Groundwater Sustainability Commission
for the San Luis Obispo Valley Groundwater Basin

Agenda
April 10, 2019

NOTICE IS HEREBY GIVEN that the Groundwater Sustainability Commission for the San Luis Obispo Valley Groundwater Basin will hold a special meeting at **3:30 P.M. on Wednesday, April 10, 2019** at the San Luis Obispo City/County Library Community Room, 995 Palm Street, San Luis Obispo, CA 93401.

NOTE: In compliance with the Americans with Disabilities Act, if you need disability-related modifications or accommodations to participate in this meeting, please contact Joey Steil at (805) 781-4076. The Groundwater Sustainability Commission reserves the right to limit each speaker to three (3) minutes per subject or topic.

Adam Hill, Member, County of San Luis Obispo
Bob Schiebelhut, Chair, EVGMWC
Dennis Fernandez, Member, ERMWC/VRMWC
Mark Zimmer, Vice Chair, GSWC
Andy Pease, Member, City of San Luis Obispo

Bruce Gibson, Alternate, County of San Luis Obispo
George Donati, Alternate, EVGMWC
James Lokey, Alternate, ERMWC/VRMWC
Toby Moore, Alternate, GSWC
Aaron Floyd, Alternate, City of San Luis Obispo

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1. **Call to Order** (Chair)
2. **Roll Call** (City Staff: Mychal Boerman)
3. **Pledge of Allegiance** (Chair)
4. **Public Comment – Items not on Agenda** (Chair)
5. **Approval of Meeting Minutes** (Chair)
    a) December 12, 2018
6. **Overview of SGMA Compliance Efforts in the San Luis Obispo Valley Groundwater Basin** (County Staff: Dick Tzou)

    Recommendation

    a) Receive a summary update on the SGMA efforts in the San Luis Obispo Valley Groundwater Basin (SLO Basin).
7. **Consider Formation of a Stakeholder Advisory Committee** (City/County Staff: Dick Tzou/Mychal Boerman; Commission Members: Andy Pease and Dennis Fernandez)

    Recommendation

    a) Consider and approve proposed alternative approach to SAC formation.
8. **Groundwater Sustainability Plan (GSP) Development "Kickoff"** (WSC Consultant Team: Michael Cruikshank and Team)

    Recommendation

    a) Receive a presentation on the basin characterization recap, GSP team member roles and responsibilities, and project approach, scope of work, and schedule.

9. **Future Items** (Chair)
    a) Presentation on the draft Stakeholder Communication and Engagement (C&E) Plan
    b) Presentation on the platform options for an integrated flow model
    c) Next regular meeting on June 12, 2019.
10. **Adjourn** (Chair)

The following members or alternates were present:

Mark Zimmer, Vice Chairperson, GSWC
Dennis Fernandez, Member, ERMWC/VRMWC
Andy Pease, Member, City of San Luis Obispo
Adam Hill, Member, County of San Luis Obispo
George Donati, Alternate Member, EVGMWC

1. Call to Order	Vice Chair, Mark Zimmer, calls the meeting to order at 3:35 PM
2. Roll Call	City Staff, Aaron Floyd, calls roll. Chairperson, Bob Schiebelhut absent.
3. Pledge of Allegiance	Member, Pease, leads the Pledge of Allegiance
4. Public Comment – Items not on Agenda	Vice Chairperson Zimmer opens the floor for public comment on items not on the Agenda. • Carrie Mattingly, City Staff, announced her upcoming retirement as the Utilities Director for the City of San Luis Obispo, effective December 28, 2018. • A representative from a local automation company left contact information with the Commission.
5. Approval of Meeting Minutes	Member Pease motioned to approve the Regular Meeting minutes from June 13, 2018 and the Special Meeting minutes from July 26, 2018, and Member Hill seconded the motion.
6. Overview of SGMA Compliance Efforts in the San Luis Obispo Valley Groundwater Basin	County Staff, Carolyn Berg: Provided a brief overview of the key milestones and progress made towards SGMA compliance in the SLO Basin and applauded the group on their progress to date. Vice Chairperson Zimmer: opens the floor for public comment • None
7. Discussion on the Formation of a Stakeholder Advisory Committee	City/County Staff Aaron Floyd and Dick Tzou: Provided a presentation on the potential formation of a stakeholder advisory committee for the Groundwater Sustainability Commission. They recommended that the Commission designate one or two members to work with City and County staff to develop the structure and formation process for the stakeholder advisory committee. Various Commission members posed questions about the formation and function of a stakeholder advisory committee. By unanimous consensus, the commission appointed Commission Members Andy Pease and Dennis Fernandez to serve as representatives on the working group. City/County staff was tasked with further defining the roles of the Advisory Committee. Vice Chairperson Zimmer: opens the floor for public comment

	• None
8. Status Update on the Request for Proposal for the Groundwater Sustainability Plan (GSP)	City/County Staff Aaron Floyd and Dick Tzou; Alternate Member Toby Moore: Provided a status update on the Request for Proposals solicitation. The RFP solicitation period ended November 2, 2018 and one proposal was received. The consultant team was interviewed and deemed to be well qualified for the GSP work so the County is currently negotiating a contract. Vice Chairperson Zimmer: opens the floor for public comment • A member of the public wanted to know if the Request for Proposals was listed on the County's website.
9. Future Items	Vice Chairperson Zimmer: • GSP development kick-off with GSP Consultant • Further discussions on the formation of a Stakeholder Advisory Committee • Informal presentation by Cal Poly students regarding geophysics technologies to supplement groundwater basin characteristics • Next regular meeting on March 13, 2018
10. Adjourn	**Motion By:** Mark Zimmer **Second By:** Dennis Fernandez **Motion:** The Commission moves to adjourn the meeting at 4:24 PM

Members	Ayes	Noes	Abstain	Recuse
Mark Zimmer (Vice Chairperson)	X			
Dennis Fernandez (Member)	X			
Andy Pease (Member)	X			
Adam Hill (Member)	X			
George Donati (Alternate Member)	X			

DRAFTED BY: City Staff: Megan Wilbanks

GROUNDWATER SUSTAINABILITY COMMISSION
for the San Luis Obispo Valley Groundwater Basin
April 10, 2019

Agenda Item 6 – Overview of SGMA Efforts in the San Luis Obispo Valley Groundwater Basin
(Presentation Item)

Recommendation

a) Receive a summary update on the SGMA efforts in the San Luis Obispo Valley Groundwater Basin (SLO Basin).

Prepared By

Dick Tzou, County of San Luis Obispo

Discussion

The following summary highlights the key SGMA milestones for the SLO Basin to date:

- Groundwater Sustainability Agency (GSA) formations (County – 5/23/2017, City – 5/16/2017)
- Memorandum of Agreement (MOA) (Effective 1/25/2018)
- SLO Basin characterization study (1/18/2018)
- Grant award for the development of a Groundwater Sustainability Plan (GSP) (3/26/2019)
- Upcoming consultant contract execution for the development of a GSP (4/9/2019)

GSA Formations and MOA Adoption Background

In May 2017, both the City of San Luis Obispo (City) and the County of San Luis Obispo (County) each formed GSAs, resulting in full coverage of the SLO Basin. SGMA encourages that other entities participate as stakeholders even though the SLO Basin is fully covered by both GSAs. Representatives of other entities overlying the SLO Basin participated in developing the governance structure for the SLO Basin including the Golden State Water Company (GSWC), Edna Ranch Mutual Water Company (ERMWC), Varian Ranch Mutual Water Company (VRMWC), and Edna Valley Growers Mutual Water Company (EVGMWC). These entities have been engaging local stakeholders since 2015.

In January 2018, the County GSA, the City GSA, and the other eligible entities (i.e., GSWC, ERMWC, VRMWC, and VRMWC) listed above entered into a Memorandum of Agreement (MOA) that established the Commission (advisory body to the GSAs) and the terms under which the City GSA and County GSA will jointly develop a single GSP, in coordination with the Commission.

GSP Development Background

In December 2016, the County contracted with GSI Water Solutions Inc. to develop a groundwater basin characterization study. The study was finalized in January 2018 and helped to create a foundational understanding of the groundwater basin for the future GSP development process. A State Department of Water Resources Prop 1 Sustainable Groundwater Planning (SGWP) grant was awarded to the County of San Luis Obispo for development of GSPs for the SLO Basin and Santa Maria Basin. The County (acting as the contracting agent on behalf of the County and City GSAs) has successfully selected a consultant for the development of a GSP through its request for proposal (RFP) solicitation process. It is anticipated that on April 9, 2019, the County Board will execute a contract with Water Systems Consulting, Inc. to start off the GSP development efforts.

Attachment:

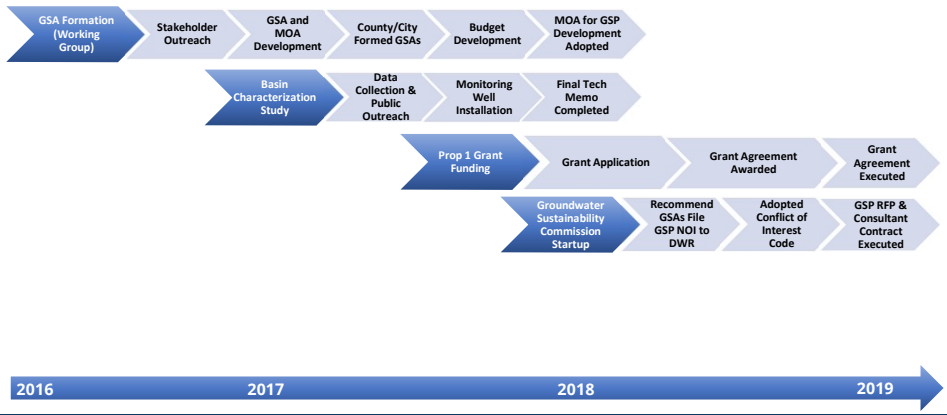
1.Presentation

Overview of SGMA Efforts in the San Luis Obispo Valley Groundwater Basin

April 10, 2019

Groundwater Sustainability Commission
for the San Luis Obispo Valley Basin

Overview of SGMA Milestones in the San Luis Obispo Valley Groundwater Basin



New **SLO Basin** Webpage at County's New Website Platform

https://www.slocounty.ca.gov/slobasin

GROUNDWATER SUSTAINABILITY COMMISSION
for the San Luis Obispo Valley Groundwater Basin
April 10, 2019

Agenda Item 7 – Consider the Formation of Stakeholder Advisory Committee (SAC) (Action Item)

Recommendation
a) Consider and approve proposed alternative approach to SAC formation:

Prepared By
Dick Tzou, County of San Luis Obispo
Mychal Boerman, City of San Luis Obispo

Discussion
On December 12, 2018, the Commission designated Commission Members, Andy Pease and Dennis Fernandez to join City and County staff as a working group to prepare recommendations regarding the structure and formation process of a stakeholder advisory committee (SAC) for the Commission and Groundwater Sustainability Agency (GSA) governing bodies to consider. The SAC could consist of representatives from any or all of the beneficial uses or users pursuant to Water Code Section 10723.2[1].

On March 13, 2019, the working group met with the selected consultant, WSC, Inc, to discuss the SAC formation process. WSC Inc's contract is anticipated to be approved and executed by the County Board of Supervisors on April 9, 2019. The working group discussed the various approaches to public involvement and engagement and how the Commission and GSAs would consider the interests of all beneficial uses and users through these efforts. County staff provided two examples of how other County basins are implementing their communication and engagement (C&E) plans either by utilizing the SAC approach or otherwise. For example, the Cuyama Basin GSA formed a Standing Advisory Committee to review all GSP materials and draft chapters, and then provide their recommendations to the GSA. As another example, the Paso Basin Cooperative Committee (PBCC) composed of various GSAs decided not to form a SAC to represent the various stakeholder interests. The PBCC relies on the individual GSAs in the Paso Groundwater Basin to represent their respective stakeholders and encourages all comments to be given during public meetings where all PBCCC members can hear, discuss, and respond in an open forum. However, the SLO Basin GSA governance structure is different from either of the two governance models mentioned above. Therefore, direct comparisons are difficult to make regarding the approach to SAC formation.

While it is required that the interests of all beneficial uses and users are to be considered (Water Code Section 10723.2[1], it is equally important that they are implemented in an efficient manner. The working group concluded that there is no need to form a SAC since the Groundwater Sustainability Commission (GSC) already functions as an advisory body and members of the GSC also represent many of the stakeholder interests in the basin. Therefore, the benefits of establishing another advisory committee consisting of the same interest groups as the GSC are diminished. However, the working group recommends that an active stakeholder list from various interest areas should be maintained, especially for those stakeholders who are not represented by the GSC members. All interested stakeholders will be kept well informed on the vetting process. Special attention and extra efforts will be devoted to communicating and helping the stakeholders to

[1] Water Code Section 10723.2 - "The groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater, as well as those responsible for implementing groundwater sustainability plans. …"

understand the GSP materials enabling them to provide meaningful feedback and comments by providing outreach literature and inviting them to attend various workshops and public meetings through emails and website postings and encouraging them to stay engaged in the decision-making process. The consultant ensured the working group that they will be able to develop a well thought out C&E plan including all the above activities without having to form a SAC. The plan will be informative, robust, and inclusive to involve the interests of all beneficial uses and users. The consultant team will provide more details of their C&E plan as part of their GSP scope of work presentation in a separate agenda item in the meeting.

The working group recommends that the GSC approve the proposed alternative approach described above rather than following the anticipated plan of establishing a SAC. The alternative approach is to: 1.) ensure that the GSC will provide an open forum for all interest stakeholders to participate, 2.) continue to develop a robust C&E plan without a SAC, and 3.) implement the plan and encourage all interested stakeholders to get involved through public workshops, meetings, outreach literature, online portal, and surveys. The consultant will work with the City and County staff to develop a stakeholder C&E plan to support the public outreach efforts and facilitate valuable stakeholder input for GSP development. It is anticipated that the GSAs and Commission may find benefit in establishing additional technical advisory committee or peer review team as development of the GSP progresses. However, the appointment of such groups would be discussed and determined as needs arise.

