

December 4, 2017

Mr. Dick McKinley
Public Works Director
City of Paso Robles – City Hall
1000 Spring Street
Paso Robles, California 93446

Re: Request for Proposals (RFP) for Groundwater Sustainability Plan Development

Dear Mr. McKinley:

Aquilologic, Inc. is pleased to submit the accompanying proposal in response to the above referenced Request for Proposals (RFP) for groundwater sustainability plan (GSP) development for the Paso Robles Sub-basin pertinent to compliance with the Sustainable Groundwater Management Act (SGMA). **Aquilologic** is an employee-owned, groundwater-focused, environmental and water resources consulting firm founded in 2011. While we may be perceived as a small consulting company, in the past six years, we have executed projects with fee values up to \$3 million, and have the staffing and financial capacity to successfully deliver this project.

Our proposal addresses all of the requirements of the RFP, describing our experience and qualifications, the project team, our approach to delivering this important project, pertinent project experience, and client references. Our cost estimate to complete the scope of work is summarized in the proposal and is valid for 90-days. Given the 30-page limit for the proposal, we have focused the proposal on technical content. Curriculum vitae (CV) for project staff, detailed project descriptions, a complete Statement of Qualifications (SOQ), and fee estimate details are not provided in the proposal, but can be provided, if needed. In addition, supporting company information is available at our website: www.aquilologic.com.

As identified in the attached proposal, Steve Ross will be the Project Manager (PM) for this scope of work:

Steve Ross, PG
Principal Hydrogeologist, Aquilologic, Inc.
245 Fischer Avenue, Suite D-2, Costa Mesa, CA 92626
Phone: +1.714.770.8040
Email: steve.ross@aquilogic.com

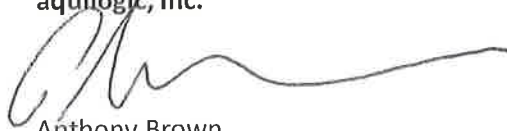
We hope that our proposal provides the information needed to assist in your selection of a consultant. We understand that other groundwater consulting firms/teams will be responding to

this RFP, and they (like **aquilogic**) have the technical capability to deliver the project. However, the following attributes differentiate **aquilogic** from these other companies/teams:

- Detailed technical understanding of the Sub-basin
- Harmonization of the SGMA process with the quiet title litigation
- More cost-effective project delivery
- Awareness of the issues that will arise during GSP development
- Understanding of the perspectives, goals, and limitations of the different stakeholder groups
- A simple team structure to deliver this project – one company, one point-of-contact, one message (if the GSA partners want a team – consider picking your own team members!)
- Local delivery of this important project
- Understanding of SGMA, GSP requirements, DWR BMPs, etc.
- The ability to communicate complex and contentious technical issues to a variety of parties
- An ability to develop more holistic solutions that consider legal, public relations, political, economic, and other aspects of groundwater management

Perhaps more than these differentiators, **aquilogic's** core philosophy drives client satisfaction: We are smart, we are honest, we are agile, we are passionate, and we are fun! We have demonstrated these qualities to our existing clients, and we are confident that we can deliver this important project on time and on-budget and provide you with the level of service you demand. If you have any questions, please contact us via telephone, email, or mail.

Sincerely,
aquilogic, Inc.

A handwritten signature in black ink, appearing to read "Anthony Brown", written over a horizontal line.

Anthony Brown
CEO & Principal Hydrologist

A handwritten signature in blue ink, appearing to read "Stephen D. Ross", written over a horizontal line.

Stephen D. Ross
Project Manager & Principal Hydrogeologist

1.0 INTRODUCTION

Aquilologic, Inc. (**aquilologic**) is pleased to submit this proposal in response to the Request for Proposals (RFP) for groundwater sustainability plan (GSP) development for the Paso Robles Sub-basin in compliance with the Sustainable Groundwater Management Act (SGMA).

Aquilologic will support the five groundwater sustainability agencies (GSA's) currently identified within the San Luis Obispo portion of the Sub-basin: City of Paso Robles (the City), the County of San Luis Obispo GSA (the County), San Miguel Community Service District (SMCSD), Heritage Ranch Community Service District (HRCSD), and the Shandon-San Juan (SSJ) GSA (collectively the "GSA partners"). It is anticipated that the Estrella-El Pomar-Creston Water District (EPCWD) will also participate in the preparation of the GSP. In addition, a portion of the Sub-basin lies within Monterey County and beyond the GSA partner boundaries. It is our understanding that the Salinas Valley Basin (SVB) GSA will represent the portion of the Sub-basin within Monterey County, as well as the adjoining Upper Valley Aquifer (UVA) Sub-basin. Coordination activities between the GSA partners and the SVB GSA, as well as adjoining sub-basins (i.e., the Atascadero Basin GSA), will be required during the preparation of the Paso Robles Sub-basin GSP.

Technical Understanding

In supporting the GSAs, the technical consultant will need a sound understanding of hydrogeology, groundwater flow conditions, water quality issues, the differentiation between subterranean waters and percolating groundwater, groundwater management, local and regional planning (e.g., land use changes), current and future water demands, competing water interests, other available water resources (e.g., Lake Nacimiento), potential future alternative water supplies (e.g., brackish water), and the perspectives of the various stakeholders. Given our current work in the Paso Robles Sub-basin and other basins (e.g. Kern Sub-basin), **aquilologic** has expertise and experience in all of these considerations. As many of the GSAs may be aware, we are currently providing expert witness consulting services and testimony on behalf of the City of Paso Robles and other public agencies in the quiet title action brought to address water rights within the Sub-basin.

Implementation of SGMA in many basins will mean that less groundwater is available to meet existing and future demands, at a time when existing supplies are already strained due to minimum environmental flow requirements. Therefore, an understanding of conjunctive use, water rights, water transfers, enhanced recharge, aquifer storage, marginal water use (e.g. brackish water treatment), and potential public grant funding sources will be critical to successful SGMA compliance. To develop and implement a successful GSP, there will need to be a focus on improved groundwater management, optimization of existing resources, and the development of new sources, rather than on the allocation of current resources based on current demands.

Stakeholder Considerations

The GSP for the Paso Robles Sub-basin will need to meet the needs of a diverse stakeholder group with a variety of strong positions about all water issues in the Sub-basin. We are familiar with many of the concerns and perspectives that the various stakeholders have. This familiarity is partly based on our experience in the quiet title litigation, but also on our SGMA-related work in other basins for municipalities (e.g., City of Riverside), water districts (e.g., Westside District Water Authority [WDWA] in Kern County), agricultural interests (e.g. the Wonderful Company), oil companies (e.g., California Resource Corporation), land owners (e.g., Santa Margarita Ranch), and other stakeholder groups (e.g., community groups in Ventura County).

A GSP development process that includes coordination with multiple GSAs and adjacent sub-basins, and engagement with a variety of stakeholder groups, is a significant undertaking. The technical challenges are significant, but not insurmountable. However, it is the ability to address technical, legal, political, and stakeholder challenges in an integrated, consistent, and reasonable manner that will ultimately lead to the development of a successful GSP. Our ability to working alongside GSA members, other technical consultants, legal counsel, and outreach consultants, and our experience working in similar basins with diverse stakeholder groups, will be critical ingredients that **aquilogic** can bring to the development process. One word characterizes our approach to development of a successful GSP – collaboration.

Quiet Title and SGMA Harmonization

Finally, developing and implementing a GSP while treating the current quiet title litigation as a separate and distinct process is not advisable or cost-effective. Senate Bill 226, a companion bill to Assembly Bill 1390, requires that groundwater adjudications be managed to minimize interference with completion and implementation of GSPs. Adjudications in such basins must also proceed in a manner that permits the timely attainment of basin sustainability goals prescribed by SGMA. More importantly, the development and implementation of a GSP must be “harmonized” with the adjudication process.

If selected as the GSP development consultant, our involvement in the quiet title action on behalf of the public agencies will greatly facilitate the required harmonization and result in a more cost-effective process. Our existing work on basin boundaries, water budgets, other existing water supplies (i.e. Santa Margarita Lake, Lake Nacimiento, Lake San Antonio), native safe yield and operating safe yield determination, overdraft conditions, and our experience working with the Sub-basin groundwater flow model, will feed directly into the GSP process. This will result in not only harmonization but also significant cost savings. Further, the development of a “physical solution” in the quiet title action must be closely coordinated with GSP development. In fact, the GSP and the groundwater management plan (GMP) required as part of the physical solution should be materially similar. Again, having the same consultant

develop the GSP and physical solution would ensure harmonization and result in significant costs savings.

