finalize the pilot operational criteria and initial chemical dosages. Pilot processes include magnetic ion exchange resins (MIEX); advanced oxidants (ozone and chlorine dioxide); high-rate clarification (dissolved air flotation and lamella plate settlers); activated carbon; and conventional, biological, and direct filtration.

Duck River Development Agency, Maury County Strategic Water Supply Plan, Shelbyville, TN, Technical Reviewer – Provided technical guidance and consultation to the project team for the development of water supply and treatment alternatives for a regional water system in central Tennessee. The plan evaluated both short-term and long-term options to improve water supply reliability and assist several participating utilities in optimizing their capital investments.

Washington Suburban Sanitation Commission, Potomac Water Treatment Plant (WTP) Filter Underdrain and Chlorination Upgrades, Potomac, MD, Technical Reviewer – This project was needed to address immediate issues with underdrain performance problems, and required fast-track work efforts to ensure the project could be implemented to avoid further damage. Provided initial review of the work plan and assisted in reviewing work products developed by the team.

PRIOR TO OBG

Naval Security Group Activity, Safe Drinking Water Act (SDWA) Water System Assessment, Sugar Grove, WV, Technical Director – As part of a U.S. Navy contract, led a team that provided a complete water system review and analysis for SDWA compliance. The work included an assessment of the water treatment plant for the base that treats surface water from the South Fork of the South Branch of the Potomac River. The work product was a summary report covering compliance with all regulations and recommendations for improvements to the operating procedures and activities by the base staff.

New York City Department of Environmental Protection (NYCDEP), Catskill-Delaware Water Treatment Plant (WTP), Westchester County, NY, Process Expert – Served as a water treatment process expert on the value engineering team for the \$2 billion Catskill/Delaware WTP project. Initiated and evaluated several major cost saving ideas generating several hundred millions of dollars in savings, including the use of UV disinfection instead of filtration. The NYCDEP moved forward with implementing that approach with a 2 billion gallon per day capacity.

North West Water, Water Program, United Kingdom, Senior Process Reviewer – Served as senior process reviewer for the North West Water Program, which involved the implementation of \$500 million of improvements in 80 projects to address regulatory drivers such as trihalomethanes (THMs) and cryptosporidium. The projects included several of the larger treatment works including a 600-ML/day direct filtration plant and a 250-ML/day ozonation/slow sand filtration plant.

Metropolitan Water District of Southern California, California State Water Project, Los Angeles, CA, Technical Lead – Provided cost estimating services

for granular activated carbon treatment and reporting on full-scale plant tests for water treatment using an ozone direct filtration process for plants with capacities ranging from 500 to 1,000 mgd. Completed detailed design for an oxidation demonstration project including the evaluation of an advanced oxidation process (using ozone and hydrogen peroxide) was evaluated. Also managed office engineering during construction.

Metropolitan Water District of Southern California, San Gabriel Valley Groundwater Basin, Los Angeles, CA, Technical Lead – Completed a scoping study for a pilot facility to evaluate treatment processes for the San Gabriel Valley groundwater basin to convert the contaminated groundwater (contaminants included synthetic organics, nitrate, and radon) to drinking water. Processes included in the proposed plant were ion exchange, granular activated carbon, air stripping, advanced oxidation, and biological denitrification for the reduction of waste ion exchange brine.

City of West Palm Beach, Water Treatment Improvement Program, FL, Program Manager – Provided oversight of several consultants involved in major improvements to an existing 48-mgd WTP, as well as bench- and pilot-scale testing of alternative treatment processes. Processes included MIEX® for total organic carbon (TOC) removal, low pressure membranes, and alternative taste and odor removal processes such as UV/peroxide and GAC for a potential replacement plant. Provided technical guidance throughout this multi-year program on behalf of the City to ensure that process performance and costs were balanced in the final solutions.

City of Baltimore, Water Treatment Plants, MD, Technical Lead – Served as a key technical resource for a comprehensive water system evaluation for three water treatment plants with capacities of 165, 128, and 112 mgd. Provided plant evaluation experience in reviewing current process performance of the filters and other unit processes and recommending immediate improvements at the plants for enhancing finished water quality. As part of this study, directed a comprehensive plant-scale testing program including tracer tests of major process units, optimization of flocculation, and development of revised operating procedures to minimize plant wastewater streams. The project also

included extensive pilot evaluations of the best process combinations of short-term improvements as well as long-term modifications for meeting future regulations.

Northern Kentucky Water District, Ft. Thomas and Taylor Mill Water Treatment Plants, Value Engineering, KY, Process Expert

– Served as senior water treatment process expert on the value engineering team for two WTP projects for the Northern Kentucky Water District. The District was embarking on a major advanced treatment program using GAC and UV disinfection at the WTPs and needed to ensure that most effective and economical solution was implemented. The value engineering team developed many ideas for both of the plants that improved the overall implementation of these advanced processes at a reduced cost.