Attachment:

1. Presentation

Consider Formation of a Stakeholder Advisory Committee (SAC)

April 10, 2019

Groundwater Sustainability Commission
for the San Luis Obispo Valley Basin

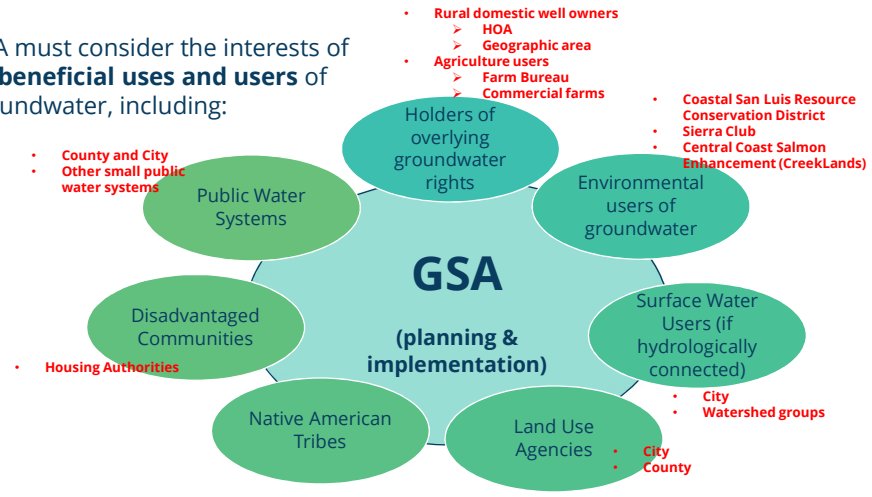
California Water Code

Section 10723.2. The groundwater sustainability agency **shall consider the interests of all beneficial uses and users of groundwater**, as well as those responsible for implementing groundwater sustainability plans. These interests include, but are not limited to, all of the following:

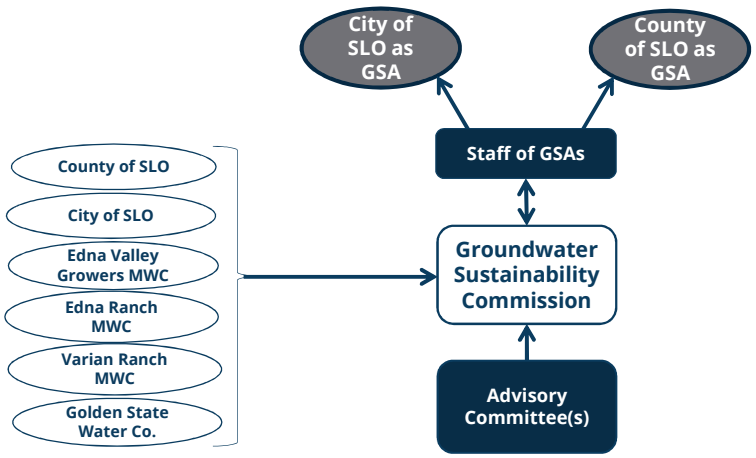
(a) Holders of overlying groundwater rights, including:
  (1) Agricultural users, including farmers, ranchers, and dairy professionals.
  (2) Domestic well owners.
(b) Municipal well operators.
(c) Public water systems.
(d) Local land use planning agencies.
(e) Environmental users of groundwater.
(f) Surface water users, if there is a hydrologic connection between surface and groundwater bodies.
(g) The federal government, including, but not limited to, the military and managers of federal lands.
(h) California Native American tribes.
(i) Disadvantaged communities, including, but not limited to, those served by private domestic wells or small community water systems.
(j) Entities listed in Section 10927 that are monitoring and reporting groundwater elevations in all or a part of a groundwater basin managed by the groundwater sustainability agency.

Who are the Users and the Uses?

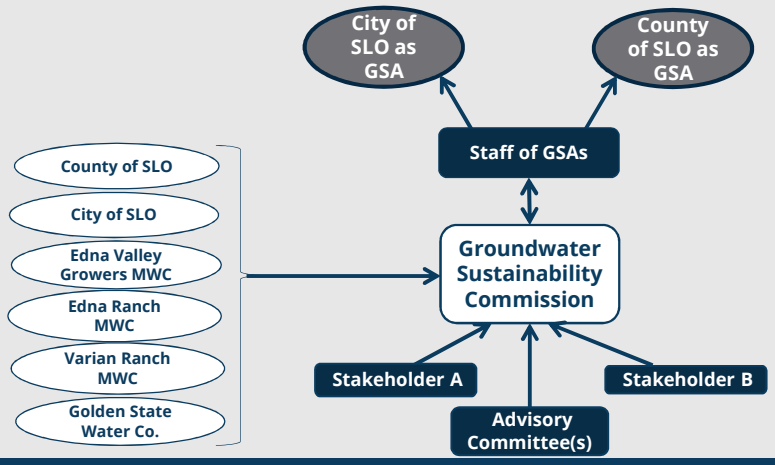
GSA must consider the interests of **all beneficial uses and users** of groundwater, including:



GSA Coordination Structure (Anticipated)



GSA Coordination Structure (Proposed)



Proposed Alternative Approach to Stakeholder Advisory Committee

- Ensure that the GSC will provide an open forum for all interest stakeholders to participate.
- Continue to develop a robust C&E plan without a stakeholder advisory committee.
- Implement the plan and encourage all interested stakeholders to get involved through public workshops, meetings, outreach literature, online portal, and surveys.

Recommendation

a) Consider and approve proposed alternative approach to SAC formation.

Thank you!

For more information, join our email list:
www.slocountywater.org/sgma

Groundwater Sustainability Commission
for the San Luis Obispo Valley Groundwater Basin

April 10, 2019

Agenda Item 8 - Groundwater Sustainability Plan (GSP) Development "Kickoff"
(Presentation Item)

Recommendation

a) Receive a presentation on the basin characterization recap, GSP team member roles and responsibilities, and project approach, scope of work, and schedule.

Prepared by

Michael Cruikshank, Water Systems Consulting, Inc.
David O'Rourke, GSI Water Solutions, Inc.

Discussion

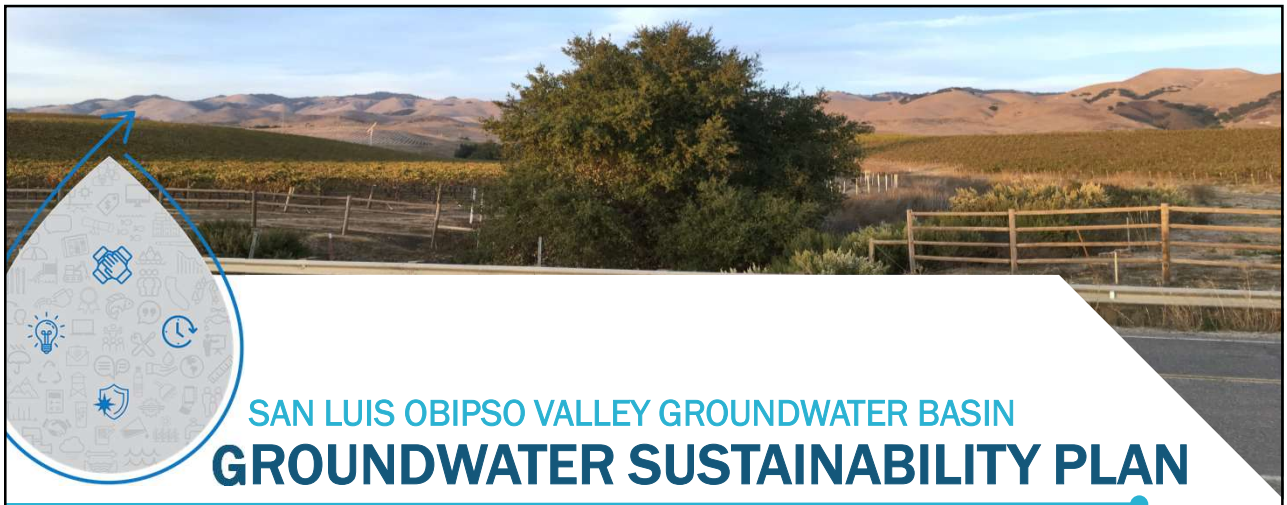
It is anticipated that Water Systems Consulting, Inc. (WSC) will be approved by the County Board of Supervisors on April 9, 2019 to develop the Groundwater Sustainability Plan (GSP) for the high priority San Luis Obispo Valley Groundwater Basin (SLO Basin) on behalf of the two Groundwater Sustainability Agencies (GSAs) formed by the County and City of San Luis Obispo. The Groundwater Sustainability Commission (GSC), made up of representatives from the GSAs and participating partners, will collaboratively participate in the development of the GSP. The GSP must be compliant with the Final GSP Emergency Regulations approved by the California Water Commission and outline a clear, supported, and sustainable path forward to address declining groundwater conditions.

WSC, has partnered with GSI Water Solutions, Inc. (GSI), Cleath Harris Geologists, (CHG) GEI Consultants Inc. (GEI), and Stillwater Sciences (Stillwater) to bring the right combination of technical and stakeholder facilitation expertise to help develop a compliant and defensible plan that will provide the greatest value to the SLO Basin GSAs and GSC participating partners.

The WSC team will present a summary of the related work previously completed by GSI for the Basin Characterization Study. This work will be incorporated into the GSP analysis. The GSP team member roles and responsibilities, project approach and scope of work, and schedule will also be summarized in this presentation, which is included in Attachment 1. WSC's full scope of work is provided as Attachment 2.

Attachments:

1. Presentation
2. GSP Scope of Work



SAN LUIS OBIPSO VALLEY GROUNDWATER BASIN

GROUNDWATER SUSTAINABILITY PLAN

Groundwater Sustainability Commission Meeting
April 10, 2019

AGENDA

- Team Member Roles & Responsibilities
- Stakeholder Communication and Engagement Plan
- Data Management System
- SLO Basin Characterization
- Integrated Groundwater Surface Water
- Schedule

WSC
Water Systems Consulting, Inc.

TEAM MEMBER ROLES & RESPONSIBILITES

WSC
Water Systems Consulting, Inc.

OUR TEAM MEMBERS







Experienced in Facilitating Collaboration

Unparalleled Knowledge of the Basin and its stakeholders

Lessons Learned from developing GSPs for critically over-drafted basins

Experts in SGMA

Simplified GSP Outline

1. Introduction to SLOVB GSP
2. Agency Information (§ 354.6)
3. Description of Plan Area (§ 354.8)
4. Hydrogeological Conceptual Model (§ 354.14)
5. Groundwater Conditions (§ 354.16)
6. Water Budget (§ 354.18)
7. Sustainable Management Criteria (§ 354.22-354.30)
8. Monitoring Networks (§ 354.34)
9. Projects and Management Actions (§ 354.44)
10. Implementation Plan
11. Notice and Communications (§ 354.10)
12. Interagency Agreements (§ 357.2-357.4)
13. References

WSC
Water Systems Consulting, Inc.

5

PATHWAY TO SUSTAINABILITY

ADDRESSING THE SIX UNDESIRABLE RESULTS

Chronic Lowering of Groundwater Levels

Water Quality Degradation

Reduction of Groundwater Storage

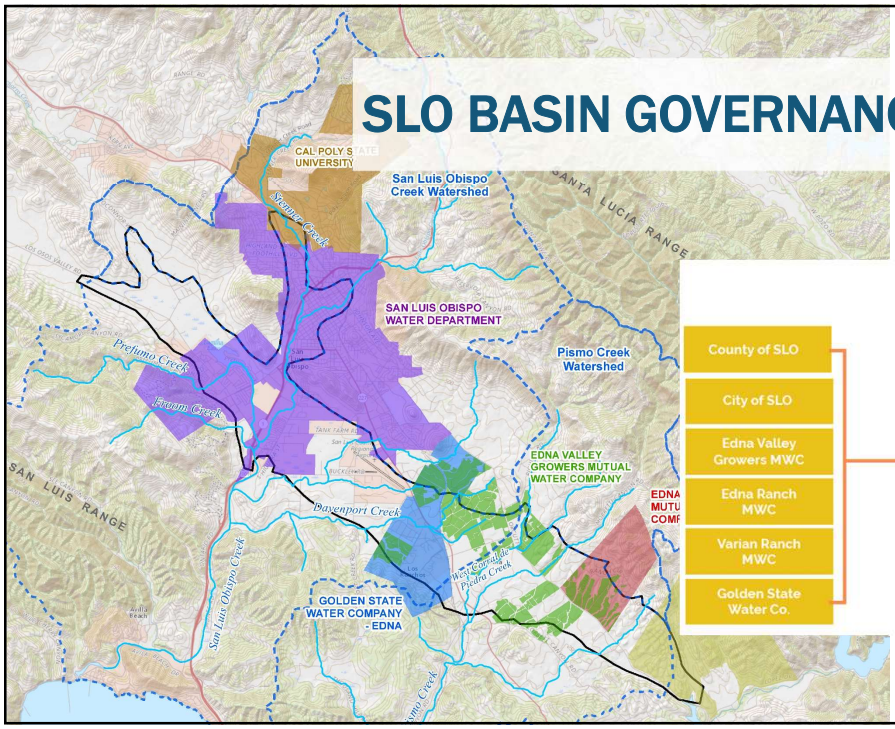
Interconnected Surface Water Depletions

Land Subsidence

Seawater Intrusion

6

SLO BASIN GOVERNANCE STRUCTURE



PROJECT APPROACH

BUILD TRUST THROUGH CLARITY, CONSISTENCY, AND INVOLVEMENT

PHASE 1
FACT REPORTING AND EDUCATION

- GSP Kickoff
- C& E Plan
- Plan Area and Basin Setting: Hydrogeologic Conceptual Model, Current Historical GW Conditions, and Water Budget
- Groundwater Model Development
- Data Management System

March 2019 to August 2020

PHASE 2
SUSTAINABLE GOAL SETTING

- Sustainable Management Criteria: Management Areas
- Sustainability Goal, Measurable Objectives, Minimum Threshold, and Undesired Results