Simplified Project Team Structure

We also offer a simplified project team structure – one company, one message, one point of contact, and one throat to choke. Other responders will likely have multiple companies on the project team. This will likely result in the following issues:

- unclear lines of communication
- inconsistent message to stakeholder groups
- internal conflict and possible in-fighting over work
- problems with work coordination and execution
- lack of consistent strategic input and direction
- duplication of work effort and rewriting
- complex contracting structure
- excessive project management
- too many consultants at too many meetings
- constant staffing changes
- Excess cost

If the GSA partners really want a team to deliver this project, why not pick your own team members, rather than being confined to picking a pre-set team!

2.0 BACKGROUND

Aquilogic is an employee-owned, S-corporation registered as a small (micro) business in California since January 2012 (DUNS 078884866). Currently, the company has one staffed office located in Costa Mesa, California, and there are eight full-time employees and five contract (zero-hour) employees located in that office. However, it is planned that Steve Ross, the PM for this project, will be based in San Luis Obispo. In fact, Steve and his family will be looking for a new home and new office the week of December 25, 2017.

Aquilogic was established by Anthony Brown, the Principal-in-Charge (PIC) for this project. Anthony was formerly the founder, senior shareholder, Chief Executive Officer (CEO) and Principal Hydrologist at Komex Environmental. Steve Ross was a principal, shareholder, and manager of Canadian operations at Komex. All of the proposed project team members have worked together for the past 20 years at **aquilogic** and Komex.

The team of professionals at **aquilogic** is committed to the development and application of solutions to water and environmental challenges while delivering value to our clients.

Combining exceptional technical capability with a personal approach to service, **aquilogic** has proven itself as a leader in the fields of environmental and hydrological consulting services. **Aquilogic's** most important resource is its employees. Collectively, they have an unsurpassed level of expertise in water resources and environmental consulting. In particular, all of our professional staff have advanced degrees and/or professional registration. Perhaps more importantly, our employees embody our core values: be smart, be honest, be agile, be passionate and, most of all, be fun!

At **aquilogic**, we provide our clients with the highest level of service and responsiveness, developing personal relationships. In addition to technical advice, we provide valuable input in the regulatory, legislative, and legal aspects of projects. Our ability to work as a team with client's staff, counsel, and other consultants has been critical to the success of these projects.

3.0 RELEVANT EXPERIENCE AND QUALIFICATIONS

Aquilogic has worked on hundreds of groundwater resources projects throughout California (see www.aquilogic.com/projects.php). The following are selected clients to whom we are currently providing SGMA-related support and groundwater management consulting services:

- Orange County Water District
- Water Replenishment District
- Indian Wells Valley Water District
- City of Santa Monica
- City of Riverside
- Mission Springs Water District
- Indian Wells Valley Water District
- City of Bakersfield
- City of Fresno
- City of Atwater
- City of Torrance
- Golden State Water Company
- Wonderful Company
- Madera County Farm Bureau
- RTS Agribusiness
- California Resources Corporation
- Sentinel Peak Resources
- Rossi Enterprises (Santa Margarita)

3.1 Qualifications

Aquilogic can provide the level of technical expertise and client service that the GSA partners are expecting, and we have the following specific qualifications relative to the project needs:

1. Knowledge of the requirements and expectations of SGMA

Aquilogic has for the past several years been addressing many of our client's needs in regards to the implementation of SGMA. Publications on the **aquilogic** website demonstrate our comprehensive understanding of SGMA and associated requirements and guidelines (www.aquilogic.com/publications.php). As noted, **aquilogic** is working with numerous public agencies and private sector clients in the development and implementation of SGMA compliance strategies.

2. Knowledge of local hydrogeology, water quality conditions, and groundwater pumping

Aquilogic has extensive knowledge of hydrogeology, water quality conditions, and groundwater pumping activity in the Paso Robles Sub-basin. As noted, we are the designated expert for the City of Paso Robles in the quiet title action brought to address water rights in the Sub-basin. In our work in this matter we are in the evaluating boundary conditions, hydro-stratigraphy, groundwater flow, hydraulic parameters, well locations and yields, groundwater quality, subterranean water and percolating groundwater differentiation, groundwater-surface water interaction, land use water demands, natural and enhanced aquifer recharge, lake/reservoir-groundwater interactions, native and operating water budgets, native safe yield determination, operating yield determination, overdraft conditions, other undesirable results, etc. We are also working extensively with the groundwater flow model developed for the Sub-basin by San Luis Obispo County.

Specifically, we have reviewed the Phase 1 (2002) and Phase 2 (2005) Paso Robles Basin Groundwater Studies, the 2011 Groundwater Management Plan, and the 2015 Salt and Nutrient Management Plan, and other relevant local and regional studies, and are knowledgeable as to their applicability to GSP development within the Sub-basin.

It is also assumed that additional information, documentation, and data that may be pertinent to the GSP development process will be made to **aquilogic** by the partner GSAs, other public agencies, or other sources (e.g., individual pumpers).

3. Knowledge of technical issues in the groundwater basin

As noted, **aquilogic** has a detailed understanding of technical issues in the Sub-basin. Based on our existing knowledge, we would expect the issues to include, but perhaps not be limited to, the following:

- a. Overdraft and associated groundwater level declines and loss of storage
- b. Well interference from expanding cones of depression
- c. Reduced well yields, well screen encrustation, and other well performance issues
- d. Water quality (e.g., nitrates and localized contamination)
- e. Localized subsidence from groundwater pumping
- f. Inter-basin flows, notably from the Atascadero Sub-basin and into the UVA Sub-basin
- g. Natural recharge and supplemental recharge
- h. Groundwater-surface water interaction and environmental flows (e.g., to maintain riparian and/or lacustrine habitats)
- i. Differentiation between pumping of State-permitted subterranean water versus percolating groundwater
- j. Lake/reservoir-groundwater interactions, notably enhanced localized recharge and “ownership” of lake recharge
- k. Water budgets and what should/should not be included

- l. Ownership of treated wastewater, return flows, and potential marginal waters
- m. Safe yield determinations, both native and operational
- n. Allocation of safe yield (the elephant in the room) by various methodologies
- o. Well metering
- p. Pumping reduction schedules, allocations, and enforcement
- q. Failure to harmonize the quiet title action and SGMA
- r. And..... funding the development and implementation of the GSP

Many of the above issues are not purely technical, but include significant policy considerations. However, the technical aspects should be used as a platform for policy decisions. That is, policy decisions should appear to be based on data and technical analysis, while considering other factors (e.g., economics) and stakeholder perspectives/goals. Otherwise, there is a risk that decisions may be seen as biased, self-serving, arbitrary, and/or capricious.

In addition, some of the issues are basin-wide; whereas, many are more localized. It is clear that groundwater conditions vary between areas of the Sub-basin (e.g., Estrella versus Shandon). Historically, the Sub-basin has been divided into a series of groundwater management areas (GMAs) based upon variation in groundwater conditions: Bradley, North Gabilan, South Gabilan, Estrella, Shandon, San Juan, Creston, Atascadero (now a separate sub-basin under SGMA but not the quiet title action), and the San Andreas GMAs. SGMA allows for the definition of defined GMAs that can then set their own sustainability goals, thresholds, management actions, and GSP projects, so long as they are consistent with those of the overall Sub-basin, and support groundwater sustainability. SGMA-defined GMAs can be based on groundwater conditions and/or other management considerations (e.g., GSA boundaries). Therefore, the GSA partners need to assess whether the Sub-basin should be divided into SGMA-defined GMAs, how such GMAs would be established, their role in GSP development (e.g., GSP “chapters”), how these areas should be managed, and how management will be coordinated between GMAs. If separate GMAs are not created then applying basin-wide restrictions and management actions may work for one area and not another, or many not work for any area!

