ARROYO SANTA ROSA BASIN

GROUNDWATER SUSTAINABILITY AGENCY

SPECIAL MEETING BOARD AGENDA

October 6, 2021

5:00 P.M.

Camrosa Water District, 7385 Santa Rosa Road, Camarillo, CA 93012

MEMBERS OF THE BOARD

JEFFREY C. BROWN, *Camrosa Water District*
TERRY L. FOREMAN, *Camrosa Water District*
AL E. FOX, *Camrosa Water District*
TIMOTHY H. HOAG, *Camrosa Water District*
JEFF PRATT, *Ventura County Public Works Agency*
EUGENE F. WEST, *Camrosa Water District*

ALL AGENDA DOCUMENTS ARE AVAILABLE AT THE CAMROSA WATER DISTRICT OFFICE AND ONLINE AT WWW.CAMROSA.COM/SRGSA

TO BE HELD REMOTELY

In light of continuing public health responses to COVID-19, the Camrosa office remains closed to the public. Board meetings are publicly accessible only via web teleconference, as described below.

To participate via the web to see the board meeting presentation, click https://us02web.zoom.us/j/9235309144 on your computer, tablet, or smartphone. You'll need to download and install the zoom app before logging on.

If you'd like to make a comment, you'll have to log in via the app so we can identify you and invite you to participate.

To listen in via phone, call (669) 900-6833; when prompted, enter the meeting ID: 923 530 9144.

CALL TO ORDER

PUBLIC COMMENTS

At this time, the public may address the Board on any item not appearing on the agenda that is subject to its jurisdiction. Persons wishing to address the Board must make themselves known directly after the Call to Order, through the chat to the host or verbally when the President asks for public comment.

Matters appearing on the Consent Agenda are expected to be noncontroversial and will be acted upon by the Board collectively, without discussion, unless a member of the Board or staff requests an opportunity to address a given item. Approval by the Board of Consent Items means that the recommendation of staff is approved along with the terms and conditions described in the Board Memorandum.

CONSENT AGENDA

1. **Approve the minutes of the August 12, 2021 special meeting**
2. **Ratify Vendor Payments**

PRIMARY AGENDA

3. **GSP Consultant**

   The Board will consider authorizing the Executive Director to enter into an agreement with and issue a purchase order to INTERA Incorporated in an amount not to exceed $603,390.00 to complete the Arroyo Santa Rosa Basin Groundwater Sustainability Plan (GSP).

4. **GSP Project Manager**

   The Board will consider authorizing the Executive Director to enter into an agreement with and issue a purchase order to Bondy Groundwater Consulting Inc., in an amount not to exceed $138,500, for GSP management services Tasks 1, 2, and 3 as described in the attached proposal.

The Board of Directors may hold a closed session to discuss personnel matters or litigation, pursuant to the attorney-client privilege, as authorized by the California Government Code. Any of the above items that involve pending litigation may require discussion in closed session on the recommendation of the GSA's legal counsel.

COMMENTS BY THE EXECUTIVE DIRECTOR

COMMENTS BY THE BOARD OF DIRECTORS

ADJOURN

ARROYO SANTA ROSA BASIN

GROUNDWATER SUSTAINABILITY AGENCY

MINUTES OF THE SPECIAL MEETING OF THE BOARD

August 12, 2021

5:00 P.M.

Camrosa Water District, 7385 Santa Rosa Road, Camarillo, CA 93012

CALL TO ORDER The meeting was called to order at 5:03 P.M.

Present: Jeffrey C. Brown (via teleconference)
Terry L. Foreman
Al E. Fox
Timothy H. Hoag
Glenn Shephard (for Jeff Pratt)
Eugene F. West

Staff: Greg Jones, Legal Counsel
Ian Prichard, Camrosa Water District
Sandra Llamas
Tony Stafford, Executive Director

Guests: Eric Vogler, Stantec

PUBLIC COMMENTS

None

SPECIAL PRESENTATIONS AND ANNOUNCEMENTS

None

CONSENT AGENDA

1. **Approve the minutes of the January 28, 2021 meeting**
2. **Ratify vendor payments**

Motion to approve the Consent Agenda: Fox. **Second:** Hoag. *A roll call vote was taken and the motion carried unanimously.*

PRIMARY AGENDA

3. **Quarterly results**

   Staff presented results through the fourth quarter of Fiscal Year 2020-21.

4. **Fiscal Year 2021-22 Budget**

Mr. Shephard indicated it was the understanding of the Ventura County Public Works Agency (VCPWA) that the VCPWA would contribute $100,000 total to the budget, rather than the $100,000 per year presented in the budget message. The Executive Director proposed that staff would work with the VCPWA to develop a conclusive understanding and return to the Board with an update.

The Board approved the FY21-22 budget as presented by staff.

Motion to approve the FY21-22 budget: Fox. **Second:** Hoag. *A roll call vote was taken and the motion carried unanimously.*

5. **GSP Contract**

Staff presented a proposal from Stantec to prepare a groundwater sustainability plan (GSP) in accordance with the Sustainable Groundwater Management Act.

Director Foreman gave a presentation summarizing the existing body of knowledge on the Santa Rosa Basin and how the GSP should build upon the nearly 100 years of available research and analysis. He proceeded to discuss the interaction between the ad hoc appointed at the September 24, 2020 meeting and Stantec over the intervening ten months and the ways in which he considered Stantec unresponsive to the ad hoc's repeated requests for further explanation of their methodology and approach to the GSP. After significant discussion among the Board with input from Mr. Vogler, a motion was made to proceed with the action item as described in the agenda.

Motion to enter into the GSP scoping contract with Stantec: Fox. **Second:** West. *A roll call vote was taken: Brown: no; Fox: yes; Foreman: no; Hoag: no; Shephard: yes; West: yes. There being no majority, the motion died.*

As part of his presentation, Director Foreman proposed a two-track process for accomplishing a GSP more responsive to the needs of the ASRGSA. In the wake of the prior motion failing, Director Foreman made a separate motion to pursue the GSP on two tracks, with Track 1 focusing on a compliant GSP and Track 2 dedicated to substantively addressing technical deficiencies of previous hydrogeological study of the SRB to be used for future basin management and GSP updates.

Motion to pursue the GSP as described by Director Foreman: Foreman. **Second:** Brown. *A roll call vote was taken: Brown: yes; Fox: no; Foreman: yes; Hoag: no; Shephard: no; West: no. There being no majority, the motion died.*

President West forestalled further discussion of the item, instead directing staff to meet with Director Foreman to develop a specific course of action regarding the development of a GSP and the engagement of a project manager for the duration of the GSP process and to return to the Board for deliberation at a future Board meeting.

ADMINISTRATIVE ITEMS

None

INFORMATIONAL ITEMS

None

COMMENTS BY THE EXECUTIVE DIRECTOR

None

COMMENTS BY THE BOARD OF DIRECTORS

Director Fox announced that the Association of Water Agencies of Ventura County's annual water symposium would be held, via teleconference, on October 21, 2021.

ADJOURN

There being no further business, the meeting was adjourned at 7:08 P.M.

_____	_____ (ATTEST)
Tony L. Stafford	Eugene F. West, Chair
Executive Director	Board of Directors
Arroyo Santa Rosa Basin GSA	**Arroyo Santa Rosa Basin GSA**

ARROYO SANTA ROSA BASIN

GROUNDWATER SUSTAINABILITY AGENCY

Camrosa Water District, 7385 Santa Rosa Road, Camarillo, CA 93012

BOARD MEMORANDUM

DATE: October 6, 2021

TO: Board of Directors

FROM: Tony Stafford, Executive Director

OBJECTIVE: Ratify vendor payments as presented by Staff.

ACTION: Ratify accounts payable.

SUMMARY: A summary of accounts payable previously paid by the Arroyo Santa Rosa Groundwater Sustainability Agency in the amount of $1,326.89 is provided for Board information and ratification.

Check Number	Post Date	Vendor Name	Invoice Number	Description	Amount
	7/31/2021	Union Bank		July 2021 Bank Fees	40
34	8/18/2021	Hathaway, Perrett, Webster	113633	Legal Services	91.73
35	8/18/2021	Stantec	1819312	GSP Scoping Prof Serv Period Ending July 23, 2021	85
	8/31/2021	Union Bank		August 2021 Bank Fees	40
36	9/10/2021	Hathaway, Perrett, Webster	114314	Legal Services	1070.16
Total Vendor Payments					**$ 1,326.89**

The Arroyo Santa Rosa GSA's bank account balance as of August 2021, was $46,577.97.

ARROYO SANTA ROSA BASIN

GROUNDWATER SUSTAINABILITY AGENCY

Camrosa Water District, 7385 Santa Rosa Road, Camarillo, CA 93012

BOARD MEMORANDUM

DATE: October 6, 2021

TO: Board of Directors

FROM: Tony Stafford, Executive Director

OBJECTIVE: Proceed with the groundwater sustainability plan

ACTION: Authorize the Executive Director to enter into an agreement with and issue a purchase order to INTERA Incorporated in an amount not to exceed $603,390.00 to complete the Arroyo Santa Rosa Basin Groundwater Sustainability Plan (GSP).

DISCUSSION: At the August 12, 2021, meeting, the Board directed staff and Director Foreman to work together to solicit proposals for the GSP. Staff and Director Foreman met with INTERA and GSI, highly respected geoscience firms currently working on GSPs in other basins.

After several meetings discussing the scope of the GSP, GSI decided not to propose.

INTERA's proposed scope of work, attached, is primarily technical. The administrative and policy aspects of the GSP, including stakeholder engagement and certain plan sections, will be handled by GSA staff and a contracted project manager. Regionally, INTERA provides this level of service for the Mound Basin and Upper Ventura River Basin GSPs, and they perform similar modeling and groundwater sustainability work nationwide. INTERA are well acquainted with the requirements of the Sustainable Groundwater Management Act and are confident the GSP will be completed by the grant deadline of December 31, 2022, in compliance with the Proposition 1 Sustainable Groundwater Planning Grant that the Department of Water Resources awarded the GSA in 2018.

The proposed GSP exceeds the approved FY21-22 budget. The ASRGSA is funded through contributions from Camrosa and Ventura County. The Camrosa Board will consider the increased contributions at the October 14, 2021 meeting of its Board of Directors. Upon approval of the transfer of funds, staff will return to the ASRGSA Board to amend the ASRGSA FY2021-22 budget. It is anticipated that the County will also contribute their portion of this project cost. The County has a yearly total contribution cap of $100,000.

Arroyo Santa Rosa Groundwater Sustainability Agency
7385 Santa Rosa Rd.
Camarillo, CA 93012
Telephone (805) 482-4677 - FAX (805) 987-4797

Some of the important terms of this agreement are printed on pages 2 through 3. For your protection, make sure that you read and understand all provisions before signing. The terms on Page 2 through 3 are incorporated in this document and will constitute a part of the agreement between the parties when signed.

TO: INTERA Incorporated
3838 W. Carson St. #380
Torrance, CA 90503

DATE: October 6, 2021

Agreement No.: 2022-03

The undersigned Consultant offers to furnish the following: for development of Groundwater Sustainability Plan and Surface-Water/Groundwater Model of the Arroyo Santa Rosa Basin per proposal dated 9/28/2021 attached.

Contract price $: Not to exceed $603,390 per proposal attached

Contract Term: 10/06/2021 – 12/31/2023

Instructions: Sign and return original. Upon acceptance by Arroyo Santa Rosa GSA, a copy will be signed by its authorized representative and promptly returned to you. Insert below the names of your authorized representative(s).

Accepted: Arroyo Santa Rosa GSA	Consultant: INTERA Incorporated
By: _____	By: Van Kelley
Tony L. Stafford	Van Kelley P.G.
Title: General Manager	Title: Senior Vice President Water Resources
Date: _____	Date: 10/1/2021
Other authorized representative(s):	Other authorized representative(s):
_____	_____

Consultant agrees with ASRGSA that:

a. **Indemnification:** To the extent permitted by law, Consultant shall hold harmless, defend at its own expense, and indemnify the ASRGSA, its directors, officers, employees, and authorized volunteers, against any and all liability, claims, losses, damages, or expenses, including reasonable attorney's fees and costs, arising from negligent acts, errors or omissions of Consultant or its officers, agents, or employees in rendering services under this contract; excluding, however, such liability, claims, losses, damages or expenses arising from the ASRGSA's sole negligence or willful acts.

b. **Minimum Insurance Requirements:** Consultant shall procure and maintain for the duration of the contract insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Consultant, his agents, representatives, employees or subcontractors.

c. **Coverage:** Coverage shall be at least as broad as the following:

   1. **Commercial General Liability (CGL) -** Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including products and completed operations, property damage, bodily injury, personal and advertising injury with limit of at least two million dollars ($2,000,000) per occurrence. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (coverage as broad as the ISO CG 25 03, or ISO CG 25 04 endorsement provided to the ASRGSA) or the general aggregate limit shall be twice the required occurrence limit.

   2. **Automobile Liability -** (If applicable) Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01), covering Symbol 1 (any auto) or if Consultant has no owned autos, Symbol 8 (hired) and 9 (non-owned) with limit of one million dollars ($1,000,000) for bodily injury and property damage each accident.

   3. **Workers' Compensation Insurance -** as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than $1,000,000 per accident for bodily injury or disease.

   4. **Waiver of Subrogation:** The insurer(s) named above agree to waive all rights of subrogation against the ASRGSA, its directors, officers, employees, and authorized volunteers for losses paid under the terms of this policy which arise from work performed by the Named Insured for the ASRGSA; but this provision applies regardless of whether or not the ASRGSA has received a waiver of subrogation from the insurer.

   5. **Professional Liability** - (also known as Errors & Omission) Insurance appropriate to the Consultant profession, with limits no less than $1,000,000 per occurrence or claim, and $2,000,000 policy aggregate.

d. **If Claims Made Policies:**

   1. The Retroactive Date must be shown and must be before the date of the contract or the beginning of contract work.

   2. Insurance must be maintained and evidence of insurance must be provided **for at least five (5) years after completion of the contract of work.**

   3. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a Retroactive Date prior to the contract effective date, the Consultant must purchase "extended reporting" coverage for a minimum of five (5) years after completion of contract work.

If the Consultant maintains broader coverage and/or higher limits than the minimums shown above, the ASRGSA requires and shall be entitled to the broader coverage and/or higher limits maintained by the Consultant. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the ASRGSA.

Other Required Provisions: The general liability policy must contain, or be endorsed to contain, the following provisions:

a. **Additional Insured Status:** ASRGSA, its directors, officers, employees, and authorized volunteers are to be given insured status (at least as broad as ISO Form CG 20 10 10 01), with respect to liability arising out of work or operations performed by or on behalf of the Consultant including materials, parts, or equipment furnished in connection with such work or operations.

b. **Primary Coverage:** For any claims related to this project, the Consultant's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to the ASRGSA, its directors, officers, employees, and authorized volunteers. Any insurance or self-insurance maintained by the ASRGSA, its directors, officers, employees, and authorized volunteers shall be excess of the Consultant's insurance and shall not contribute with it.

Notice of Cancellation: Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the ASRGSA.

Self-Insured Retentions: Self-insured retentions must be declared to and approved by the ASRGSA The ASRGSA may require the Consultant to provide proof of ability to pay losses and related investigations, claim administration, and defense expenses within the retention. The policy language shall provide, or be endorsed to provide, that the self-insured retention may be satisfied by either the named insured or the ASRGSA.

Acceptability of Insurers: Insurance is to be placed with insurers having a current A.M. Best rating of no less than A:VII or as otherwise approved by the ASRGSA.

Verification of Coverage: Consultant shall furnish the ASRGSA with certificates and amendatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by the ASRGSA before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Consultant's obligation to provide them. The ASRGSA reserves the right to require complete, certified copies of all required insurance policies, including policy Declaration and Endorsements pages listing all policy endorsements. If any of the required coverages expire during the term of this agreement, the Consultant shall deliver the renewal certificate(s) including the general liability additional insured endorsement to ASRGSA at least ten (10) days prior to the expiration date.

Subcontractors: Consultant shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein, and Consultant shall ensure that the ASRGSA, its directors, officers, employees, and authorized volunteers are an additional insured on Commercial General Liability Coverage.

Other Requirements:

a. Consultant shall not accept direction or orders from any person other than the General Manager or the person(s) whose name(s) is (are) inserted on Page 1 as "other authorized representative(s)."

b. Payment, unless otherwise specified on Page 1, is to be 30 days after acceptance by the ASRGSA.

c. Permits required by governmental authorities will be obtained at Consultant's expense, and Consultant will comply with applicable local, state, and federal regulations and statutes including Cal/OSHA requirements.

d. Any change in the scope of the professional services to be done, method of performance, nature of materials or price thereof, or to any other matter materially affecting the performance or nature of the professional services will not be paid for or accepted unless such change, addition or deletion is approved in advance, in writing by the ASRGSA. Consultant's "other authorized representative(s)" has/have the authority to execute such written change for Consultant.

The ASRGSA may terminate this Agreement at any time, with or without cause, giving written notice to Consultant, specifying the effective date of termination.

INTERA Incorporated
3838 W. Carson Street, #380
Torrance, California 90503 USA
424.275.4055

September 28, 2021

Mr. Ian Prichard, Assistant General Manager
Camrosa Water District &
Arroyo Santa Rosa Groundwater Sustainability Agency
7385 Santa Rosa Road
Camarillo, California 93012-9284

RE: Proposal for Development of Groundwater Sustainability Plan and Surface-Water/Groundwater Model of the Arroyo Santa Rosa Basin

Dear Mr. Prichard,

INTERA is pleased to submit this proposal for the *Development of a Groundwater Sustainability Plan and Surface-Water/Groundwater Model of the Arroyo Santa Rosa Basin* to the Arroyo Santa Rosa Groundwater Sustainability Agency (ASRGSA). The proposal is based on a) discussions and communications that INTERA has had with Camrosa Water District (CWD) staff (Mr. Ian Prichard) and Board Director (Mr. Terry Foreman), b) communication received via email with guidance on the scope for this endeavor, c) basin-specific data and documents received related to the Arroyo Santa Rosa (ASR) basin, and d) Groundwater Sustainability Plan (GSP) requirements and recommendations as laid out in the Sustainable Groundwater Management Act (SGMA) regulations and Department of Water Resources (DWR) Draft Best Management Practices (BMPs). INTERA has considerable experience leading and supporting the development of GSPs and is currently leading the development of two GSPs (for the Upper Ventura River and Mound Groundwater Basins) and supporting the development (through groundwater modeling) of four other GSPs (for the South and East Las Posas, Santa Monica, San Gorgonio Pass, and Coastal Plain of San Diego Basins). Several of these (East and South Las Posas, Mound, and Upper Ventura River Basins) are proximal to the Arroyo Santa Rosa Basin with a similar basin setting and beneficial uses. As such, we have also relied on our understanding of the GSP process and guidance we have received through our interactions with DWR and SGMA stakeholders in other similar basins.