Louisville Water Company, B.E. Payne Treatment Plant Riverbank Filtration Project, Louisville, KY, Technical Review

– Provided technical review services for treatment issues related to the B.E. Payne plant's ability to handle all aspects of RBI water. Specific impacts addressed included dissolved oxygen, softening, and filterability.

Fairfax Water, Frederick P. Griffith, Jr. Water Treatment Plant (WTP), Fairfax, VA, Design Leader/Assistant Project Manager

– Served as treatment plant design task leader and assistant project manager on the \$110 million Frederick P. Griffith, Jr. WTP project. The new 120-mgd plant includes intermediate ozonation and deep-bed granular activated carbon (GAC) filtration. Responsibly included leading the design team for the treatment facilities and conducting value engineering throughout the project to ensure compliance with the \$123M budget.

Newport News Waterworks, Lee Hall and Hardwood's Mill Water Treatment Plants Ozonation Facilities, VA, Project Manager

– Managed the design of ozonation facilities for primary disinfection at the 54-mgd Lee Hall and 48-mgd Harwood's Mill WTPs. The design incorporated a targeted disinfection goal of 3-log Giardia inactivation with the ability to expand the system in the future to achieve 10-log Giardia inactivation (assumed to equal 2-log Cryptosporidium inactivation). Responsibilities also included managing the instrumentation and control design for the new Lee Hall plant, including dissolved air flotation (DAF) as the clarification

process followed by ozonation and biological filtration. Since a system was being added to an existing plant, major coordination efforts with client staff were required to ensure compatibility with existing hydraulics and process requirements.

Fairfax Water, Lorton/Occoquan Water Treatment Plant, Fairfax, VA, Project Manager

– Managed a comprehensive evaluation of the 112-mgd capacity Lorton/Occoquan water treatment system. The evaluation included extensive pilot treatment plant studies including the use of ozone/biofiltration and various membrane treatment options (microfiltration, ultrafiltration, and nanofiltration). The work also involved facility evaluations of the existing treatment plants for process performance capability and included tracer testing of various unit processes. Utilized a computer decision modeling tool in a workshop to determine the best process option for the plant. The study led to the decision to build a new 120-mgd plant which incorporated intermediate ozonation for Cryptosporidium inactivation and replacement of chlorine with ozone as the primary disinfectant to reduce haloacetic acid levels in the distribution system.

Newport News Waterworks, Lee Hall and Hardwood's Mill Water Treatment Plants Disinfection Study, VA, Project Manager

– Managed a study evaluating disinfection practices and plant process options for 52-mgd Lee Hall and 31-mgd Harwood's Mill WTPs. Responsibilities included providing input during pilot testing for ozone design criteria, filtration design criteria, and microfiltration testing. Also managed the preparation of design documents for implementing ammonia addition at both of the WTPs. A preliminary design report was produced using DAF, post-clarification ozonation, and deep-bed GAC filters.

Waterleidingbedrijf Zuid-Holland-Zuid, Ozonation System, Rotterdam, Netherlands, Project Engineer

– Performed preliminary design for a 120-mgd ozonation system, including development of an optimization model for combining contact time and ozone dose to achieve pathogen disinfection and pesticide oxidation goals simultaneously.

Western Virginia Water Authority, Alternative Groundwater Source Evaluation, Roanoke, VA, Technical Director

– Evaluated options for providing an alternative groundwater source of supply for "drought-proofing" the West Virginia Water

Authority's water supply system. The project examined several membrane treatment options using groundwater under the influence of surface water and other groundwater sources. The potential solutions included dual membrane (UF/NF) processes as well as an analysis of blending of the treated water in the distribution system to prevent upset in the existing corrosion control process.

City of Dahlonega, Water Treatment Plant, GA, Technical Director – Assisted the City with obtaining approval from the Georgia regulatory body for a direct filtration membrane plant, the first-of-its-kind in the state. Guided the City with proposing a membrane treatment process with coagulation based on the high level of source water quality and on a plan to conduct pilot testing to “prove” the ability of the process to reduce disinfection byproducts as well as provide low turbidity, low pathogen treated water. By incorporating a membrane process, the plant was designed and built in a shorter period of time allowing the City to replace an aging, less effective conventional plant.

Broad River Water Authority, Water Treatment Plant, Spindale, NC, Technical Director – Served as technical director for the expansion of the Broad River Water Authority treatment plant from 8 to 10 mgd (with further potential to expand to 12 mgd). This facility needed modernization as well as the ability to expand to serve current and potential future wholesale customers while keeping the overall capital costs low. The proposed process solutions allowed for modernization while preparing the pretreatment portion of the plant for future expansion based on plant-scale testing with minimal additional capital expenditures.