4. Understanding of stakeholder perspectives.

Aquilogic has a long history of working with stakeholders in Paso Robles and the Central Coast. Currently we represent the City of Paso Robles and other public agencies in the quiet title action, we also represent Wonderful Company (owner of Justin), Rossi Enterprises (owner of the Santa Margarita Ranch), and Twin Oaks Ranch. In the past, the project team has worked on numerous other projects on the Central Coast (Komex had a five-person office in San Luis Obispo for many years). Based on our experience, we would expect the following stakeholder groups to have differing perspectives on groundwater issues:

municipal water pumpers (e.g., City of Paso Robles), large agricultural land owners (e.g. Wonderful), smaller agricultural land owners (e.g. Twin Oaks), other public agencies (e.g., San Luis Obispo County), and the general public. As can be seen, we currently work for clients representative of each of these stakeholder groups. These clients have already, or will if needed, waive any conflict to allow **aquilogic** to support this project.

Outside of the Paso Robles Sub-basin, we are also currently providing consulting support to numerous public water agencies (municipal and County-wide), investor-owned water utilities, mutual water companies, large and small agricultural interests, major oil companies, community groups, State agencies, and environmental groups (e.g., Sierra Club). This experience provides us with a broad insight into the perspectives, goals, and limitations of these stakeholder groups. As an example, in Kern County, we currently provide groundwater consulting services to a water agency (WDWA), a municipality (Bakersfield), a large agricultural interest (Wonderful), a smaller agricultural interest (RTS), and two oil companies (CRC, Sentinel Peak). Our ability to understand and support the goals of these clients, while promoting improved and collaborative groundwater management and “new-water” development, has allowed us to provide broad and varied input into the GSP development process led by the Kern Groundwater Authority (KGA).

Our brochure on GSA formation (www.aquilogic.com/publications.php) outlines a process to engage with the various stakeholders. In our experience, the best way to avoid battles and project delays, develop a successful GSP, and save money in the long run, is to make a strong effort up-front in stakeholder engagement.

5. Understanding the goals of the Paso Robles Sub-basin GSA partners.

The statewide requirements and processes put in place under SGMA are unprecedented. However, through our work with other clients, we understand the dynamics of agency needs during GSA formation, GSP development, and GSP implementation. As we understand it, the goals of this project are:

- a. assist the Paso Robles Sub-basin GSAs in formulating strategies, tactics, and a set of tasks to meet the requirements of the SGMA
- b. optimize opportunities for successful coordination with other GSA’s within the Paso Robles Sub-basin
- c. aid the Paso Robles Sub-basin GSAs in reviewing available data and reports detailing the water supplies; land use patterns, and hydrogeologic characteristics of the Sub-basin
- d. assess and identify potential data gaps that must be completed to achieve all of the project goals.

Aquilogic understands these goals and believes they can be achieved. We also believe that a GSP can be developed that meets the needs of all stakeholders, and the SGMA process can be harmonized with the quiet title litigation.

4.0 PROJECT TEAM

Key project team professionals are listed below. Given the 30-page limit for this proposal, curriculum vitae (CV) for project team members have not been provided. They can be provided, if desired, and biographical sketches for all staff are available at the **aquilogic** website (www.aquilogic.com/people.php).

Name	Role	Education & Registration	Years of Experience
Anthony Brown	PIC, CEO & Principal Hydrologist	BS, MS	30
Stephen Ross	PM, Principal Hydrogeologist	BS, MS, PG	25
Brandon Eisen	Senior Hydrogeologist	BS, MS, PG, CHG	25
Eddy Teasdale	Senior Hydrogeologist	BS, MS, PG, CHG	20
Lee Paprocki	Senior Hydrogeologist	BS, MS, PG	20
Wade Major	Principal Engineer	BS, MS, MBA, PE	20
Stacey King	Civil Engineer	BS, MS, PE	15
Jason Stern	Geomatics Analyst	BS, MS	12

4.1 Anthony Brown - Principal-in-Charge

Anthony Brown will be the PIC for this project. He will provide the leadership, broad vision, strategic thinking, and advocacy needed to deliver a successful project for the partner GSAs in the Paso Robles Sub-basin. He will also have final review and sign-off on all **aquilogic** work product. His strategic insight has helped clients successfully deliver projects with complex water resources, regulatory, legal, and public relations issues. Currently, he is assisting municipal and agricultural interests in six critically over-drafted basins subject to the requirements of SGMA (Indian Wells Valley, Kern, Tule, Madera, Chowchilla, and Paso Robles).

Anthony will provide critical leadership in the following areas: Project strategy, GSA-Board presentations, stakeholder outreach and engagement, public participation, regulatory interaction, and legal implications.

Anthony has the ability to communicate complex technical issues in a simple and concise way understandable to the lay-person. He also has a talent for engaging empathetically with stakeholders, accommodating their input, and synthesizing multiple perspectives into a single approach. In addition, on many groundwater management projects, he helps parties with differing goals and agendas reach consensus on contentious issues. Most importantly, he helps clients resolve issues when there seems to be an impasse, by juggling multiple perspectives, identifying areas of compromise, and identifying innovative solutions. As such, he will play a leadership role in key project communication and structured facilitation.

Anthony is the founder, CEO, and Principal Hydrologist at **aquilogic**. He was previously the CEO and one of the founding principals at Komex Environmental, a global environmental consulting company. Anthony received his Master of Science degree in Engineering Hydrology from Imperial College London in 1988. Anthony has over 30 years of experience in many aspects of infrastructure engineering and environmental consulting, with a focus on hydrologic science, water resources, environmental engineering, and water treatment & supply.

4.2 Steve Ross, PG - Project Manager

Steve Ross will be the PM leading the day-to-day project activities. Steve will be the primary point of contact with the Paso Robles Sub-basin GSA partners. In this role, he will serve as a hub through which information gathered and/or generated by **aquilogic** will be delivered to the GSA partners. Steve will be responsible for ensuring that project goals are achieved and that client expectations are met. He will have primary responsibility for all aspects of project delivery.

Steve received his Bachelor and Master of Science degrees in Earth Science from the University of Waterloo, Ontario. He is a versatile and proficient water resources professional with experience in hydrology, hydrogeology, water quality, groundwater modeling, fate and transport of contaminants, groundwater remediation, regulatory strategy, and litigation support. The following are selected water resources projects that Steve has supported:

- Expert witness testimony on behalf of Golden State Water Company in regards to a water rights petition and adjudication for the American River - Sacramento, California
- Expert witness testimony regarding water rights in Southern California – Confidential Clients
- Performed a groundwater basin assessment for the development of a gaming facility - Santa Rosa, California
- Performed an assessment the safe yield of the City of Pomona’s groundwater basin for a water rights evaluation – Pomona, California
- Completed a water rights evaluation of tributary versus non-tributary water for the American River Petition, and provided expert opinions at the State Water Resources Control Board (SWRCB) hearing - Rancho Cordova, California

4.3 Eddy Teasdale, PG, CHG, Senior Hydrogeologist

Eddy has more than 20 years of experience working on hydrogeologic investigations around the world. He is an experienced professional who has successfully managed large, complex, groundwater projects. He has extensive experience in writing technical reports and working with local, state, and federal regulatory agencies including presenting project information and resolving project issues. Eddy received his Bachelor of Science in Geology from the University of Texas and his Master of Science in Hydrogeology from the University of Idaho. The following are selected water resources projects that Eddy is currently supporting:

- Appointed to the Technical Advisory Committee to the IWV GSA in regards to the development and implementation of a GSP – Indian Wells Valley, California
- Advising the City of Newman through the process of forming a GSA and development of the GSP - Newman, California
- Preparation of a GMP for the Northern Agencies in the Delta-Mendota Canal Service Area – Los Banos, California
- Assistance to South Tahoe Public Utilities District in updating a GMP, including a groundwater basin condition assessment and design of the basin-wide monitoring program – South Tahoe PUD, Lake Tahoe, California
- Providing third-party review of an integrated surface water-groundwater water balance to evaluate a projects potential effects upon water availability to local users – Fresno County Department of Public Works, Fresno, California

4.4 Brandon Eisen, PG, CHG, Senior Hydrogeologist

Brandon Eisen has more than 25 years of experience in hydrogeology and groundwater engineering. He has been the project manager and technical manager on projects related to groundwater resource development, contaminant hydrogeology, and groundwater modeling. Brandon received his Master’s Degree in Civil Engineering from Colorado State University. He is a Professional Geologist and Certified Hydrogeologist in the State of California. Brandon’s recent technical and project management experience includes the following:

- Evaluating of the effect of possible GSA actions and the GSP on the current and planned operational activities of an agricultural client.
- Assessment of a localized nitrate contamination of a large municipal water supply well on behalf of a regional water district.
- Providing technical support for a private company planning the implementation of an ASR project along a series of coalescing alluvial fans that form the periphery of a large, interior groundwater basin.