The ASR Basin (DWR Basin 4-007) is a low-priority basin under SGMA. While low-priority basins are not required to develop a GSP under SGMA, the ASRGSA applied for and received a DWR SGMA planning grant to develop a GSP for the basin. Based on our understanding, the ASRGSA needs to submit the GSP to DWR by December 31, 2022. SGMA requires quantitative evaluation of (historical, current, and future) groundwater budgets as well as sustainable management criteria (SMC) using the "best available data and science". In most cases this entails the use of groundwater models developed using basin-specific data. A groundwater flow model has been developed for the ASR Basin (by MWH, now Stantec), but needs to be updated and refined to a) reflect a deeper understanding of key hydrogeologic processes and b) incorporate recent hydrologic and geologic datasets in the ASR Basin. INTERA proposes the development of the GSP and update of the groundwater model over two "tracks" (consistent with guidance received via email and discussion with Director Foreman on the scope of this project). "Track 1" will focus on the development of the GSP to meet stipulated SGMA regulations and the timeline for the SGMA Grant Agreement (GSP submittal by December 31, 2022). Under this track, the groundwater model will be updated and refined *to the extent necessary to support the GSP*. The primary emphasis will be on

developing improved estimates of key water budget terms and reliably use the model to evaluate SMC associated with groundwater levels and surface-water/groundwater interactions. Available and relevant data and literature will be incorporated into the GSP and model refinement. Due to the expedited timeline for the GSP submittal, the amount of effort on this first phase of model refinement will need to be constrained based on the needs of the GSP. As such, "Track 2" – to be initiated after the bulk of the GSP development scope is complete – will focus on further refining/calibrating the model to enhance modeling capabilities for key hydrogeologic processes (recharge, return flows, evapotranspiration, underflows, and surface-water/groundwater interactions) as needed for future groundwater management and GSP update purposes. This proposal includes the scope, schedule, and budget for each track. Note, the "Track 2" modeling scope, budget, and schedule is preliminary and may be revised based on a) model limitations, uncertainties, and data-gaps identified during "Track 1", b) discussions with ASRGSA and CWD on future modeling objectives, and c) additional data/knowledge gathered during and subsequent to "Track 1".

Throughout this process, INTERA will work very closely with ASRGSA and CWD staff, Board members, and the Ad Hoc Technical Advisory Committee (TAC) to ensure the GSP and model reflects the most current and best understanding of basin hydrogeology as well as the goals and objectives for sustainable basin management. We will update staff, Board, and TAC members on a regular basis and seek timely feedback on and resolution to key GSP and modeling decisions. Any deviations from the proposed scope, level of effort, budget, and schedule will be promptly communicated with alternatives for contingencies/amendments identified.

Proposed Scope of Work

The following scope of work details the scope, budget, and schedule for both tracks. "Track 1" is organized in terms of GSP sections, with data compilation and modeling scope items pertinent to each GSP chapter identified as sub-tasks. The proposal includes an annotated outline of the GSP with relevant SGMA regulatory sections highlighted for each section. INTERA has successfully used this outline for the Upper Ventura and Mound Basin GSPs and proposes using the same outline for the ASR Basin GSP.

Track 1

1. Introduction to Plan Contents (and Executive Summary)

The Executive Summary and Introduction sections will provide an overview of SGMA requirements and summarize the content and organization of the GSP, including administrative information, basin setting, sustainable management criteria, monitoring network, and projects and management actions.

The section will be completed after all other GSP sections have been finalized. INTERA will submit this Section in the preliminary draft GSP for review and comment by CWD/ASRGSA staff, and TAC. INTERA will respond to one round of comments and finalize the draft section for public comment. INTERA will revise and finalize the draft section (based on public comment) and submit the final to DWR by the GSP deadline.

2. Administrative Information

This section will contain a description of the groundwater sustainability agency (GSA), the plan area, existing monitoring/management/land-use plans, and details on the notice and stakeholder communication of the GSA. Further details for the administrative information include:

- ASRGSA formation, and GSP initiation, evolution, and content.
- ASRGSA authority, contact, members, notice of formation, management structure.
- ASRGSA policies, requirements and/or guidelines as required by the SGMA
- Description of the plan basin area, jurisdictional areas, existing wells/monitoring/management plans, and land use. This will include well-head protection, well construction, abandonment and destruction policies promulgated by VCWPD, as well as efficient water management practices developed by CWD.
- List of beneficial uses and users in the basin, details on the notice and stakeholder communication, and communication structure.

INTERA will incorporate relevant information available in the Arroyo Santa Rosa Groundwater Management Plan (MWH, 2013) as well as relevant material from the prior draft FCGMA GSP (Hydrometrics and GSI, 2016 and Dudek, 2017). This section will require input from ASRGSA staff to reflect the most recent administrative/management setting. As such, we will work closely with ASRGSA staff to get the necessary information and text for relevant section areas.

INTERA will submit a preliminary draft of this section for review and comment by CWD/ASRGSA staff. INTERA will respond to one round of comments and subsequently submit a revised draft section for TAC review and comment. INTERA will revise the draft section based on TAC comment and incorporate the updated section into the draft GSP to be submitted for Board and Public comment. We assume a 1-week period for the review by CWD/ASRGSA staff and TAC, respectively.

3. Basin Setting

This section will contain details on the hydrogeologic conceptual model, groundwater conditions, the surface-water and groundwater budget, and management areas (if any). Section 3 contains the bulk of the effort towards the GSP and the model. Work entailed requires a thorough review of data and background for the Basin and involves the review of previous work, drafting of several maps, cross sections, analysis/graphing of data, calculations, and the modeling required to quantify water budget components and groundwater/surface water interactions. Detailed Section 3 scope is shown below organized based on GSP sub-sections and supporting data-collection and modeling steps:

3.1 Hydrogeologic Conceptual Model (HCM): the HCM includes the description, graphical depiction, and numerical representation of the physical setting, structure, hydrology, and geology the ASR Basin. SGMA also requires that the HCM also identify data-gaps and uncertainties that could impact groundwater management and sustainability. The HCM assimilates existing data, previous studies, hydrogeologic knowledge, and numerical modeling of the basin. The scope for this sub-section is organized accordingly.

3.1.1 Data Collection and Compilation: INTERA will collect, compile, and organize relevant basin-specific literature and data related to topography, hydrology (groundwater level records, water level contours, streamflow records, stream network, precipitation, temperature), geology (well location and construction information, geophysical logs, regional cross-sections, surface geology maps, soil types, hydrostratigraphic surfaces, geologic features such as faults/anticlines/synclines, and basin and watershed boundaries), groundwater production, surface-water discharges or diversions, surface-water and groundwater quality (including any known contaminated sites), land-use, and water deliveries/use. For budgeting purposes, we have assumed the data collection will cover 25 years of the historical period. INTERA will also collect and organize the existing numerical model files and import them into a groundwater modeling visual interface (Groundwater Vistas). Digital data will be organized in a SGMA-specific Data Management System (developed and used by INTERA for other GSPs). GIS data will be organized in a Geodatabase. INTERA will also collect, compile, and organize existing reports and publications related to the ASR Basin in a structured and easily searchable folder with a corresponding reference file. Based on our understanding Stantec has already collected and compiled much of the basin-specific data under a prior task for the GSA. We assume that this data will be made available to INTERA in a readily accessible and organized manner. We will coordinate with ASRGSA staff to collect the most recent, up-to-date, and accurate records for this purpose. We assume that ASRGSA will help with the coordination and collection of data/information from neighboring agencies such as FCGMA, UWCD, City of Thousand Oaks, City of Camarillo, and Calleguas Municipal Water District. Since much of the data has been collected and reviewed by past consultants and Agency staff, we assume that there will *not* be major inconsistences or inaccuracies in the data. INTERA has assumed minimal time for QA/QC and resolution of data errors or inconsistencies. Significant data errors or inconsistencies will be communicated promptly to ASRGSA staff and contingencies to address these identified.

As part of the information-gathering process, we have assumed one full-day for a site-visit/field-reconnaissance trip to supplement our understanding of the physical basin setting with observations of land use, geology, current and potential new monitoring sites, existing active and abandoned production wells, and field checking of potential or known areas of surface water groundwater interaction, groundwater recharge and groundwater dependent ecosystems (GDEs). INTERA will coordinate the logistics for this with ASRGSA staff.

3.1.2 HCM – GSP Sections: INTERA will review previous reports/studies and the data collected as part of 3.1.1 to develop a thorough understanding of the physical setting, structure, hydrology, geology, and hydrogeology of the ASR Basin. We anticipate that much of the preliminary information for the GSP section can be gathered from the 2013 GMP as well as prior draft GSP sections (Hydrometrics and GSI, 2016; Dudek, 2017). Published reports (for example, the 2013 GMP and

the Basin Boundary Modification documentation) and existing model layers will be used to develop up to five geologic (two east to west and three north to south) cross-sections across the ASR Basin. INTERA will review up to 20 well-construction records and geophysical logs from wells within the basin to extend (for example, west of the Bailey Fault), update, and refine the geologic cross-sections, as needed. INTERA will incorporate information (including photographs) gathered during the field reconnaissance trip into our description of the HCM. We will work closely with CWD/ASRGSA staff to ensure their best understanding of the basin hydrogeology and hydrologic processes is incorporated into the HCM.

Note, this task will go hand-in-hand with the historical model construction and calibration. As such, the HCM section will be updated upon completion of the historical model construction and calibration. Based on our final evaluation of the HCM, we will identify significant data-gaps and uncertainties in the HCM and describe how these relate to the water budget, SMCs, and basin management decisions. We will also recommend data-collection/monitoring efforts that the ASRGSA may undertake to reduce these uncertainties and close the data-gaps.

3.1.3 Historical Model Construction, Calibration, and Post-Processing: Our understanding is that a single-layer, steady state groundwater model has been developed by MWH/Stantec for the ASR Basin. The model will be refined/updated based on the data collected as part of 3.1.1 and our best understanding of the HCM. Groundwater modeling is an inherently uncertain and non-unique (wherein different model properties/boundary-conditions can yield similar results) process. To reduce the uncertainty/non-uniqueness in models it is essential that the model be constrained to all the prior hydrogeologic knowledge and data available. We propose the following steps to refine and update the model:

- Model layer structure will be refined based on well-construction records, geophysical logs, and refined cross-sections (3.1.2). We have assumed review and assimilation of a total of 20 well construction records/geophysical logs for this purpose.

- Literature values and available data will be used to develop a preliminary conceptual water balance. Based on our discussion with Director Foreman, there are significant discrepancies and uncertainties in prior water budget estimates. INTERA will compile the range of water budget terms, identify any errors/inconsistencies, and develop uncertainty ranges for key water budget terms. These will be used to constrain the numerical model water budget during the construction and calibration phase.

- The model will be converted to transient conditions with monthly stress periods. SGMA requires a minimum 10-year historical water-budget in the GSP. For budgeting purposes, we have assumed an approximately 25-year historical simulation period. The historical simulation period will include a range of water years (for example, the very wet 1998 and 2005; average

1997, 2001, and 2003; and the 2012 – 2016 dry/drought years). The final historical simulation period will be selected based on a number of criteria: data availability; hydrologic patterns; water-year types; land-use and water-use practices, and other factors. Note, that the historical period prior to the 1990s may be limited by data (water levels, pumping, streamflow) availability. Where appropriate we will fill data gaps and extrapolate key hydrologic time-series to develop the transient model.

- We propose using the USGS BCM (Flint and Flint, 2013) regional watershed model to estimate groundwater recharge from precipitation. The BCM calculates in-place evapotranspiration, runoff, and recharge using regional datasets for precipitation, temperature, land-use, soil-type, etc. BCM estimates for recharge are readily available for the historical simulation period available. Note, BCM does not include M&I or agricultural return flows from irrigation or septic/distribution losses, hence these will be estimated based on land-use, water deliveries, and water-use data for the ASR Basin. These will be estimated (outside BCM) using land-use data, water deliveries information, water-use data, and appropriate return-flow factors. Return flow estimates will be added to the BCM recharge values to compute total recharge. We assume ASRGSA staff will make relevant land-use, water deliveries, and water-use data in an accessible digital format. The precipitation-based recharge and return flow estimates will be compared to estimates from previous studies to ensure they are within reasonable range.

- We propose using the MODFLOW NWT (Niswonger et al., 2011) version of MODFLOW, due to its enhanced capabilities to simulate unconfined groundwater dynamics as well as drying and rewetting of cells in a numerically efficient and accurate manner.

- Phreatophytes that may depend on groundwater will be identified based on the GDE mapping and included in the MODFLOW EVT package.

- We propose using the coupled SW/GW MODFLOW enhanced streamflow (SFR2) package to simulate SW/GW interactions along the Conejo Creek, Arroyo Santa Rosa, Santa Rosa Tributary, and Arroyo Conejo (within the basin boundary). We will use high-resolution DEM and Lidar data (if available) to delineate the streams and arroyos. Discharge at the Confluence Flume from the Hill Canyon WWTP as well as stormflow contributions from the tributaries will be included in the SFR package. We assume that ASRGSA staff will assist in collecting the WWTP discharge data for this purpose. Note, that there is limited data for tributary flows (gage 828 on Arroyo Santa Rosa has variable data that may have inaccuracies). For this phase of modeling, we will develop first order estimates of tributary stormflow contributions using a curve number approach and by comparing/analyzing flows at the downstream gage 800. Runoff estimates are also available from BCM (albeit at a relatively coarse grid scale), and these will be compared against the curve number

estimates. The tributary contributions may need to be revised (along with stream and aquifer properties) during the model calibration phase to match groundwater levels near the Arroyo/Creeks and outflows at gage 800. Note, based on our review gage 800 does not have available data past 2011. Hence, the period with available data will be used for calibration purposes.

- All measured (M&I and FCGMA) groundwater pumping will be incorporated into the model using the MODFLOW WEL package. Based on our understanding agricultural pumping outside the FCGMA area is not metered. We will use remote sensed data (such as CalETa or similar data products) to estimate agricultural ET demands. We will account for surface deliveries and/or precipitation to estimate applied groundwater for the agricultural parcels. We assume that the cost for commercial CalETa (or similar) remote sensed data will be covered directly by ASRGSA. Domestic and de minimis pumping will be estimated using water-use estimates obtained from ASRGSA and CWD.

- Estimates of underflow and/or mountain front recharge will be based on BCM recharge from watershed areas outside the groundwater basin. Bedrock contributions are, in general, highly uncertain and difficult to measure. As such, these preliminary estimates may need to be fine-tuned during the model calibration phase to match observed groundwater levels and streamflows.

- Model calibration will entail making changes to model hydraulic properties (conductivities and storage properties), streamflow parameters in the SFR package, and boundary fluxes to match observed groundwater levels and streamflows during the simulated historical period. Calibration will be achieved, at a minimum, to the industry standard of 10% normalized RMSE (root mean square of calibration error divided by range of observed values) for groundwater levels. Measured streamflows at gage 800 will also be matched. Since stormflows are highly transient with the basin, the focus will be on match baseflows, which are a better indicator of SW/GW interactions.

- The calibrated historical model will be post-processed using custom Python scripts to develop water level contour maps, hydrographs, and historical and current water budget estimates for GSP purposes.

- Throughout this process, we will work closely with CWD/ASRGSA staff to ensure their best understanding of the basin hydrogeology and hydrologic processes is incorporated into the numerical model.

3.2 Groundwater Conditions

This section will include a detailed description of each applicable sustainability indicator (groundwater levels, storage, water quality, land subsidence, and interconnected surface water)

within the basin. Results from the calibrated groundwater model will be used to show water level contours and storage for the ASR basin.

Water quality data for chloride, sulfate, total dissolved solids (TDS), and nitrate (the key groundwater quality constituents of concern) will be analyzed to describe and graph water quality trends within the basin. Data from Geotracker and GAMA will be downloaded and reviewed to assess any known groundwater contamination sites or areas with elevated emerging contaminants emerging contaminants, including per- and polyfluoroalkyl substances (PFAS) and 1,2,3-trichloropropane (TCP).

The section will also introduce, identify, and describe groundwater dependent ecosystems (GDEs) within the basin. GDE information will be primarily based on 1) The Nature Conservancy (TNC) and DWR statewide database of indicators of groundwater dependent ecosystems (iGDEs) and, 2) descriptions of vegetation alliances from the USDA's Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) which generally correspond with the Natural Communities Commonly Associated with Groundwater (NCCAG) classifications. It is our understanding that the GSA may contract with biologists to survey, ground-truth, and characterize GDEs. We have assumed that this additional information on GDEs will be made available through the ASRGSA or their consultant.

While subsidence is not a concern for the basin, given the geologic setting (unconfined conditions with no regionally continuous clay units), we will utilize DWR-provided InSAR data to show historical subsidence (or the lack thereof).

Throughout this process, we will work closely with CWD/ASRGSA staff to ensure their best understanding of groundwater conditions in the ASR basin is incorporated into the GSP section.

3.3 Water Budget

3.3.1 Historical and Current Water Budget: INTERA will use the calibrated groundwater model to present surface-water and groundwater budgets. These estimates will be compared and contrasted against historical estimates, and any differences and uncertainties explained. The water budget information will include designation of water year types, as well as surface-water deliveries and their reliability (per SGMA requirements).

3.3.2 Predictive Model Construction and Post-Processing: SGMA requires a future water budget (for a minimum of 50 years) incorporating changes to land-use, water-use, and climate change. INTERA will extend the historical calibrated model to a 50-year predictive timeframe based on DWR-provided climate change datasets (precipitation, ET, and streamflow change factors) for the ASR Basin. The historical hydrologic datasets will be extended (as needed) to develop the 50-year baseline timeseries to apply the DWR climate change factors. This may entail creating synthetic hydrologic time-series (using correlations with precipitation and periods with available data) for periods with data-gaps or unavailable historical data. Changes to future land-use and water-use/pumping will be

discussed with ASRGSA staff and incorporated into these projections. Post-processing capabilities using custom Python scrips will be developed to support the water budget and SMC reporting in the GSP. For budgeting purposes, we have assumed a maximum of three future scenarios: baseline (no climate change), 2030s (mid-term climate change), and 2070s (long-term climate change).

3.3.3 Projected Water Budget: INTERA will utilize the predictive models to calculate and present the projected water budget. This will also include future water year types, as well as surface water deliveries and their reliability.

3.3.4 Sustainable Yield Estimate: the sustainable yield for the basin represents the maximum amount of water that can be pumped without causing undesirable results. As such, the sustainable yield will be calculated during the modeling for SMC.

3.4 Management Areas: the need for management areas will be discussed with ASRGSA staff. It is possible that the area west of the Bailey Fault could be defined as a management area (due to hydrogeologic and management reasons). Management areas will be described and shown in maps in the GSP. For budgeting purposes, we have assumed a maximum of two management areas for the GSP.

This section will require input from ASRGSA staff to reflect their best understanding of the hydrogeology, water budget, and groundwater conditions. We will work closely with ASRGSA staff to get the necessary information and text for relevant section areas.

INTERA will submit a preliminary draft of this section for review and comment by CWD/ASRGSA staff. INTERA will respond to one round of comments and subsequently submit a revised draft section for TAC review and comment. INTERA will revise the draft section based on TAC comment and incorporate the updated section into the draft GSP to be submitted for Board and Public comment. We assume a 1-week period for the review by CWD/ASRGSA staff and TAC, respectively.

4. Sustainable Management Criteria

4.1 SMC – GSP Sections: The GSP will contain a section for each of the applicable SMC (chronic lowering of groundwater levels, reduction of storage, degradation of water quality, and depletion of interconnected surface-water – with the assumption that subsidence and seawater intrusion will be screened out from consideration given the basin setting). Each section will describe the process for establishing the SMC and the quantification of the parameters for the Basin's sustainability indicators. The ASRGSA sustainability goal will also be defined based upon discussion with ASRGSA staff, Board members, and TAC. For each applicable SMC, the GSP section will include quantification and description of minimum thresholds, combination of exceedances leading to undesirable results, relationships across sustainability indicators, effects on beneficial uses and users for the Basin, definition of measurable objectives and interim measures, status for each sustainability indicator, and the 20-year plan to reach and/or maintain sustainability.

4.2 Additional Modeling Scenarios/Post-Processing: to assess SMCs under different future scenarios, we have assumed a maximum of three additional scenarios with associated pre- and post-processing.

This section will require input from ASRGSA staff on basin-specific sustainable management criteria and corresponding GSP implications. We will work closely with ASRGSA staff to get the necessary information and text for relevant section areas.