Davidson Water, Inc., Miscellaneous Projects, Lexington, NC, Technical Director – Provided assistance to a large, private water company to achieve better performance and avoid regulatory and public relations issues for minimal costs. Projects included a full-scale plant hydraulic study to produce an additional 5 mgd from the WTP without any capital expenditures. Also completed a study to address lead in the distribution system which determined that a new coagulation regime would solve the lead issue while also reducing disinfection byproducts avoiding public relations issue with key customers, including schools. Assisted more than six utilities to ensure they performed an Initial Distribution System Evaluation (IDSE) of their system to determine where the worst

potential for disinfection byproducts (DBP) formation existed in accordance with part of the Stage 2 Disinfectants and DBP Rule. This work included an initial workshop to determine sampling sites and a final determination of proposed Stage 2 sampling locations based on the results for acceptance by the regulatory agencies.

City of Shelby, Shelby WTP DBP Reduction Project, NC, Technical Director – Served as technical director for the Shelby WTP disinfection byproduct (DBP) reduction project where an alternative to chloramination was proposed to avoid the higher capital cost and the increased potential for distribution system water quality issues. The proposed solution incorporated a pH reduction and modification in corrosion control practices using a blended phosphate corrosion inhibitor as well as enhanced pretreatment with pre-chlorination on top of the filters to achieve significant DBP reduction with minor capital cost. With implementation of the proposed solution, the Shelby utility and its primary wholesale customer were able to reach compliance with the DBP rule within the first quarter after start-up.

Columbus Water Works, Trihalomethane Study, Columbus, GA, Technical Director – Served as Technical Director for a Trihalomethane study that evaluated multiple alternative technologies for compliance with the Stage 1 and Stage 2 DBP maximum contaminant levels (MCLs). A major component of this effort was mapping the levels of DBPs in the distribution system and developing a clear understanding of the variations in DBP levels across the utility system. The results of this study provided an initial screening of alternatives that led to subsequent detailed evaluations of potentially successful options.

City of Clarksville, Water Treatment Plant, TN, Senior Technical Advisor – Served as senior technical advisor for a preliminary study to evaluate upgrades and rehabilitation of the existing water treatment facilities. The project required innovative concepts to ensure that increased capacity could be achieved within the limitations of existing infrastructure and client budget.

Murfreesboro Water and Sewer Department, Stones River Water Treatment Plant, Murfreesboro, TN, Senior Technical Advisor – Served as senior technical advisor for a preliminary

study to evaluate upgrades and rehabilitation of the existing water treatment facilities. The project required innovative concepts to ensure that increased capacity could be achieved within the limitations of existing infrastructure and client budget.

City of Franklin, Water Treatment Plant Evaluation, TN, Technical Director – Developed alternatives for regulatory compliance related to raw water with a high DBP formation potential. An alternative organic ion exchange technology (MIEX) was evaluated at both bench- and pilot-scale to determine capability to reduce DBP precursor levels below the MCLs. The MIEX process proved to be the lowest cost, viable alternative technology to meet the DBP MCLs.

White House Utility District, Water Treatment Plant Expansion, White House, TN, Technical Director – Served as Technical Director for a plant expansion project which included the use of innovative technology consisting of a submerged membrane technology using existing concrete tankage to achieve increased capacity within a limited client budget.

Hallsdale-Powell Utility District, New Water Treatment Facility, Knoxville, TN, Technical Director – Provided oversight of a treatability study for a high-quality lake supply. The treatability data indicated that even with low TOC water, this source had the potential to form high levels of DBPs. Several technology options were evaluated based on this information, including submerged membranes, pressurized membranes, and conventional treatment. The membrane alternatives included a coagulation step to ensure removal of the dissolved organic DBP precursor material before membrane treatment.

Spartanburg Water, Taste and Odor Evaluation Study, Spartanburg, SC, Technical Director – Provided technical direction for the study of Lake Blalock which focused on reservoir management alternatives such as in-lake aeration, copper sulfate treatment, and watershed controls as the most cost-effective means for achieving high-quality raw water prior to the water entering the Lake Blalock water treatment plant. These reasonably low cost options provide large gains in water quality improvement. The project also included significant baseline monitoring to establish the best “triggers” for when a taste and odor episode is about to occur.

U.S. Navy, Water System Evaluations, Various Locations, Project Manager – Served as project manager for several comprehensive evaluations of small and medium sized water systems at Navy bases in the U.S. and overseas to determine their compliance with SDWA. The studies included evaluations of source of supplies, treatment processes, and distribution system water quality. A comprehensive document was produced outlining compliance status and presenting necessary recommendations for improving water system performance and compliance.

U.S. Air Force, SDWA Monitoring Program Evaluation, Various Locations, Project Manager – Managed an evaluation of the SDWA monitoring program at six Air Force Bases in the U.S. and overseas. The project included an evaluation of the entire monitoring program to determine whether each facility is sampling, analyzing, and monitoring properly. Developed a SDWA management action plan that provides responsible individuals with a detailed guide to achieving compliance with monitoring requirements.