January 2020 to July 2020

PHASE 3
PLAN TO SUSTAINABILITY

- Projects and Management Actions to Achieve Sustainability: Projects and Management Actions
- Plan Implementation: Estimate Costs and Schedule

June 2020 to February 2021

PHASE 4
GSP DOCUMENTATION

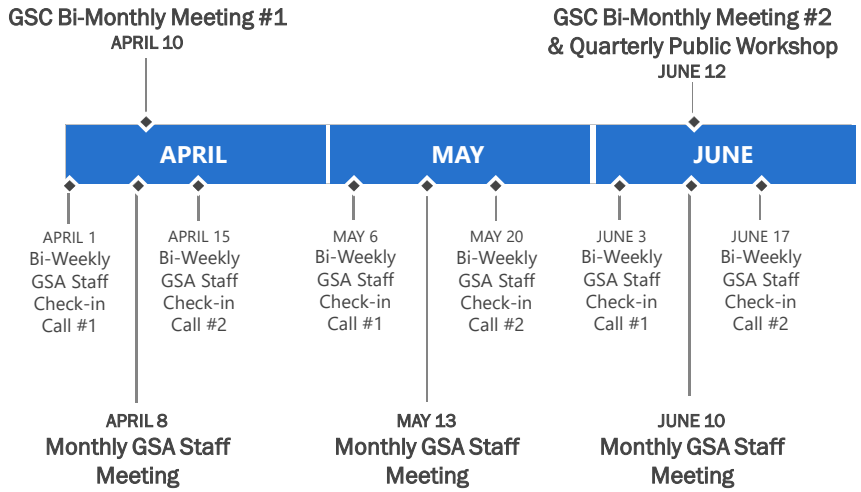
- Administrative Draft GSP
- Final GSP

October 2020 to August 2021

DEFENSIBLE PLAN

8

STRATEGIC MEETINGS & OUTREACH



GSA STAFF MEETINGS
(2ND Monday of the Month)

GSA STAFF CALLS
(1ST + 3ND Monday of the Month)

GSC MEETINGS
(2ND Wednesday of the Month)

GSC MEETING SUMMARY BROCHURE
(Last Monday of the Month)

PUBLIC WORKSHOP MEETINGS
(2ND Wednesday of the Month)

9

10

STAKEHOLDER COMMUNICATION AND ENGAGEMENT PLAN

- Objectives of C&E Plan (from proposal)
  - Meet engagement requirements of SGMA and the GSP Regulations
  - Remain consistent with DWR's Stakeholder and Engagement Guidance Document
  - Provide a roadmap to maximize stakeholder engagement while keeping costs within budget.

WSC Water Systems Consulting, Inc.

ALL PRESPECTIVES MUST BE HEARD AND CONSIDERED

- Groundwater rights holders
- Public water systems
- Local land use planning agencies
- Environmental users
- Surface water users
- Disadvantaged communities
- Public

WSC Water Systems Consulting, Inc.

SHARED GOAL

A sustainably managed groundwater basin that supports our way of life.

STRATEGIC PROJECT COMMUNICATIONS

PROMOTES SUPPORT AND UNDERSTANDING

- Summarizes key issues
- Documents decisions
- Adjustable for councils, city advisors, and agencies' staff

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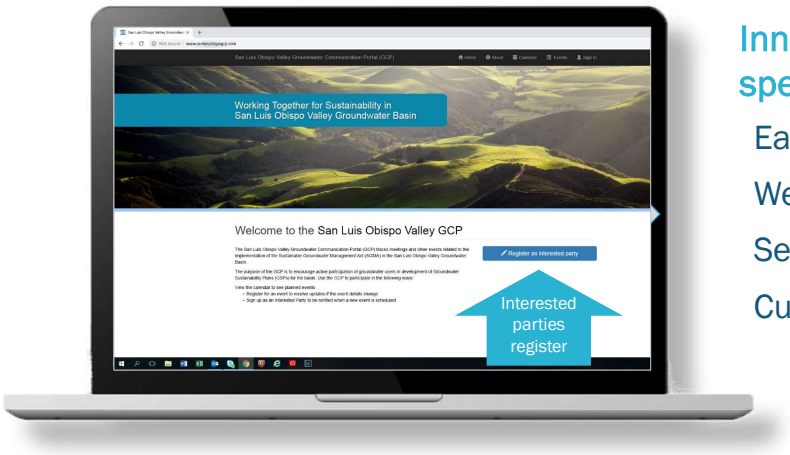
GROUNDWATER COMMUNICATIONS PORTAL

INCREASES PUBLIC ACCESSIBILITY

GROUNDWATER COMMUNICATIONS PORTAL

STREAMLINES THE PROCESS



Innovative tool developed specifically for SGMA

- Easy to use
- Web-based
- Secure
- Customizable

DATA MANAGEMENT SYSTEM

WSC
Water Systems Consulting, Inc.

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Data Management System

County-wide web-based DMS that meets requirements of SGMA

- Coordinate with San Luis Obispo County to integrate into their system
- How will integrate data from existing SGMA DMS in Atascadero Basin and Paso Robles Basin
- How collect data from SLO Valley Basin agencies that support the development of the GSP for inclusion in SLO Basin portion of DMS

WSC
Water Systems Consulting, Inc.

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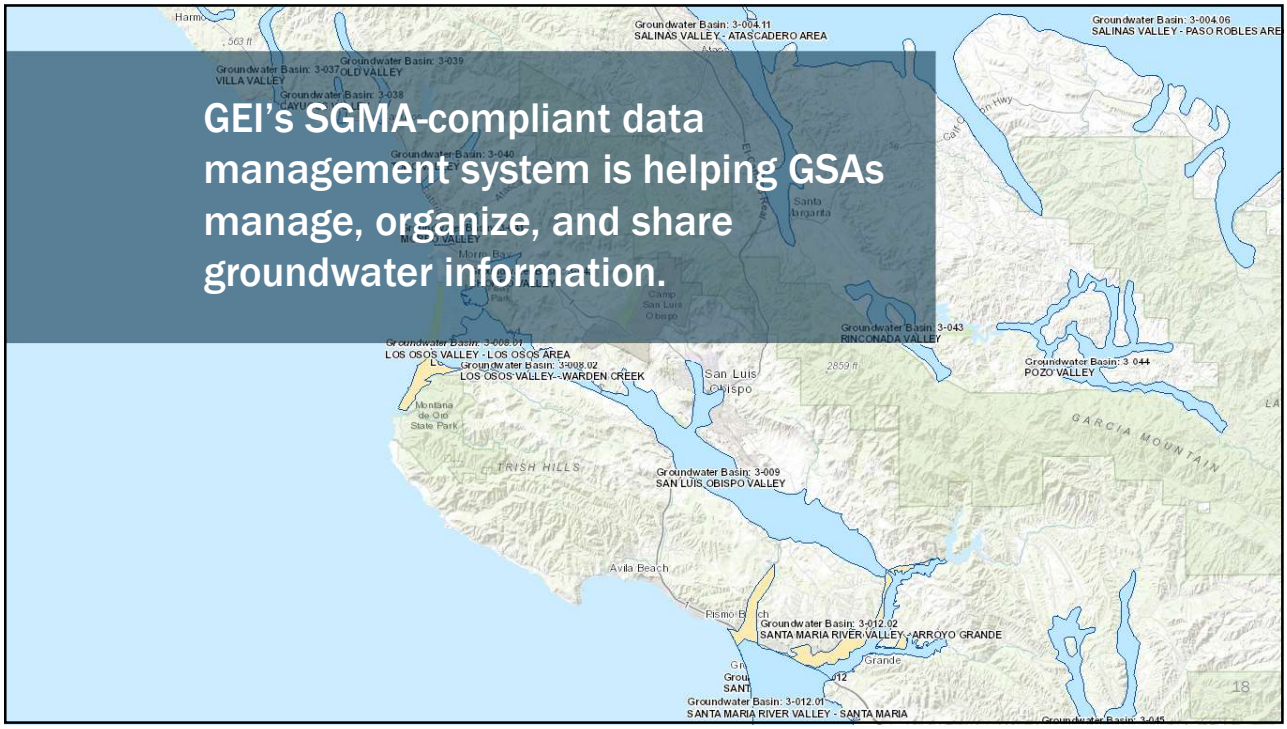

DMS ROADMAP

PLANNING PROCESS

- Data Management Plan
- Needs assessment
- Scope
- Schedule

GATHER DATA & DESIGN DATABASE

- Data schema
- Access database
- Data gathering
- Use tools to check and clean-up data
- Select high-quality data
- Normalize select data

IMPORT DATA

- Import the data that the GSP relies upon
- Only bring in high-quality data

DEVELOP VIEWER

- Same schema as Access database
- Include form for agencies to upload data
- Repeat process for enhancing system – adding more data, new features, etc.

19

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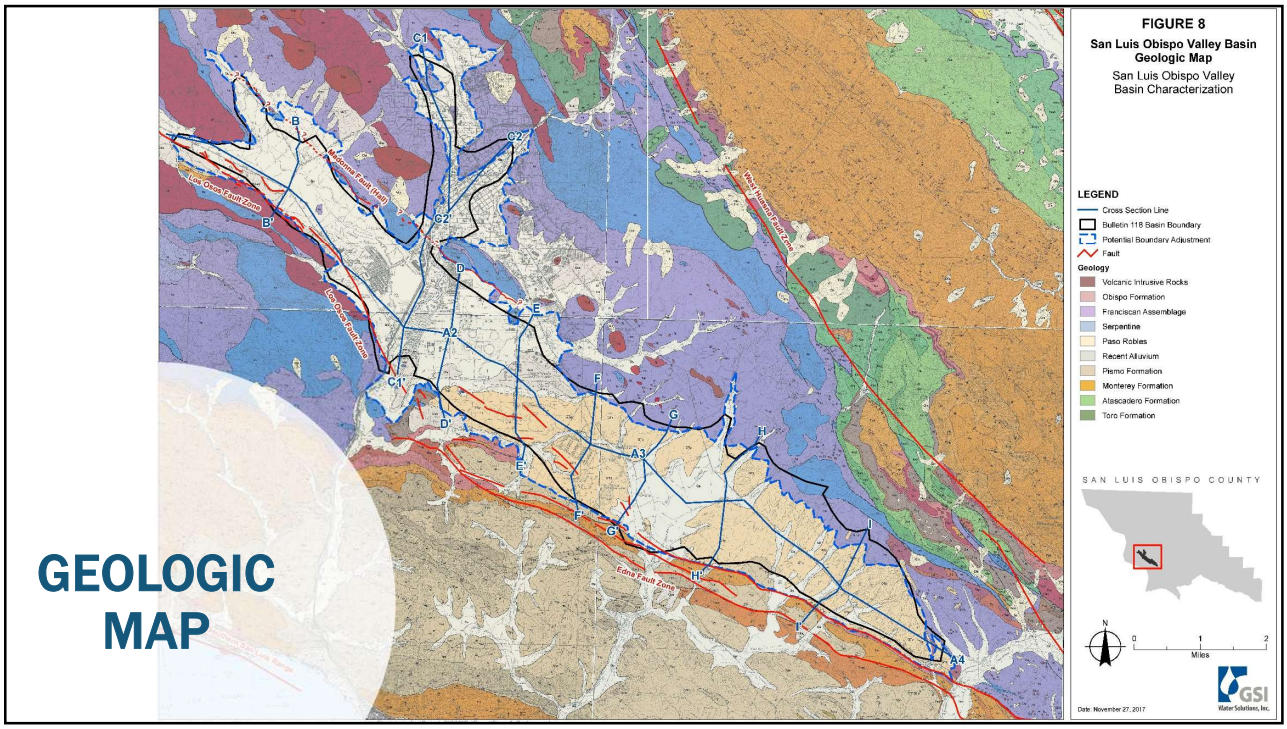
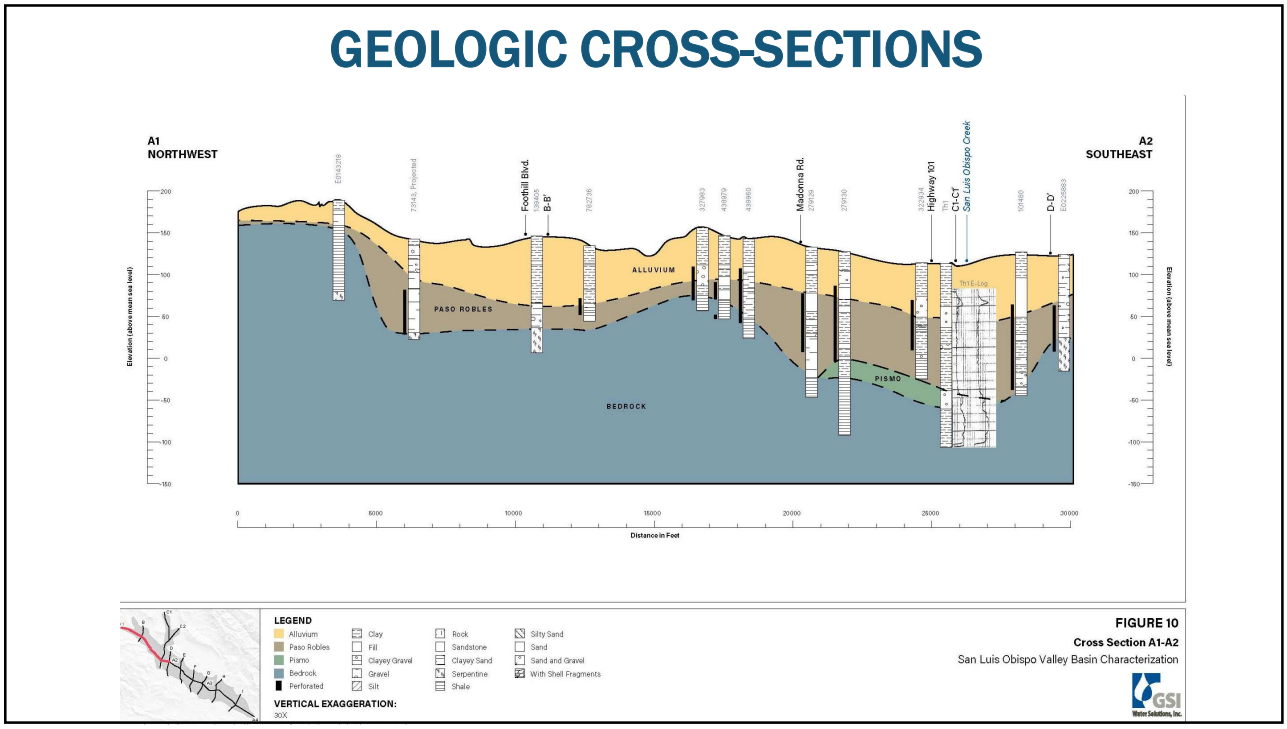
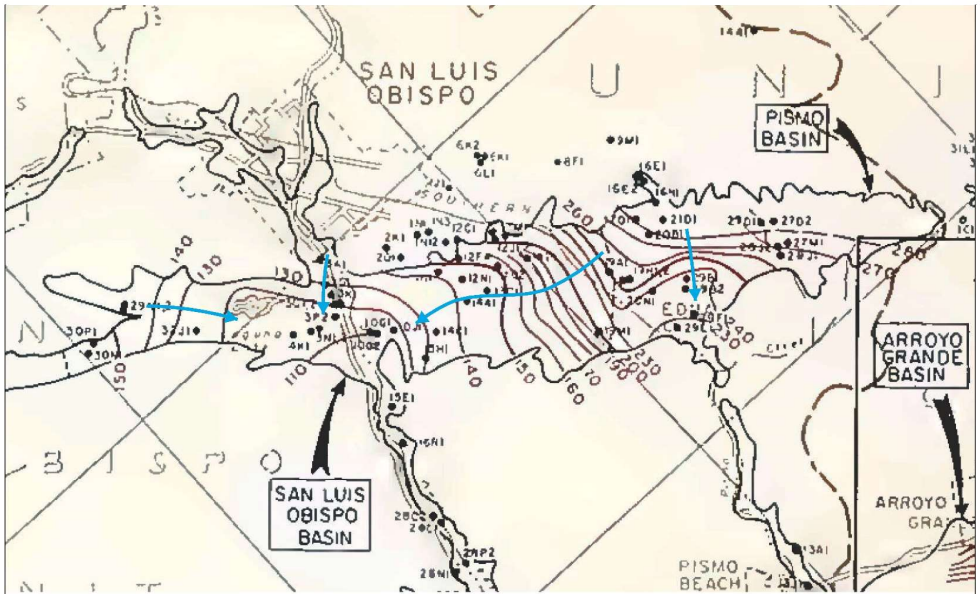
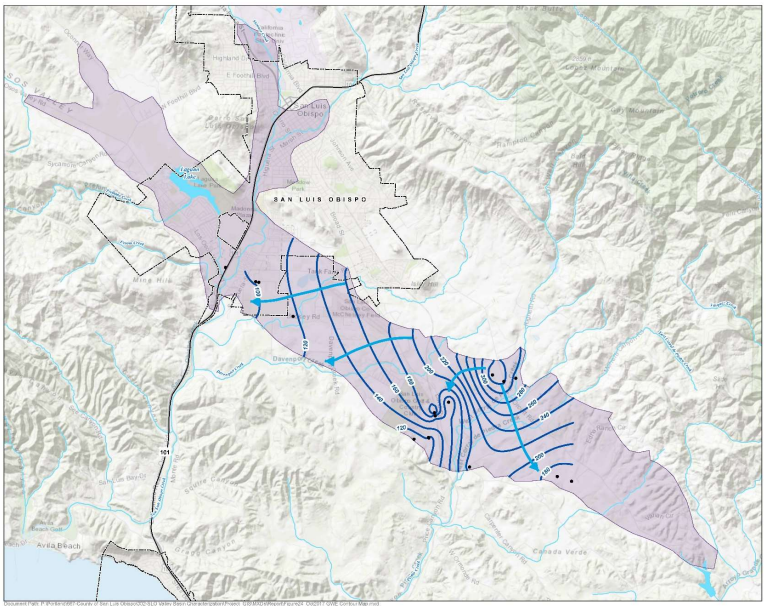