INTERA will submit a preliminary draft of this section for review and comment by CWD/ASRGSA staff. INTERA will respond to one round of comments and subsequently submit a revised draft section for TAC review and comment. INTERA will revise the draft section based on TAC comment and incorporate the updated section into the draft GSP to be submitted for Board and Public comment. We assume a 1-week period for the review by CWD/ASRGSA staff and TAC, respectively.

5. Monitoring Network: This section will include the current available monitoring network components as they pertain to each sustainability indicator and identify additional monitoring needs. Information available in the 2013 GMP and prior draft GSPs will be incorporated into the write-up with relevant sections updated. For the proposed monitoring network, we will: define the monitoring objectives and design criteria; present the details of each monitoring network on maps and tables; analyze the current level of monitoring attainment; define data and reporting standards and protocols; and identify data gaps and additional monitoring needs or improvements.

This section will require input from ASRGSA staff on basin-specific monitoring requirements and recommendations. We will work closely with ASRGSA staff to get the necessary information and text for relevant section areas.

INTERA will submit a preliminary draft of this section for review and comment by CWD/ASRGSA staff. INTERA will respond to one round of comments and subsequently submit a revised draft section for TAC review and comment. INTERA will revise the draft section based on TAC comment and incorporate the updated section into the draft GSP to be submitted for Board and Public comment. We assume a 1-week period for the review by CWD/ASRGSA staff and TAC, respectively.

6. Projects and Management Actions:

6.1 Projects and Management Actions – GSP Sections: This section will review existing projects and management actions related to the Basin, and their potential impacts to achieving the sustainability goal. Information available in the 2013 GMP and prior draft GSPs will be incorporated into the write-up with relevant sections updated. Additional projects and management actions required to address any future undesirable results or meet measurable objectives will be presented based on modeling projections are also identified. The relationship of projects and management actions to each applicable sustainability indicator is reviewed based on relevant measurable objectives; implementation triggers; public notice process; permitting and regulatory process; implementation timeline and approach; anticipated benefits; legal authority; and cost and funding.

6.2 Additional Modeling Scenarios/Post-Processing: to assess basin sustainability under different project and management actions, we have assumed a maximum of two additional modeling scenarios with associated pre- and post-processing.

This section will require input from ASRGSA staff on basin-specific projects and management actions. We will work closely with ASRGSA staff to get the necessary information and text for relevant section areas.

INTERA will submit a preliminary draft of this section for review and comment by CWD/ASRGSA staff. INTERA will respond to one round of comments and subsequently submit a revised draft section for TAC review and comment. INTERA will revise the draft section based on TAC comment and incorporate the updated section into the draft GSP to be submitted for Board and Public comment. We assume a 1-week period for the review by CWD/ASRGSA staff and TAC, respectively.

7. GSP Implementation: This section will describe the plan implementation process. The cost and schedule for plan implementation will be presented, and the required reporting and data management described. This section will require input from ASRGSA staff on GSP implementation schedule and budget. We will work closely with ASRGSA staff to get the necessary information and text for relevant section areas.

INTERA will submit a preliminary draft of this section for review and comment by CWD/ASRGSA staff. INTERA will respond to one round of comments and subsequently submit a revised draft section for TAC review and comment. INTERA will revise the draft section based on TAC comment and incorporate the updated section into the draft GSP to be submitted for Board and Public comment. We assume a 1-week period for the review by CWD/ASRGSA staff and TAC, respectively.

8. References and Technical Studies: INTERA will compile all relevant references, attachments, and appendices to be submitted as part of the GSP. As part of this task, INTERA will also document the inputs, assumptions, and results from the groundwater model (including the predictive modeling scenarios) in a technical memorandum, which will be submitted as an appendix to the GSP. INTERA will submit a preliminary draft of the Model TM for review and comment by CWD/ASRGSA staff. INTERA will respond to one round of comments and subsequently submit a revised draft section for TAC review and comment. INTERA will revise the draft section based on TAC comment and incorporate the updated section into the draft GSP to be submitted for Board and Public comment. We assume a 1-week period for the review by CWD/ASRGSA staff and TAC, respectively.

Stakeholder Workshops: INTERA assumes that the ASRGSA will take the lead for all stakeholder outreach activities. INTERA will support these efforts by providing technical analysis and requisite presentation material from the GSP and modeling efforts. For budgeting purposes, we have assumed a total of three stakeholder workshops.

Comment to and Resolution of Responses: As described above, INTERA will submit preliminary draft GSP sections for review and comment by CWD/ASRGSA staff. Revisions will be incorporated into draft GSP sections provided to the TAC for review. INTERA will revise the draft section based on TAC comment and incorporate the updated section into the draft GSP to be submitted for Board and Public comment (assumed to be over a 60-day period). Public comments will be compiled and reviewed with the GSA when the public comment period closes, and the GSP will then be updated to address comments based on an

agreed upon strategy. Comment responses will be included in the final GSP to be uploaded to the DWR website. INTERA will revise and finalize the draft section (based on public comment) and submit the final to DWR by the GSP deadline.

GSP and Data upload: INTERA will submit all GSP documents and datasets before December 31, 2022 and ensure that all DWR requirements and guidelines for GSP submittal are satisfied.

GSP Team Calls/Coordination/Project Management: Due to the close coordination required with CWD/ASRGSA staff and TAC, we have assumed a 2-hr weekly call to report progress and discuss relevant issues with CWD/ASRGSA staff. We have also assumed 1-hr monthly call with the TAC to provide updates and seek input. In addition to the weekly and monthly progress calls, we have assumed bi-monthly focused calls or in-person meetings (up to 2 hrs) to resolve modeling and GSP issues with CWD/ASRGSA staff and TAC members. The INTERA team will also have internal coordination and project management calls to ensure the project is executed efficiently and within time and budget.

Track 2

1. Modeling Workshop

Upon completion of the bulk of the GSP and Track 1 modeling effort, INTERA will organize a half-day modeling workshop with CWD/ASRGSA staff, Board Members, and TAC. The workshop will focus on: the status of the model at the end of Track 1; limitation, uncertainties, and data gaps in the existing model; modeling needs by CWD/ASRGSA for future basin management and project planning purposes; and what model enhancements can be supported by available data/modeling tools and are warranted for basin management and planning purposes. INTERA will discuss the pros and cons of different modeling approaches and identify the modeling enhancements that provide maximum value to CWD/ASRGSA and Basin stakeholders. This discussion may lead to revisions to the proposed scope outlined in this proposal. As such, the scope and budget for the subsequent sections is preliminary and subject to change. INTERA will distribute notes with key decisions reached during the workshop.

2. Development of a Watershed Model

One of the areas identified as a potential limitation to the SW/GW model developed under Track 1 is the use of the regional (relatively coarse) BCM model to estimate groundwater recharge. The recharge, in turn, is based on a regional (relatively coarse) estimate of groundwater ET (calculated by BCM). The first phase of the modeling also takes an approximate curve-number approach to stormflow contributions to Conejo Creek, Arroyo Santa Rosa, and Arroyo Conejo. Finally, bedrock contributions from the surrounding Conejo Volcanics and the Tierra Rejada Groundwater Basin are also poorly constrained and characterized. To improve the characterization of the surficial groundwater and surface-water budgets a distributed watershed model such as INFIL (USGS, 2008) or GSFLOW (Markstrom et al., 2008) codes is recommended. INFIL is a watershed model that simulates rainfall, runoff, recharge, soil storage, snow, snowmelt, and sublimation. The model can be created at an appropriate grid scale to account for basin-specific land-use, vegetation, and topographic variability. GSFLOW is a fully coupled watershed, surface-water, and groundwater model and combines PRMS-V (Precipitation-Runoff Modeling System) with underlying MODFLOW boundary packages like SFR2 (enhanced stream flow) and UZF (unsaturated flow). Based on our experience, while GSFLOW provides powerful functionality (by coupling watershed, surface-flow, and

groundwater dynamics), it tends to be computationally very demanding and can encounter convergence issues. Hence, based on our previous experience, our current approach proposes using INFIL to estimate distributed runoff, evapotranspiration, and recharge. Recharge from INFIL can then be linked to the existing (Track 1) GW model. The unsaturated zone (USZ) package can be added to the Track 1 model, if the groundwater table is deep in certain areas (for example, west of the Bailey fault) to simulate storage and lag effects in the vadose zone. Refined basin-specific data for rainfall, temperature, land-use, vegetation, soil type, will be used to develop the INFIL model. A key uncertainty/data-gap in any watershed modeling is the apportionment of precipitation between recharge, evapotranspiration, and runoff. Surface-water flow data is essential to constrain and calibrate watershed models like INFIL. This uncertainty may be reduced by surface-flow monitoring prior to the development of the INFIL model (this will be part of the uncertainty/data-gaps recommendations in the GSP). Evapotranspiration is another key uncertainty in watershed models. We will utilize remote sensed datasets such as CalETa (to be purchased by ASRGSA) to validate and refine INFIL estimates of evapotranspiration. Bedrock contributions are another poorly characterized water budget term. The refined INFIL model will provide a better estimate of bedrock contributions from recharge in areas outside the groundwater basin. These estimates will be incorporated into the groundwater model.

Throughout this process, we will work closely with CWD/ASRGSA staff to ensure their best understanding of key basin hydrology is incorporated into the watershed model.

3. Update/Recalibrate the Model

Once the recharge and bedrock contributions from the watershed model have been updated, the model may need to be recalibrated to maintain groundwater and surface-water calibration. We will update model properties to retain the original state of calibration. Note, if additional data is available in this phase or if a higher level of calibration is required for basin management/planning purposes then the state of calibration may need to be improved in specific areas. Since we have do not know what future data or modeling needs may entail, we have not assumed any additional calibration beyond the Track 1 state of calibration. However, the need for additional calibration will be identified and discussed in the workshop and addressed as scope amendments/contingencies in this phase of the contract.

4. Predictive Modeling

Based on basin management and planning needs, INTERA will develop up to two additional predictive modeling scenarios. The predictive simulations will be run, post-processed, and results provided to aid basin-management and CWD/ASRGSA decision-making. For budgeting purposes, we have assumed that the level of effort for this predictive modeling will be commensurate to the predictive modeling performed for the GSP under Track 1.

5. Update to Model Technical Memorandum

INTERA will update the existing Model TM to include the watershed model description, assumptions, parameters, and results in addition to documenting any changes made to the groundwater model. The model TM will be submitted for one round of comment and revisions to the CWD/ASRGSA staff and TAC.

Attachment A presents the estimated level of effort and budget for Track 1 and Track 2. The estimated budget for both tracks is $603,390, with a 10% contingency ($60,339).

Attachment B presents the proposed schedule for Track 1 and Track 2. Track 1 will be completed before December 31, 2022. Track 2 model updates are expected to be completed within a seven-month timeframe by July 31, 2023.

We have carefully selected our project manager and technical staff based on the needs of this project. Our project manager – Dr. Abhishek Singh – has led several GSPs and modeling projects. He is based out of Torrance, CA, and can be available for meetings and calls at short notice. Our GSP lead – Mr. Steven Humphrey bring recent and relevant experience having worked on two GSPs in Ventura County. Our modeling lead – Dr. Raghavendra Suribhatla – bring several years of experience building complex and robust models. Our support staff has recent and relevant SGMA and modeling experience, as well. Attachments C and D present the proposed INTERA team resumes along with recent and relevant project descriptions, respectively.

Attachment E is an example GSP outline with relevant SGMA GSP regulatory sections highlighted.

INTERA appreciates the opportunity to submit this proposal for the *Development of a Groundwater Sustainability Plan and Surface-Water/Groundwater Model of the Arroyo Santa Rosa Basin* to the Arroyo Santa Rosa Groundwater Sustainability Agency (ASRGSA). We believe that INTERA offers the best value in completing this work—high-quality and defensible technical work products and efficient GSP development services delivered in a cost-effective manner in accordance with the Agencies' schedule and budget requirements and expectations. Please do not hesitate to contact me if you have any questions or concerns.

Sincerely,

Abhishek Singh, PhD, PE
Principal Engineer
Vice President – Western Region
INTERA Incorporated
asingh@intera.com | (m) 217.721.0301

Attachment A: Proposal Budget

Attachment B: Proposal Schedule

Attachment C: Relevant SGMA and Modeling Project Descriptions

Attachment D: Resumes of Key Staff

Attachments E: Example GSP Outline

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Torrance, California 90503 USA
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Attachment A: Proposal Budget

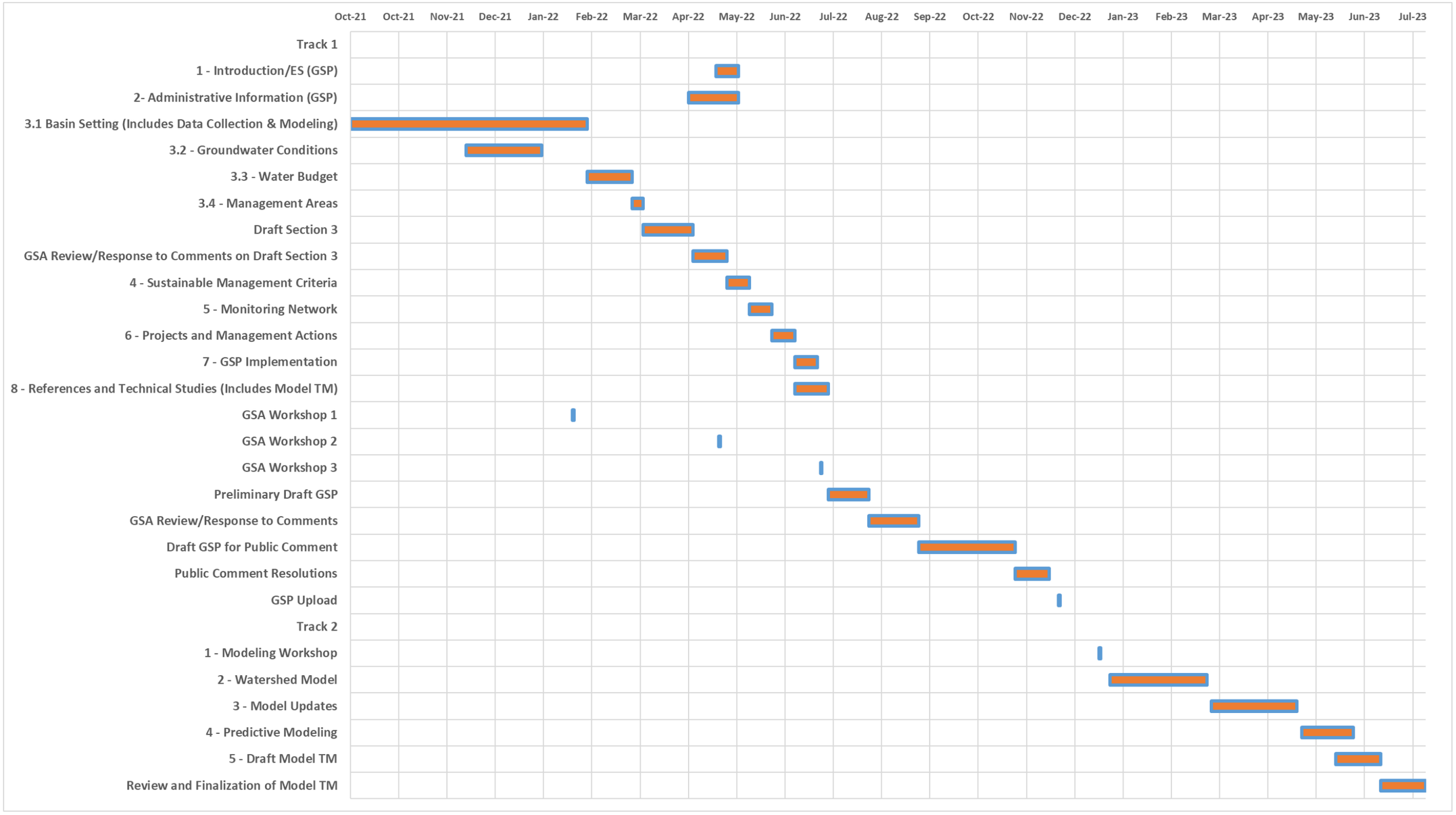
Track 1		Hours						Budget						
Section/Task	Section/Task Title	Principal Engineer/ Project Manager	Senior Engineer/ Lead Modeler	Senior Hydrogeologist/ GSP Lead	GIS Specialist	Tech Editor	Engineer/ Scientist	Principal Engineer/ Project Manager	Senior Engineer/ Lead Modeler	Senior Hydrogeologist/ GSP Lead	GIS Specialist	Tech Editor	Engineer/ Scientist	Total
								$ 225	$ 180	$ 150	$ 130	$ 95	$ 130	
1	Introduction/Executive Summary - GSP Sections	8		16	4	4		$ 1,800	$ -	$ 2,400	$ 520	$ 380	$ -	$ 5,100
2	Administrative Information - GSP Sections	4		32	16	8		$ 900	$ -	$ 4,800	$ 2,080	$ 760	$ -	$ 8,540
3	Basin Setting							$ -	$ -	$ -	$ -	$ -	$ -	$ -
3.1	Hydrogeologic Conceptual Model (HCM)							$ -	$ -	$ -	$ -	$ -	$ -	$ -
3.1.1	Data Collection, Compilation, Field Reconnaissance	32	24	40	80		80	$ 7,200	$ 4,320	$ 6,000	$ 10,400	$ -	$ 10,400	$ 38,320
3.1.2	Hydrogeologic Conceptual Model - GSP Sections	40	16	40	40	16	40	$ 9,000	$ 2,880	$ 6,000	$ 5,200	$ 1,520	$ 5,200	$ 29,800
3.1.3	Historical Model Construction, Calibration, and Post-Processing	24	40	80	40		160	$ 5,400	$ 7,200	$ 12,000	$ 5,200	$ -	$ 20,800	$ 50,600
3.2	Groundwater Conditions - GSP Sections	8	8	24	40	24	24	$ 1,800	$ 1,440	$ 3,600	$ 5,200	$ 2,280	$ 3,120	$ 17,440
3.3	Water Budget							$ -	$ -	$ -	$ -	$ -	$ -	$ -
3.3.1	Historical and Current Water Budget - GSP Sections	16	8	40	8	2	40	$ 3,600	$ 1,440	$ 6,000	$ 1,040	$ 190	$ 5,200	$ 17,470
3.3.2	Predictive Model Construction and Post-Processing	24	24	40	24		120	$ 5,400	$ 4,320	$ 6,000	$ 3,120	$ -	$ 15,600	$ 34,440
3.3.3	Projected Water Budget - GSP Sections	8	8	16	8	2	40	$ 1,800	$ 1,440	$ 2,400	$ 1,040	$ 190	$ 5,200	$ 12,070
3.3.4	Sustainable Yield Estimate - GSP Sections	8	8	8		2	8	$ 1,800	$ 1,440	$ 1,200	$ -	$ 190	$ 1,040	$ 5,670
3.4	Management Areas - GSP Sections	8		16	8	4	4	$ 1,800	$ -	$ 2,400	$ 1,040	$ 380	$ 520	$ 6,140
4	Sustainable Management Criteria							$ -	$ -	$ -	$ -	$ -	$ -	$ -
4.1	SMC - GSP Sections	16	8	40	16	4	24	$ 3,600	$ 1,440	$ 6,000	$ 2,080	$ 380	$ 3,120	$ 16,620
4.2	Additional Modeling Scenarios/Post-Processing	8	16	24	16		40	$ 1,800	$ 2,880	$ 3,600	$ 2,080	$ -	$ 5,200	$ 15,560
5	Monitoring Networks - GSP Sections	8	8	24	24	4	8	$ 1,800	$ 1,440	$ 3,600	$ 3,120	$ 380	$ 1,040	$ 11,380
6	Projects and Management Actions							$ -	$ -	$ -	$ -	$ -	$ -	$ -
6.1	Projects and Management Actions - GSP Sections	16	8	16	8	2	16	$ 3,600	$ 1,440	$ 2,400	$ 1,040	$ 190	$ 2,080	$ 10,750
6.2	Additional Modeling Scenarios/Post-Processing	8	16	24	16		24	$ 1,800	$ 2,880	$ 3,600	$ 2,080	$ -	$ 3,120	$ 13,480
7	GSP Implementation	8	8	16	8	2		$ 1,800	$ 1,440	$ 2,400	$ 1,040	$ 190	$ -	$ 6,870
8	References and Technical Studies	8	8	24		40	16	$ 1,800	$ 1,440	$ 3,600	$ -	$ 3,800	$ 2,080	$ 12,720
8.1	Model TM	24	40	24	40	16	40	$ 5,400	$ 7,200	$ 3,600		$ 1,520	$ 5,200	$ 22,920
	GSA Workshops	24	8	24	24		24	$ 5,400	$ 1,440	$ 3,600	$ 3,120	$ -	$ 3,120	$ 16,680
	Comment to Responses (Includes Staff and TAC Review)	80	40	80	80	80	80	$ 18,000	$ 7,200	$ 12,000	$ 10,400	$ 7,600	$ 10,400	$ 65,600
	GSP Upload	4		8	24	16	16	$ 900	$ -	$ 1,200	$ 3,120	$ 1,520	$ 2,080	$ 8,820
	GSP Team Calls / Coordination / Project Management	120	60	80	80		80	$ 27,000	$ 10,800	$ 12,000	$ 10,400	$ -	$ 10,400	$ 70,600
Sub-Total		504	356	736	604	226	884	$ 113,400	$ 64,080	$ 110,400	$ 73,320	$ 21,470	$ 114,920	$ 497,590
Track 2		**Hours**						**Budget**						
Section/Task	Section/Task Title													
1	Modeling Workshop	8	8	8			8	$ 1,800	$ 1,440	$ 1,200	$ -	$ -	$ 1,040	$ 5,480
2	Develop Watershed Model	24	40	24	40		120	$ 5,400	$ 7,200	$ 3,600	$ 5,200	$ -	$ 15,600	$ 37,000
3	Updates to Groundwater Model	24	40	24	24		80	$ 5,400	$ 7,200	$ 3,600	$ 3,120	$ -	$ 10,400	$ 29,720
4	Predictive Modeling	16	24		24		40	$ 3,600	$ 4,320	$ -	$ 3,120	$ -	$ 5,200	$ 16,240
5	Updates to Model TM	8	16	24	24	8	40	$ 1,800	$ 2,880	$ 3,600	$ 3,120	$ 760	$ 5,200	$ 17,360
Sub-Total		80	128	80	112	8	288	$ 18,000	$ 23,040	$ 12,000	$ 14,560	$ 760	$ 37,440	$ 105,800
Total		584	484	816	716	234	1172	$ 131,400	$ 87,120	$ 122,400	$ 87,880	$ 22,230	$ 152,360	$ 603,390
												Contingency 10%		60,339