U.S. Air Force, Lajes Air Force Base, Azores, Portugal, Project Manager – Managed the design for the complete replacement of a water distribution system pipe network at Lajes Air Force Base. The project was on a fast track due to the failing existing system and the need to procure a contractor to utilize construction funds before the end of the fiscal year. The project was completed on schedule and within budget even with the addition of a new pump station and reservoir modifications that were not included in the original scope of work.

Casitas Municipal Water District, Treatment Feasibility Study, Ojai, CA, Project Manager – Conducted a treatment feasibility study for a surface water supply that required filtration according to the SDWA Amendments of 1986 and subsequently a preliminary design study for the proposed 35-mgd treatment plant. Following the feasibility study, directed pilot studies of the selected process, an unconventional high-rate in-line filtration process with pre-ozonation, to prove its capability to the State Health Department. As result of the pilot study, the process was approved by the State Health Department.

Milwaukee Water Works, Ozonation System Preliminary Design, Milwaukee, WI, Technical

Reviewer – Served as technical reviewer of the ozonation system preliminary design for the 105-mgd Howard Avenue and 275-mgd Linnwod 275 Water Purification plants in Milwaukee, Wisconsin, the site of the largest Cryptosporidiosis outbreak in the U.S. Ozonation was selected as the process for inactivating this pathogen and it was critical to ensure proper design criteria were used. Assisted the project team in developing a preliminary design that met the disinfection objectives of 2-log Cryptosporidium inactivation at these plants.

Long Beach Water Department, Groundwater Treatment Plant, Long Beach, CA, Project Engineer

– Served as project engineer for the conceptual and preliminary design efforts for a colored groundwater treatment plant with an ultimate capacity of 75 mgd.

City of Moorhead, Ozonation System Design, Moorhead, MN, Project Engineer – Performed the ozonation system design development for a 10-mgd treatment plant using PSA oxygen feed.

Santa Fe Irrigation District, R.E. Badger Water Treatment Plant, Rancho Santa Fe, CA, Lead Design Engineer – Served as lead design engineer for the expansion/rehabilitation design of the R.E. Badger WTP, a 40-mgd conventional treatment plant in Southern California. Responsibilities included coordinating the efforts of the design team for the entire project and design of the chemical feed systems, flocculation/sedimentation basins, and operations building modifications.

City of Tulsa, Water Treatment Plant Design, OK, Project Engineer – Participated in the preliminary design of the new 100-mgd Mohawk WTP. Responsibilities included design alternative evaluations for the pretreatment system including rapid mix, flocculation, and sedimentation. Developed concepts were implemented as part of the final design and construction of the facilities.

Metropolitan Water District of Southern California, Construction Management Services, Los Angeles, CA, Project Engineer – Performed water treatment plant construction management for \$25 million worth of constructed projects at various facilities. The facilities included advanced oxidation demonstration plants, a demonstration plant with ozone/hydrogen peroxide for taste and odor control on surface water, and a 22-mgd backwash water

reclamation facility for a 500-mgd water treatment plant.

American Water Works Association/Metropolitan Water District of Southern California, Surface Water Treatment Regulatory Compliance, Los Angeles, CA, Project Engineer – Involved in a project that included surveys of utilities nationwide and an evaluation of their ability to comply with the proposed federal regulations on surface water treatment. The results of this study were used by the U.S. Environmental Protection Agency (EPA) to modify these regulations before they appeared in final form.

PUBLICATIONS

Wilkes, D.R. 2007. **Drinking Water Quality Optimization: Distribution System Focus**. Proceedings of the 2007 Florida Water Resources Conference, April 17, 2007, Orlando, FL.

Wilkes, D.R. 2006. **Drinking Water Quality Optimization: Distribution System Focus**. Proceedings of the 86th Annual Meeting of the North Carolina Section of American Water Works Association (AWWA) / Water Environment Association (WEA), November 14, 2006, Greensboro, NC.

Wilkes, D.R. 2005. **Understanding and Using AWWA Standards**. Proceedings of the 85th Annual Meeting of the North Carolina Section of AWWA/WEA, November 15, 2005, Greensboro, NC.

Wilkes, D.R. 2005. **Bench and Pilot-Scale Testing of a Proprietary Ion Exchange Resin for Disinfection Byproduct Reduction**. Proceedings of the 85th Annual Meeting of the North Carolina Section of AWWA/WEA, November 14, 2005, Greensboro, NC.

Wilkes, D.R. and B. Treanor. 2003. **Bench and Pilot-Scale Testing of a Proprietary Ion Exchange Resin for Disinfection Byproduct Reduction**. Proceedings of the 2003 Florida Section AWWA Conference, November 16-20, 2003.

Wilkes, D.R. and D.B. Williams. 2002. **Implementation of UV at Drinking Water Plants: Practical Planning, Design and Procurement Considerations**. Proceedings of the 82nd Annual Meeting of the North Carolina Section of AWWA/WEA, November 17 – 20, 2002, Winston-Salem, NC.