GEOLOGIC MAP
FIGURE 8
San Luis Obispo Valley Basin Geologic Map
San Luis Obispo Valley Basin Characterization
LEGEND
Cross Section Line
Bulletin 118 Basin Boundary
Potential Boundary Adjustment
Fault
Geology
Volcanic Intrusive Rocks
Obispo Formation
Franciscan Assemblage
Serpentine
Paso Robles
Recent Alluvium
Pismo Formation
Monterey Formation
Atascadero Formation
Toro Formation
SAN LUIS OBISPO COUNTY
Miles
Date: November 27, 2017
Los Osos Fault Zone
Madonna Fault Zone
West Huasna Fault Zone
Edna Fault Zone


GEOLOGIC CROSS-SECTIONS
A1
NORTHWEST
A2
SOUTHEAST
Foothill Blvd.
Madonna Rd.
Highway 101
San Luis Obispo Creek
ALLUVIUM
PASO ROBLES
PISMO
BEDROCK
Elevation (above mean sea level)
Distance in Feet
LEGEND
Alluvium
Paso Robles
Pismo
Bedrock
Perforated
Clay
Fill
Clayey Gravel
Gravel
Silt
Rock
Sandstone
Clayey Sand
Serpentine
Shale
Silty Sand
Sand
Sand and Gravel
With Shell Fragments
VERTICAL EXAGGERATION:
FIGURE 10
Cross Section A1-A2
San Luis Obispo Valley Basin Characterization

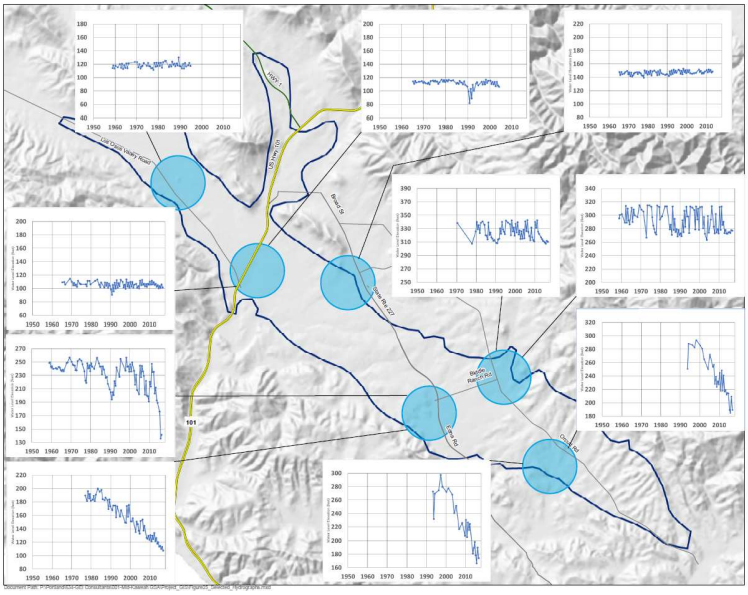
HYDROGEOLOGIC SETTING – WATER LEVELS 1954



HYDROGEOLOGIC SETTING – WATER LEVELS 2017



HYDROGEOLOGIC SETTING – HYDROGRAPHS



HYDROGEOLOGIC SETTING – WATER BUDGET

	DWR (1958)	Boyle (1991)	DWR (1997 Draft) 1
Recharge	2,250	3,650	4,560
Groundwater in Storage	67,000	69,900	46,700 – 55,800
Groundwater Pumpage	1,900	5,690 – 7,810	4,380 – 7,640
Sustainable Yield	2,000	5,900	6,000-7,000
1) The 1997 DWR Report was only issued in Draft form.			

INTEGRATED GROUNDWATER / SURFACE WATER MODEL

- The WSC Team will evaluate various coupled groundwater/surface water model platforms
- An appropriate model platform will be selected and recommended for final approval
- Important tool to evaluate the Interconnected Surface-Water Depletions Sustainability Indicator

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INTEGRATED GROUNDWATER / SURFACE WATER MODEL

- WSC Team will review available data
- Develop a TM to evaluate the appropriate model platform and provide a recommendation to staff
  - Conceptual Model
    - Groundwater and Surface-water FLOW (GSFLOW)
    - MODFLOW- One Water Hydrologic Model (OWHM)
    - Custom coupling of surface-water and groundwater standalone models
- Draft TM to GSC Staff -- May 13th
- Presentation at GSC Meeting -- June 12th

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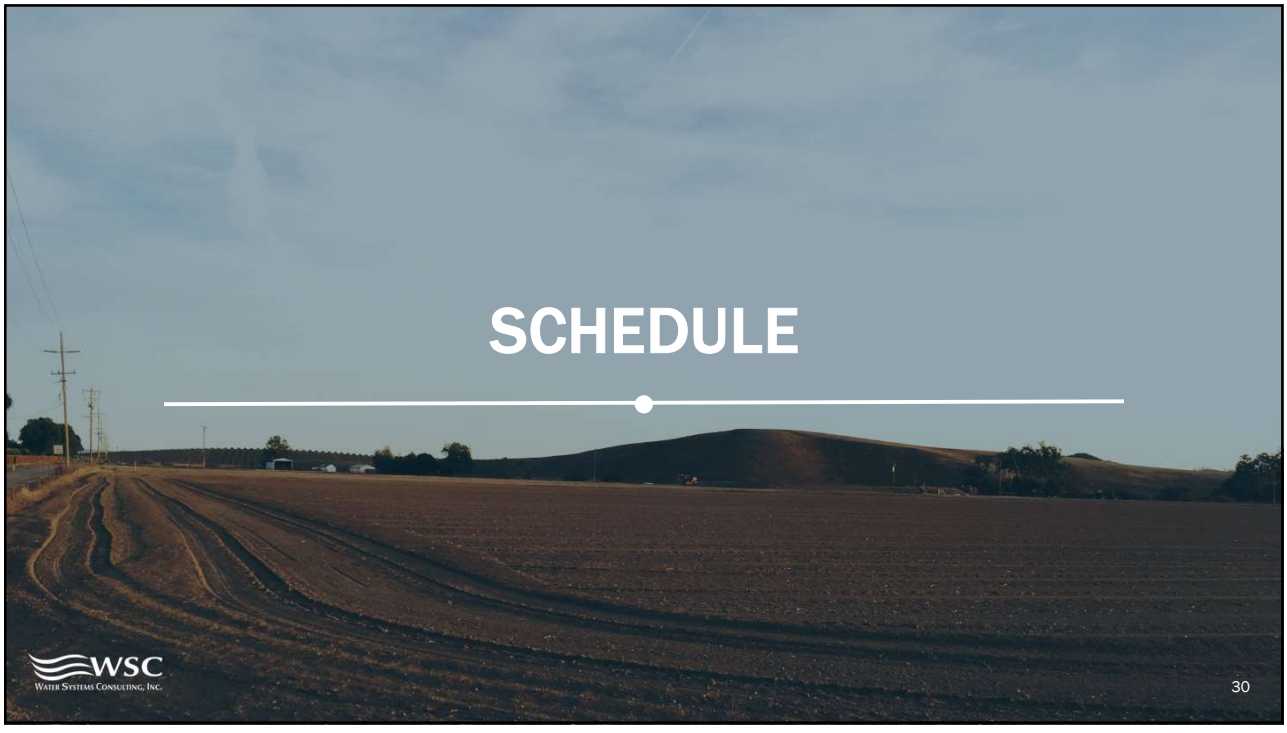
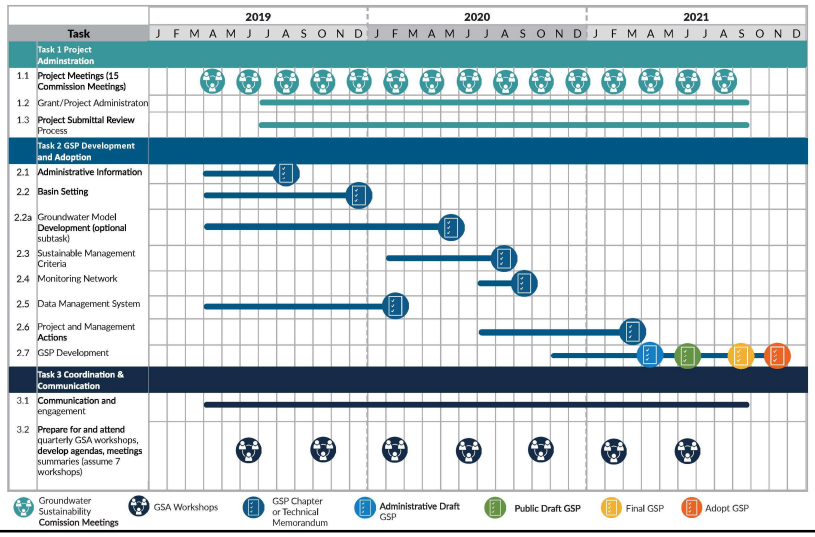


PROJECT SCHEDULE



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WORK PLAN/ TECHNICAL SERVICES

Our experienced and multi-disciplinary team understands groundwater sustainability from every aspect—technical, funding, governance, and stakeholder involvement. As a partner, we will work with the Groundwater Sustainability Commission (GSC) and basin stakeholders to deliver understandable explanations of complex hydrogeologic concepts and apply our knowledge of SGMA requirements to develop practical and effective strategies that achieve sustainable groundwater management in the most cost-effective and practical manner possible.

The following section details our team's approach to leading the development of a supported, defensible GSP.

We take a science-based approach to water resource planning.

Decisions about water resources planning can be contentious, and the best way to ensure fairness is to rely on sound science and unbiased, fact-based reasoning. Our team includes the preeminent experts on the hydrogeology of the San Luis Obispo Valley Groundwater Basin (SLO Basin). Paul Sorensen and Tim Cleath both have been working in the region for three decades and have built their careers on their dedication to an unbiased, science-based approach to water resources management. Their extensive history in the basin and unparalleled knowledge of the area's hydrogeology will frame our recommendations and shape discussions with stakeholders, and help interested parties achieve consensus.