Section/Task Categories
Modeling Tasks
Reporting Tasks

Proposed Staff

Principal Engineer/Project Manager	Abhishek Singh, PhD, PE
Senior Engineer/Lead Modeler	Raghavendra Suribhatla, PhD, PE
Senior Hydrogeologist/GSP Lead	Steven Humphrey, PG
GIS Specialist	Erick Fox
Tech Editor	Joanna Stakutis
Engineer/ Scientist	Nathan Hatch, Mitsuyo Tsuda, Saman Tavakoli

Attachment B: Proposal Schedule



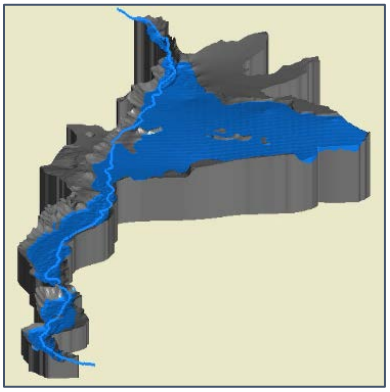
Attachment C:
Relevant SGMA and Modeling Project Descriptions

INTERA, Inc. (INTERA) has delivered technically sound and reliable solutions to water resources, environmental, coastal, and waste isolation challenges since 1974. INTERA's water resources services encompass groundwater sustainability planning, surface water modeling, water rights analysis, groundwater recharge evaluations, alternative water supply planning and wellfield siting, design, installation, and optimization. Recently, INTERA has provided support for the submittal of four Groundwater Sustainability Plans in the southern California area, and their project descriptions are included below.

Development of a Groundwater Flow Model and Groundwater Sustainability Plan for the Upper Ventura Groundwater Basin, Casitas Springs, CA

Client: Upper Ventura River Groundwater Agency

INTERA teamed with Bryan Bondy (Bondy Groundwater Consulting, Inc.) to provide numerical groundwater modeling services and support the development of a Groundwater Sustainability Plan (GSP) for the Upper Ventura River Groundwater Agency (UVRGA). Project work initially included research, data acquisition and management, and weekly meetings to complete task orders from UVRGA meetings and to construct a groundwater model.



A hydrogeologic conceptual model was developed according to GSP requirements and informed the numerical groundwater model, which was built using MODFLOW. Basin geometry and aquifer properties, and transient streamflow, groundwater-surface water interaction, pumping wells, recharge, and evapotranspiration were incorporated into the model for calibration. The multiple datasets from federal, state, county, and local agencies were incorporated into a Data Management System (DMS). The Basin is characterized by a rapid filling and draining unconsolidated alluvial fill system controlled by Ventura River flows following precipitation events. Beneficial use of groundwater includes agricultural and municipal supplies, groundwater dependent ecosystems (GDEs), and migrating steelhead trout populations in segments of the river that depend on discharge from the groundwater basin. Working collaboratively with Mr. Bondy and the UVRGA, multiple impact assessment modeling scenarios were simulated to address UVRGA concerns and GSP requirements, including uncertainty due to climate change effects. Simulated historical, current, and projected time periods also provided estimates for the basin-scale surface water and groundwater budget components. GDEs were evaluated based on the modeled depletion of streamflow due to pumping.

Sustainable management criteria (including the minimum thresholds, interim measures, and measurable objectives for monitoring parameters) were developed for four sustainability indicators within the basin: 1) chronic lowering of groundwater levels, 2) reduction of groundwater storage, 3) degradation of groundwater quality, and 4) depletion of interconnected surface water. The monitoring network, project and management actions, and the GSP schedule and budget were also developed by Mr. Bondy and INTERA. Following the draft submittal of the GSP, comment periods provided several edits and updates to the GSP text, figures, tables, and appendices to finalize the report for submittal to DWR.

Development of a Groundwater Sustainability Plan for the Mound Basin Groundwater Sustainability Agency, Ventura, CA

Client: Mound Basin Groundwater Sustainability Agency

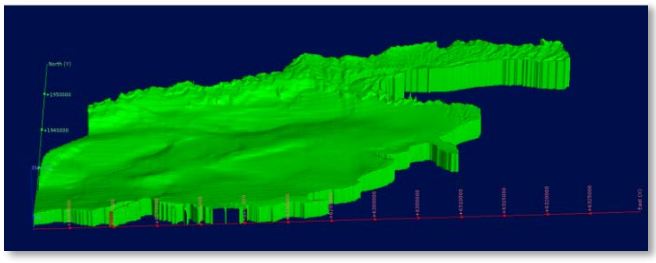
INTERA worked closely with Bryan Bondy (Bondy Groundwater Consulting, Inc.) and United Water Conservation District (UWCD) to develop the Groundwater Sustainability Plan (GSP) for the Mound Basin Groundwater Sustainability Agency (MBGSA). INTERA collaborated with Mr. Bondy and UWCD to refine the hydrogeologic conceptual model and document numerical modeling results in support of the GSP requirements. INTERA also reviewed, organized, and managed all the documentation for the GSP submittal, in addition to developing the Data Management System (DMS).

The Mound Basin is characterized by very thick sequences of deep confined sedimentary aquifer units separated by aquitards, overlain by non-potable shallow groundwater. INTERA supported the documentation of the Basin setting and the results of the UWCD model simulations to assess impacts to beneficial uses and users in the Basin, in addition to calculating the historical, current, and projected surface water and groundwater budget components. The groundwater dependent ecosystems (GDE) in the Santa Clara River and Estuary were also evaluated for potential impacts from the GSP.

Sustainable management criteria (including the minimum thresholds, interim measures, and measurable objectives for monitoring parameters) were developed for five sustainability indicators within the basin: 1) chronic lowering of groundwater levels, 2) reduction of groundwater storage, 3) seawater intrusion, 4) degradation of groundwater quality, and 5) land subsidence. The monitoring network, project and management actions, and the GSP schedule and budget were also developed by Mr. Bondy and INTERA. Following the draft submittal of the GSP, comment periods provided several edits and updates to the GSP text, figures, tables, and appendices to finalize the report for submittal to DWR.

Development of a Groundwater Flow Model of the East and South Las Posas Basins, Thousand Oaks, CA

Client: Calleguas Municipal Water District



INTERA supported the Calleguas Municipal Water District (CMWD) on developing a numerical groundwater flow model of the East and South Las Posas Basin. The model was used to support the Las Posas Basin GSP development process in collaboration with the Fox Canyon Groundwater Management Authority (FCGMA), the Technical Advisory Group (TAG), and their Groundwater Sustainability Plan (GSP) consultant. Other objectives of the project included using the numerical model to evaluate potential aquifer storage and recovery (ASR) management alternatives, as well as to understand the interaction between surface-water flows and the groundwater system.

The basins are characterized by complex hydrostratigraphy (faulting and folding) and dynamic interactions with surface water flows in the Arroyo Las Posas. Discharge of treated wastewater effluent to Arroyo Las Posas has resulted in a transition to perennial flow from historical conditions where surface water flows only occurred in

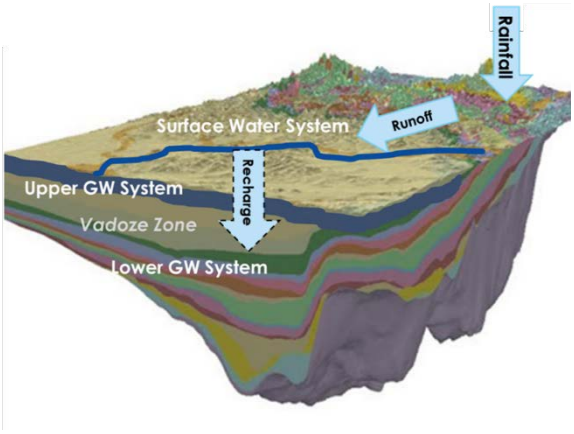
Arroyo Las Posas during large precipitation events. Through close coordination with CMWD contract hydrogeologist (Mr. Bryan Bondy, PG, CHG), INTERA developed a detailed numerical representation of the Arroyo, capturing the highly dynamic flow, width, and stage relationships characteristic of different reaches along the Arroyo. Data from aerial surveys, streamflow gages, shallow groundwater wells, and dry-weather flow studies was integrated into the surface-water/groundwater modeling framework. The model was used to assess historical and future water budgets (incorporating the impact of Climate Change) and assess various project and management actions for the GSP preparation.

Throughout the project INTERA in an efficient and cost-effective manner to achieve the project goals. This was accomplished via regular communication through weekly conference calls, technical memoranda, and presentations to stakeholders. INTERA completed the work on time and under budget by regularly communicating with CMWD. We also collaborated successfully with numerous other Basin parties such as the FCGMA, their TAG, and their GSP consultant, onone of the first GSPs developed in the State of California under the Sustainable Groundwater Management Act (SGMA).

Integrated Surface-Water/Groundwater Modeling of the San Gorgonio Pass Basin, Riverside County, CA

Client: San Gorgonio Pass Groundwater Sustainability Agency

INTERA developed a comprehensive suite of watershed and integrated surface-water and groundwater models of the San Gorgonio Pass Basin in support of SGMA requirements. The Basin is bounded on the north by the San Bernardino Mountains and on the south by the San Jacinto Mountains and is characterized by arid hydrogeology and complex hydrostratigraphy (faulting and folding). The groundwater modeling was based on previous modeling done by the USGS and local agencies, and the results were used to evaluate several SGMA Groundwater Sustainability Plan (GSP) components, including the current and future water budget, sustainable management criteria, and sustainable yield for the Basin.



The modeling framework consisted of a watershed scale INFIL model to simulate rainfall, runoff, recharge, and evapotranspiration at the catchment scale. Runoff from the INFIL model was routed through the updated streamflow (SFR2) package with vadose zone in a shallow groundwater model that simulated groundwater/surface-water interactions and perched groundwater levels. Recharge from the shallow groundwater model was routed through an unsaturated zone (UZF) package in a deep groundwater model to simulate observed lags in groundwater levels and surficial recharge events. The models were calibrated to groundwater levels and streamflow data. Complex stratigraphy and basin faulting and folding were incorporated into the geologic framework of the model. Throughout the process, INTERA led technical presentations and communication with various GSA agencies and stakeholders as well as coordinated with the USGS and local hydrogeologic experts on knowledge/data exchange.

Attachment D:
Resumes of Key Staff

Abhishek Singh, PhD, PE
Vice President/Principal Engineer

Years of Experience: 17

Education:

- PhD, 2007, Civil and Environmental Engineering, University of Illinois
- MS, 2003, Civil and Environmental Engineering, University of Illinois
- BE, 2001, Civil Engineering, Birla Institute of Technology and Science

Professional Registrations/Affiliations:

- Professional Engineer, CA, 2018, No. 89384
- Professional Engineer, TX, 2018, No. 44222
- Associate Editor: Journal of Water Resources Planning and Management
- Co-Chair: Technical Committee, Groundwater Resources Association of California
- Past-Chair: Groundwater Council, Environmental & Water Resources Institute (EWRI) of the American Society of Civil Engineers (ASCE)
- Member, ASCE, American Geophysical Union (AGU)
- Review Panel for 5 Journals: Water Resources Research, Groundwater, Journal of Hydrology, Journal of Hydrologic Engineer, and Journal of Hydroinformatics

Professional History:

2019 – Present	Vice President – Western Region / Principal Engineer/Scientist – INTERA Incorporated, Torrance, CA
2015 – 2019	California Operations Manager / Senior Engineer/Scientist – INTERA Incorporated, Torrance, CA
2012 – 2015	Technical Group Manager / Senior Environmental Scientist – INTERA Incorporated, Austin, TX
2007 – 2012	Environmental Scientist – INTERA Incorporated, Austin, TX
2006 – 2007	Teaching Assistant – University of Illinois, Urbana Champaign, IL
2001 – 2007	Research Assistant – University of Illinois, Urbana Champaign, IL
2003	Research Assistant – Interactive Genetic Algorithm Laboratory, Kyushu University, Fukuoka, Japan

Specialized Training & Software:

- GoldSim, ESRI® ArcGIS/ArcObjects, PEST, MODFLOW-USG, C2VSim

Dr. Abhishek Singh leads INTERA's Western Division and has more than 17 years of research and consulting experience in the areas of water resources planning and management, hydrologic modeling (surface water and groundwater), risk and uncertainty analyses, optimization techniques, geographic information systems (GIS), and data analytics. He manages and leads several projects in California and across the United States involving integrated water resources planning; groundwater sustainability planning; assessing water supplies and infrastructure; modeling complex hydrogeologic systems including surface-water/groundwater interactions and seawater intrusion; fate and transport modeling; remedial investigations for contaminated sites; climate change impact assessments; developing GIS and geodatabases; and field-scale hydrologic and water quality data-collection. Dr. Singh has served as a technical expert on groundwater litigation cases and provides permitting and regulatory support to water agencies across California. Dr. Singh is adept at several modeling software including the MODFLOW family of codes (including MODFLOW-USG) GoldSim, LeapFrog, MT3DMS, RT3D, STOMP, VS2DI, TOUGH2, HYDRUS, MIKE-SHE, PEST, GSLIB, and ESRI® ArcGIS Tools,. He is experienced at data-processing and work-flow automation using C, C++, Perl, Python, Matlab, VBA, and Fortran.

Project Experience – Water Resources

Designated Technical Expert on Groundwater Safe Yield Litigation, Confidential Client, CA. 2019 – Present. *Technical Lead.* Led a team to update and calibrate a groundwater model to calculate groundwater budget terms for estimation of safe yield of a groundwater basin in Southern California. The model and analyses incorporated basin-specific hydrologic, hydrogeologic, land-use, and water-use data. Developed expert opinion, testimony, and technical reports for submittal. Reviewed reports and data from other parties' technical experts. Communicated closely with the lawyers and other technical experts on the team. The work was completed on time and on budget under very tight deadlines.

Development of the Groundwater Sustainability Plan (GSP) for the Upper Ventura River Basin, Upper Ventura River Groundwater Agency, CA. 2019 – Present. *Project Manager.* Leading a team to develop the groundwater sustainability plan (GSP) for the Upper Ventura River Basin, a medium-priority basin under SGMA. The plan adheres to regulatory requirements under the California Groundwater Sustainable Management Act (SGMA). The Upper Ventura River basin is characterized by complex groundwater/surface-water interactions with the Ventura River gaining, losing, and going dry along different reaches and under different hydrologic conditions. Beneficial use of groundwater includes agricultural and municipal supplies, groundwater dependent ecosystems, and migrating steelhead trout populations in segments of the river that depend on discharge from the groundwater basin. The project involves

incorporating multiple datasets from several federal, state, county, and local agencies into a data-management system (DMS), analyzing historical and future groundwater conditions and water budget, and developing a model to assess groundwater/surface-water interactions as well as future undesirable results and sustainability indicators as per SGMA requirements. On-going work entails developing the GSP document, technical analysis to support the GSP, as well as coordinating/communicating with the Groundwater Sustainability Agency, local hydrogeologic experts, and stakeholders.

Groundwater Modeling for the San Gorgonio Pass Groundwater Sustainability Plan (GSP), San Gorgonio Pass Water Agency, CA. 2019 – Present. *Project Manager.* Leading a team to develop a groundwater model to support the San Gorgonio Pass Sub-Basin GSP, a medium-priority basin under SGMA. The San Gorgonio Pass sub-basin is located in Riverside County and is bounded on the north by the San Bernardino Mountains and on the south by the San Jacinto Mountains. The basin is characterized by arid hydrogeology and complex hydrostratigraphy (faulting and folding). The groundwater modeling is incorporating previous modeling done by local agencies as well as the USGS. On-going efforts include assessing and recalibrating the models, calculating the water budget, and developing future scenarios integrating the California Department of Water Resources (DWR) climate-change datasets. Leading technical presentations and communication with various GSA agencies and stakeholders. Also coordinating with the USGS and local hydrogeologic experts on knowledge/data exchange.

Groundwater Modeling for the Coastal Plain of San Diego Basin Groundwater Sustainability Plan (GSP), City of San Diego, CA. 2019 – Present. *Project Manager.* Leading a team to review, update, and utilize a groundwater model to support the Groundwater Sustainability Plan (GSP) for the Coastal Plain of the San Diego Basin. The modeling was based on an existing finite-element FEMFLOW3D model, covering the entire Coastal Plain of San Diego groundwater Basin and encompassing watersheds of the major rivers including the San Dieguito, San Diego, Sweetwater, Otay and Tijuana Rivers. The model was extended based on the most recent groundwater data. The model was used to assess the water budget and key groundwater sustainability indicators such as groundwater levels, storage depletions, and seawater intrusion under future conditions, including climate change impacts. Developed technical memoranda, figures, and documentation for the GSP. Coordinated and communicated with the City, GSP lead, and stakeholders.