Wilkes, D.R. 2001. **The New Stage 2 DBP Rules: Strategies for Evaluation and Compliance.** Proceedings of the 81st Annual Meeting, North Carolina Section of the AWWA, November 11 – 14, 2001.

Wilkes, D.R., M. Sultan, and D. Brinkman. 1997. **Complex Water Treatment Alternative Evaluation: Using a Computer-Based Decision Model for Analysis.** Proceedings of the 1997 AWWA Annual Conference, June 15-19, 1997.

Wilkes, D.R., S. Chellam, T. Bonacquisti, B. Long, and J. Jacangelo. 1996. **Conventional Treatment as a Pretreatment of Nanofiltration: Impact on DBP Precursor Removal, Fouling, and Facilities Design.** Proceedings of the 1996 AWWA Annual Conference, June 23-27, 1996.

Wilkes, D.R., M. Schwartz, and D. Brinkman. 1996. **Rigorous Filter Evaluations Improve Plant Performance.** Proceedings of the 1996 AWWA Engineering and Construction Conference, March 17-20, 1996.

Van der Veer, B., G.J. Schers, and D.R. Wilkes. 1994. **Optimization of Ozonation System Design to Achieve Disinfection and Oxidation.** Proceedings of the 1994 AWWA Annual Conference. June 19-23, 1994.

Wilkes, D.R., J.H. Borchardt, D.W. Ferguson, and T.A. Rulla. 1992. **Building New Technologies: Construction Experience with Advanced Oxidation Processes.** International Ozone Association Conference Proceedings. March 10-13, 1992.

Wilkes, D.R. and R.H. Barnett. 1990. **Meeting the Challenge of the Surface Water Treatment Rule: Pilot Studies at Lake Casitas.** Proceedings of the 1990 AWWA Annual Conference, June 17-21, 1990.

McGuire, M.J., M.K. Davis, S.Liang, C.H. Tate, E.M. Aieta, I.E. Wallace, D.R. Wilkes, J.C. Crittenden, and K. Vaith. 1989. **Optimization and Economic Evaluation of Granular Activated Carbon for Organic Removal.** AWWA Research Foundation Report.

Wilkes, D.R. and M. Young. 1987. **Study and Implementation of Waste Minimization at IBM Austin.** Proceedings of the 42nd Annual Purdue Industrial Waste Conference, May 12-14, 1987.

Wilkes, D.R. and D.F. Lawler. 1984. **Flocculation Model Testing: Particle Sizes in a Softening Plant.**

American Water Works Association Journal 76(7):90-97.

PRESENTATIONS

Wilkes, D.R. 2010. **Optimizing Distribution System Water Quality.** National AWWA Webcast, January 13, 2010.

Wilkes, D.R. 2007. **Drinking Water Quality Optimization: Distribution System Focus.** 2007 Florida Water Resources Conference, April 17, 2007, Orlando, FL.

Wilkes, D.R. 2006. **Drinking Water Quality Optimization: Distribution System Focus.** 86th Annual Meeting of the North Carolina Section of AWWA/WEA. November 14, 2006, Greensboro, NC.

Wilkes, D.R. 2006. **Development of IDSE Plans for the Stage 2 DBP Rules.** Water Environment Association of South Carolina (WEASC) Conference, September 7, 2006, Columbia, SC.

Wilkes, D.R. 2006. **Know Algae: No Taste and Odor.** Kentucky-Tennessee Water Professionals Conference, July 10, 2006, Chattanooga, TN.

Wilkes, D.R. 2006. **Using MIEX to Control Disinfection Byproducts – A Case Study.** Tennessee Association of Utility Districts Technology Conference, March 15, 2006, Gatlinburg, TN.

Wilkes, D.R. 2005. **Understanding and Using AWWA Standards.** Georgia Association of Water Professionals Fall Conference, November 16, 2005, Athens, GA.

Wilkes, D.R. 2005. **Understanding and Using AWWA Standards.** 85th Annual Meeting of the North Carolina Section of AWWA/WEA, November 15, 2005, Greensboro, NC.

Wilkes, D.R. 2005. **Bench and Pilot-Scale Testing of a Proprietary Ion Exchange Resin for Disinfection Byproduct Reduction.** 85th Annual Meeting of the North Carolina Section of AWWA/WEA, November 14, 2005, Greensboro, NC.

Wilkes, D.R. 2005. **Understanding and Using AWWA Standards.** Kentucky-Tennessee Water Professionals Conference, September 12, 2005, Newport, KY.

Wilkes, D.R. 2005. **Bench and Pilot-Scale Testing of a Proprietary Ion Exchange Resin for Disinfection**

Byproduct Reduction. Georgia Water and Pollution Control Association Annual Conference, July 20, 2005, Savannah, GA.

Wilkes, D.R. 2005. **The New Stage 2 DBP Rules: Strategies for Evaluation and Compliance.** Tennessee Water and Wastewater Association Meeting, May 12, 2005, Cleveland, TN.