We believe that building strong relationships and trust are key to achieving consensus on a GSP.

We will work with the Commission and its stakeholders with the goal of developing a shared understanding of basin conditions and building consensus on sustainability goals and criteria. This collaborative approach will result in a flexible and adaptive groundwater management framework that provides maximum business certainty for agricultural interests. A strong communication and engagement plan is vital for the GSP process to be a success. WSC brings unique strategic communications capabilities and GEI has a custom-built online communications portal designed specifically with the GSP process in mind. WSC's strategic communications team will use the innovative GCP tool to engage stakeholders throughout the development of the GSP, and to fulfill SGMA's reporting requirements.

We understand that cost is critical.

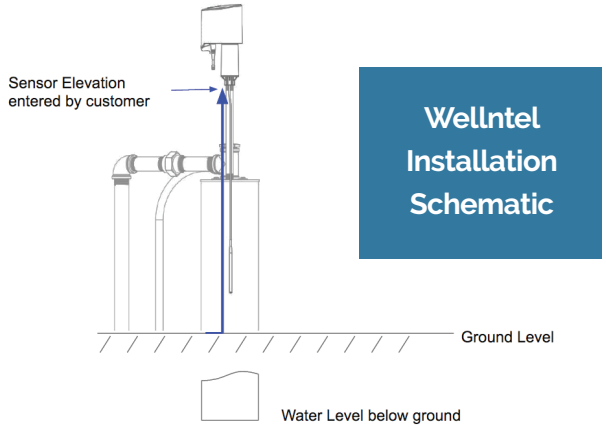
We will be developing a planning document, not conducting a new study. A GSP must meet Department of Water Resources (DWR) regulations, but it need not be exhaustive or overly detailed. Our approach is to develop a right-sized GSP — compliant and defensible without getting mired in unnecessary detail. As DWR SGMA program manager Trevor Joseph put it: "Perfection is the enemy of groundwater management." Our team will control costs by relying on the extensive body of existing groundwater data and previous work completed by GSI to the maximum extent possible. Team members from GSI, led by Paul Sorensen and Dave O'Rourke, completed the SLO Basin Characterization Report that will serve as the basis for Task 2.2: Basin Setting. Their extensive familiarity with this work and the hydrogeologic investigations that led up to it will enable us to hit the ground running without ramp-up time.

CAPABILITY TO DEVELOP ADVANCED AND INNOVATIVE TECHNIQUES

The WSC team provides cutting edge expertise in the development and utilization of advanced and innovative techniques in the groundwater industry. In the following pages of the approach section of this proposal, we describe how we will use innovative tools and techniques to maximize their impact for the GSP development and implementation. Here are a few examples of such techniques.

GROUNDWATER MONITORING

The manual data collection programs currently performed by the City and County are important, but monitoring is performed manually and only twice a year. This program could be enhanced through the use of automated data collection and transmission using technology such as that offered by the Wellntel© Groundwater Information System, or equivalent technology. Wellntel is a groundwater information system that combines acoustic measurement technology, remote telemetry, and a cloud platform to collect accurate, consistent, and reliable groundwater-level measurements. The technology provides greater data density faster and cheaper than the current program. This technology could be installed on wells, reducing or possibly eliminating the need to drill new monitoring wells.



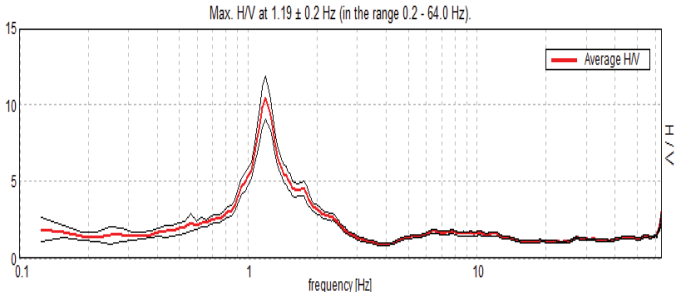
Wellntel Installation Schematic

STAKEHOLDER OUTREACH

The power of the internet can be leveraged to provide increased public accessibility to data, programs, comments, and information through a customized GCP to be developed by GEI. The GCP will be used over the lifetime of the GSP implementation for access to technical documents, meeting agendas and summaries, calendar of events, email blasts, stakeholder surveys, public comments, and more. WSC's strategic communications team will use the GCP platform to effectively educate and engage all stakeholders an interested parties with simple to understand content and graphics.

GEOPHYSICAL EXPLORATION

CHG has expertise in passive seismic geophysical exploration to enhance subsurface definition, should the stakeholders find this desirable. The horizontal to vertical spectral ratio (HVSR) passive seismic geophysical method provided by CHG relies on the observation that all materials in nature have a natural resonance frequency. By analyzing the amplitude and frequencies of vibrations at ground surface, the depths and general composition of layers can be modeled to provide insight into subsurface conditions. The HVSR method can be valuable for several reasons. The first is that it is relatively unaffected by conditions that may preclude other geophysical methods. No cables or lines along the ground are required for the HVSR method, which reduces the operational impacts that other geophysical methods can have.



Example HVSR spectral output – prominent peak corresponds to base of permeable sediments.

WATER ACCOUNTING FRAMEWORK

Many variations of water accounting frameworks have been proposed in different Basins throughout the state. The WSC team will survey systems in place throughout the state and work with the GSC to utilize the most innovative approaches, customized for specific requirements of SLO Basin and the GSC, and potentially coupled with the Data Management System and GCP to leverage a system with the simplest and most understandable approach for the Basin stakeholders.

TASK 1: PROJECT ADMINISTRATION

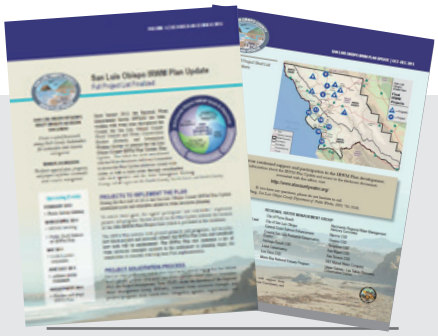
TASK 1.1: PROJECT MEETINGS

KICKOFF MEETING

The WSC Team will plan, schedule, conduct, and document a project kickoff meeting at a GSC meeting with representatives from the County, City, GSC members, other interested stakeholders, and key staff from the WSC Team. The purpose of the kickoff meeting will be to make introductions, review the overall project objectives and scope of work, discuss project schedule and budget, and review roles and responsibilities. A GSP-annotated outline detailing the sections of the report that each team member is responsible for will be provided for County, City and GSC review.

REGULARLY SCHEDULED MEETINGS

Based on the WSC Team members extensive experience in the SLO Valley Basin, we are proposing an accelerated schedule to complete the GSP in about two (2) years corresponding to fifteen (15) GSC Meetings from the project kick-off meeting to the adoption of the GSP (See table). In addition to the bi-monthly GSC meetings, the WSC Team anticipates monthly meetings with GSC Staff or Memorandum of Agreement (MOA) parties. The bi-monthly GSC meetings will continue to occur on the second Wednesday from 3:30 to 5:30 p.m. and staff meetings on the second Monday of every month. Public workshops will be held as necessary on a quarterly basis following the regular bi-monthly GSC meeting at night to allow for increased public engagement. See Task 3: Coordination and Communication for a more detailed description.



The WSC Team will develop agendas, presentation materials with write-ups on key discussion points to be included in the agenda packet prior to the meetings, and summaries of key issues and decisions for each GSC meeting. A brochure, similar to the SLO County Integrated Regional Water Management (IRWM) Plan, will be created at the conclusion of each GSC meeting and will be distributed through the Groundwater Communication Portal, which is described in Task 3.

Repeated Quarterly Schedule

	Month 1	Month 2	Month 3
Staff MOA Meetings (2nd Monday of month)	✓	✓	✓
Management Staff MOA Calls (1st and 3rd Monday of month calls)	✓	✓	✓
GSC Meetings (2nd Wednesday of month)	✓		✓
GSC Meeting Summary Brochure (Last Monday of month)	✓		✓
Public Workshop Meetings (2nd Wednesday of month)	✓		

Regular communication and meetings with stakeholders keeps everyone updated on the progress of the project, and provides opportunities to make amendments and direct work flow towards a defensible plan.

- Public Workshop meetings occur once every quarter following a Commission meeting on the 2nd Wednesday of that month from 7:00pm – 8:00 pm. Public workshops will be announced at the beginning of the month in which they will occur.
- Commission meetings occur on the 2nd Wednesday every other month from 3:30 pm – 5:30 pm.
- Staff MOA meetings occur every month on the 2nd Monday of every month from 10:00 am – 11:00 am.

In addition to the monthly MOA party meetings, the Project Manager and Assistant Project Manager will participate in as-needed bi-weekly one-hour conference calls with the MOA parties to: 1) provide updates on GSP progress, present interim results, review data needs, discuss project related methodologies, and discuss topics of interest as the GSP progresses.

TASK 1.1 DELIVERABLES

- Proposed work plan, budget, and schedule of meeting dates.
- Periodic project briefings agendas and summaries.
- Agendas and presentation materials.

TASK 1.2: GRANT/PROJECT ADMINISTRATION

PROJECT ADMINISTRATION

The WSC Project Manager will provide oversight, manage communication, assign resources, and coordinate work efforts of the Consultant Team (WSC, GSI, GEI, CHG, Stillwater) to align with the GSP priorities and achieve cost-effective performance.

- Maintain and monitor the master program schedule. Monitor scope, including tracking approved out of scope work.
- Administer subcontracts.
- Prepare monthly invoices and progress reports to the County.

GRANT ADMINISTRATION

The WSC Team understands that the County will provide grant administration services and be the point of contact to DWR. The monthly invoices and clear, concise progress reports generated by WSC will assist the County in developing the quarterly invoices and progress reports to DWR.

The WSC Team will assist the County and City to prepare a draft Project Completion Report in accordance with DWR specifications. The project Completion Report is no later than 90 days after work completion.

TASK 1.2 DELIVERABLES

- Monthly Progress Reports and invoices to DWR.
- Grant/Project Completion Report.

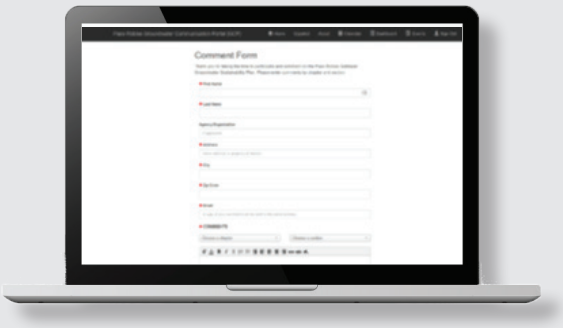
TASK 1.3: PROJECT SUBMITTAL REVIEW PROCESS

The WSC Team will utilize the GCP developed by GEI to collect public comments on draft GSP chapters into a database for easy tracking and sorting. The GCP's public comment module facilitates the collection and management of public comments on the draft GSP. Comments are entered by interested parties online via a user-friendly web form arranged by GSP Chapter and Section. The comments are collected in a database and provided to the GSA for review and response. Comments can be easily sorted by management area, GSP Chapter and Section, or by commenter. This allows more time to be spent reviewing and considering the comments rather than arranging and managing the comments. While an attachment feature will be available, interested parties are encouraged to enter comments by Chapter and Section to receive detailed responses.

TASK 1.3 DELIVERABLES

- Spreadsheet for tracking QA/QC reviews.

Innovative Approach



THE GCP STREAMLINES THE COMMENT PROCESS

The GCP's public comment module enables interested parties to submit their comments through a user-friendly web form. The comments are stored in a database and arranged by GSP chapter to facilitate responses and streamline the reporting process.

TASK 2: GSP DEVELOPMENT & ACTION

TASK 2.1: ADMINISTRATIVE INFORMATION

The GSP introduction section presents overview information to address the SGMA requirements including:

- Description of the GSP purpose (i.e. Executive Summary).
- Agency information (i.e., organization of the Committee and its legal authority).
- Description of how the GSP is organized and the preparation checklist for GSP submittal.
- Stakeholder Communication and Engagement Plan.

Our team will work with the Committee to develop this required information. Where possible, this information may be provided to the GSAs to minimize the GSP development costs.

This task includes preparation of agendas and presentation materials for meetings and workshops, as needed.