Groundwater Modeling for the Santa Monica Groundwater Sustainability Plan (GSP), City of Santa Monica, CA. 2019 – Present. *Project Manager.* Led a team to perform groundwater modeling to support the Groundwater Sustainability Plan (GSP) for the Santa Monica Basin, a medium-priority basin under SGMA. The modeling effort entailed reviewing, assessing, and incorporating data from several local and regional models - including the USGS unstructured grid model of the Los Angeles Coastal Plain groundwater model (LACPGM). On-going efforts include developing water budget under historical and future conditions as well as assessing key groundwater sustainability indicators such as declining groundwater levels, storage depletions, and seawater intrusion using the model.

Joint Los Angeles Basin Replenishment and Extraction Master Plan, Water Replenishment District (WRD) and Los Angeles Department of Water and Power (LADWP), Los Angeles, CA. 2019 – Present. *Project Manager*. Leading a team to provide groundwater modeling support the Water Replenishment District of Southern California and the Los Angeles Department of Water and Power on a joint master plan aimed to identify solutions to maximize use of the Central and West Coast Groundwater Basins through development of the Joint Los Angeles Basin Replenishment and Extraction Master Plan. The Master Plan uses a regional approach to identify a comprehensive list of existing and potential new replenishment water sources, treatment facilities, and replenishment and extraction locations. These system components are screened and used to develop implementable, complementary projects that can be initiated upon completion of the plan. Worked closely with the prime Engineering firm, WRD, and LADWP on the the overall planning and feasibility assessment effort. Led the hydrogeologic and groundwater modeling analyses, ensuring the projects in the Master Plan are ideal from an economic, hydrogeologic, engineering, and stakeholder standpoint. The modeling involved simulating multiple project portfolios and scenarios using the USGS MODFLOW unstructured grid (USG) model of the Los Angeles Coastal Plain groundwater model (LACPGM) to assess hydrogeologic feasibility and optimal configuration for injection and extraction facilities. The goal of the Master Plan and resulting projects is to reduce reliance on imported water through development of local water resources, increase regional water supply reliability, maximize use of local groundwater supplies, and reduce ocean discharges through increased reuse.

Regional Water Supply Infrastructure Model, Inland Empire Utilities Agency (IEUA), Chino, CA. 2018 – Present. *Project Manager.* Leading a project to develop a planning-level model of the surface water and groundwater supplies and infrastructure for the IEUA regional system to support phase-II of IEUA's Integrated Regional Plan (IRP2). IEUA provides imported water from the State Water Project and reclaimed water service to multiple water agencies in the Chino Basin. Data from IEUA and

member agencies has been compiled within a GIS framework. The model developed in EPANET and converted to InfoWater incorporates imported supplies, local groundwater and surface-water supplies managed by retail and wholesale agencies, and interconnections between and within agencies. The model serves as a decision-support tool to evaluate operational constraints and identify infrastructure and operational strategies to improve the reliability of the regional water supply system in the event of reduction/interruption of supplies. The model has been used to assess the reliability of current supplies under a range of future scenarios including loss of imported water, extended drought conditions, and groundwater quality impairment. The model is being used to identify and assess future projects to meet the planning objectives of IEUA, member agencies, and the Chino Basin Water Master. Organized and attended meetings, stakeholder workshops, and a 'planning charrette' with IEUA, IEUA's member and neighboring agencies, and the Water Master focused on data-sharing, modeling results, and future project opportunities.

Development of A Groundwater Flow Model of the East and South Las Posas Basins, Calleguas Municipal Water District, CA. 2016 – Present. *Task Manager/Modeling Lead.* As part of the development of a long-term operational plan for Calleguas' Las Posas Basin Aquifer Storage and Recovery (ASR) Project, this numerical groundwater flow model of the east and south Las Posas groundwater basins will be used to predict water level fluctuations related to ASR operations within the basins. The basins are characterized by complex hydrostratigraphy (faulting and folding) and dynamic interactions with surface water flows in the Arroyo Las Posas/Simi. Led the development of a MODFLOW-NWT model using the SFR2 package to simulate Arroyo flows and surface-water/groundwater interactions. Calibrated the model with respect to head data from 1970 to 2015. Performed particle tracking simulations to verify travel paths and travel times based on water quality and tracer data. The Las Posas Basin is a high-priority basin under the Sustainable Groundwater Management Act (SGMA). The model was used to support the groundwater sustainability plan (GSP) for the basin. This entailed predictive simulations incorporating DWR climate change datasets. Future work includes modeling to evaluate basin yields and optimize ASR operations.

Sunset Gap Seawater Intrusion Modeling, Orange County Water District (OCWD), Fountain Valley, CA. 2016 – Present. *Project Manager/ Technical Lead.* Leading the development of numerical flow model for assessment of saltwater intrusion in the Sunset Gap in Orange County, CA. The Sunset Gap itself is a geologically complex area inland of the Newport-Inglewood Fault and seawater intrusion has led to deterioration of water quality and shutdown of inland production wells. Project involves development of a numerical model for evaluation of the possible intrusion pathways including leakage across fault, adjacent coastal gaps and vertical downward flow through dredged channels and tidal marshes. Currently overseeing the development of the groundwater flow and transport model of Alamitos and Sunset Gap area. A three-dimensional geologic model was created in Leapfrog based on geologic and geophysical logs, cross-sections, and water level/quality data. The model was used to combine stratigraphy from the Alamitos Gap to the Talbert Gap area, incorporating hydrostratigraphy and faulting in the Sunset Gap. The 15-layer MT3DMS model was calibrated to observed water level and water quality data. On-going predictive modeling entails assessing different project alternatives to mitigate seawater intrusion.

Flow and Transport Model Development of the North Orange County Basin, Orange County Water District (OCWD), Fountain Valley, CA. 2014 – Present. *Assistant Project manager/Lead Modeler.* Technical lead and assistant project manager for conceptual and numerical model development of the northern portion of the Orange County Basin in support of a human health risk assessment and feasibility study of remedial alternatives being considered to mitigate volatile organic compound (VOC) contamination in the Basin. VOC contamination in the North Basin area has resulted in the destruction of three municipal water supply wells and one private well used for commercial purposes. Led a team to evaluate structure, stratigraphy, vertical hydraulic heads to determine pressure breaks, and geophysical logs to determine hydraulic properties for the modeling effort. Oversaw and directed the evaluation of electric logs for lithology and structure. Structure for the aquifer and aquitards was updated based on picks from existing and new wells. Water budget were estimated using a combination of techniques ranging from extracting and scaling values from existing regional model to estimation from OCWD observation data. Calibration of the transport model based upon observed groundwater quality data was performed using hydraulic and water quality data from over 200 monitoring wells. The transport model is complete and is currently being applied to evaluate potential remedial options. Currently performing capture zone and predictive analyses to evaluate remediation alternatives for OCWD. The site is currently under U.S. Environmental Protection Agency (EPA) oversight, and support is ongoing to OCWD as they move through the Remedial Investigation/Feasibility Study (RI/FS) process. The model was documented in a series of technical memoranda and a comprehensive report submitted to the district as well as EPA and other stakeholders. Presented modeling details and results at technical workshops for the EPA, California Department of Toxic Substances Control, and the State Water Resources Control Board. In addition to technical modeling duties, also managed the budget and staff resourcing for this project.

Raghavendra Suribhatla, PhD, PE

Senior Water Resources Engineer

Years of Experience: 16

Education:

- PhD, 2007, Civil Engineering, State University of New York at Buffalo
- MS, 2004, Civil Engineering, State University of New York at Buffalo
- B. Tech, 2001, Civil Engineering, Indian Institute of Technology-Madras

Professional Registrations/Affiliations:

- Professional Engineer, CA, 2017, No. 87025

Professional History:

2015 – Present	Senior Water Resources Engineer – INTERA Incorporated, Los Angeles, CA
2008 – 2015	Project Engineer / Hydrogeologist – Geomatrix, Oakland, CA
2007 – 2008	Post-Doctoral Research Associate – University of Arizona, Stochastic Subsurface Hydrology Group, Tucson, AZ
2001 – 2006	Research Assistant – University of Buffalo, Groundwater Research Group, Buffalo, NY

Specialized Training & Software:

- Modeling: MODFLOW-USG, MODFLOW-NWT, MODHMS, SEAWAT, MT3D, HydroGeoSphere (FRAC3DVS), PEST, Split, Visual Bluebird, EarthImager, RES2DINV, VSAFT2, C2VSim
- Programming: MATLAB, FORTRAN, MPI, VB.NET
- Other: GSLIB, ESRI ArcGIS, TECPLOT, SURFER, Leapfrog
- Modeling Environments: GMS, Groundwater Vistas, Visual MODFLOW

Dr. Suribhatla is a California-licensed professional engineer with well over a decade of research and consulting experience in computational groundwater and surface water hydrology, and hydrogeophysical data integration. He has led or managed modeling projects for government, private, and legal clients and has authored/co-authored innovative research proposals to DoD, DoE and secured external and internal competitive research funds. His project experience includes developing and updating numerical models for several water resources and remediation projects in California. Dr. Suribhatla specializes in stochastic modeling, analytical methods, integrated surface water-groundwater modeling and data integration methods. His research background includes developing new analytical techniques for modeling flow in anisotropic domains and implementation of non-Gaussian conductivity models for anisotropic formations, inverse modeling and quantification of parameter uncertainty, innovative techniques for subsurface characterization including hydraulic tomography, and geophysical data integration. He has extensive parallel programming experience in Fortran MPI and MATLAB Distributed Computing. He has authored/co-authored seven peer-reviewed articles in applied mathematics, water resources, and environmental engineering journals and has developed design tools for groundwater remediation.

Representative Project Experience

Integrated Surface Water-Groundwater Modeling for the Coastal Plain of San Diego Basin Groundwater Sustainability Plan, City of San Diego, CA. 2019 – 2021. *Modeling Manager.* Lead modeler for review, update, and application of an integrated surface water-groundwater model to support the Groundwater Sustainability Plan (GSP) for the Coastal Plain of the San Diego Basin. The modeling was based on an existing finite-element FEMFLOW3D model, covering the entire Coastal Plain of San Diego groundwater basin and encompassing watersheds of the major rivers including the San Dieguito, San Diego, Sweetwater, Otay and Tijuana Rivers. Led the model transition to the City of San Diego stakeholders, identified several critical updates in the existing model, and developed additional documentation for model pre-processing tools. The model was extended based on the most recent pumping data and projections of historical production data. The model was used to assess the water budget and key groundwater sustainability indicators such as groundwater levels, storage depletions under future conditions, including climate change impacts. Developed technical memoranda, figures, and documentation for the GSP. Coordinated and communicated with the City, GSP lead, and stakeholders.

Groundwater Modeling for the San Gorgonio Pass Groundwater Sustainability Plan, San Gorgonio Pass Water Agency, CA. 2019 – Present. *Modeling Lead.* Leading a modeling team to develop a groundwater model to support the San Gorgonio Pass Sub-Basin GSP, a medium-priority basin under SGMA. The San Gorgonio Pass sub-basin is located in Riverside County and is bounded on the north by the San Bernardino Mountains and on the south by the San Jacinto Mountains. The basin is characterized by arid hydrogeology and complex hydrostratigraphy (faulting and folding). The groundwater modeling is incorporating previous modeling done by local agencies as well as the USGS. Ongoing efforts include assessing and

recalibrating the models, calculating the water budget and sustainable yield, and developing future scenarios integrating the California Department of Water Resources (DWR) climate-change datasets.

Joint Los Angeles Basin Replenishment and Extraction Master Plan, Water Replenishment District and Los Angeles Department of Water and Power, Los Angeles, CA. 2019 – Present. *Modeling Lead*. Lead modeler providing groundwater modeling support to the Water Replenishment District of Southern California and the Los Angeles Department of Water and Power on a joint master plan aimed to identify solutions to maximize use of the Central and West Coast Groundwater Basins through development of the Joint Los Angeles Basin Replenishment and Extraction Master Plan. The Master Plan uses a regional approach to identify a comprehensive list of existing and potential new replenishment water sources, treatment facilities, and replenishment and extraction locations. Worked closely with the prime Engineering firm, WRD, and LADWP on the overall planning and feasibility assessment effort. Led the Phase-1 screening and Phase-2 groundwater modeling analyses, ensuring the projects in the Master Plan are ideal from hydrogeologic, engineering, and stakeholder standpoint. Supported the Engineering Team with a detailed review of the Adjudication and Storage Judgements in the West Coast and Central Basins, and sections relevant for modeling analyses. The goal of the Master Plan and resulting projects is to reduce reliance on imported water through development of local water resources, increase regional water supply reliability, maximize use of local groundwater supplies, and reduce ocean discharges through increased reuse.

Upper Santa Clara River Integrated Groundwater-Surface Water Model Updates, Los Angeles County Sanitation Districts, CA. 2013 – 2014. *Project Modeler. Project* Modeler for updating MODHMS model of the Upper Santa Clara River and implementation of future scenarios involving different types of water treatment and varying quality of imported State Water Project water. The Santa Clara River flows through Los Angeles and Ventura Counties and provides beneficial uses that include agricultural and urban water supply, groundwater recharge and biological habitat. Portions of the river basin have undergone significant urbanization over the last two decades, creating salinity management challenges for the groundwater and surface water systems. Portions of the Santa Clara River in the Santa Clarita Valley and downstream agricultural areas are now listed on California's 303(d) list of impaired waters with respect to chloride, resulting in the Los Angeles Regional Water Quality Control Board (LARWQCB) adopting a total maximum daily load (TMDL) for chloride in 2002. To address the TMDL requirements, an integrated groundwater/surface- water interaction model (called GSWIM) capable of simulating flow and chloride transport throughout the TMDL study area was developed and is being used to evaluate impacts of different water use scenarios and point source loadings from water reclamation plants. Worked with Principal Engineer and in collaboration with LACSD staff to implement future scenarios, developed detailed data preparation and documentation procedures along with codes to translate data from client provided EXCEL files to model input and perform numerical simulations to evaluate chloride concentration in the Santa Clara river basin till year 2030.

Sunset Gap Seawater Intrusion Modeling, Orange County Water District, Orange County, CA. 2015 – Present. *Modeler and Hydrogeologist.* Modeler for development of a numerical flow model for evaluation of possible intrusion pathways including leakage across fault, adjacent coastal gaps and vertical downward flow through dredged channels and tidal marshes. Seawater intrusion in Orange County occurs near coastal gaps and is currently controlled by the Alamitos Gap Barrier and Talbert Gap Barrier injection wells that flank the Sunset Gap to the north and south respectively. The Sunset Gap itself is a geologically complex area inland of the Newport-Inglewood Fault and seawater intrusion has led to deterioration of water quality and shutdown of inland production wells. Refined the hydrogeologic conceptual model of the Sunset Gap area and interpreted aquifer mergence zones based on well hydrographs, published cross-sections and chloride concentrations. Developed a Leapfrog Hydro model to combine model stratigraphy from existing numerical models of Alamitos Gap and Talbert Gap areas, and integrate picks from geophysical and lithologic logs. Developed a new MODFLOW-MT3D model of the Alamitos-Sunset Gap area and calibrated the model to groundwater head data and chloride concentrations. The updated model is currently being used to evaluate potential seawater barrier scenarios consisting of injection and extraction wells in the Sunset Gap.

Steven Humphrey
Senior Hydrogeologist

Years of Experience: 13

Education:

- MS, 2008, Hydrogeology, University of Nevada
- BS, 2002, Geology, California State University

Professional Registrations and Affiliations

Professional Geologist, 2017, IN (IN2559)

Member, National Ground Water Association

Member, Colorado Environmental Management Society

Professional History:

2021 – Present	Senior Hydrogeologist – INTERA Incorporated, Boulder, CO
2011 – 2021	Hydrogeologist/Groundwater Modeler – Gemoega Inc., Boulder, CO
2008 – 2010	Staff Hydrogeologist – Golder Associates, Portland, OR
2007 – 2008	Hydrogeologist – Aqua Hydrogeologic Inc, Reno, NV
2007 – 2008	Research Assistant – Desert Research Institute, Reno, NV
2005 – 2007	Groundwater Research Assistant – Sierra Army Depot, Herlong, CA
2000 – 2005	Hydrologic Surveyor and Technician, Hydmet Inc., Redding, CA

Specialized Skills and Software

- FEFLOW, MODFLOW (2000/2005/SURFACT/USG/6), PEST, MT3D, MS Office, AQTESTOLV, Aquifer Test Pro, QGIS, Surfer, ArcGIS, SQL, Scilab, Python, MATLAB, Fortran.
- 24-hour MSHA new miner training

Mr. Humphrey is a hydrogeologist with expertise in numerical groundwater modeling. For 13 years, he has provided technical support in a variety of disciplines in the hydrologic sciences. He has supported and managed projects involving groundwater flow and mass transport modeling with both finite-difference and finite-element methods; hydrogeologic characterization; feasibility studies; groundwater sustainability plans; water resource and water quality assessments; litigation support; and aquifer storage and recovery (ASR) programs. He has field experience in monitoring well installation; aquifer pumping and slug tests; and water quality sampling and fluid level measurements, interpretation, and analyses. He also has experience in environmental forensics and fingerprinting of geochemical data at contaminated sites.

Project Experience – SGMA support

Upper Ventura River Groundwater Sustainability Plan, Upper Ventura Groundwater Sustainability Agency, Casitas Springs, CA. 2021. *Senior Hydrogeologist*. Compiled and Managed the Groundwater Sustainability Plan documentation and submittal in accordance with the California Groundwater Sustainability Act. Reviewed Code of Regulations and Best Management Practices and QA/QC of document content and model simulation results. Reviewed the Hydrogeologic Conceptual Model and interpreted and processed modeling results for the water budget analysis and impact assessments. Developed the Sustainable Management Criteria, monitoring networks, and evaluated projects and management actions for the Basin. Coordinated with team of professionals on comment responses and document updates and revisions.

Mound Basin Groundwater Sustainability Plan, Mound Basin Groundwater Sustainability Agency, Ventura, CA. 2021. *Senior Hydrogeologist*. Compiled and Managed the Groundwater Sustainability Plan documentation and submittal in accordance with the California Groundwater Sustainability Act. Reviewed Code of Regulations and Best Management Practices and QA/QC of document content and model simulation results. Reviewed the Hydrogeologic Conceptual Model and modeling results for the water budget analysis and impact assessments. Developed the Sustainable Management Criteria, monitoring networks, and evaluated projects and management actions for the Basin. Coordinated with team of professionals on comment responses and document updates and revisions.

Project Experience – Groundwater Modeling

Upper Ventura River Groundwater Sustainability Plan, Upper Ventura Groundwater Sustainability Agency, Casitas Springs, CA. 2021. *Senior Hydrogeologist*. Reviewed the numerical model files and setup and executed numerical model simulations in support of the Groundwater Sustainability Plan (GSP). Assessed impact scenarios for beneficial users and supported the post-processing for documentation, tabulation, and graphing of model results in a technical memorandum which served as an appendix to the GSP.

Mass Transport and Remediation Support, Suncor Energy, Commerce City, CO. 2014 – 2021. *Groundwater Modeler/Project Manager.* Provided litigation support for a groundwater contaminated site, and subsequently provided consulting and modeling support. Organized and evaluated information, databases, updated and calibrated a groundwater flow and transport model using MODFLOW-USG, MT3D, and PEST; reviewed groundwater and soil remediation efficacy. Modeled and presented results for several remediation scenarios to assist decision making. Developed and supervised a field

sampling and analysis program (soil gas, soil, groundwater, LIF (UVOST), slug testing) in support of modeling and environmental forensics.