Wilkes, D.R. 2004. **Disinfecting Potable Water with Ultraviolet Radiation.** Tennessee Association of Utility Districts Technology Conference, December 7, 2004, Gatlinburg, TN.

Wilkes, D.R. 2004. **The New Stage 2 DBP Rules: Strategies for Evaluation and Compliance.** Georgia Water and Pollution Control Association Annual Conference, August 4, 2004, Columbus, GA.

Wilkes, D.R. 2004. **Drinking Water Quality Optimization: Distribution System Focus.** Kentucky-Tennessee Section Water Professionals Conference and Exposition, July 22, 2004, Nashville, TN.

Wilkes, D.R. 2004. **Sludge Generation, Types and Minimization.** North Carolina Waterworks Operators Association, 14th Spring School Advanced Day, April 14, 2004, Raleigh, NC.

Wilkes, D.R. 2003. **Membrane Treatment: What You Need to Know.** Tennessee Association of Utility Districts Technology Conference, December 1, 2003, Gatlinburg, TN.

Wilkes, D.R. and Bill Treanor. 2003. **Bench and Pilot-Scale Testing of a Proprietary Ion Exchange Resin for Disinfection Byproduct Reduction.** 2003 Florida Section AWWA Conference, November 18, 2003.

Wilkes, D.R. 2003. **Emerging Issues and Technologies in Water.** The University of Texas at Austin, Civil Engineering Centennial Celebration Seminars, November 7, 2003, Austin, TX.

Wilkes, D.R. 2003. **Process Selection for Operational Success.** 64th Annual Raleigh School Advanced Day, North Carolina Waterworks Operators Association, October 8, 2003, Raleigh, NC.

Wilkes, D.R. and George Shemaka. 2003. **Submerged Membrane Retrofit: J.M. Cranor Water Treatment Plant.** Georgia/South Carolina Drinking Water Technology Forum, September 25, 2003, Savannah, GA.

Wilkes, D.R. 2003. **New Technology in Old Infrastructure: An Overview.** AWWA Annual Conference, June 18, 2003, Anaheim, CA.

Wilkes, D.R., I. Lail, D. Haas, and S. Levesque. 2003. **Procuring a Membrane System for Water Treatment: South Blount County's Experience.** North Carolina AWWA/WEA Spring Fling Conference, April 1, 2003, Wilmington, NC.

Wilkes, D.R. 2003. **Total Water Management: The Future of Water Supply and Water Quality.** North Carolina AWWA/WEA Reuse Seminar, March 6, 2003, High Point, NC.

Wilkes, D.R. and D.B. Williams. 2002. **Implementation of UV at Drinking Water Plants: Practical Planning, Design and Procurement Considerations.** 82nd Annual Meeting of the North Carolina Section of AWWA/WEA, November 19, 2002, Winston-Salem, NC.

Wilkes, D.R. and D.B. Williams. 2002. **Implementation of UV at Drinking Water Plants: Practical Planning, Design and Procurement Considerations.** Kentucky-Tennessee Section AWWA Annual Conference and Exposition, September 19, 2002, Chattanooga, TN.

Wilkes, D.R. 2002. **Strategies for Compliance with Emerging Regulations.** Pine Island Conference of the Water Environment Association of South Carolina, September 5, 2002.

Wilkes, D.R. 2002. **Adjusting to the New Filtered Water Turbidity Regulations.** Georgia Water and Pollution Control Association Annual Conference, August 14, 2002, Cobb County, GA.

Wilkes, D.R. 2002. **Membrane Treatment: What You Need to Know.** Tennessee Association of Utility Districts Annual Conference, August 8, 2002, Gatlinburg, TN.

Wilkes, D.R. and P. Burnett. 2002. **Total Water Management: The Future of Water Supply and Quality.** AWWA Annual Conference, June 19, 2002, New Orleans, LA.

Wilkes, D.R. 2002. **Know Algae - No Taste and Odor?** Taste and Odor Seminar for Kentucky-Tennessee Section AWWA, May 23, 2002, Louisville, KY.

Wilkes, D.R. 2002. **DBP Stage 1: Compliance Approaches**. Advanced Drinking Water Technology Workshop of the Association of State Drinking Water Administrators, May 1, 2002, Atlanta, GA.

Wilkes, D.R., B. Treanor, and S. Pugh. 2002. **Optimizing the Coagulation Process**. Full-day Training Program for the Tennessee Association of Utility Districts, April 2, May 15, and August 7, 2002, Murfreesboro, Kingsport, and Gatlinburg, TN.

Wilkes, D.R. and David B. Williams. 2002. **Implementation of UV at Drinking Water Plants: Practical Planning, Design and Procurement Considerations**. South Carolina Environmental Conference, South Carolina Section AWWA, March 19, 2002, Myrtle Beach, SC.

Wilkes, D.R. 2001. **The New Stage 2 DBP Rules: Strategies for Evaluation and Compliance**. 81st Annual Meeting, North Carolina Section AWWA, November 12, 2001, Pinehurst, NC.