4.5 Wade Major, PE, Civil Engineer

Wade Major has more than 24 years of experience in consulting. He has been involved in more than 100 projects focusing on remediation assessment, design engineering, and cost estimating; and over 70 projects in water and wastewater treatment assessment and design, marine/riverine assessments, oceanography, and outfall design. Wade received his Bachelor’s and Master’s degrees in Civil Engineering from the University of Alberta, and an MBA in Executive Management from Royal Roads University. Wade is a Professional Civil Engineer in the State of California and the Province of British Columbia.

4.6 Stacey King, PE, Civil Engineer

Stacey is a civil engineer at **aquilogic** with more than fifteen years of environmental and water resources consulting experience. Stacey received her Master of Science Degree in Civil Engineering and Master of Public Health Degree from University of Hawaii. Stacey is a licensed Professional Engineer (Civil) in the state of California. Stacey's project assignments include performing cost-benefit analysis for groundwater extraction alternatives; developing the design specifications and cost estimates of drinking water treatment systems; and developing remedial alternatives and associated costs for investigation and assessment of regional groundwater contamination by multiple parties.

4.7 Jason Stern

Jason is the Geomatics Analyst at **aquilogic**. He has over ten years of experience using GIS to provide solutions to environmental and water engineering challenges, with a primary focus on groundwater and water resources management. Using tools such as ArcGIS for viewing and understanding spatial relationships, and Earthsoft's EQUIS for managing and reporting groundwater data, he has been able to provide improved project understanding and efficiency. Jason received both his Bachelor of Arts Degree in Environmental Analysis and Policy and Master of Arts degree in Environmental GIS and Remote Sensing from Boston University.

5.0 PROJECT APPROACH

Aquilogic believes that one word will define success or failure when it comes to SGMA compliance – Collaboration (or lack thereof)! The groundwater resources challenges facing the Paso Robles Sub-basin GSA partners cannot be solved by one party or one GSA alone. Development of inter- and intra-basin coordination agreements to align boundary conditions, data collection and sharing, monitoring procedures, and GSP administration will be a considerable undertaking. These challenges must be addressed collectively by all stakeholders with an interest in the various groundwater basins. Therefore, stakeholders must collaborate on the key elements of SGMA compliance, including the following:

- Selection of a regional governance and basin management structure/model
- Sharing of data between adjacent GSAs and stakeholders, and agreement regarding the data sets on which GSPs and management decisions are based
- Alignment of evaluation tools across boundaries (e.g., two adjacent models cannot have substantially different hydrogeologic interpretations or cross boundary fluxes)
- Alignment of monitoring procedures and measurable objectives (management objectives, thresholds and action levels)
- Regional coordination of management actions and projects

- Alignment with Integrated Regional Water Management planning and leveraging of funds from a variety of sources to maximize potential state grant funding

This collaboration can follow the following six step process:

1. **Identify and engage** the stakeholders (frequently, clearly, honestly)
2. **Assess and understand** the stakeholders (their constituency, perspectives, and issues)
3. **Inform** the stakeholders (to create a common understanding and transparency)
4. **Involve** the stakeholders (in the process to get “buy-in”).
5. **Collaborate** with the stakeholders (to develop a common set of goals, constraints, issues, and solutions).
6. **Empower** the stakeholders (to “own” the process and get involved in decision-making).

Implementing the above steps around a data-driven process can be an ideal way to facilitate engagement since all parties will need data, and collaborative development and sharing of data will help to foster trust, transparency and a working relationship.

In assisting the GSA partners in the development of the GSP for the Paso Robles Sub-basin, **aquilogic** will need to consider a series of underlying technical factors. In general, these will focus on the following “water balancing” questions:

- How much groundwater (supply) is available?
- How much water (demand) is needed?
- How to “mind the gap”?
- Who will have to reduce pumping, and by how much, and when?
- Where will any “new” water come from to fill the gap?

To answer these questions, we will need to know the current “state of the basin”: hydrology and hydrogeology; groundwater flow and water quality conditions; the level of overdraft; how much “new” water can be added to the system and from where; how much additional conservation can be expected; what are likely increases in population and agricultural water demand; what are the required reductions in pumping; how would these reductions be allocated; and how and when would they be applied; as well as the legal, political, regulatory, social, and economic implications.

5.1 Compile and Organization of Existing Information

Aquilogic’s approach to the development of a GSP starts with the review and leverage of available data, the creation of a data management system (DMS), and the identification of data gaps. Initially, the available data, documentation and other pertinent information (collectively the “data”) will be surveyed, along with the current format is in (e.g. spreadsheet, database,

paper). The primary DMS users (i.e., the GSA partners, County) will then define their goals and expectations for the DMS as part of a needs assessment.

Based on the survey and needs assessment, a DMS architecture will be developed, including platform (e.g., Access, Oracle), structure, relational databases, fields, nomenclature and naming conventions, levels of access, analysis requirements, and reporting, etc.. Once the architecture is defined, the database structure will be created within the selected platform. The platform will have a visualization interface (i.e., a geographic information system [GIS] such as ArcView) and data analysis package (e.g., ESRI Visual Analyst).

Aquilogic recommends that subsequent DMS population proceed in three steps: (1) population of data needed for GSP development (as part of this scope); (2) population of data for GSP implementation (after GSP adoption); and (3) ongoing updates to the DMS as data is generated during implementation.

Aquilogic will collect the recent and historical data to populate the DMS. It is assumed that the data is already in some type of electronic format (e.g., excel, access). Once the data has been compiled, **aquilogic** will identify and evaluate data gaps so that the “known unknowns” can be identified and addressed in planning and management activities. In addition, the available plans, tools and monitoring programs that can serve as the basis for GSP development and basin management will be assessed. The data will also be analyzed to identify areas where groundwater can be managed more effectively or additional water resources can be developed (e.g., enhanced recharge, marginal water use).

Table 1: Summary of Data Requirements for Selected Resource Areas

Data Type	Data to be Compiled
Hydrology and Water Supply	<ul style="list-style-type: none"> • Maps and descriptions of the groundwater Sub-basin derived from published reports, studies, public information websites, County databases, and other sources. • Maps and description of surface water hydrology overlying the groundwater Sub-basin. • Maps and descriptions of water management agencies overlying the Sub-basin and the areas outside the Sub-basin adjacent to the GSA boundaries. • A summary of water resources and supply management, with a focus on groundwater resources and on current and forecasted groundwater demand, derived from published General Plan documents, Urban Water Management Plans (UWMPs), Integrated Regional Water Management Plans (IRWMPs), GMPs, Agricultural Water Management Plans (AWMPs), information available from water agencies, and studies performed for the 2013 (and pending 2018) update of the California Water Plan. • A discussion of the management, hydrology, water demand, and environmental flow requirements of surface water resources and their relationship to groundwater. This should include historical and anticipated future surface water delivery volumes and reliability under reasonably foreseeable conditions. • A discussion of the potential effects of climate change derived from studies performed for the 2013 (and the pending 2018) update of the DWR California Water Plan.

Data Type	Data to be Compiled
Soils and Geology	<ul style="list-style-type: none"> • A description of the geology of the groundwater Sub-basins derived from published reports, studies, public information websites, local databases, and other sources. • An assessment of historical subsidence in the GSA, the findings of current subsidence monitoring programs, and the potential for future subsidence derived from published reports and DWR websites. • An assessment of recharge potential based on topography and near surface soil conditions supported by data from the UC Davis Soil Agricultural Groundwater Banking Index (SAGBI) website and other sources.
Agriculture	<ul style="list-style-type: none"> • A discussion of the relationship between water management and agriculture in the GSA derived from General Plan and Farm Bureau data and AWMPs. • A summary of current agricultural land use and practices within the GSA, and anticipated trends in the foreseeable future. • Maps as needed to illustrate agricultural land use distribution.
Biology	<ul style="list-style-type: none"> • A discussion of Groundwater-Dependent Ecosystems (GDEs) within the GSA, if any, including seeps, springs, wetlands, and riparian vegetation that are underlain by a shallow regional water table and may be affected by groundwater withdrawal. • A map showing the locations of GDEs derived from data regarding the depth to the regional water table, the USGS National Hydrography Database, the United States Fish and Wildlife Service National Wetlands Inventory, and other public GIS data sources.
Population and Housing	<ul style="list-style-type: none"> • A discussion of communities (including disadvantaged communities), and population trends within the GSA that may affect or may be affected by water management, as derived from UWMPs, General Plan documents, and studies conducted for the 2013 update of the California Water Plan.