Mass Transport and Remediation Support, Olin Chemical, Wilmington, MA. 2018 – 2021. *Groundwater Modeler/Project Manager.* Developed FEFLOW mass transport modeling scenarios for an EPA superfund site. Updated an existing model and evaluated mass transport forecasting results to assess feasibility options for site cleanup, and efficacy of existing remediation infrastructure. Reviewed and modified a 2-D variable-density FEFLOW model to simulate DAPL migration. Developed a work plan for data collection and future modeling efforts and submitted to EPA for approval.

Mass Transport Modeling and Remediation Support, Flint Hills Alaska Refinery, North Pole, AK. 2011 – 2019. *Groundwater Modeler and Project Manager.* Supported litigation and regulatory support for a groundwater contaminated site in a sub-arctic setting. Managed the construction, calibration, verification, and documentation of a groundwater flow and mass transport model using FEFLOW. Modeling documentation followed state regulation guidelines and was presented and reported to the State during development. Several reports and presentations were developed to describe model advancements, and the model findings were presented at trial in Fairbanks in 2019.

Groundwater Supply Modeling, Goldcorp, Mazapil, Mexico. 2016 – 2018. *Groundwater Modeler/Project Manager.* Provided groundwater modeling support for an open pit mine site in a semi-arid region of Mexico. Reviewed and updated a conceptual model and data inputs for a numerical groundwater model, and built and calibrated, conducted predictive simulations, and sensitivity analysis using MODFLOW-USG and PEST.

Predictive Modeling, Silver Standard, Marigold Mine, NV. 2015. *Hydrogeologist.* Provided regulatory and technical support for the development of a MODFLOW-USG model used to determine future mining impacts.

Pit Lake Modeling Support, Kinross, Bald Mountain, NV. 2013. *Groundwater Modeler.* Supported the construction and modeling of a regional fractured bedrock aquifer and pit lake inflow MODFLOW-SURFACT model evaluating the impacts of mining operations at Bald Mountain, Nevada.

Aquifer Storage and Recovery Modeling, City of Dallas, OR. 2010. *Project Hydrogeologist.* Constructed and calibrated a groundwater flow and mass transport model using FEFLOW designed to locate optimal placement of Aquifer Storage and Recovery (ASR) wells in a high-TDS fractured bedrock aquifer.

Stochastic Modeling Drawdown, Sierra Army Depot, Herlong, CA. 2006 – 2008. *Hydrogeologist.* Updated, modified, and recalibrated a basin-wide three-dimensional transient MODFLOW-2000 groundwater flow model of Honey Lake Valley in Nevada and California. Assessed impacts of drawdown across the state line for municipal supply wells and conducted an uncertainty analysis for the model inputs.

Project Experience – Hydrogeologic Data Collection and Analysis

Data Gaps Work Plan, Olin Chemical, Wilmington, MA. 2018 – 2019. *Hydrogeologist/Project Manager.* Produced an EPA-approved Data Gaps Work Plan for an EPA superfund site. A phased approach was planned with geophysical data collection, confirmatory borings, monitoring well installation, water quality and soil sampling and data collection. Coordinated with several professionals from multiple consulting firms and participated in EPA meetings.

Forensic Investigation, Suncor Energy, Commerce City, CO. 2015 – 2017. *Hydrogeologist/Project Manager.* Developed and supervised a sampling work plan for the collection of soil-vapor, LIF survey, slug testing, and soil and groundwater data on a contaminated refinery. Also developed and updated a site conceptual model for the aquifer system and the remediation measures, reviewing bore logs and drafting several cross sections across the site.

Conceptual Model Design, Flint Hills Resources Alaska, North Pole, AK, 2012 – 2014. *Hydrogeologist.* Provided conceptual model development and evolution for an alluvial aquifer in Fairbanks, AK. Assisted in the selection of monitoring well placement, geophysical data collection to assess permafrost distribution, groundwater sampling and analysis program, and fluid level measurements.

Erick Fox
GIS Analyst

Years of Experience: 7

Education:

- MS, 2016, Geographic Information Systems and Remote Sensing, University of Pittsburgh
- BA, 2004, Urban Studies, University of Pittsburgh

Professional Registrations/Affiliations:

- Certified GIS Professional (GISP), Certificate No. 160701
- FAA Part 107 Licensed sUAS Pilot, Certificate No. 4092569
- Current Board Member, New Mexico Geographic Information Council (NMGIC)
- Past Board Member, Urban and Regional Information Systems Association (URISA), Central Appalachia Chapter

Professional History:

2017 – Present	GIS Analyst – INTERA Incorporated, Albuquerque, NM
2015 – 2016	GIS Analyst – Bankson Engineers, Pittsburgh, PA
2015 – 2016	Instructor – University of Pittsburgh, Pittsburgh, Pittsburgh, PA

Specialized Skills:

- ESRI software: ArcGIS Pro, ArcMap
  - 3D Analyst
  - Spatial Analyst
  - Drone2Map
  - ArcGIS Online
- FAA Part 107 training and certification
- Python, SQL
- QGIS, InfoWater, EPANET

Erick Fox is a geospatial professional with experience in data analysis and management for water resources and environmental science applications. He has successfully delivered on complex quantitative and conceptual tasks for large public agencies and private clients alike, giving decision makers a solid foundation on which to support planning initiatives. With the industry-standard GISP certification, a Federal Aviation Administration drone pilot's license, and current board membership in a professional geographic information system (GIS) organization, Mr. Fox has shown a commitment to maintaining and improving his skillset to meet the specific needs of his clients. Mr. Fox's wide range of technical skills has been put to use developing GIS datasets for groundwater basin management in California under the Sustainable Groundwater Management Act (SGMA), assisting the development of a basin-scale water budget in Indiana, creating a regional water infrastructure model in southern California, and evaluating remote sensing data to determine the presence of irrigated agriculture in the Rio Grande valley. Mr. Fox has demonstrated experience in ArcGIS and QGIS software packages, geodatabase design and implementation, InfoWater/EPANET hydraulic modeling software, multispectral remote sensing, spatial analysis, global positioning system (GPS) fundamentals, and Python scripting for automating data analysis workflows.

Project Experience – Water Resources

Groundwater Sustainability Plan (GSP) Development, Upper Ventura River Groundwater Agency. 2019 – Present. *GIS Analyst.* Supporting the creation of a GSP for a complex groundwater basin in Southern California by completing many data analysis tasks using GIS and Python. Authored a repeatable script to consolidate groundwater pumping data from more than 100 wells across several decades into a combined time series. Programmed scripts to access large-scale climate datasets to extract groundwater recharge information to INTERA's local basin MODFLOW model. Performed a repeatable GIS analysis to delineate subwatersheds for incorporation as inputs to the groundwater model. Interpolated a bedrock surface across the basin that used a variety of original sources such as well log picks and geologic cross sections. Authored dozens of maps to include in the GSP.

Groundwater Sustainability Plan (GSP) Development, Mound Basin Groundwater Sustainability Agency. 2019 – Present. *GIS Analyst.* Construct and maintain the spatial data framework that underlies much of the Mound Basin GSP. Processed and organized over 100 datasets into a spatial database for analysis and visualization. Designed dozens of complex maps to accurately and coherently display source data such as groundwater modeling results, well construction information, water level elevations, and geologic features. Assist in the design and maintenance of a data management system (DMS) to maintain groundwater and surface water data in a format that meets the requirements of the Sustainable Groundwater Management Act (SGMA).

PFAS Database Development, Analysis, and Planning Support, California American Water. 2020 – Present. *GIS Analyst.* Assist in the development of a decision support system to identify spatial and temporal trends of a variety of hydrogeological and water quality data. This will enable the client to meet changing state and federal water quality requirements regarding PFAS, and create a resilient capital improvement plan that identifies which wells are at risk for future contamination.

Water Infrastructure Model Development, Inland Empire Utilities Agency, Chino, CA. 2018 – Present. *GIS Analyst.* Constructed a large multi-agency water infrastructure model with thousands of feature elements to support regional planning efforts in our client's service area of more than 800,000 residents. Incorporated water utility infrastructure data from more than a dozen agencies into a custom ESRI geodatabase structured on the Local Government Model. Converted the database using Python scripts into an EPANET hydraulic model of the entire connected system to understand and improve the resilience of the water supply infrastructure under a variety of service disruption scenarios. As the project continued to show its value, the model was ultimately converted into an InfoWater database to enable forecasting of various management scenarios including water quality impacts, proposed new infrastructure investment, and potential future impacts from natural or human-caused water shortages.

Joint Los Angeles Basin Replenishment and Extraction Master Plan, Water Replenishment District of Southern California (WRD) and Los Angeles Department of Water and Power (LADWP). 2020 – Present. *GIS Analyst.* The purpose of the Master Plan is to reduce reliance on imported water through development of local water resources, increase regional water supply reliability, maximize use of the groundwater basins, and reduce ocean discharges through increase water reuse. Provided GIS support as part of INTERA's review of hydrogeologic conditions and several regional groundwater models. Maintained a geodatabase of modeling, hydrogeologic, and water quality data which was used to identify suitable locations for capital improvements identified as necessary for the successful implementation of the Master Plan.

Alamitos Barrier Recycled Water Project - Five-Year Update of the Title 22 Engineering Report, Water Replenishment District of Southern California (WRD). 2020. *GIS Analyst.* Provide modeling and GIS data support for a comprehensive groundwater model update that was expedited to meet regulatory deadlines. Used Python scripts to efficiently and reproducibly create dozens of figures of model results for the engineering report.

Water Availability Modeling, Indiana Finance Authority, IN. 2019. *GIS Analyst.* Processed hundreds of thousands of water use records for inclusion in the Central Indiana Water Study. Thirty-three years of monthly water use records for 13,000 wells and surface intakes were processed and joined to a separate record of geographic points to enable visualization and the creation of a water budget by INTERA hydrologists. Authored custom scripts using the Python Pandas library to automate the cleaning, processing, and manipulation of the data into a usable format, saving many hours of manual work. Spatially joined the resulting dataset to United States Geologic Services (USGS) surface water basins and stream gages to help get a more complete picture of water use in the basin.

Water Rights Application Consulting, City of Boulder, CO. 2018 – 2019. *GIS Analyst.* Evaluate soil and alluvial groundwater conditions using Colorado Decision Support System (CDSS) and Soil Survey Geographic Database (SSURGO) data in support of water rights decision making. Combine multiple sources of information to perform hydrologic analyses such as calculating mean transmissivity along a path from a recharge basin to a stream. These analyses have helped enable our client to make better decisions about which water rights applications to contest.

Groundwater Model Report, Calleguas Municipal Water District, Las Posas Groundwater Basin, Thousand Oaks, CA. 2019 – 2021. *GIS Analyst.* Saved many hours of manual work and reduced the possibility of human error by authoring Python scripts to process dozens of source shapefiles to generate almost 200 figures showing MODFLOW groundwater model results. Packaged GIS data with proper metadata and consistent projections to deliver to the client to increase the value and usability of the data.

Groundwater Model Report, Water Replenishment District of Southern California (WRD), Lakewood, CA. 2019. *GIS Analyst.* Created a geodatabase to integrate a large USGS model grid with the client's more focused regional model grid. Work with groundwater modelers to incorporate new results into the database for analysis and visualization.

Joanna Stakutis
Senior Technical Editor

Years of Experience: 18

Education:

- MA, 2003, Secondary English University of Maine, Orono, ME
- BA, 2002, English Technical Writing and Rhetoric, University of Maine, Orono, ME

Professional History:

2015 – Present	Senior Technical Editor, Albuquerque Office Manager – INTERA Incorporated, Albuquerque, NM
2014 – 2015	Chair of the English Department, Senior English Instructor – Valencia High School, Los Lunas, NM
2013 – 2014	Student Support Specialist – Community College of Allegheny County, Pittsburgh, PA
2013	Project Coordinator of Perkins Gender Equity in Math Study – Maine Community College System, Augusta, ME
2010 – 2013	Assistant to the Director of the Learning Center, Instructor of English and Business Writing – York County Community College, York, ME
2003 – 2010	Instructor of English and Communication – University of Maine, Bangor, ME

Specialized Training & Software:

- Microsoft Office: Word, PowerPoint, Project, Excel, Publisher, OneDrive, SharePoint
- Visual Basic for Applications: Macro Design Tools
- Adobe Suite: Acrobat, Photoshop and Premier

As Senior Technical Editor at INTERA, Ms. Stakutis is responsible for the editing, quality assurance (QA), layout, compilation, and production of reports and documents for state, municipal, and private clients. Her role at INTERA includes supporting both internal and external project teams to design, author, develop, edit, and produce deliverables. This role includes coordinating with multiple authors, often in multiple locations worldwide.

Project Experience

Groundwater Sustainability Plan, Upper Ventura River Groundwater Agency. 2020 – Present. *Senior Technical Editor.* Developed a custom template to provide information from the relevant section of California Code of Regulations. Coordinating between multiple authors to combine drafts and comments. Documenting a large library of references. Quality assurance and editing of several draft versions. Preparing drafts for public comment periods.

Groundwater Sustainability Plan, Mound Basin Groundwater Sustainability Agency. 2020 – Present. *Senior Technical Editor.* Developed a custom template to provide information from the relevant section of California Code of Regulations. Coordinating between multiple authors to combine drafts and comments. Assisting with development and compilation of tables, figures, and appendices.

2018 Annual Report, Northern Trinity Groundwater Conservation District, Tarrant County, TX. 2019. *Senior Technical Editor, Graphics Support.* Analyzed the 2017 Annual report to catalogue which sections and sentences need updating for the client. Updating multiple graphics, including Texas Priority Groundwater Management Areas maps, Palmer Drought Severity Index maps, U.S. Drought Monitor maps, and mapped locations of saltwater disposal/injection wells in the region using publicly available mapping tools from federal and state websites. Downloading water use data from the Texas Water Development Board to plot water use data by aquifer in Tarrant County.

2018 New Mexico State Water Plan, New Mexico Interstate Stream Commission, Santa Fe, NM. 2019. *Senior Technical Editor, Graphics Support, and Project Coordination*. Project coordinator for the 2018 update of the New Mexico State Water Plan. Project roles included setting up and maintaining project management software for the duration of project. Working with lead scientists, developed graphics that were designed to effectively communicate information regarding statutes and governmental resources related to water issues. Assured all photographs were either open source or owned by the Interstate Stream Commission (ISC) to ensure there were no copyright issues. Edited multiple drafts of the full document and of individual sections as needed.

Water 2120: Securing Our Water Future - Water Resources Management Strategy Report, Albuquerque Bernalillo County Water Utility Authority, Albuquerque, NM. 2015 – 2016. *Senior Technical Editor, Project Coordination, and Production*. Provided support for the development of the Water Authority's Water 2120 100-year water plan. Water 2120 articulates all aspects of the Water Authority's water planning for the next 100 years, including surface- and groundwater management as well as potential new supplies. Project roles included author coordination, draft management, and senior technical editing. Designed and developed several supporting documents for Albuquerque Bernalillo County Water Utility Authority's template.

Nathan Hatch
Hydrologist

Years of Experience: 3

Education:
- MS, 2020, Civil Engineering, TU Delft
- BS, 2017, Hydrology, UC Davis

Professional Registrations/Affiliations:
- Member, Groundwater Resources Association of California
- Member, Geological Society of America

Professional History:
2020 – Present	Hydrologist – INTERA Incorporated, Torrance, CA
2018 – 2019	Junior Hydrologist – Bachand & Associates, Davis, CA
2017 – 2018	Research Specialist – UC Water, Davis, CA

Specialized Training:
- MODFLOW, MODPATH, Python, MATLAB, R, ArcGIS

Nathan Hatch is a hydrologist with strong quantitative skills and familiarity with hydrological principles and planning. Nathan is adept at hydrological modeling with in-depth project work focused on surface-water/groundwater interactions as well as agricultural and complex hydrogeological environments. Nathan's experience includes using FloPy for a new method of estimating the steady-state interface of seawater intrusion in coastal aquifers using MODFLOW and evaluating agricultural water requirements and estimating supply based on hydrological scenario planning with limited data. He has built strong quantitative analysis skills in several programming languages (Python, R, and MATLAB) as well as learned how to develop and maintain large databases and geodatabases. Nathan has experience creating groundwater flow models and specific model packages as well as experience in data quality assurance of those development procedures. Nathan's varied and technical project experience has amplified his abilty to synthesize and develop efficient and transparent workflows that lend themselves to rapid production and analysis. He has learned how to communicate and work with anyone and is able to apply custom solutions rather than one-size-fits-all approache. He has worked with local governments, private engineering firms, academia within the US, and international academics, farmers, and nonprofits.

Project Experience – Water Resources

Upper Ventura River Groundwater Sustainability Plan Model Development, Upper Ventura River Groundwater Agency, Ojai, CA, 2020 – Present. *Hydrologist.* Developing MODFLOW model packages for evapotranspiration, groundwater pumping, surface-groundwater interactions, and recharge for the Upper Ventura River Groundwater Basin (UVRGB). Modeled complex and detailed processes involving spatially and temporally dynamic processes as well as rapidly produced different management scenario alternatives through scripting of model packages. Organized and manipulated a database of multi-sourced data to develop input data for models up to 50 years in length. Also developed model packages to represent climate change scenario adjustments. This model development is a key of the basin's Groundwater Sustainability Plan (GSP). Analyzed UVRGB water balance and wrote components of GSP related to the model documentation and water balance. Assisted in creation of animation of Ventura River stream conditions and water levels to help stakeholders understand the complicated surface-groundwater interactions along the channel.

Orange County Underflow Model Comparison, Orange County Water District, Fountain Valley, CA, 2020 – Present. *Hydrologist.* Synthesizing time-series data for multiple intersecting MODFLOW models to compare calibration inputs and results. Organizing data across models to compare spatially and in-kind. Assisting in visualization and presentation of findings of model comparison. Comparing model inputs and parameters including hydraulic properties and boundary conditions to evaluate model calibration and material differences.

San Gorgonio Pass Groundwater Sustainability Plan, San Gorgonio Pass Water Agency, Beaumont, CA, 202I – 2021. *Hydrologist.* Helped troubleshoot model packages related to climate change impacts. Created streamflow model packages that are representative of projected climate-change scenarios for the MODFLOW model input.

Santa Monica Groundwater Sustainability Plan Model Testing, Santa Monica Basin Groundwater Sustainability Agency, Santa Monica, CA, 2020 – 2021. *Hydrologist.* Analyzing models such as United States Geological Survey INFIL to parse recharge components used in model development. Ran particle tracking experiments to ascertain the flow directions and contributions from different areas to use for model analysis and helped communicate these results to clients through presentations.

Saman Tavakoli, PhD
Water Resources Engineer

Years of Experience: 10

Education:

- PhD, 2018, Civil and Environmental Engineering, Hydrology and Water Resources, Colorado State University
- MSc, 2012, Civil Engineering, Water Resources Engineering, Sharif University of Technology
- BSc, 2010, Civil Engineering, Iran University of Science and Technology

Professional Registrations/Affiliations:

- Member, American Geophysical Union

Professional History:

2020 – Present	Water Resources Engineer – INTERA Incorporated, San Diego, CA
2018 – 2020	Post-Doctoral Fellow – Colorado State University, Fort Collins, CO
2013 – 2018	Graduate Research Assistant – Colorado State University, Fort Collins, CO
2010 – 2012	Graduate Research Assistant, Sharif University of Technology, Tehran, Iran

Specialized Training & Software:

- PEST, Python, FORTRAN, MATLAB, ArcGIS, APEX, SWAT, RT3D, FloPy
- MODFLOW-NWT, MODFLOW USG, MODPATHH, MT3DMS, MODFLOW GUIs (e.g. GWV, GMS, and ModelMuse), Geo-HECRAS, QUAL2K
- ETABS, AutoCAD

Dr. Saman Tavakoli is a water resources engineer with over of nine years research and consulting experience in the area of water resources planning and management such as constructing and application of groundwater flow models for salt impaired land remediation practices . Dr. Tavakoli experience has focused on hydrology and water resources focusing on modeling hydrologic and water quality specifically in salinity fate and transport. He has experience in developing and calibrating an integrated surface/subsurface watershed modeling by coupling APEX and MODFLOW using PEST. He also has taught mechanics of solids for a summer course during his PhD. Mr. Tavakoli has shown a commitment to maintain and improve his skillset to meet specific needs of his clients. Dr. Tavakoli has demonstrated experience in several modeling softwares including MODFLOW, MODFLOW-USG, FloPy, MODPATH, RT3D, ArcGIS, PEST, Python, FORTRAN, and MATLAB.