Wilkes, D.R. 2001. **The New Stage 2 DBP Rules: Strategies for Evaluation and Compliance**. Kentucky-Tennessee Section AWWA Annual Conference and Exposition, September 18, 2001, Lexington, KY.

Wilkes, D.R. and P. Burnett. 2001. **Comprehensive View of Water Planning**. GA/SC Drinking Water Technology Forum, September 14, 2001, St. Simons Island, GA.

Wilkes, D.R. 2001. **Water Filter Evaluation**. Pine Island Conference of the Water Environment Association of South Carolina, September 6, 2001.

Wilkes, D.R. 2001. **New Water Treatment Techniques**. Tennessee Association of Utility Districts Annual Conference, August 9, 2001, Gatlinburg, TN.

Wilkes, D.R., G. Helfrich and D. Williams. 2000. **Alternative Disinfectants and Oxidants for Regulatory Compliance**. Kentucky-Tennessee AWWA Annual Conference and Exposition, October 3, 2000, Nashville, TN.

Wilkes, D.R. and E. Landsberg. 1999. **Ozone System Design Optimization**. GWPCA Annual Conference and Exposition, August 2, 1999, Macon, GA.

Wilkes, D.R. and R. Harris. 1997. **Project Management: Utility and Consulting Perspectives**.

64th Annual Meeting, Virginia Section AWWA, October 10, 1997, Richmond, VA.

Wilkes, D.R., S. Chellam, T. Bonacquisti, B. Long, and J. Jancangelo. 1997. **Conventional Treatment as a Pretreatment for Nanofiltration: Impact on DBP Precursor Removal, Fouling, and Facilities Design**. 64th Annual Meeting, Virginia Section AWWA, October 9, 1997, Richmond, VA.

Wilkes, D.R., M. Sultan, and D. Brinkman. 1997. **Complex Water Treatment Alternative Evaluation: Using a Computer-Based Decision Model for Analysis**. AWWA Annual Conference, June 19, 1997, Atlanta, GA.

Wilkes, D.R., T. Bonacquisti, and D. Brinkman. 1996. **Optimization of Ozone System Design for Cryptosporidium Inactivation**. 63rd Annual Meeting, Virginia Section AWWA, October 17, 1996, Norfolk, VA.

Wilkes, D.R., S. Chellam, T. Bonacquisti, B. Long, and J. Jancangelo. 1996. **Conventional Treatment as a Pretreatment for Nanofiltration: Impact on DBP Precursor Removal, Fouling, and Facilities Design**. Annual Meeting, AWWA Annual Conference, June 27, 1996, Toronto, Canada.

McNelly Dacier, N., D.R. Wilkes, M. Schwartz, and D. Brinkman. 1996. **Rigorous Filter Evaluations Improve Plant Performance**. AWWA Engineering and Construction Conference, March 17-20, 1996, Denver, CO.

Wilkes, D.R. 1995. **Computer Modeling of Distribution System Water Quality**. 62nd Annual Meeting, Virginia Section AWWA, October 18, 1995, Roanoke, VA.

Wilkes, D.R., B. van der Veer, and G.J. Schers. 1994. **Optimization of Ozonation System Design to Achieve Disinfection and Oxidation**. AWWA Annual Conference, June, 1994, New York, NY.

Wilkes, D.R. and R. Starr. 1993. **The Hardy W. Croxton Water Treatment Plant: Flexible Water Treatment Technology for the 21st Century**. AWWA Southwest Section Conference, October, 1993, Oklahoma City, OK.

Wilkes, D.R., D.W. Ferguson, and K.G. Ferguson. 1992. **Oxidation Demonstration Plant Design**. AWWA Advanced Oxidation Processes Workshop, April 14, 1992, Miami, FL.

Wilkes, D.R., J.H. Borchardt, D.W. Ferguson, and T.A. Rulla. 1992. **Building New Technologies: Construction Experience with Advanced Oxidation Process**. International Ozone Association Conference, March 1992, Pasadena, CA.

Wilkes, D.R. and R.H. Barnett. 1990. **Meeting the Challenge of the Surface Water Treatment Rule: Pilot Studies at Lake Casitas**. AWWA Annual Conference, June 1990, Cincinnati, OH.

Borchardt, J., C. Dougherty, and D.R. Wilkes. 1988. **Survey of Ozone System Construction Costs**. International Ozone Association Conference, December 1988, Myrtle Beach, SC.

Wilkes, D.R. 1988. **Impact of the Surface Water Treatment Rule on Water Utilities**. AWWA Ohio Section Conference, September 1988, Columbus, OH.

Wilkes, D.R. 1988. **Optimization and Economic Evaluation of Granular Activated Carbon**. AWWA Southwest/Texas Section Conference, October 1988, Tulsa, OK.