5.2 Description of the Plan Area

Aquilologic will develop a description of the GSP Plan Area, as required in the GSP regulations. The data necessary to prepare this description is summarized **Table 1** above. The plan area description will include, but may not be limited to, the following:

- Maps depicting the area covered by the GSP
- Land use elements in the basin
- Existing water resource monitoring and management programs
- Conjunctive use programs in the basin
- Parties affected by, and stakeholders involved in, the GSP
- Additional plan elements that may influence the GSP

5.3 Description of the Basin Setting

Aquilologic will update the existing basin setting as presented in the existing Phase I (2002) and Phase II (2005) Paso Robles Sub-basin studies in accordance with requirements of SGMA, as presented in the December 2016 Hydrogeological Conceptual Model best management practice (BMP). Basin setting descriptors to be addressed in a refined basin setting include the following:

- Topographic maps, aerial photographs, highways and infrastructure features
- Jurisdictional boundaries and parcels
- Land use maps
- Surficial geology and soil classification maps
- Hydrogeologic cross-sections and isopach maps for critical hydro-stratigraphic zones
- Maps showing the distribution of hydraulic properties (e.g. hydraulic conductivity in the Paso Robles Formation)
- Recharge areas and recharge potential (based on soil types and geology)
- Discharge areas and other surface water features (springs, seeps, and wetlands)
- Well locations (pumping and monitoring)
- Groundwater levels (over time) as hydrographs and potentiometric surface maps
- Maps depicting key groundwater quality data (e.g. total dissolved solids [TDS], nitrate)
- Locations of sources and points of delivery for imported water
- Water supply distribution networks

5.4 Hydrogeologic Conceptual Model

Aquilogic will update the Hydrogeologic Conceptual Model (HCM) presented in the existing Phase I (2002) and Phase II (2005) Paso Robles Sub-basin studies in accordance with requirements of SGMA, as presented in the December 2016 Hydrogeological Conceptual Model BMP. Basin setting descriptors to be addressed in a refined basin setting will include, but may not be limited to, the following:

- Identification of principal aquifers and aquitards
- Hydraulic properties of the principal aquifers and aquitards
- Structural geologic properties of the basin that would restrict groundwater flow
- Basin boundary conditions
- Groundwater elevations, flow directions, gradients, and saturated thickness
- Groundwater velocities and fluxes at key locations (e.g., basin boundaries)
- Areas of groundwater-surface water interaction
- Recharge areas and discharge features
- Influence of lake/reservoirs on groundwater conditions
- Differentiation between subterranean waters and percolating groundwater
- Groundwater quality within the principal aquifers
- Identification of the primary uses of groundwater within each principal aquifer (municipal, agricultural, domestic, or industrial).

5.5 Groundwater Conditions

Based upon information available in the existing hydrogeologic literature, **aquilogic** will document the groundwater conditions within the Paso Robles Sub-basin. This work will include

much of the information presented within the HCM, but will also include the following (focusing on potential undesirable results):

- Identification of “key” CASGEM compliant wells that will subsequently be used for evaluation with regard to the basin sustainability goal and threshold monitoring
- Documentation of contaminated site locations, contaminants of concern (COCs), and the extent of any groundwater contamination
- Documentation of interconnected surface water and groundwater dependent ecosystems
- Estimate the quantity and timing of surface water depletions
- Evaluation of available data regarding subsidence

5.6 Preparation of Water Budget

In addition to the plan description, basin setting, HCM, and groundwater conditions, information to support the development of a robust water budget must be compiled. **Aquilogic** will prepare a water budget for the Paso Robles Sub-basin to provide an understanding of historical and projected hydrologic conditions. It is anticipated that the existing numerical groundwater flow model for the entire Paso Robles Sub-basin (within both Monterey and San Luis Obispo Counties) will be utilized to prepare a water budget sufficient to meet the requirements of the DWR. We are intimately familiar with the model and are using the model to support the quiet title litigation. However, we would also recommend that a graphical and spreadsheet water budget also be developed. Such depictions are more easily understood by stakeholders that may perceive the model as a “black box” or developed to serve the interests of a particular party.

The water budget expands upon the equation of hydraulic conductivity where: $\text{Water In} = \text{Water Out} \pm \text{any change in groundwater storage}$ (a derivation of the conservation of mass). Thus, the water budget focuses on sources of recharge and discharge, and any changes in groundwater storage, and quantifies these budget elements. The water budget must cover a reasonable period of time to be representative of baseline conditions. Thus, recharge and discharge cannot be evaluated for a single year, but rather an extended timeframe that covers wet years, droughts, and “normal” years (e.g., 30 to 50 years). The water budget forms the accounting platform from which to determine native safe yield, annual operating safe yield, and any proposed sustainable yield. The typical data types and sources to develop a water budget are summarized in **Table 2**.

Table 2: List of Water Budget Data Sources

Hydrologic Data	Sources
Groundwater Elevations (current and historical)	<ul style="list-style-type: none"> • California Statewide Groundwater Elevation Monitoring (CASGEM) data
Surface Water Recharge/Discharge (current and historical)	<ul style="list-style-type: none"> • Gaging station data
Underflow In/Out (Boundary Fluxes)	<ul style="list-style-type: none"> • Water level data and Darcy flow calculations • Published studies and reports

Areal Recharge from Precipitation	<ul style="list-style-type: none"> • Simulated water balances • Climate station data • Simulated water balances
Agricultural Groundwater Demand, Evapotranspiration of Applied Water, and Deep Percolation	<ul style="list-style-type: none"> • AWMPs and reported pumping by irrigation districts • Reported surface water diversions by irrigation districts and in the SWRCB Electronic Water Rights Information System (eWRIMS) • DWR studies for 2013 update of the California Water Plan • Supplemental GIS and aerial imagery data and County Agricultural Commissioner Reports
Domestic Groundwater Demand	<ul style="list-style-type: none"> • GIS analysis of census block data in areas not served by public water agencies • Data regarding small water systems from the County and SWRCB Division of Drinking Water
Municipal Groundwater Demand	<ul style="list-style-type: none"> • UWMPs and reported municipal pumping data • DWR studies for 2013 (and pending 2018) update of the California Water Plan
Municipal Wastewater Discharge	<ul style="list-style-type: none"> • Data from municipal wastewater treatment plants • Data from the Regional Water Quality Control Board (RWQCB) for Waste Discharge Requirements (WDR) permits

In addition to establishing a water budget for the baseline period, future water budgets must be evaluated considering changes in land use, population, water demand, water supplies, climate change, environmental flow requirements, inter-basin flows, etc. The model can be used to evaluate such changes, with graphical and spreadsheet depictions for critical changes.

5.7 Surface Water – Groundwater Flow Model

As noted, an existing groundwater flow model has been developed for the Paso Robles Sub-basin. No significant updates to the existing model are proposed for this scope of work. However, based on our experience, the model appears to under predict the degree of hydraulic communication between groundwater and surface water at the Salinas River, several tributaries, and downstream of lakes/reservoirs. Thus, some model adjustments may be required within the surface water package to more accurately reflect groundwater-surface water interaction.

Aquilogic will develop a Modeling Plan that will provide guidance for future modeling efforts. The Modeling Plan will include a data gap analysis and recommendations for additional studies, if appropriate. The Modeling Plan will be guided by the following objectives:

- Extensive groundwater basin characterization and modeling has been completed in the Paso Robles Sub-basin. Any new, or updated, groundwater flow model should respect, utilize, and build on this work to the extent possible.
- A clear modeling objective or objectives should be defined. The modeling approach should address issues related to boundary conditions, inter-basin underflow with neighboring Sub-

basins, and groundwater-surface water-interactions at a level of detail appropriate to achieve the defined modeling objectives.

- The model should incorporate current and reasonably foreseeable groundwater demand and management trends to serve as a representation of the affected hydrologic environment.
- To the extent possible, the modeling effort should identify and fill data gaps, help to characterize issues, and support further development of tools needed to plan for sustainable groundwater management within the Paso Robles Sub-basin GSA partners' boundaries.