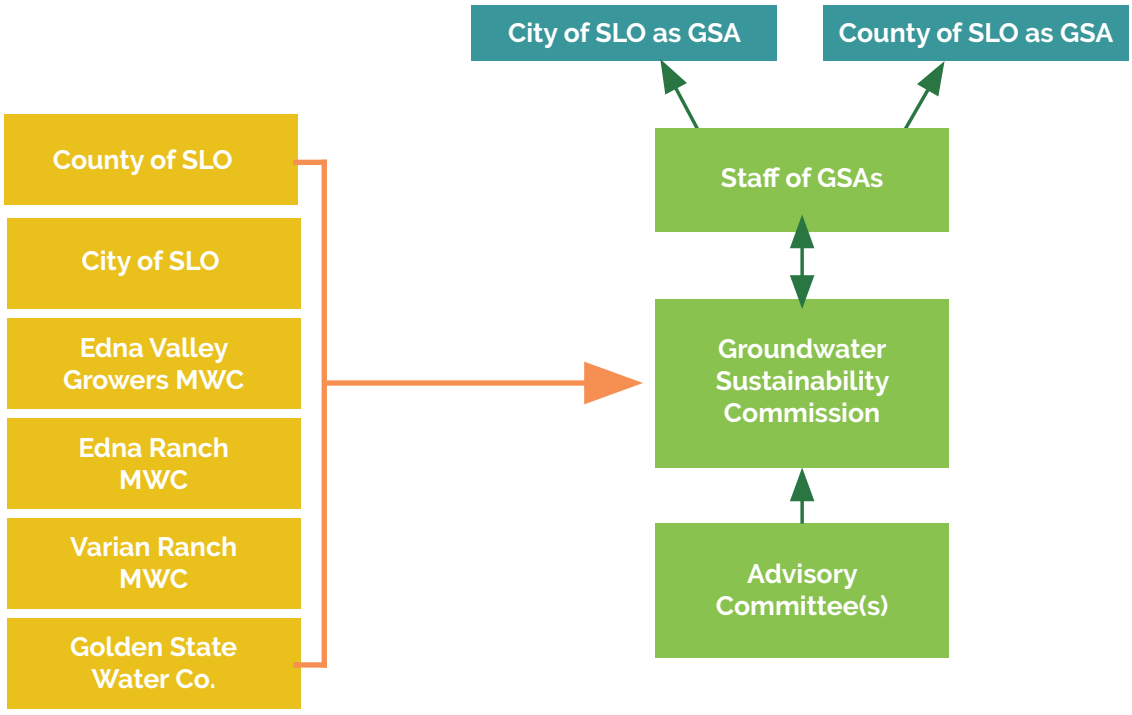
a) General Information

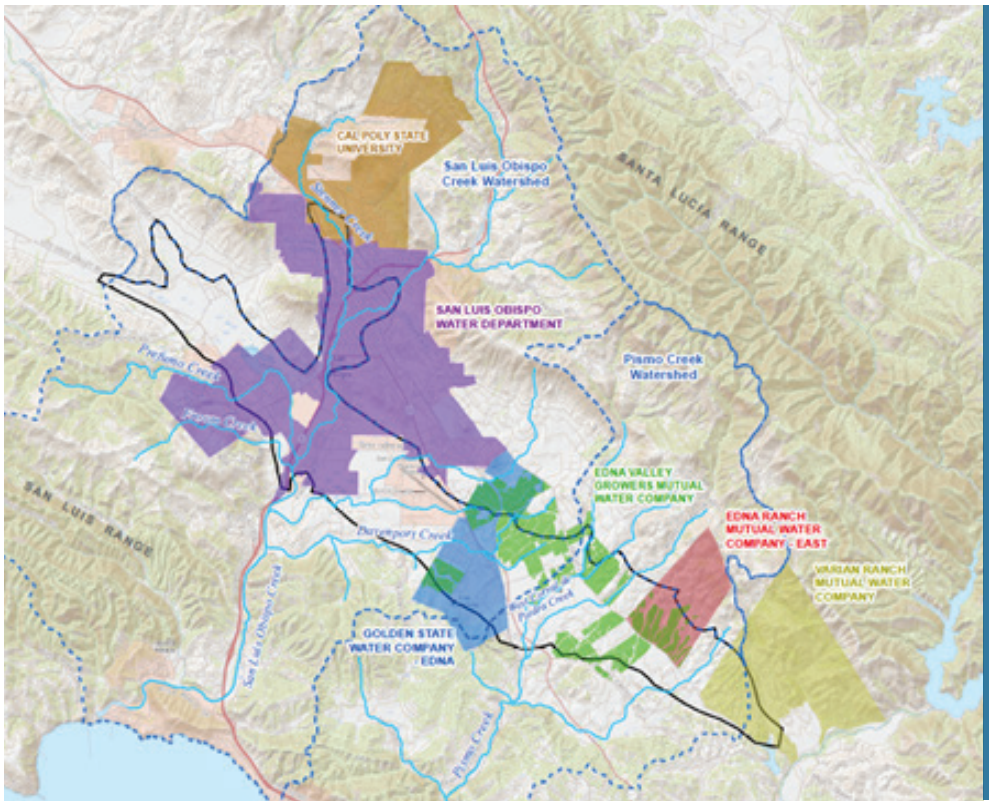
Per the SGMA regulations, the WSC Team will draft an Executive Summary of the GSP and provide a list of references, technical studies and reference maps used in the development of the GSP. The executive summary will be completed with the Administrative Draft described in Task 2.7: GSP Development.

b) Agency Information

The County and the City both formed GSAs by June 30, 2017. Both the City and the County recognized early on that coordination on a single, basin-wide GSP would be key to the basin's success. While GSAs were formed by the two local public agencies, SGMA provides that other entities are eligible to participate in GSAs. Representatives of eligible entities within the SLO Basin, including the Golden State Water Company (GSWC), Edna Ranch Mutual Water Company

SLO Basin Governance Structure





Participating Partners and Water Purveyors in the SLO Basin

Representatives of eligible entities within the SLO Basin include the County of San Luis Obispo, City of San Luis Obispo, Golden State Water Company, Edna Ranch Mutual Water Company, Varian Ranch Mutual Water Company, and Edna Valley Growers Mutual Water Company.

(ERMWC), Varian Ranch Mutual Water Company (VRMWC), and Edna Valley Growers Mutual Water Company (EVGMWC), have been involved in developing the governance structure for the SLO Basin and in engaging local stakeholders since 2015. The fruits of these discussions are reflected in a MOA, which details GSP development coordination and cost sharing among agencies and defines a means for consideration of basin users. The MOA formed a GSC, including five appointed representatives of the City, County, and other eligible entities. The purpose of the commission is to advise the City Council (acting as a GSA) and County Board of Supervisors (acting as a GSA) regarding GSP development, adoption and submittal to DWR.

SGMA requires that the GSAs consider the interests of all beneficial uses and users of groundwater, including, but not limited to, holders of overlying groundwater rights (agricultural users and domestic well owners). This may be accomplished through formation of advisory committee(s) and other means to engage and consider these interests. The graphic shown above depicts the relationship of the GSAs, participating agencies, and stakeholders.

c) Description of Plan Area

This subtask provides a description of the plan area for the SLO Valley Basin. Many of the requirements of the plan area chapter are included in many of the documents already prepared for the City or the County and have been authored by members of the WSC team. For example, the WSC team will leverage the recently completed SLO Characterization Study authored by GSI.

PREPARE STAKEHOLDER COMMUNICATION AND ENGAGEMENT PLAN

d) Notice and Communication

Development of a Stakeholder Communication and Engagement Plan (C&E Plan) will begin at the outset of GSP development. It is important to complete a draft of the C&E Plan early in the project because the process of developing and reviewing the plan will help the team further understand the appropriate frequency and scale for stakeholder outreach efforts. Forming an approach to communications and engagement early in the project will help the team confirm that outreach is correctly estimated in the GSP budget and schedule, preventing surprises mid-project.

The objectives of the C&E Plan are summarized in the list below.

- **Meet engagement requirements of SGMA and the GSP Regulations.** Both SGMA and the GSP Regulations outline specific and numerous stakeholder engagement requirements. The C&E Plan will address how each of these requirements shall be met. WSC's C&E team have a thorough understanding of the engagement requirements and will develop a table, cross referenced with the legislation and regulations, explaining how the San Luis Obispo Valley Basin will successfully fulfill each requirement. The final table will be included with the C&E Plan.

- **Remain consistent with DWR's Stakeholder Communication and Engagement Guidance Document.** The C&E Plan will be designed to follow guidance provided by DWR. Maria Pascoal (GEI) and Michael Cornelius (GEI) assisted in the preparation of DWR's Stakeholder Communication and Engagement Guidance Document, which recently won an award from the Public Relations Society of America (California Capital Chapter). This experience gives the WSC C&E team a thorough understanding of the direction provided by DWR.
- **Provide a roadmap to maximize stakeholder engagement while keeping costs within budget.** Each of California's groundwater basins are unique and the WSC team understands that one size does not fit all when it comes to stakeholder engagement. Therefore, our team will develop creative and targeted approaches to outreach for the San Luis Obispo Valley Basin. The C&E Plan will describe these approaches in detail and explain how to implement them. The C&E Plan will also detail a schedule of stakeholder meetings. Meetings can be a costly form of outreach when done in excess or without clear goals. Combining a carefully planned meeting schedule with creative alternative outreach solutions will save time and money for the project.

The first step to building the C&E Plan is to draft and approve an outline. To save clients from reinventing the wheel for each SGMA C&E Plan, Maria Pascoal (GEI) developed a standard outline for SGMA engagement plans based on the legislation, regulations, and DWR's guidance document. She will use this standard as a starting point to tailor a C&E Plan outline for the needs of the stakeholders in the San Luis Obispo Valley Basin. After the outline is approved, a draft C&E Plan will be developed and provided for review. After suggested revisions are made, the C&E Plan will remain in a draft state until approved as a part of the Final GSP, allowing updates to be made as needed during GSP development.

TASK 2.1 DELIVERABLES

Draft GSP Section(s).

Executive Summary of GSP.

- List of references, technical studies, and reference maps.
- Stakeholder C&E Plan and GCP tool.
- Agendas and presentation materials.

TASK 2.1 MEETINGS

GSP Kickoff Meeting – GSC.

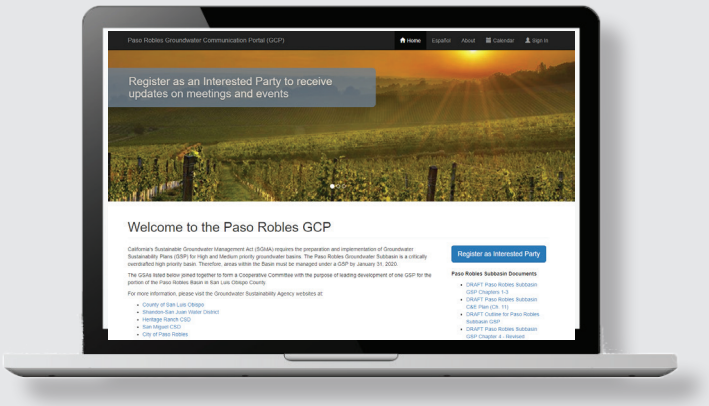
Workshop 1 - GSA.

WSC's team will develop a customized C&E Plan that fits the unique needs specific to the SLO Basin while complying with the guidelines provided by DWR. WSC's subconsultant GEI supported DWR in developing its Stakeholder Communication and Engagement Guidance Document which gives our team a thorough understanding of the direction provided by DWR.

Innovative Approach

CUSTOMIZED GROUNDWATER COMMUNICATIONS PORTAL

The GSP implementation period is long, with multiple GSP updates and numerous annual reports before reaching sustainability by 2042. Our team's Groundwater Communications Portal captures stakeholder information to a database for knowledge transfer over time.



The GCP allows for new administrators to be given access as time passes and staff roles shift. No information is lost when a new administrator comes onboard. There will be no sifting through old emails or file folders to find past materials or stakeholder communications. Everything remains archived in the GCP.

The WSC team recognizes that the level of stakeholder engagement required by SGMA and the GSP Regulations is substantial. We suggest utilizing a unique tool developed by GEI to facilitate the successful execution of these requirements. The GCP provides a method for GSAs to reach out to their constituents and to track that outreach for reporting to DWR. The GCP is web based, easy to use, and requires no special training. Because the tool already exists, the only labor required for implementation in the San Luis Obispo Valley Basin will be for customization. This customization can be done quickly with relatively few consultant staff.

There are two types of users who engage with a GCP: public users (interested parties) and administrative users (GSA and consultant staff). Public users visit the GCP to register as an interested party, view events, view public documents, and comment on the draft GSP. Administrative users utilize the GCP for much more. The core administrative functions of the GCP are listed below.

- Interested Parties List. The GCP stores the interested parties list and allows new interested parties to self-register. Part of customization will be importing the GSAs' existing contacts to the GCP. After this one-time data upload, the interested parties list will maintain itself, automatically updating as new people register.
- Calendar of Events. Create events for the public calendar and send notices to interested parties. Documents can be saved on the event page for public download. Interested parties may register for an event to receive updates.
- Email blasts (e-blasts). Send email messages to everyone on the interested parties list. This feature is handy to send out reminders such as the close of a survey or comment period.
- Stakeholder surveys. Invite interested parties to participate in surveys. This is one method to conduct outreach and receive feedback outside a meeting venue.
- Communication log. Document communications from interested parties (e.g., emails) as well as any GSA responses. A short form may be completed for each communication with attachments allowed if necessary.
- Public comments. Collect public comments using the GCP's online form. The form allows comments to be input by GSP Chapter and GSA for easy sorting at the close of the comment period.
- Outreach reporting. The reporting feature for the GCP will be finalized after DWR releases information about how GSP data should be submitted. The reports out of the GCP will be tailored to include the information requested by DWR.

TASK 2.2: BASIN SETTING

This task involves developing the foundation of the GSP — basin conditions — and includes the following elements: basin setting, land use, existing water resource monitoring/ management programs, hydrogeologic conceptual model, current and historical groundwater conditions, evaluation of groundwater dependent ecosystems, water budget (current, historical, and projected), and an estimate of the sustainable yield. One of our goals will be to make sure that GSC, City, County, and stakeholders understand how the basin works, what the gaps in understanding are, and what the key sustainability issues are as we move through the planning process. The approach described below satisfies the Regulations Article 5, Subarticle 2 Basin Setting (including § 354.12, 354.14, 354.16, 354.18, 354.20).

The Basin covers approximately 20 square miles in central San Luis Obispo County. The Basin extents are defined as the contact of water-bearing sediments with the non-water-bearing formations of the Santa Lucia Range to the northeast, and the San Luis Range and the Edna Fault Zone to the southwest. It is commonly divided into two sub-areas: San Luis Valley and Edna Valley. The San Luis Valley is the area in approximately the northwestern half of the Basin; it includes the City of San Luis Obispo, and the primary land use is municipal and industrial. Currently, most water supply in the San Luis Valley is from imported surface water sources (Whale Rock Reservoir, Salinas Reservoir, and Nacimiento Reservoir). Previously, the City used groundwater as part of the water supply portfolio. They are not currently pumping groundwater, but maintain their well network as a drought contingency supply option. The Edna Valley occupies the southeastern half of the Basin. The primary land use is agriculture, with wine grapes as the dominant crop type. Groundwater is the major source of water supply in the Edna Valley.