Project Experience – Water Resources

Regional Brackish Water Reclamation Program Replenishment Study, Water Replenishment District of Southern California, Lakewood, CA. 2021 - Present. *Water Resources Engineer.* evaluating project alternatives for the Regional Brackish Water Reclamation Program using MODFLOW-USG and MODPATH models.

Sensitivity Analysis for an integrated surface/groundwater model for San Gorgonio Water Pass, San Gorgonio Groundwater Sustainability Agency, Banning, CA. 2021 - Present. *Water Resources Engineer.* Using PESTPP to analyze the watershed parameters on stream flows and water table elevations.

Statistical analysis of historical weather data, Denver Water Department, Denver, CO. 2021 - Present. *Water Resources Engineer.* Analyzing historical weather data to be able to forecast the water demand in future.

Development of a MODFLOW Model for San Gorgonio Water Pass, San Gorgonio Groundwater Sustainability Agency, Banning, CA. 2020 - Present. *Water Resources Engineer.* Applying Python scripts and ArcGIS to create MODFLOW package (SFR, RCH, DRN, GHB) to expand the existing USGS model temporally and spatially.

Development of a Predictive MODFLOW Model for San Gorgonio Water Pass, San Gorgonio Groundwater Sustainability Agency, Banning, CA. 2021 - Present. *Water Resources Engineer.* Developing a predictive model using calibrated historical model for future scenario analysis. The process involves precipitation and evapotranspiration projection for surface water analysis, pumping projection, etc to construct the predictive model.

Analysis and Future Climate Date for Santa Monica Basin, Santa Monica Basin Groundwater Sustainability Agency, Santa Monica, CA. 2020- Present. *Water Resources Engineer.* The process involves projecting ET, pumping rate, and precipitation for future climate change scenarios for water management act in California.

Analysis and Future Climate Date for Mound Basin, Mound Basin Groundwater Sustainability Agency, Ventura, CA. 2020-Present. *Water Resources Engineer.* The process involves projecting ET, pumping rate, and precipitation for future climate change scenarios for water management act in California.

Attachment D:
Example GSP Outline [with SGMA GSP Regulations]

Executive Summary
Table of Contents
List of Figures
List of Tables
List of Appendices
Definitions of Key SGMA Terms
Acronyms and Abbreviations

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- 2.1 Agency Information [§354.6]
  - 2.1.1 Name and Mailing Address [§354.6(a)]
  - 2.1.2 Organization and Management Structure [§354.6(b)]
  - 2.1.3 Plan Manager and Contact Information [§354.6(c)]
  - 2.1.4 Legal Authority [§354.6(d)]
- 2.2 Description of Plan Area [§354.8]
  - 2.2.1 Summary of Jurisdictional Areas and Other Features [§354.8(a)(1),(a)(2),(a)(3),(a)(4),(a)(5), and (b)]
  - 2.2.2 Water Resources Monitoring and Management Programs [§354.8(c) and (d)]
    - 2.2.2.1 Existing Water Resource Monitoring Programs [§354.8(c) and (d)]
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    - 2.2.2.3 Conjunctive Use Programs [§354.8(e)]
  - 2.2.3 Land Use/General Plans
    - 2.2.3.1 Land Use and General Plans Summary [§354.8(f)(1),(f)(2), and (f)(3)]
      - 2.2.3.1.1 How Land Use Plans May Impact Water Demands and Sustainable Groundwater Management
      - 2.2.3.1.2 How Sustainable Groundwater Management May Affect Water Supply Assumptions of Land Use Plans
      - 2.2.3.1.3 Impact of Land Use Plans Outside of Basin on Sustainable Groundwater Management [§354.8(f)(5)]
    - 2.2.3.2 Well Permitting [§354.8(f)(4)]
  - 2.2.4 Additional Plan Elements [§354.8(g)]
- 2.3 Notice and Communication [§354.10]
  - 2.3.1 Beneficial Uses and Users [§354.10(a)]
  - 2.3.2 Public Meetings [§354.10(b)]
  - 2.3.3 Public Comments [§354.10(c)]
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3.0 Basin Setting [Article 5, SubArticle 2]

3.1 Hydrogeologic Conceptual Model [§354.14]

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3.1.1.3 Imported Water [§354.14(d)(6)]

3.1.2 Regional Geology [§354.14(b)(1) and (d)(2)]

3.1.3 Soil Characteristics [§354.14 (d)(3)]

3.1.4 Principal Aquifers and Aquitards [§354.14(b)(4)(A)]

3.1.4.1 Physical Properties of Aquifers and Aquitards

3.1.4.1.1 Basin Boundary (Vertical and Lateral Extent of Basin) [§354.14(b)(2),(b)(3),(b)(4)(B), and (c)]

3.1.4.1.2 Groundwater Flow Barriers [§354.14(b)(4)(C) and (c)]

3.1.4.1.3 Hydraulic Properties [§354.14(b)(4)(B)]

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3.1.4.4 Primary Beneficial Uses [§354.14(b)(4)(E)]

3.1.5 Data Gaps and Uncertainty [§354.14(b)(5)]

3.2 Groundwater Conditions [§354.16]

3.2.1 Groundwater Elevations [§354.16(a)]

3.2.1.1 Groundwater Elevation Contours [§354.16(a)(1)]

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3.2.5 Land Subsidence [§354.16(e)]

3.2.6 Interconnected Surface Water Systems [§354.16(f)]

3.2.7 Groundwater-Dependent Ecosystems [§354.16(g)]

3.3 Water Budget [§354.18]

3.3.1 Historical Water Budget [§354.18(c)(2)(B)]

3.3.1.2 Reliability of Historical Surface Water Supplies [§354.18(c)(2)(A)]

3.3.1.3 Impact of Historical Conditions on Basin Operations [§354.18(c)(2)(C)]

3.3.2 Current Water Budget [§354.18(c)(1)]

3.3.3 Projected Water Budget

3.3.3.1 Projected Water Budget Calculation Methods [§354.18(d)(1),(d)(2),(d)(3),(e), and (f)]

3.3.3.1.1 Projected Hydrology [§354.18(c)(3)(A)]

3.3.3.1.2 Projected Water Demand [§354.18(c)(3)(B)]

3.3.3.1.3 Projected Surface Water Supply [§354.18(c)(3)(C)]

3.3.3.2 Projected Water Budget

3.3.4 Overdraft Assessment and Sustainable Yield Estimate [§354.18(b)(5), (b)(7)]

ARROYO SANTA ROSA BASIN

GROUNDWATER SUSTAINABILITY AGENCY

Camrosa Water District, 7385 Santa Rosa Road, Camarillo, CA 93012

BOARD MEMORANDUM

DATE: October 6, 2021

TO: Board of Directors

FROM: Tony Stafford, Executive Director

OBJECTIVE: Professionally manage the GSP

ACTION: Authorize the Executive Director to enter into an agreement with and issue a purchase order to Bondy Groundwater Consulting Inc., in an amount not to exceed $138,500, for GSP management services Tasks 1, 2, and 3 as described in the attached proposal.

DISCUSSION: At the August 12, 2021, meeting, in addition to directing staff to engage a new firm as lead consultant on the GSP, the Board also directed staff to contract with an experienced hydrogeologist to act as the project manager for the GSP. After extensive consultation between GSA staff, Director Foreman, and Bryan Bondy, staff recommends that the GSA retain Mr. Bondy to manage the GSP.

As described in the attached scope of work, Mr. Bondy has broken the project into five main tasks: Tasks 1, 2, and 3 are related to the completion of the GSP by December 31, 2022, while Tasks 4 and 5 are related to subsequent analysis and the ongoing annual report. The first three tasks include general project management as well as technical and policy analysis and furnishing certain administrative/narrative portions of the GSP; these are critical to the plan's completion. Note that Mr. Bondy's proposal states that services will be provided on a time-and-materials basis; ASRGSA staff will provide oversight of subtasks and activity.

Task 4 relates to additional modelling work intended to better characterize the basin and inform project planning. Task 5 relates to managing the annual report required of all GSAs by the Sustainable Groundwater Management Act. Staff expects that Mr. Bondy will continue to augment ASRGSA staff as GSP project manager, but as the exact scope of his role will be better informed by the process of developing the GSP, staff recommends postponing authorization of those tasks until closer to their execution.

Mr. Bondy has extensive experience in the region, including in the Santa Rosa Basin, where he's doing work supporting Calleguas Municipal Water District and the Calleguas Creek Watershed TMDL group; he was a member of the Fox Canyon Groundwater Management Agency's Technical Advisory Group during the three years that group lent its collective expertise to the creation of the GSPs for the Oxnard and Pleasant Valley Basins; and he currently serves as the Executive Director and GSP project manager for the Mound Basin and Upper Ventura River Basin GSAs and project manager for the Carpinteria Basin GSP.

Combined with the GSP contract, project management services exceed the FY2021-22 approved budget. The ASRGSA is funded through contributions from Camrosa and Ventura County. The Camrosa Board will consider the increased contributions at the October 14, 2021 meeting of its Board of Directors. Upon approval of the transfer of funds, staff will return to the ASRGSA Board to amend the ASRGSA FY2021-22 budget. It is anticipated that the County will also contribute their portion of this project cost. The County has a yearly total contribution cap of $100,000.

Changes to the language in the contract with Mr. Bondy have been reviewed and approved by legal counsel.

Arroyo Santa Rosa Groundwater Sustainability Agency
7385 Santa Rosa Rd.
Camarillo, CA 93012
Telephone (805) 482-4677 - FAX (805) 987-4797

Some of the important terms of this agreement are printed on pages 2 through 4. For your protection, make sure that you read and understand all provisions before signing. The terms on Page 2 through 4 are incorporated in this document and will constitute a part of the agreement between the parties when signed.

TO:	Bondy Groundwater Consulting, Inc. 10488 Graham Ct. Ventura, CA 93004	DATE: Agreement No.:	October 6, 2021 2022-02

The undersigned Consultant offers to furnish the following:

Provide consulting services to Arroyo Santa Rosa Groundwater Sustainability Agency (ASRGSA) to assist in project management services to develop a groundwater sustainability plan ("GSP") per proposal dated 9/29/2021, attached. For Task 1,2, and 3 only.

Contract price $:	$138,500 plus materials and travel. To be billed based upon time and materials, per attached proposal dated 9/29/2021 attached.
Contract Term:	October 6, 2021 – December 31, 2023

Instructions: Sign and return original. Upon acceptance by ASRGSA, a copy will be signed by its authorized representative and promptly returned to you. Insert below the names of your authorized representative(s).

Accepted:	Arroyo Santa Rosa GSA	Consultant:	Bondy Groundwater Consulting, Inc.
	Tony L. Stafford		Bryan Bondy
Title:	Executive Director	Title:	Principal
Date:		Date:	
Other authorized representative(s):		Other authorized representative(s):	
			None

Consultant and ASRGSA agree that:

a. **Indemnification:** To the extent permitted by law, and subject to the limitations specified herein, Consultant shall hold harmless, and indemnify the ASRGSA, its directors, officers, and employees, against any and all liability, losses, damages, or expenses, including reasonable attorney's fees and costs, solely to the extent actually caused by the by negligent acts, errors or omissions of Consultant or its officers, agents, or employees in rendering services under this contract; excluding, however, such liability, claims, losses, damages or expenses arising from the ASRGSA's negligence or willful acts. Consultant shall have no duty to provide or to pay for an up-front defense against unproven claims or allegations, but shall promptly reimburse ASRGSA for reasonable attorney's fees and costs of suit actually incurred by ASRGSA in defense of those claims which are determined in a final non-appealable judgment rendered by a court of competent jurisdiction to have been actually caused by Consultant's negligent act, error or omission.

b. **No Guarantee**. ASRGSA acknowledges and agrees that Consultant does not and cannot guarantee the results or effectiveness of the services provided by Consultant pursuant to this Agreement. Without limitation, and notwithstanding anything to the contrary in this Agreement, or any scope of work related hereto, Consultant shall not be responsible for, in any manner whatsoever, and shall not be deemed in breach of this Agreement, or obligated to indemnify, hold harmless, or reimburse ASRGSA, its directors, officers, or employees, with respect to any of the following:

(i) Failure to obtain Department of Water Resources' approval of the GSP;
(ii) Failure to receive grant funds from any existing grants or be awarded any grants that may be applied for or otherwise pursued with respect to the GSP or any related projects; and/or
(iii) Any legal, regulatory, or other action involving ASRGSA, or any related agency, in connection with or related to the GSP or water rights.

c. **Minimum Insurance Requirements:** Consultant shall procure and maintain for the duration of the contract insurance against claims for injuries or death to persons or damages to property which may arise from or in connection with the performance of the work hereunder and the results of that work by the Consultant, his agents, representatives, employees or subcontractors.

d. **Coverage:** Coverage shall be at least as broad as the following, unless otherwise agreed to by ASRGSA in writing:

1. **Commercial General Liability (CGL):** Insurance Services Office (ISO) Commercial General Liability Coverage (Occurrence Form CG 00 01) including property damage, bodily injury, personal injury with limit of at least two million dollars ($2,000,000) per occurrence or the full per occurrence limits of the policies available, whichever is greater. If a general aggregate limit applies, either the general aggregate limit shall apply separately to this project/location (coverage as broad as the ISO CG 25 03, or ISO CG 25 04 endorsement provided to the ASRGSA) or the general aggregate limit shall be twice the required occurrence limit.
2. **Automobile Liability:** (If applicable) Insurance Services Office (ISO) Business Auto Coverage (Form CA 00 01), covering Symbol 1 (any auto) or Symbol 7 (scheduled autos) or if Consultant has no owned autos, Symbol 8 (hired) and 9 (non-owned) with limit of one million dollars ($1,000,000) for bodily injury and property damage each accident.
3. **Workers' Compensation Insurance:** as required by the State of California, with Statutory Limits, and Employer's Liability Insurance with limit of no less than $1,000,000 per accident for bodily injury or disease.
4. **Waiver of Subrogation:** The insurer(s) named above agree to waive all rights of subrogation against the ASRGSA, its directors, officers, employees, and authorized volunteers for losses paid under the terms of this policy which arise from work performed by the Insured for the ASRGSA; but this provision applies regardless of whether or not the ASRGSA has received a waiver of subrogation from the insurer.
5. **Professional Liability** (also known as Errors & Omission) Insurance: appropriates to the Consultant profession, with limits no less than $1,000,000 per claim, and $2,000,000 policy aggregate.

e. **If Claims Made Policies:**

1. The Retroactive Date must be shown and must be before the date of the contract or the beginning of contract work.

2. Insurance must be maintained and evidence of insurance must be provided **for at least three (3) years after completion of the contract of work.**
3. If coverage is canceled or non-renewed, and not replaced with another claims-made policy form with a Retroactive Date prior to the contract effective date, the Consultant must purchase "extended reporting" coverage for a minimum of three (3) years after completion of contract work.

Other Required Provisions: The general liability policy must contain, or be endorsed to contain, the following provisions:

a. **Additional Insured Status: Except on Professional Liability and Workers' Compensation,** the ASRGSA, its directors, officers, employees, and authorized volunteers are to be given insured status (at least as broad as ISO Form CG 20 10 10 01), with respect to liability arising out of work or operations performed by or on behalf of the Consultant including materials, parts, or equipment furnished in connection with such work or operations.

b. **Primary Coverage:** For any claims related to this project, the Consultant's insurance coverage shall be primary at least as broad as ISO CG 20 01 04 13 as respects to the ASRGSA, its directors, officers, employees, and authorized volunteers. Any insurance or self-insurance maintained by the ASRGSA, its directors, officers, employees, and authorized volunteers shall be excess of the Consultant's insurance and shall not contribute with it.

Notice of Cancellation: Each insurance policy required above shall provide that coverage shall not be canceled, except with notice to the ASRGSA.

Self-Insured Retentions: Self-insured retentions must be declared to and approved by the ASRGSA. The ASRGSA may require the Consultant to provide proof of ability to pay losses and related investigations, claim administration, and defense expenses within the retention. The policy language shall provide, or be endorsed to provide, that the self-insured retention may be satisfied by either the insured or the ASRGSA.

Acceptability of Insurers: Insurance is to be placed with insurers having a current A.M. Best rating of no less than A:VII or as otherwise approved by the ASRGSA.

Verification of Coverage: Consultant shall furnish the ASRGSA with certificates and amendatory endorsements or copies of the applicable policy language effecting coverage required by this clause. All certificates and endorsements are to be received and approved by the ASRGSA before work commences. However, failure to obtain the required documents prior to the work beginning shall not waive the Consultant's obligation to provide them. If any of the required coverages expire during the term of this agreement, the Consultant shall deliver the renewal certificate(s) including the general liability additional insured endorsement ASRGSA at least ten (10) days prior to the expiration date.

Subcontractors: Consultant shall ensure that all subcontractors maintain insurance meeting all the requirements stated herein, and Consultant shall ensure that the ASRGSA, its directors, officers, employees, and authorized volunteers are an additional insured on Commercial General Liability Coverage.

Other Requirements:

a. Consultant shall not accept direction or orders from any person other than the Executive Director or the person(s) whose name(s) is (are) inserted on Page 1 as "other authorized representative(s)." It shall be ASRGSA's responsibility to ensure that only authorized persons are providing direction or orders to Consultant on behalf of ASRGSA.

b. Payment, unless otherwise specified on Page 1, is to be 30 days after receipt of invoice. for services performed. In the event ASRGSA disputes any portion of Consultant's invoice, it shall timely pay any undisputed amounts invoiced and notify Consultant in writing of the specifics of any disputed amounts within thirty (30) days of receipt.

c. Permits required by governmental authorities will be obtained at Consultant's expense, and Consultant will comply with applicable local, state, and federal regulations and statutes including Cal/OSHA requirements.

d. Any change in the scope of the professional services to be done, method of performance, nature of materials or price thereof, or to any other matter materially affecting the performance or nature of the professional services will not be paid

for or accepted unless such change, addition or deletion is approved in advance, in writing by the ASRGSA. Consultant's "other authorized representative(s)" has/have the authority to execute such written change for Consultant.

ASRGSA or Consultant may terminate this Agreement at any time, with or without cause, giving thirty (30) days' prior written notice to the other party, specifying the effective date of termination. ASRGSA shall pay the Consultant a prorated amount based on the services completed and materials provided by Consultant prior to the effective date of termination.

The total amount of all claims the ASRGSA may have against the Consultant under this Agreement or arising from the performance or non-performance of the Services under any theory of law, including but not limited to claims for negligence, negligent misrepresentation and breach of contract, shall be strictly limited to the Consultant's fees actually received by Consultant pursuant to this Agreement. As the ASRGSA's sole and exclusive remedy under this Agreement any claim, demand or suit shall be directed and/or asserted only against the Consultant and not against any of the Consultant's employees, officers or directors.