The modeling plan will serve as a pragmatic and comprehensive basis to build on prior groundwater analysis and planning that has occurred.

5.8 Identify Sustainable Management Criteria

Aquilogic will identify and evaluate sustainable management criteria for the GSP in accordance with requirements of SGMA, as presented in the November 2017 Sustainable Management Criteria BMP. We will also describe the metrics used to track the sustainability goal and monitor for undesirable results using minimum thresholds and measurable objectives. However, it should be noted that we can only provide the technical platform from which policy decisions regarding sustainability goals must be made.

5.8.1 Sustainability Goal

We will assist in identifying and describing sustainability goals for the GSP. Such goals can be qualitative, quantitative, or even a holistic narrative. The development of sustainability goals will be strongly influenced by how the Sub-basin will be managed: (1) A single set of goals can be developed for the entire Sub-basin, or (2) a broad "umbrella goal" can be established for the Sub-basin and specific goals can be identified for each GMA. As noted, groundwater conditions vary significantly between areas of the Sub-basin (e.g. Estrella versus Shandon). Thus, it may prove problematic to establish a single set of goals and thresholds for the entire Sub-basin that must be met in all areas. It may be preferable to have GMA-specific goals that are consistent with an "umbrella goal" and have no undesirable results in adjacent GMAs. The underlying premise in SGMA is the local management of groundwater; thus, dividing a Sub-basin into GMAs provides for even more localized management and improved groundwater sustainability.

As noted, we can only provide the technical analysis that will be used to support policy decisions on the sustainability goals that consider input from all stakeholders.

5.8.2 Undesirable Results

Aquilologic will identify potential undesirable results for each of the six sustainable management criteria. We will also describe the groundwater conditions that would lead to the undesirable results, and potential effects on the beneficial uses and users of groundwater.

A description will be developed for each sustainability criteria and what constitutes an undesirable result. The description will be used throughout the GSP as a check for whether the GSP is adequately preventing undesirable results through implementation. The description will also be used to help set the threshold on monitoring to avoid future undesirable results. We will prepare an undesirable result narrative for all six criteria:

1. Chronic lowering of groundwater levels
2. Significant and unreasonable reduction of groundwater storage
3. Significant and unreasonable seawater intrusion
4. Significant and unreasonable degraded water quality
5. Significant and unreasonable land subsidence that substantially interferes with land uses
6. Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

5.8.3 Minimum Thresholds

Aquilologic will identify a minimum threshold for each sustainability indicator. We will also describe how each one was established, its relationship to the sustainability indicators, how it was selected to avoid undesirable results, how it may affect the interests of beneficial uses and users of groundwater in the basin, and how it will be quantitatively measured. The methodology used to define minimum thresholds relative to undesirable results will be documented.

Again, the development of minimum thresholds will be influenced by how the Sub-basin will be managed. Either a single set of minimum thresholds for the entire Sub-basin can be established, or thresholds can be set for each GMA. If the later approach is taken, then the minimum thresholds established for one GMA cannot create undesirable results in an adjacent GMA. Groundwater levels provide an example of how a single threshold for the Sub-basin may prove problematic. Groundwater levels across the Sub-basin vary depending on topographic elevation, proximity to recharge, proximity to surface water (as a point of recharge or discharge), aquifer hydraulic properties, groundwater pumping activities, etc. All of these elements vary considerably across the Sub-basin. A “low” basin-wide groundwater level threshold could promote sustainable management in one area but lead to increased overdraft in another area. Alternatively, a “high” threshold could promote sustainable management in one area but essentially prohibit pumping in another.

5.8.4 Measurable Objectives

Aquilogic will develop and describe measurable objectives for each sustainability indicator. This will include descriptions of a reasonable margin of error, and a reasonable path to achieve and maintain the sustainability indicators including relevant milestones for each sustainability indicator. The methodology used to define measurable objectives relative to the minimum threshold and their relationship to the margin of operational flexibility to avoid undesirable results will be documented.

5.9 Monitoring Networks and Protocols

Aquilogic recommends a review of existing management plans, tools and monitoring programs to serve as a basis for GSP development and implementation. Existing active GWMPs can serve as a basis for GSP development if specified information and sections regarding groundwater management are added. A thorough review can identify the scope of activities and additional information needed for GSP development. The extent and accuracy thresholds of existing monitoring networks and activities should be evaluated to assess the adequacy of existing monitoring practices to meet GSP requirements. It may be necessary to achieve greater monitoring resolution to meet SGMA requirements than is the current practice under CASGEM, and additional monitoring may be needed to address water quality issues and land subsidence. As with goals and thresholds, the type, density, and frequency of monitoring may vary between GMAs, if a more localized approach to groundwater management is adopted.

5.10 Identify Projects and Actions

Aquilogic will assist in identifying and prioritizing projects and management actions that will be implemented to promote sustainable groundwater management. This will also include contingency projects or management actions that could be implemented should groundwater conditions not adequately respond during GSP implementation or if minimum thresholds are exceeded. This task will design a management program that considers potential projects and management actions to that meet regulatory requirements and local needs. Projects and management actions to be considered will be solicited as part of the stakeholder engagement strategy. Management actions and projects may be basin-wide (e.g. parcel storm water retention) or implemented within a specific GMA (e.g., marginal water development).

A series of scenarios can be evaluated to meet the required goal of a locally-managed, sustainable groundwater basin by 2040. Realistically, they will involve varying levels of groundwater pumping reductions coupled with the development of “new water” projects to offset reductions. The technical (feasibility), legal, political, economic, and social implications of each scenario will be evaluated by the **aquilogic** in concert with, and for consideration by, the GSA partners and other stakeholders.

The above technical analysis must be completed; however, it can only be used to support tough policy decisions. Clearly, any pumping reductions (and their allocation) will result in conflict between various user groups (e.g., municipal vs. mutual vs. domestic vs. large growers vs. small growers vs. land owners). Based on our experience, any analysis of reductions should be run in parallel with efforts to develop “new water”. Reductions (the medicine) are more palatable if alternate water supplies (the sugar) can be identified to make the reductions “easier to swallow”. Thus, perhaps even more effort should be made to evaluate projects that would lead to additional water supplies, such as the following:

- Enhanced recharge through storm water capture and diversion, increased reservoir water percolation, high stream flow diversions
- Marginal water use (e.g., oil field produced waters, brackish groundwater)
- Coastal desalination

5.11 Plan Implementation

Aquilologic will work with the GSA partners to develop a plan of action for implementing the projects and management actions identified in the GSP, and for successful reporting and evaluation of the GSP in the future.

5.12 Outreach and Stakeholder Involvement

In developing and implementing a GSP we foresee at least three levels of stakeholder engagement and coordination: Between GSAs or GMAs (intra-basin); with adjacent GSAs (inter-basin); and with a broader stakeholder group within the Sub-basin.

As noted, a single, basin-wide, management approach (and single GSP) or a multiple GMA approach (and multiple chapter GSPs) could be adopted. Regardless of which approach is taken, SGMA requires a coordinated approach to developing a basin-wide GSP (and/or chapters).

Aquilologic can provide technical support for this coordination; however, most of the effort will rest with the GSA partners and legal counsel. It will be important for each of the GSA partners to be working from a single, consistent, and defensible technical dataset and analyses (see **Sections 5.1 through 5.10**) that all parties agree will form the platform for discussions.

There are five groundwater basins adjacent to the Paso Robles Sub-basin: Carrizo Plain (3-019), Cholame Valley (3-005), Atascadero Area (3-004.11), Lockwood Valley (3-006), and Salinas Valley UVA (3-004.05). The Atascadero Area (high priority) and UVA (medium priority) are subject to SGMA and must prepare GSPs. Therefore, the GSA partners in the Paso Robles Sub-basin will need to coordinate with the GSAs for these adjacent basins. In particular, any actions in one basin cannot create undesirable results in an adjacent basin. **Aquilologic** will provide technical support to these discussions, most notably with regard to inter-basin flows (both groundwater and surface water) and the development of sustainability goals, minimum thresholds,

measurable objectives, monitoring programs, management actions, and projects. In developing goals, thresholds, objectives, monitoring, actions, and projects proximate to the boundaries with these two Sub-basins, the potential impacts on the adjacent basins need to be considered.