The work conducted in this task will build on the considerable efforts previously conducted by teaming partner GSI as part of the basin characterization study, which compiled existing collected data to define characteristics of the SLO Basin. This task includes preparation of agendas and presentation materials for meetings and workshops, as needed.

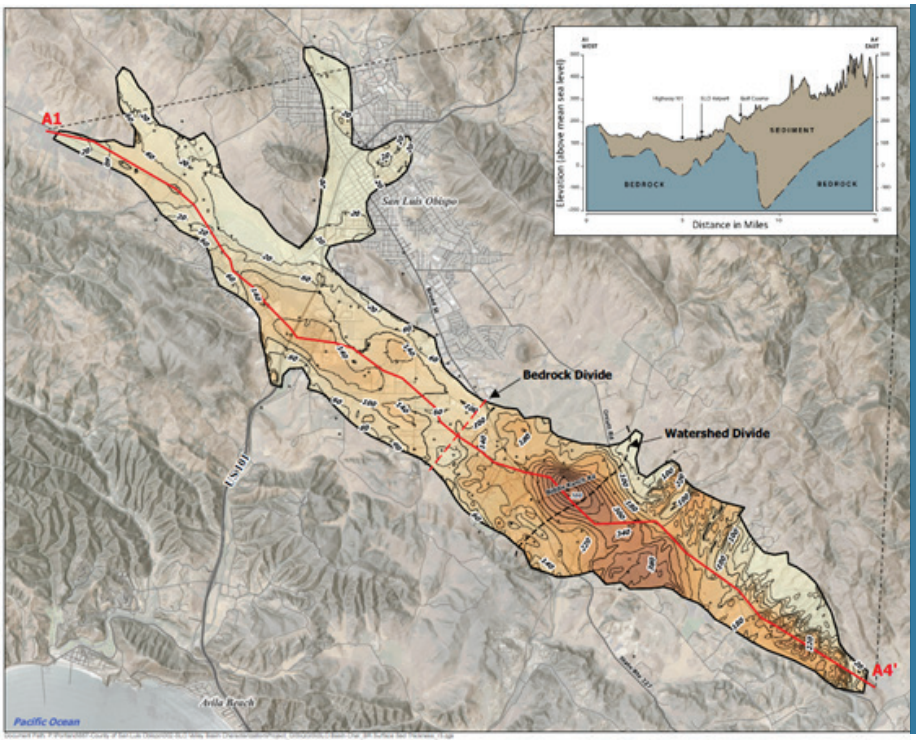
a) Hydrogeologic Conceptual Model (HCM)

The hydrogeologic conceptual model describes the physical characteristics of the basin and shows how the basin works hydrogeologically, identifying hydrogeologic units, significant inflows and outflows to the basin, and regional groundwater flow patterns. One of the purposes of the HCM and groundwater conditions information is to provide stakeholders with a more detailed understanding of the Basin's mechanics to illustrate why certain portions of the Basin behave differently than neighboring areas. This basic understanding then can be applied when considering undesirable results, developing sustainability indicators, and interpreting model results. The HCM also will inform the optional numerical modeling effort to support the evaluation, selection, and configuration of numerical models to be used to investigate specific groundwater management projects and programs.

We will ensure that Committee, City, County, and stakeholders have a clear, shared understanding of how the basin works, what are the unknowns, and what the key sustainability issues are as we move through the planning process.

Much of the foundational work for development of an HCM has been completed by GSI during the completion of the SLO Basin Characterization Report (2018). Three geologic formations function as aquifers in the Basin: the Recent Alluvium, Paso Robles Formation, and the Squire member of the Pismo Formation. In the San Luis Valley portion of the Basin, Alluvium and Paso Robles Formation comprise the primary aquifer. In the Edna Valley, significant thickness of strata of the Pismo Formation, which is not present in the San Luis Valley, comprise the greater part of the aquifer. There is no evidence of a regionally or laterally extensive impermeable strata that isolates the formations from one another vertically. As a result, it appears that in the San Luis Valley, the Recent Alluvium and the Paso Robles Formation function as a single hydrogeologic unit, and in the Edna Valley, the Paso Robles Formation and the Pismo Formation function as a single hydrogeologic unit.

The primary inflows to the SLO Basin groundwater system are recharge from precipitation, agricultural return flows, municipal return flows, and seepage from streamflow. The primary outflows are pumping, evapotranspiration, and outflow through alluvial sediments in San Luis and Corral de Piedras Creeks. Surface water/groundwater interaction along San Luis



The aquifer thickness beneath the San Luis Valley is shallower (~140 ft) compared to the deeper Edna Valley (~400 ft). As shown in the figure, a bedrock divide separates the San Luis Valley portion of the SLO Basin from the Edna Valley portion.

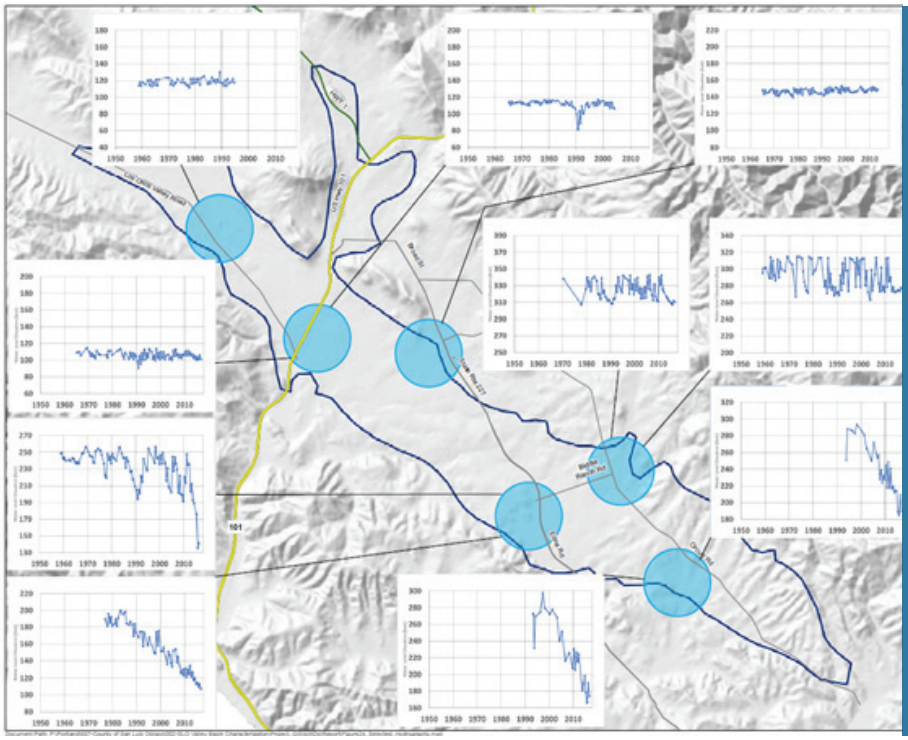
Creek and the Corral de Piedras Creeks comprise a significant portion of recharge in some areas. Stillwater Science's experience and field work along both creeks in the Basin will be indispensable in further characterizing surface water and groundwater interaction in the Basin. Before groundwater development in the area, groundwater was recharged to the aquifer system (i.e., inflows) via areal infiltration of rainfall across the Basin, seepage losses to underlying aquifers from seasonal streamflow, and, to some extent, mountain front recharge along the Basin margins. Pre-development outflows from the Basin occurred via evapotranspiration of shallow groundwater, and through outflow from the Basin through alluvial sediments at the locations where San Luis Obispo Creek and Pismo Creek leave the Basin. Since groundwater development became prevalent in the 20th century, the components of the water budget have changed from the pre-development system. Removal of groundwater via pumping has become the dominant outflow component of the water budget. In addition, secondary recharge occurs through deep percolation of applied irrigation water, and additional stream seepage resulting from release of treated wastewater to San Luis Creek.

b) Groundwater Conditions

An assessment of groundwater conditions in the Basin, and the communication of technical elements to a non-technical stakeholder group, are essential components in understanding the conditions necessary to address in the development of the GSP. Groundwater conditions can be represented in two basic ways. The first method is groundwater contour maps; a groundwater level map presents contours of equal groundwater elevation in the basin at a particular time. This type of map is like a snapshot in time of groundwater conditions and is used to evaluate regional trends in groundwater flow direction, and areas of recharge and discharge within the Basin. The second method is preparation of groundwater level hydrographs; a hydrograph displays variations in water levels (as either elevation or depth to water) over a series of years and is useful in identifying long-term trends in basin conditions due to pumping or other factors.

Groundwater elevation contour maps from 1954, 1990, and 2017 depict similar flow patterns, with groundwater flowing in a northwesterly direction from the Edna Valley toward the San Luis Valley, and flowing in a southeasterly direction in the area along Los Osos Valley Road toward San Luis Creek. These groundwater contour maps indicate that groundwater is leaving the Basin through the alluvium associated with San Luis Creek and the Corral de Piedras Creeks.

Long-term groundwater level hydrographs in the Basin tell different stories in different areas. In the San Luis Valley, water levels were observed to experience significant declines during the drought of the late 1980s and early 1990s. However, inspection of the hydrograph indicate that water levels rebounded after that drought, and no long-term trends of declining water levels are evident in the time since. In the Edna Valley, the hydrographs indicate declines in groundwater



The groundwater levels beneath the San Luis Valley portion of the SLO Basin are relatively constant in contrast to the declining water levels in the Edna Valley.

elevations during the past 20 years in response to increased agricultural pumping.

It is important for the GSC to have good understanding of the different groundwater conditions in different areas of the Basin, so that these considerations may be used in decisions regarding establishment of separate management areas, the development of potential management actions, evaluation of potential engineering projects, and the ultimate development of the GSP. The WSC team will provide the stakeholders with the information and education necessary to make informed choices with respect to these issues.

c) Water Budget

A basin-wide water budget will be developed as required under GSP regulations (354.18). The water budget will provide an accounting and assessment of the total annual volume of groundwater and surface water entering and leaving the basin, including historical, current and projected water budget conditions, and the change in volume of water stored. A quantification of overdraft and basin safe yield is also required.

For this task, we will compile and summarize key elements of the inflow and outflow components of the water budget that were conceptually identified in the Hydrogeologic Conceptual Model—pumping and agricultural water use, rainfall, evapotranspiration (ET), streamflow data, etc.—from available information, import data into the data management system, and organize the data for importation into a numerical groundwater flow model (optional). If authorized, the numerical groundwater model will be developed and used to generate historical, present, and future water budgets.

If the optional basin-wide numerical groundwater model is not authorized by the GSC, the water budget, overdraft, and safe yield will be developed using an analytical model. The analytical model approach would compartmentalize the basin into subareas for applying groundwater flow equations, surface water runoff/stream seepage/percolation of precipitation calculations, and incorporating pumping data and other hydrologic budget information. The analytical model would be calibrated to change in storage calculations over a base period of time.

Under this subtask, in coordination with the GSC, we will:

- Obtain data by year for crop types, acreages, demand factors and water use estimates from water meter data and resources planning information gathered from local agencies and private well users.
- Establish appropriate periods for historical, current, and future water budgets based on cumulative departure from mean precipitation curves and data availability.
- Characterize historical, current, and projected future changes in land use, and using this information, calculate projected water uses.
- Use either the optional numerical groundwater flow model or an analytical model to calibrate the water budget and quantify overdraft and safe basin yield.

Current and Historical Water Budget

The objective of this subtask is to quantify each component of the water budget as required by SGMA and the GSP regulations. Previous studies, dating back to the 1958 DWR

Bulletin 18, have included water budget information and safe yield estimates. The most recent documented efforts at developing a water budget and basin safe yield were in 1991 (Boyle) and 1997 (DWR unpublished draft). The results of prior studies were summarized in the 2018 Basin Characterization Report (GSI). Given the amount of time which has elapsed since these historical reports were prepared, the current water budget for the GSP will need to be developed from a comprehensive review of available source of information.

Sources of information for the water budget include, but are not limited to, the following:

- Hydrogeologic and geologic studies and maps
- Groundwater monitoring reports
- County stream flow gages
- County and NOAA precipitation stations
- CIMIS weather stations
- County water level monitoring program
- County and DWR land use data and planning documentation
- County Ag Commissioner's office datasets
- Agricultural applied irrigation estimates
- Geotracker (GAMA) Groundwater Information System
- RWQCB Ag Waiver program
- Stakeholder supplied information
- Water rights filings (Statement of Diversion and Use)
- Wastewater discharge reports

Projected Water Budget

The projected hydrology for future conditions will use 50 years of historical precipitation, evapotranspiration, and streamflow information as the baseline condition (actual historical data supplemented by data estimates). Projected water demand will include the most recent land use, evapo-transpiration, and crop coefficient information as the baseline conditions for estimating future water demand. Projected surface water supply will use the most recent water supply information as the baseline condition for estimating future water supply. Water rights filings will be used for projecting surface water inflow from West Corral de Piedra Creek. City of San Luis Obispo wastewater discharge and streamflow data will be used for San Luis Obispo Creek inflow and outflow, with modifications for future recycled water projects.

Overdraft and Sustainable Yield

Sustainable yield is generally defined as the amount of water that can be withdrawn without producing undesirable results. For the GSP, these undesirable results are related to the sustainability indicators for which thresholds will be established. The water budget and optional numerical model or analytical model would provide the mechanism to correlate hydrologic data with sustainability indicators and quantify the basin sustainable yield and any associated current, historical, or projected overdraft.