Wilkes, D.R. and M.K. Young. 1987. **Study and Implementation of Waste Minimization at IBM Austin**. 42nd Purdue Industrial Waste Conference, May 1987, West Lafayette, IN.

Wilkes, D.R. 1983. **Flocculation and Sedimentation in Water Treatment: Field Measurements and Testing of a Mathematical Model**. AWWA Annual Conference, June 1983, Las Vegas, NV.

AWARDS

ASCE National Edmund Friedman Young Engineer of the Year Award, 1992

AWWA Academic Achievement Award for Master's Thesis, 1984

Anthony E. Miller, Ph.D.

Chief Executive Officer
Entanglement Technologies, Inc.

An expert in the application of precision laser techniques, precision measurement, and signal processing to the analysis of environmental Hazards. Develops and implements quantitative analytical techniques toxic analysis. Extensive experience in volatile analysis in air, soil, and water. Prior expertise in the quantum mechanical limits of measurements and the role of quantum dynamics in the measurement of small systems. This included quantum limited magnetometry and single atom, strong coupling cavity quantum electrodynamics experiments. Leading expert in cavity ring-down spectroscopy and applications.

Provides field analytical services for rapid screening of contaminated sources. Services include indoor air, soil vapor, sanitary sewer headspace, and drinking water screening. Deployments have included BAAQMD, US EPA, City of Houston, ESTCP, and the City of Redding.

A. Education

INSTITUTION AND LOCATION	DEGREE	MM/YY	FIELD OF STUDY
Princeton University	A.B.	06/2004	Physics
California Institute of Technology	N/A		Physics
Stanford University	Ph.D.	9/2011	Applied Physics

B. Positions and Honors

Positions and Employment

2013- Chief Executive Officer, Entanglement Technologies, Inc.
2011-2013 Research Scientist, Entanglement Technologies, Inc.
2010-2011 Consultant, Entanglement Technologies, Inc.
2007-2011 Graduate Research Assistant, Stanford University
2004-2007 Graduate Research Assistant, California Institute of Technology
2000-2003 Undergrad Research Assistant, Princeton University

Other Experience and Professional Memberships

2011- Consultant for the nonprofit Hertz Biochar Project
2007- Reviewer, Physical Review A, Physical Review Letters

Honors

Hertz Fellow (2004)
Center for the Physics of Information Research Stipend, CalTech, USA (2004)
Shenstone Prize, Princeton University. (2004) PRISM Prize for senior thesis, Princeton University. (2004)
Elected Phi Beta Kappa, One of 16 elected early, Princeton University. (2003)
Kusaka Prize and Honorarium for junior independent work, Princeton University. (2003)
Barry M. Goldwater Memorial Scholarship. (2003)
2001, 2002 Shapiro Prize, Princeton University. (2001,2002)
Bronze Metal, 31st International Physics Olympiad. (2000)

Anthony E. Miller, Ph.D.

Chief Executive Officer
Entanglement Technologies, Inc.

C. Selected Peer-reviewed Publications, Presentations, and Patent Citations

A. Miller *et al.* *Prevalence and Extent of cVOC contamination in Sanitary Sewer Systems in the Greater Bay Area.* Battelle Chlorinated Conference, April 2018

M. Roghani, O. Jacobs, A. Miller, *et al.* *Occurrence of chlorinated volatile organic compounds (VOCs) in a sanitary sewer system: Implications for assessing vapor intrusion alternative pathways.* *Science of the Total Environment*, Pages 1149-1162, March 2018.

J. Horney, G. Castillas, A. Miller, I. Rusyn *et al.* *Conducting Environmental Health Research after Disasters: Disaster Research Response to Hurricane Florence.* In preparation.

A. Miller, B. Richman, C. R. Viteri, J. McKeever
Selective cavity-enhanced trace gas detection via diffusion time-of-flight
[SPIE Proc. 8358, \(May 1, 2012\)](#) doi:10.1117/12.919312

Device and method for cavity detected high-speed diffusion chromatography (US Pats. 9086421)

T-sensor devices and methods of using same. (US Pat. 9,086,392)

Cavity enhanced absorption spectroscopy with a laser modulation side-band frequency locked to the cavity (US Pat. 9,200,960 B2)

Michael Armen, Anthony Miller and Hideo Mabuchi, "Spontaneous dressed-state polarization in the strong driving regime of cavity QED," *Phys. Rev. Lett.* 103, 173601, (2009), PMID: 19905755.

Martin C. Fischer, Tong Ye, Gunay Yurtsever, Anthony E. Miller, Maria Ciocca, Wolfgang Wagner, Warren S. Warren, "Two-photon absorption and self-phase modulation measurements with shaped femtosecond laser pulses." *Opt. Lett.*, Vol. 30 Issue 12 Page 1551 (June 2005), PMID: 16007804.

Anthony Miller. "Suppression of tensor decoherence in QND measurements of atomic ensembles." Ph.D. Thesis. Department of Applied Physics, Stanford University 2011.



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