Given our experience in the Sub-basin, it is anticipated that a significant portion of our effort in stakeholder engagement will be focused on stakeholder groups within the Sub-basin. Most of this technical effort will focus on communication, education, and transparent analyses. GSP development and implementation will only be successful if the perspectives of all stakeholders are understood and an effort is made to address their concerns.

To prepare for development of a GSP for the Paso Robles Sub-basin, a collaboration backbone (CB) will be developed. The CB will comprise key representatives from the Paso Robles Sub-basin GSA partners and **aquilogic**. Certain stakeholders or stakeholder groups may also be part of the CB, or could be viewed as “connected” to the CB or as “collaboration ribs”. This may include elected officials or other individuals who can connect to the broader stakeholder community. Essentially, the CB provides the governance framework within which the GSP is developed and implemented.

Aside from individuals, the CB will include other assets. These include, but are not limited to, the following:

- Website – establish a project website/portal to serve as the information hub for internal and external stakeholders, including a list-serve sign-up and response mechanism to promote two-way dialogue
- Document repository – for quick and easy access to pertinent project documents and files
- DMS - with GIS access at various levels for different stakeholder groups
- GSA membership roster – develop and maintain a complete listing of contact information
- Stakeholder database – develop and maintain a comprehensive list of stakeholders and interested parties that reflects the broad range of interests related to GSAs and to schedule workshops, public meetings, etc.
- Possible stakeholder surveys to improve an understanding of stakeholder perspectives, goals, and limitations, and track the success of the engagement
- Stakeholder workshops – to promote understanding, educate all parties, and create a more transparent structure for data collation, analyses, and conclusions
- The stakeholder engagement plan – note key audiences, and their perspectives, goals, and limitations, along with engagement strategies, key milestones, and performance measurement
- A charter document and decision-making and appeals process – establish agreements and a unified vision for the development of the GSP
- Meeting facilitation plans, agendas and minutes – administrative documentation to keep meetings focused, organized and efficient

5.13 Preparation of GSP

Aquilogic will develop a draft GSP outline, which will be provided to the GSA partners for review. We will then work with the Paso Robles Sub-basin GSA partners to develop a final outline that will be used for the GSP document development. GSP outlines will be based upon the DWR's December 2016 Annotated Outline Guidance Document and DWR's December 2016 Preparation Checklist for GSP Submittals.

As the required analyses supporting GSP development proceeds (**Sections 5.1 through 5.10**), **aquilogic** will prepare draft sections of the GSP for review by the GSA partners. Comments from the GSA partners will be incorporated into public drafts for each section. We would encourage the GSA partners to solicit input from stakeholders (including DWR) on the following key sections of the GSP as the process proceeds:

- Basin setting and HCM
- Water Budget and Modeling
- Sustainable Management Criteria
- Management Actions and Projects

Where appropriate, stakeholder input will be incorporated into the final drafts for these sections. Stakeholder input not considered for inclusion will be addressed through an alternate mechanism (e.g., written responses or verbally at stakeholder meetings).

Once all sections of the GSP have been prepared, **aquilogic** will compile them into a draft GSP for review by the GSA partners. Comments from the GSA partners will either be considered in the public draft of the GSP or addressed through an alternate mechanism. The public draft will be made available for review and comment by all stakeholders within, and adjacent to, the Sub-basin. As with GSA partner comments, stakeholder comments will either be considered in the final GSP or addressed through an alternate mechanism. The final GSP will be submitted to the DWR prior to January 31, 2020.

As noted earlier, the GSP will need to be harmonized with any physical solution prepared for the quiet title litigation. In essence, the two documents should be very similar in content.

6.0 FEE PROPOSAL

A proposed budget and cost projection to perform the requested scope of services is included below. The costs identified within the fee proposal to complete the scope of work presented in the RFP will be valid for a period of at least 90 days. The proposed budget was prepared as a preliminary estimate. It is intended to address the scope of work through to development of a single GSP (i.e., no chapters) by September 4, 2019. The completion dates indicated assume a contract start date of January 2, 2018.

The estimate may need to be updated once the following are complete: 1) any decision on designating GMAs and developing separate GMA chapters; 2) incorporation of additional GSAs within the Paso Robles Sub-basin (i.e., EPC GSA); 3) intra-basin coordination agreement with the SVB GSA for that portion of the Paso Robles Sub-basin within Monterey County; 4) inter-basin coordination agreements with the SVB GSA and Atascadero Area GSA adjacent to the Sub-basin; 5) the need for fill any data gaps to complete a GSP that complies with SGMA and is acceptable to DWR; and 6) any court decisions in the quiet title litigation that impact GSP development.

The tasks marked with an asterisk (*) assume that work currently being completed in support of the quiet title litigation is finalized and can be used directly within the GSP (Tasks 5.1 [compilation], 5.3, 5.6). The tasks marked with a double asterisk (**) assume that work on certain tasks (i.e., Tasks 5.7, 5.9, 5.10, 5.13) will be performed in parallel with the development of the physical solution.

Task	Required Service	Completion Date	Total Hours	Fee Estimate
5.1	Data Compilation*	May-18	100	\$18,000
	DMS	Aug-18	300	\$54,000
5.2	Description of Plan Area	Apr-18	200	\$36,000
5.3	Basin Setting*	Jul-18	300	\$54,000
5.4	Hydrogeologic Conceptual Model	Jul-18	200	\$36,000
5.5	Groundwater Conditions*	Jul-18	100	\$18,000
5.6	Preparation of Water Budget*	May-18	100	\$18,000
5.7	Surface Water – Groundwater Flow Model	Oct-18	800	\$144,000
5.8	Sustainable Management Criteria**			
5.8.1	Sustainability Goals	Jan-09	600	\$108,000
5.8.2	Undesirable Results	Jan-19	700	\$126,000
5.8.3	Minimum Thresholds	Mar-19	500	\$90,000
5.8.4	Measureable Objectives	Mar-19	300	\$54,000
5.9	Monitoring Network and Protocols**	May-19	500	\$90,000
5.10	Identify Projects and Actions**	Jul-19	1000	\$180,000
5.11	Plan Implementation	Dec-19	150	\$27,000
5.12	Stakeholder Plan	Apr-18	300	\$54,000
	Outreach and Stakeholder Involvement	Dec-19	700	\$126,000
5.13	Preparation of GSP**	Sep-19	150	\$27,000
5.14	Project Management	Dec-19	250	\$45,000
Total			7,250	\$1,305,000

Reimbursable expenses in support of this project will be about \$1,000/month.

6.1 Schedule of Fees

Technical Services performed by personnel of **aquilogic** for hours actually spent on project activity, including office, field and travel time, will be charged as follows:

Professional Personnel*		Support Personnel	
Corporate Executive	\$365	Administrative Manager	\$105
Principal	\$285	Project Accountant	\$90
Senior Manager	\$210	Project Assistant	\$74
Project Manager	\$190	Senior Designer	\$105
Senior Technical	\$190	Design Draftsperson	\$90
Project Technical	\$137	Field Services Manager	\$105
Staff Technical	\$105	Field Technician	\$70
Intern	\$65	Laborer	\$45

*Includes all engineers, scientists and all other project professionals

All overtime (hourly or non-exempt support staff) will be billed at 1.25 times the above rates. Night, weekend or holiday work requested by the client (all staff) will be billed at 1.25 times the above rates. Specialist services (e.g. consulting boards, advisory panels or similar specialist consultation, declarations, deposition and trial preparation) will be billed at 1.5 times the above rates (with a four-hour minimum). Deposition and trial testimony will be billed at 2 times the above rates (with an eight hour minimum).

This fee schedule is effective through the contract term and completion of the GSP by September 4, 2019. Should work extend beyond the 2019 calendar year, then the hourly fees reflected hereon shall escalate at 3% on January 1 of that subsequent year, and 3% on January 1 of any subsequent year thereafter, unless an entirely new fee schedule is negotiated for any subsequent year.

7.0 CONTRACT TERMS

Aquilologic has reviewed the City of Paso Robles Professional Services Agreement (RFP Appendix 1) and minimum insurance requirements and have no issues with the terms. **Aquilologic** carries the required insurance and, if selected for the project, can provide certificates of insurance (ISO CG 00 01 and Acord Form 25-S, or equivalent) within 15 days of the notice of award.

Aquilologic acknowledges that the GSP must be completed in all respects by September 4, 2019; however, the Professional Services Agreement does not have an assigned term.