Neither the ASRGSA nor the Consultant shall be liable to the other or shall make any claim for any incidental, indirect or consequential damages arising out of or connected to this Agreement or the performance of the services on this Project. This mutual waiver includes, but is not limited to, damages related to loss of use, loss of profits, loss of income, unrealized energy savings, diminution of property value or loss of reimbursement or credits from governmental or other agencies.

Notwithstanding anything to the contrary in this Agreement or in any scope of work related to this Agreement, Consultant shall not be obligated to indemnify ASRGSA or its officers, directors and employees, and shall not otherwise be liable or responsible for any failure or delay in fulfilling or performing any term of this Agreement or any scope of work related hereto, when and to the extent such failure or delay is caused by or results from acts beyond Consultant's reasonable control, including, without limitation: (a) acts of God; (b) flood, fire or explosion; (c) war, invasion, riot or other civil unrest; (d) government order or law; (e) embargoes or blockades in effect on or after the date of this Agreement; (f) action or inaction by any governmental authority; (g) pandemic; and (h) national or regional emergency (each a "Force Majeure Event"). Consultant shall give notice to ASRGSA stating the Force Majeure Event, and (if reasonably possible) the period of time it is expected to continue, and shall use reasonably diligent efforts to end the delay as soon as reasonably possible.

September 29, 2021

Mr. Ian Prichard
Arroyo Santa Rosa Basin Groundwater Sustainability Agency
7385 Santa Rosa Road
Camarillo, California 93012-9284

RE: Proposal – Arroyo Santa Rosa Groundwater Sustainability Agency SGMA Support

Dear Ian,

Bondy Groundwater Consulting, Inc. (BGC) thanks you for the opportunity to submit this proposal to provide technical and project management support to the Arroyo Santa Rosa Basin Groundwater Sustainability Agency (ASRBGSA).

As discussed, BGC will utilize its experience managing three other groundwater sustainability plan (GSP) projects to assist you with managing ASRBGSA GSP. My resume is attached for your reference (Attachment A).

The following scope of services and estimated fees are based on our discussions and my experience managing the Carpinteria Basin, Upper Ventura River, and Mound Basin GSPs. It is noted that I am managing and collaborating with Intera, Inc. on the Upper Ventura River and Mound Basin GSPs, which is very similar to the approach that will be used to complete the GSP for ASRBGSA. BGC and Intera, Inc have a developed a close working relationship on those projects, so we know what to expect from each other and we make an excellent team. The scope of services and estimated fees are based on this past experience working with Intera, Inc.

Scope of Services

BGC anticipates providing the following services:

1. Manage GSP Development:
    - Plan and manage GSP development (assume 2 hours/week)
    - Weekly progress calls (assume 2 hours each)
    - Review draft GSP work products (assume 80 hours total)
    - Facilitate Technical Advisory Committee discussions (assume monthly 1-hour calls and six 2-hour meetings with round trip travel)
    - Attend GSA Board meetings to brief the Board (assume four 1-hour meetings with round trip travel)

- Provide input for quarterly GSP grant invoices and progress reports (to be prepared by Camrosa WD staff)

2. Stakeholder Outreach and Engagement:

   - Develop Stakeholder Outreach and Engagement Plan (assume UVRGA or MGGSA template will be used)
   - Develop period newsletters (assume four) and other misc. outreach materials
   - Plan and emcee GSP workshops (assume three)
   - Coordinate with ASRGSA for website updates and misc. outreach activities

3. Provide GSP Content:

   - Provide content for GSP sections noted in Intera, Inc. proposal as being provided by ASRBGSA staff (esp. Administrative Information and Sustainable Management Criteria sections)
   - Provide strategy and policy support to the ASRBGSA Board and you;

4. Manage the post-GSP "Track 2" model update project.

   - Attend modeling workshop
   - Manage model update (assume 0.5 hour/week)
   - Weekly progress calls (assume 1 hour each)
   - Review model work in progress and model update technical memorandum (assume 32 hours total)

5. First SGMA Annual Report:

   The first annual report required under SGMA will be due in April 2023 and will cover water year ending September 30, 2022. BGC will prepare the first annual report using available data collected by others (Camrosa Water District, Ventura County Watershed Protection District, etc.). Note, the budget for this task may need to be revised (downward or upward) depending on the report complexity, which cannot be fully determined until the GSP has been drafted.

Estimated Fees

BGC's services will be provided on a time and materials basis according to the attached rate sheet (Attachment B). As a courtesy to ASRBGSA, BGC is providing the same discounted billing rate offered to Calleguas MWD because Camrosa Water District is a Calleguas MWD purveyor. The budget breakdown is provided in the table below. The total budget will not be exceeded without prior written authorization.

Task	Budget
1. Manage GSP Development	$83,500
2. Stakeholder Outreach and Engagement	$25,000
3. Provide GSP Content and Policy Support	$30,000
4. Manage Post-GSP "Track 2" Activities	$18,250
5. Develop First Annual Report	$35,000
Total:	$191,750

The above budget estimate assumes ASRBGSA has already developed a stakeholder mailing list, will maintain the GSA website, and will provide administrative support during the project, including printing and mailing of stakeholder outreach materials, posting agendas, and hosting meetings, etc.

The project schedule is as per Intera, Inc.'s proposal dated September 28, 2021.

Closing

Thank you for considering BGC and I look forward to working with you on this project. Please contact me with any questions, comments, or concerns.

Sincerely,

Bryan Bondy

Bryan Bondy, PG 7676, CHG 821
President
Bondy Groundwater Consulting, Inc.

Attachments:

A. Bryan Bondy Resume
B. BGC Schedule of Fees

ATTACHMENT A

RESUME FOR BRYAN BONDY

Bryan Bondy, PG, CHG
Bondy Groundwater Consulting, Inc.

YEARS OF EXPERIENCE: 25

EDUCATION

- MS, Geological Sciences (Hydrogeology)
  San Diego State University
- BS, Geological Sciences (Hydrogeology)
  San Diego State University
- GIS Certification
  Mt. San Jacinto Junior College

ACADEMIC HONORS

- Summa Cum Laude
- Member - Phi Kappa Phi Honor Society
- Member - Phi Beta Kappa Honor Society
- Graduate of the Year Award

PROFESSIONAL REGISTRATIONS

- Professional Geologist, CA No. 7676
- Certified Hydrogeologist, CA No. 821

PROFESSIONAL HISTORY

2016-Present	President, Bondy Groundwater Consulting, Inc., Ventura, CA
2012-2016	Groundwater Manager, Calleguas Municipal Water District, Thousand Oaks, CA
2009-2012	Senior Hydrogeologist, United Water Conservation District Ventura County, CA
2005-2009	Principal Hydrogeologist, Aqui-Ver, Inc., Temecula, CA
2000-2005	Senior Hydrogeologist, Kleinfelder, Inc., Temecula, CA
1996-2000	Staff Hydrogeologist, Hargis + Assoc., Inc., San Diego, CA

PROFESSIONAL HONORS

- Fox Canyon Groundwater Management Agency Groundwater Stewardship Award
- Kleinfelder, Inc. President's Award for Exceptional Client Service

Bryan has 25 years of private and public-sector experience conducting a wide range of groundwater projects in California, including Sustainable Groundwater Management Act (SGMA) planning, groundwater basin and supply studies, groundwater modeling, water well design and construction management, interagency planning and coordination, stakeholder advising and facilitation, executive management, and grant writing/management. Bryan is currently assisting clients on SGMA issues in ten groundwater basins in various capacities. These services include technical review, preparing Groundwater Sustainability Plans, advising Groundwater Sustainability Agency (GSA) boards, advising landowner groups, and serving as the contract executive director of two GSAs. Bryan has served both agricultural and public agency clients on a variety of water issues in various capacities. Bryan currently serves on the Santa Paula Basin Pumpers Association Board of Directors and previously served on the City of Ventura Water Commission.

SELECTED REPRESENTATIVE EXPERIENCE

Contract Executive Director – Upper Ventura River Groundwater Sustainability Agency. Since 2019, Bryan has served as the contract Executive Director of the UVRGSA. Bryan oversees Groundwater Sustainability Plan development and agency functions.

Contract Executive Director – Mound Basin Groundwater Sustainability Agency. Since 2018, Bryan has served as the contract Executive Director of the Mound Basin GSA. Bryan oversees Groundwater Sustainability Plan development and agency functions.

Contract GSP Project Manager – Carpinteria Basin Groundwater Sustainability Agency. Since 2020, Bryan has served as the contract Project Manager on behalf of the Carpinteria Water District for SGMA activities. Bryan is managing development of the Groundwater Sustainability Plan due in 2024 for this recently reprioritized Basin.

Contract Groundwater Manager, Calleguas Municipal Water District, Ventura County, California. Bryan advises the District on technical matters related to the operation of the District's groundwater aquifer storage and recovery (ASR) project. Bryan managed several studies for the District and has worked extensively with the landowners in the basin to monitor groundwater conditions and address concerns about ASR project operations.

GSP Peer Reviewer - San Antonio Basin Groundwater Sustainability Agency, Los Alamos, CA. At the request of the San Antonio Basin Groundwater Sustainability Agency, Bryan is peer reviewing the groundwater sustainability plan under development for the basin.

SGMA Advisor - Fillmore and Piru Basins Groundwater Pumpers Associations. Bryan advises this group of agricultural landowners concerning development of the groundwater sustainability plans for the basins.

SGMA Advisor, Santa Ynez Basin Agricultural Groundwater Users Group. Bryan advises this group of agricultural landowners concerning development of the groundwater sustainability plans for the Santa Ynez Basin.

Technical Advisory Group Appointee – Fox Canyon Groundwater Management Agency (FCGMA), Ventura County, California. From 2015 - 2019, Bryan served as an appointee on the FCGMA's SGMA Technical Advisory Group. The committee was tasked with advising the Board of Directors on technical aspects of the three groundwater sustainability plans developed by the Agency.

Peer Reviewer - Simi Valley Basin Study, City of Simi Valley, CA. Bryan peer reviewed the City's groundwater study and provided recommendations.

Groundwater Model Review, United Water Conservation District, Santa Paula, CA. Bryan performed an independent, comprehensive review of the Ventura Regional Groundwater Model originally completed by the United States Geological Survey (USGS). The model area includes the groundwater basins of the Santa Clara River Valley and Coastal Plain of Ventura County, which provide almost half of the water supply for Ventura County. Bryan's review revealed that the model was not accurately predicting groundwater levels in key areas of the basins, which led to a decision by the District to develop a new model.

Groundwater Models Review – Confidential Litigation Project. Bryan assisted the litigation team by reviewing and comparing of two competing groundwater models of the subject basin. Through Bryan's careful evaluation of the models' water budget outputs, he was able to identify key differences in the model assumptions that explained why the models provided different answers.

Las Posas Valley Basin Characterization and Groundwater Model, Calleguas MWD, Ventura County, California. Bryan was the technical lead and project manager for the development of a groundwater flow model of the East and South Las Posas Valley Sub-basins. The project involved a detailed characterization of the basin aquifers, geologic structures controlling groundwater flow, and development of a groundwater flow model.

Data Gaps Evaluation – Countywide Groundwater Monitoring Program, County of San Luis Obispo. Bryan was the lead hydrogeologist for a data gap evaluation of the County's groundwater monitoring program. The purpose of the project was to identify data gaps in the existing groundwater monitoring program relative to the SGMA GSP regulations and BMPs. The project included a detailed review of the SGMA GSP regulations and BMPs that pertain to groundwater monitoring.

Goleta Basin Groundwater Model and Management Plan Updates, Goleta, California. Bryan updated and reviewed the Goleta Basin groundwater model in 2014 to assist Goleta Water District with its drought water supply planning. Bryan was also the lead author of the Goleta Water District's 2016 Groundwater Management Plan update.

Goleta Water District Water Supply Management Plan, Goleta CA. Bondy Groundwater Consulting, Inc. teamed with Steve Bachman to prepare the 2017 Water Supply Management Plan. The plan optimizes the GWD's water supply portfolio to provide the greatest reliability at the lowest possible cost. A complex spreadsheet model of the District's water supplies and demands was developed and was integrated with the District's groundwater model to ensure that the results are consistent with groundwater storage levels.

Groundwater Modeling Evaluation of Indirect Potable Reuse, City of Santa Barbara, California. Bryan led the feasibility study of indirect potable reuse (IPR) of recycled water for the City, which included working with the U.S. Geological Survey (USGS) to conduct groundwater modeling of surface infiltration of tertiary treated recycled water, injection of advanced treated recycled water, and recovery of the water.

Technical Advisor - Groundwater Dependent Ecosystems Guidance Framework, The Nature Conservancy. As part of his service on the Fox Canyon GSA's Technical Advisory Group, Bryan advised The Nature Conservancy during development of their guidance manual for the identification, evaluation, and consideration of Groundwater Dependent Ecosystems under SGMA. Bryan assisted with guidance manual development and a case study in the Las Posas Valley Basin. The guidance manual is used by groundwater sustainability agencies throughout the State.

Groundwater Modeling Evaluation of Indirect Potable Reuse Feasibility, City of Morro Bay, California. Bryan managed the construction and calibration of a groundwater model of the Lower Morro Valley Basin, which was used to evaluate the feasibility of injection and recovery of advanced treated recycled water.

Stakeholder Group Advisor/Facilitator - Las Posas Valley Groundwater Basin Users Group, Ventura County, California. Bryan served as the Las Posas Valley Groundwater Basin Users Group's technical advisor and facilitator from 2009 through 2018. During this time Bryan educated the stakeholders on the basin groundwater hydrology, groundwater management issues, and facilitated the group's development of a proposed pumping allocation management program.

Las Posas Valley Basin Groundwater Monitoring Program Development, Calleguas MWD, Ventura County, California. Bryan has worked with agricultural well owners in the Las Posas Valley Groundwater Basin to develop a voluntary groundwater monitoring program in the vicinity of the Calleguas Aquifer Storage and Recovery facilities to provide data to characterize the basin. Bryan has successfully negotiated access and monitoring agreements with agricultural landowners and other water agencies for two dozen wells in the basin. Bryan also managed the installation of five shallow groundwater monitoring wells in the basin and was the technical lead for three deep monitoring wells.

SGMA Basin Prioritization Re-Evaluation Project – Las Posas Valley Basin. Bryan, on behalf of the Las Posas Valley Groundwater Basin Users Group, worked with DWR staff to re-assess the "critical overdraft" designation of the Las Posas Valley Basin. Mr. Bondy reviewed groundwater conditions with DWR staff and recommended that the basin be reclassified. DWR staff concurred with Mr. Bondy's recommendation and the basin was delisted.

Agricultural Irrigated Lands Group Groundwater Quality Program – Ventura County, California. Bryan is the lead hydrogeologist on the consultant team working for VCAILG to address the groundwater requirements of the 2016 Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Agricultural Lands. The program addresses nitrate issues in all Ventura County groundwater basins.

Calleguas Creek Watershed Salt and Nutrient Management Planning, Ventura County, CA. Bryan is the lead hydrogeologist for the development of salt and nutrient management plans for the nine groundwater basins located within the watershed. The planning will address salt and nutrient inputs from numerous sources, including agriculture, imported water, and five publicly owned treatment works.

SGMA Stakeholder Group Facilitator – Oxnard / Pleasant Valley Basin Agricultural Landowners Group, Ventura County, California. Bryan was hired in 2017 by the Oxnard and Pleasant Valley Basins' agricultural landowners to facilitate development of a pumping allocation plan for the Groundwater Sustainability Plans.

Santee – El Monte Basin Groundwater Management Study, San Diego County Water Authority, Padre Dam Municipal Water District, Riverview Water District, Lakeside Water District, Helix Water District, and City of San Diego. Bryan was the principal investigator for this study to develop information and planning tools necessary to manage the groundwater resources of the Santee-El Monte Basin. The study consisted of a hydrogeologic evaluation of the basin, water budget development, groundwater monitoring well installation, establishment of a groundwater monitoring network, groundwater monitoring and water quality testing, and development of a groundwater flow model of the basin.

Bryan Bondy, PG, CHG
Bondy Groundwater Consulting, Inc.

PUBLICATIONS AND PRESENTATIONS

Beckett, G. D. and B. Bondy. 2006. *API-LNAST Users Guide Version 1.5, 2006.*

Bondy, B. and Boehm, G. 2005. *Use of CPT-LIF Investigation Techniques and Advanced Data Visualization for Rapid and Effective Site Investigation.* Los Angeles Regional Water Quality Control Board Technical Speaker Series. March 2005.

Bondy, B. 2011a. *The Las Posas Basin Groundwater Puzzle: Piecing Together the Big Picture.* Association of Water Agencies of Ventura County Waterwise Breakfast Speaker Series. May 2011.

Bondy, B. 2011b. *Choosing the Appropriate Scale for Groundwater Management - Basin -Specific Planning within a Groundwater Management Agency.* 28th Biennial Groundwater Conference & 20th Groundwater Resources Association Annual Meeting. October 2011.

Bondy, B. 2012a. *Ventura County Brackish Groundwater Desalination: Salt Management and New Water Supply.* Association of Water Agencies of Ventura County Waterwise Breakfast Speaker Series. February 2012.

Bondy, B. 2012b, 2013, 2014, 2015, and 2016. *Ventura County Groundwater.* Association of Water Agencies of Ventura County Annual Fall Bus Tour.

Bondy, B. 2013a. *Development of Brackish Groundwater Resources in Ventura County.* American Groundwater Trust Alternative Water Resources for Southern California Conference. Ontario, California. February 2013.

Bondy, B. 2013b. *Calleguas MWD ASR Project.* Groundwater Resources Association of California Central Coast Quarterly Branch Meeting. Fall 2013.

Bondy, B. 2014a. *Yes, Geology is Important! – How Faults, Folds and a Creek Created Challenges for the Las Posas Basin Aquifer Storage and Recovery Project.* Groundwater Resources Association Conference on Groundwater Issues and Water Management – Strategies Addressing Challenges of Sustainability and Drought in California. March 2014.

Bondy, B. 2014b. *Understanding Groundwater* (*Groundwater 101).* Association of Water Agencies of Ventura County Annual Symposium. April 2014.

Bondy, B. 2015a. *Salinity Management Options for Agricultural Pumpers in the Las Posas Basin.* Association of Water Agencies of Ventura County Waterwise Breakfast Speaker Series. February 2015.

Bondy, B. 2015b. *Water: The Resource, New Realities and Solutions.* Panelist, Water Session of the Ventura County Agricultural Summit. September 2015.

Bondy, B. 2016. *Development of a Groundwater Pumping Allocation Methodology Under SGMA – An Early Success Story from the Las Posas Valley Basin.* American Groundwater Trust Everything Aquifers and Groundwater Management Conference. Ontario, California. February 2016.

Bondy, B. 2016. *Groundwater Sustainability Plan Regulations…The Good, the Bad, and the Ugly.* Association of Water Agencies of Ventura County Waterwise Breakfast Speaker Series. June 2015.

Wittman, G. and B. Bondy, 2004. *The Use of Computerized Groundwater Modeling to Design Capture Zone Well Array for the Perchlorate Remediation System in Zone 4 at the Stringfellow Superfund Site.* Groundwater Resources Association of California Perchlorate Symposium, Glendale, California. August 2004.

BONDY
Groundwater Consulting, Inc.

ATTACHMENT B

SCHEDULE OF FEES

ARROYO SANTA ROSA BASIN GROUNDWATER SUSTAINABILITY AGENCY

Category	Rate Fiscal Year 21/22	Rate Fiscal Year 22/23
Professional Services	$218/hr	$225/hr
Vehicle Mileage:	IRS Rate	IRS Rate
Expenses:	Cost Plus 10%	Cost Plus 10%