8.0 REFERENCES

8.1 Reference Projects

Table 3 presents selected, reference projects pertinent to the scope of work required for the proposed project (*we have added additional information for some projects that may be pertinent to the Paso Robles Sub-basin RFP*). A listing of active **aquilologic** projects and links to full project descriptions can be found at: www.aquilologic.com/aquilologicprojects.php.

Table 3: Reference Projects

#	Project
1	Expert Witness Support and Testimony, City of Paso Robles and Other Public Agencies, Central Coast Water Rights Litigation in a Groundwater Basin Subject to Critical Overdraft (<i>quiet title brought by a group of wineries and other landowners against municipal and mutual water utilities, and the County of San Luis Obispo. The litigation is currently in the “safe yield/overdraft” phase, and is anticipated to reach a conclusion with the development of a physical solution in early 2019).</i>
2	Technical Advisory Committee to the Indian Wells Valley (IWW) GSA, a Basin Subject to Critical Overdraft (<i>highly diverse community with agriculture [pistachio, alfalfa], a minerals company, urban residents, Native American tribes, Department of the Navy, Bureau of Land Management [BLM], environmental non-governmental organizations [NGOs], and County and Municipal agencies. Pumping in the basin is at two-to-three times the safe yield, and there are no surface water or import water supplies).</i>
3	Technical Advisor to Wonderful Orchards for Two Basins Subject to Critical Overdraft in Kern and Tulare Counties (<i>strategic advice associated with SGMA implementation, general groundwater management and development, and overall water resources, to a very large grower with over 170,000 acres of tree crop).</i>
4	Technical Consultant to WDWA in the Kern Sub-Basin, a Basin Subject to Critical Overdraft (<i>evaluation of strategic options for groundwater management on the west side of Kern County, including hydrogeologic characterization, GMA creation, GSP chapter development, brackish groundwater use, participation in the Kern Sub-basin consultant group tasked with GSP development, and ongoing interaction with the KGA – the GSA for the area).</i>
5	Project Manager and Technical Consultant, IWWVD and the Brackish Water Study Group, IWW, a Basin Subject to Critical Overdraft (<i>hydrogeologic characterization, assessment of brackish water resources, including aerial geophysics, feasibility of brackish water development and use, implications under SGMA and for GSP development).</i>
6	Technical Advisor to the Madera County Farm Bureau, Madera and Chowchilla Sub-basins, Both Subject to Critical Overdraft (<i>evaluation of options for groundwater management under SGMA for growers in the “white areas” of the Madera County GSA, and ongoing technical support).</i>
7	Technical Consultant to Rossi Enterprises, Owner of the 15,000-acre Santa Margarita Ranch in San Luis Obispo County (<i>assessment of soil and groundwater quality, investigation of contamination associated with oil pipeline releases, development of a preferred remedial approach, and support in negotiations with the oil company).</i>
8	Litigation Support for a Confidential Public Water Utility in a Medium Priority Basin in Southern California (<i>litigation support in a dispute with another water agency, and evaluation of options for more effective groundwater management under SGMA and/or adjudication).</i>
9	Groundwater Consultant, Two Confidential Municipalities in California’s Central Valley, ASR Using Treated Municipal and Agricultural/Winery Wastewater (<i>hydrogeologic characterization, compliance with DDW and RWQCB aquifer recharge and reuse requirements, wastewater percolation investigation, groundwater flow and quality investigation, anti-degradation analysis, and groundwater banking credits).</i>

#	Project
10	Strategic Advisor, Sentinel Peak Resources, Various Oilfields, Basin Subject to Critical Overdraft (<i>assessment of groundwater management options at active oil fields, exemption of aquifers from beneficial use, impacts from produced waters, and brackish water use</i>).
12	Strategic Technical Advisor Related to SGMA for RTS Agribusiness, a Pistachio Grower Operating in Five Groundwater Basins (<i>assessment of water supply options, including groundwater banking, imported surface water, and brackish water treatment, advocate for equitable allocation of safe yield for agriculture, participate in SGMA-related projects to enhance groundwater supplies</i>).
13	Technical Consultant, City of Santa Monica, Storm Water Infrastructure Project (SWIP) (<i>assessment of storm water aquifer injection to prevent salt-water intrusion and enhance groundwater supplies, evaluation of treatment options</i>).

The following list of **aquilogic** references indicates the diversity of client perspectives we are familiar with:

Perspective	Name and Title	Organization	Phone	Email
Agriculture	Kimberly Brown, Vice-President	Wonderful Orchards	(661) 776-1319	Kimberly.brown@wonderful.com
Agriculture	Rod Stiefvater, Owner	RTS Agribusiness	(661) 829-5109	rods@rtsagribus.com
Major Landowner	Rob Rossi, Owner	Santa Margarita Ranch	(805) 543-4333	rob@rossi-ent.com
Municipal	Tom Watson, Water Resources Engineer	City of Santa Monica	(310) 458-8235	Tom.watson@smgov.net
Water District	David Bolin, Principal Hydrogeologist	OCWD	(714) 378-3245	dbolin@ocwd.com
Water District	Don Zdeba, General Manager	IWVWD	(760) 384-5555	Don.zdeba@iwvwd.com
Legal	Russ McGlothlin, Shareholder	Brownstein, Hyatt, Farber & Shreck	(805) 882-1418	rmcglathlin@bhfs.com
Legal	Jeff Dunn, Partner	Best, Best & Krieger	(949) 263-2600	jeffrey.dunn@bbklaw.com

9.0 DISCLOSURES

Aquilogic is not party to any criminal case, civil litigation, arbitration, or proceeding having a potential financial impact that would affect our ability to perform the scope of work described within the RFP. If any such litigation, arbitration, or other proceedings commence after submission of this proposal, a written statement describing any such proceedings will be provided to the Paso Robles Sub-basin GSA partners.

10.0 CLOSING

Aquilogic appreciates this opportunity to present this proposal for the development of a GSP for the Paso Robles Sub-basin. We hope that the approach, scope, project team, and project team

experience described herein provide the information needed to assist in your selection of a consultant. To reiterate, **aquilologic** brings the following key differentiators to this project:

- **Aquilologic** has developed a detailed technical understanding of the Sub-basin through our ongoing work supporting the public agencies in the quiet title litigation. We are also intimately familiar with the existing groundwater flow model developed for the Sub-basin.
- **Aquilologic** can facilitate the harmonization of the SGMA process with the quiet title litigation, as required under State law. This will result in a consistent approach to groundwater management in the Sub-basin avoiding conflict between the regulatory and legal processes.
- **Aquilologic** can develop the GSP in the more cost-effective manner, as large elements of the work scope are already being performed to support the quiet title litigation; therefore, using the same consultant will avoid duplication and result in significant costs savings.
- **Aquilologic** understands the water resources challenges in the Sub-basin, and the likely issues that will arise during GSP development, given our local experience. We also have the experience and expertise to provide solutions to these challenges and issues.
- **Aquilologic** currently represents a variety of clients with different perspectives on water resources, including water districts, municipal water utilities, investor-owned water companies, mutual water companies, large agricultural interests, large landowners, smaller growers and land owners, State agencies, oil companies, and non-profit environmental organizations. Therefore, we understand the likely perspectives, goals, and limitations of the different stakeholder groups in the Sub-basin.
- **Aquilologic** is offering a simple team structure to deliver this project – one company, one point-of-contact, one message - clear coordination, efficient execution, consistent strategy, optimal project management, staffing commitment, simple contract structure, consistent communication, and cost-effective project delivery.
- **Aquilologic** is committed to local delivery of this important project, relocating a senior professional to the area, and developing a strong, long-term, local presence.
- **Aquilologic** has a detailed understanding of SGMA, GSP requirements, DWR BMPs, and the technical aspects of groundwater management. We are currently providing SGMA-related support in numerous basins, including many subject to critical overdraft.
- **Aquilologic** senior professionals have the ability to communicate complex and contentious technical issues to a broad variety of stakeholders – regulators, land owners, water utilities, the public, and the court.
- **Aquilologic** provides sound, data-driven, technical support to our clients. However, it is our ability to understand the other issues that shape water resources management – legal, public relations, political, economic – and develop more holistic solutions that consider these aspects that sets us apart. We have a history of working with client staff, legal counsel, outreach consultants and other team members to deliver these solutions.