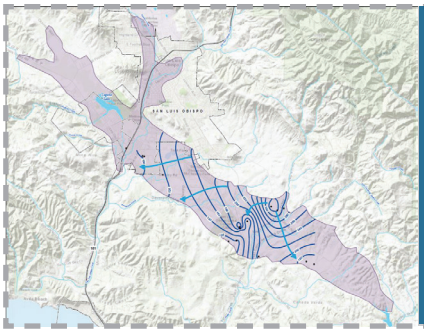
d) Management Areas

Based on information documented in prior tasks, the GSC may propose to delineate management areas to improve management and implementation of the GSP. As described above in Task 2.1, the SLO Valley Groundwater Basin is divided into two separate GSAs, formed by the County and the City. The extent of the City's boundary is located northwest of the bedrock divide identified in the SLO Characterization report and shown in Figure 4 – Basin Sediment Thickness Map. A GSC meeting will be dedicated to discussing the need for and delineation of management areas. If the GSC determines a need, a description and scientific reasons will be drafted and will be discussed at a GSC meeting. The individual management areas may have its own set of sustainability goals as described in Task 2.3.

e) Identification of Data Gaps

The GSP sustainability criteria and management actions will be built upon the solid understanding of the basin's hydrogeology. An important aspect of the basin conditions development is identifying data gaps. An initial effort at identifying data gaps in the Basin was presented in the Characterization Report (GSI, 2018). The GSP team will build upon that analysis to identify ongoing data gaps and strategies to reduce data gaps

We believe that the most cost-effective and efficient approach is to identify unknowns and address them over time—rather than collecting data now that may prove to be unnecessary in the future.



GSI developed the SLO Basin Characterization Report that included an initial effort to identify data gaps. This previous research into what data is available will give our team a head start in identifying ongoing data gaps and developing strategies to reduce data gaps.

through an updated monitoring program. DWR has made it clear that a perfect understanding of the basin hydrogeology is not necessary, and its expectation is that GSAs simply need to identify key data gaps that would materially impede the GSA's ability to achieve sustainable groundwater management. We will review and assess available data and studies, and work with the GSC and stakeholders to determine data gaps. We will identify areas of disagreement and describe any resulting uncertainties. If possible, we will perform analyses to reduce uncertainties during GSP development. Another, and perhaps more likely, option is to (1) address uncertainties as part of the GSP implementation (after the GSP is submitted and approved), (2) incorporate them via the required 5-year GSP updates, and (3) take a measured approach to implementation commensurate with increasing confidence in basin understanding. In general, we believe the most cost-effective and efficient approach is to identify uncertainties, help basin stakeholders understand them and the implications, describe them in the GSP, and address them over time on an as-needed basis. This minimizes the risk of spending precious funds on data collection efforts that may prove to have been unnecessary later. Again, DWR does not expect a perfect understanding of the basin.

TASK 2.2 DELIVERABLES

Draft GSP Section(s) and/or appropriate documentation

- Technical memoranda outlining:
  - Physical setting and characteristics.
  - HCM.
  - Data gaps and uncertainties.
  - Groundwater conditions.
  - Management areas (if needed).
  - Historical and projected water budgets.
  - Agendas and presentation materials.

TASK 2.2 MEETINGS

Groundwater Model Development Meeting – GSC.

Plan Area and Basin Setting -- Hydrogeologic Conceptual Model, Current and Historical GW Conditions – GSC.

Plan Area and Basin Setting -- Water Budget -- GSC.

Workshop 2 - GSA

OPTIONAL TASK 2.2A: GROUNDWATER/SURFACE WATER MODEL DEVELOPMENT

Subsequent to the selection of the WSC Team to prepare the GSP for the SLO Basin, representatives from the interview selection committee asked the WSC team to provide a scope of work to develop and calibrate a coupled groundwater/surface water model. The WSC Team in the proposal dated November 2, 2018, proposed to develop a groundwater flow model of the SLO Basin using MODFLOW, the industry standard groundwater modeling code developed by the USGS.

Several models have been developed over the past decade for coupled groundwater/surface-water modeling. The WSC Team will consider the following model platforms: 1) Groundwater and Surface-water FLOW (GSFLOW), 2) MODFLOW-One Water Hydrologic Model (OWHM) and 3) Custom coupling of purely surface water modeling codes, such as HSPF or SWMM, with MODFLOW.

A numerical model is an important tool used in the analysis of groundwater basins, capable of simulating transient past and future conditions in the basin. Within the context of SGMA, a well-calibrated model has several applications, including evaluating water budget components under changing climate scenarios, evaluating the effectiveness of proposed engineering projects, evaluating potential results of proposed management actions, representation of changing pumping patterns, the potential effect of climate change, and other ancillary components and effects of the GSP. Although a groundwater model is not technically required under SGMA for the completion of a GSP, there is no comparable tool capable of addressing the questions and analyzing the myriad spatial and temporal variables that will be under consideration during the development of the GSP. It is the opinion of the team that a numerical groundwater model will be essential to communicate results during the public stakeholder facilitation process.

The following tasks describe the approach to develop, calibrate and run a coupled groundwater/surface water model to support the development of the SLO Basin GSP.

2.2A.1 DATA COMPILATION AND REVIEW

The first step in any hydrogeologic study is compilation and review of existing reports and documentation. For the groundwater data available in the Basin, this task was largely completed during the completion of the Basin Characterization report. The Basin Characterization Report will serve as the basis of knowledge for the model development, should the GSC opt to develop one. Previous significant reports by Boyle Engineering, and Department of Water Resources, were summarized in that report. That report included a compilation of well completion reports in the basin with assigned geologic formation picks, shape files of sediment thickness and base of saturated sediments, and a comprehensive summary of specific capacity and transmissivity data from well testing in the Basin.

In addition to the hydrogeologic information obtained in the Basin Characterization report, all relevant hydrologic information needs to be collected and compiled for the surface water model, including precipitation, stream flow, waste water treatment plant discharge, and historical land use data for the SLO Basin area. Available GIS data will be acquired including digital air photos, historical land use maps that indicate water use, delineation of septic areas; and other similar information.

The SLO Basin does not currently have a comprehensive or robust database of surface water flow data. The County maintains stage level data for San Luis Creek but not flow data. However, the City of San Luis Obispo, County of San Luis Obispo, Central Coast Salmon, and the Central Coast Water Board have recently collected data to develop rating curves at some of the County gages including Andrews Street Bridge, Stenner Creek, and Elk Lodge. For example, the City monitors flow in San Luis Obispo Creek from April to November upstream and downstream of the WWRF discharge. The team will collect and compile the available flow data for use in calibrating the surface water model. Note that the uncertainty in the flow measurements may lead to poor calibration of the surface water model.

2.2A.2 CONCEPTUAL MODEL

Development of a robust HCM is the basis for any development of a numerical model. An HCM identifies (without assigning numerical values) all significant inflows to and outflows from the Basin, significant aquifers, groundwater flow patterns, and areas of recharge and discharge. The HCM for the groundwater basin was discussed in the characterization report, and will be refined as appropriate in cooperation with the GSC as part of the GSP. As a result, it is anticipated that significant effort will not be required for establishment of an HCM for the purpose of the numerical model development. The points of contact and interaction between the surface water model and the groundwater model will need to be refined during this phase of the project.

MODEL EXTENT/BOUNDARY CONDITIONS

The objective of this model will be to support analysis and evaluation necessary for the GSP development. It is expected that the domain of the model will be the full extent of the watershed contributing to the SLO Basin, from the boundary with the Arroyo Grande Creek Valley on the southeast to the boundary with the Los Osos Basin on the northwest. The southwestern boundary will coincide with the Edna Fault, and the northeastern boundary will be the contact of the permeable sediments with the bedrock formations that comprise the mountains (Monterey, Franciscan, and Obispo Formations that comprise the mountains

GEOLOGIC STRUCTURE MAPPING AND CHARACTERIZATION (INCLUDING FLOW PATHS AND MODEL LAYERS)

Once the significant water budget components are established, the team will integrate the geologic and aquifer characterization data to evaluate the significant flow paths of the hydrogeologic system in the model area. We will review groundwater data developed in the Characterization Report to determine regional hydraulic gradients and flow directions within each significant hydrogeologic unit. In addition, we will review data to determine the direction of vertical hydraulic gradients between aquifer units separated by significant confining clay layers.

Delineation and assignment of a model layering scheme will be the final step of conceptual model development. The team will discuss with the GSC the options Model layering will represent as closely as feasible the physical hydrogeologic units observed in the field and described in the accumulated literature of hydrogeology in the area. It is anticipated that at a minimum, the model will incorporate three layers, with at least one layer to represent each of the three primary aquifer formations: Recent Alluvium, Paso Robles Formation, and Squire member of the Pismo Formation.

2.2A.3 MODEL CONSTRUCTION APPROACH AND CODE SELECTION

The WSC Team will consult with the GSC on the coupled groundwater/surface water model platform that best supports the development of the SLO Basin GSP. The following are examples of modeling platforms that will be considered.

GSFLOW

GSFLOW is a fully integrated watershed-groundwater model (Markstrom et al., 2008) that has been widely used throughout the United States by the USGS and other hydrologic professionals to model surface water and groundwater conditions in various geologic settings. GSFLOW is a coupled groundwater and watershed flow model based on integration of the USGS Precipitation-Runoff Modeling System (PRMS) and MODFLOW. GSFLOW was developed to simulate coupled groundwater – surface water flow in one or more watersheds by simultaneously simulating flow across the land surface, within subsurface saturated and unsaturated materials, and within streams and lakes (Markstrom et al., 2008; Regan et al., 2016). The PRMS and MODFLOW models are compiled, calibrated, and run separately before calibrating and running the combined model (GSFLOW) to complete the model development process.

MODFLOW-One Water Hydrologic Model (OWHM)

MODFLOW-OWHM (Hanson et al., 2014) was developed by USGS to evaluate water management in a physically-based supply-and-demand framework. OWHM includes the useful Farm Process for MODFLOW that internally calculates crop demands and allocates surface-water and groundwater irrigation supplies to meet the demands. The primary difference between MODFLOW-OWHM and GSFLOW is that GSFLOW is intended to link MODFLOW with the watershed model PRMS, whereas MODFLOW-OWHM links MODFLOW to models of human water-resource infrastructure needed for conjunctive-use analysis. Another difference is the time-step; GSFLOW is a daily time-step where the Farm Process is about two weeks (USGS, 2017)

MODFLOW +HSPF

Dynamic two-way coupling of HSPF or SWMM with MODFLOW would require that the surface water models pass recharge from the active groundwater component of each hydrologic response unit (HRU) to the appropriate MODFLOW cells; MODFLOW would be required to pass hydraulic head information to HSPF for simulation of lower-zone storage processes and discharge of groundwater to stream reaches (e.g., Bent et al., 2011). The dynamic linking would also need to overcome differences in spatial and temporal discretization between the two models. A custom code to dynamically couple the models would need to be developed.

CODE SELECTION CRITERIA AND RESULTS

In order to best meet the goals set forth by the San Luis Obispo Basin GSP RFP, the consulting team will identify a model that best meets the objectives of the Project. Selection criteria will be developed to identify the model that would be the best fit to meet project goals. The results will be discussed and a final model selection will be presented to the GSC for final approval.

MODEL CONSTRUCTION: DEFINE MODEL GRIDS

The model grid for the surface water system will be defined by the WSC team. The model grid will consider important aspects of the conceptual model, including:

1. Identifying model boundaries.
2. Delineating watershed boundaries.
3. Ground surface digital elevation model (DEM)
4. Identifying the stream network of the watershed.
5. Delineating the groundwater management area boundary.
6. Identifying and incorporating previous documented model grid information as appropriate.
7. Identifying existing and potential well locations.
8. Delineating geologic structures.
9. Maintaining reasonable simulation times without sacrificing model integrity.

2.2A.4 SURFACE WATER MODEL CONSTRUCTION

LAND SURFACE AND CLIMATE DATA

Spatially distributed parameters are essential for the surface water component of the model. The model requires the following data to model surface water processes:

1. Geologic surface features (outcrops).
2. Soils.
3. Land use/land cover.
4. Vegetation canopy density.
5. Rainfall.
6. Temperature.
7. Solar radiation.
8. Evapotranspiration.
9. Streamflow discharge.

With these data, spatially distributed initial parameter values will be calculated and mapped to the model grid.

LAND USE ANALYSIS

An important part of the basin's water balance is water use by non-agency pumpers and return flow from all users. Return flow from agriculture, municipal use, and water treatment plants (WTPs) occurs at the surface and can recharge the aquifer, streams, or both. Identifying and representing changing land use patterns throughout the calibration period is important in achieving a defensible calibration. A land use analysis will be performed to calculate return flow estimates. This analysis involves the following:

1. Revise water use factors and return flow assumptions using the most current and up-to-date information available.
2. Conduct GIS analysis of land use for the entire basin.
3. Evaluate water use and return flow by land use zone.
4. Calculate system losses based on zones served by water supply and sewer systems.

CONSTRUCT INPUT FILES AND INITIAL MODEL RUN

The WSC Team will use the grid-based GeoDatabases from GIS to create input files, streamflow data file for all gauges, and conduct initial runs to debug and analyze initial results. The streamflow data collected in Task 1 will be assessed and may need to be estimated to fill data gaps. If sufficient data exists, historical flow data can be correlated with rainfall data to create synthetic hydrographs.

CALIBRATE SURFACE WATER MODEL

In order to successfully integrate with the groundwater model component, the surface water model will be calibrated to any available streamflow data. Parameter Estimation (PEST) software (Watermark, 2005) or other comparable industry standard method may be used to achieve a calibration that is adequate to proceed with the groundwater/surface water integration.

2.2A.5 MODFLOW MODEL CONSTRUCTION

DEFINE MODEL LAYERS, BOUNDARY CONDITIONS, AND AQUIFER PARAMETERS

Model layering will be based on the Hydrogeologic Conceptual Model. Model layering will represent as closely as feasible the physical hydrogeologic units observed in the field and described in the accumulated literature of hydrogeology in the area. Any layers representing subdivisions of aquifers and/or aquitards will be addressed with a level of detail commensurate with the data. We anticipate that, at a minimum, the model will incorporate three layers, with at least one layer to represent each of the three aquifer formations: Recent Alluvium, Paso Robles Formation, and Squire member of the Pismo Formation.

Boundary Conditions

A boundary condition is a mathematical construct used in the model to represent the physical boundaries of the aquifer or an internal source or sink (e.g. recharge, injection, pumping, etc.). Boundary conditions included in the model are used to represent:

- Aquifer boundary
- Stream recharge
- Groundwater discharge to stream
- Underflow
- Areal recharge (from precipitation and return flows);
- Pumping
- Recycled water injection

We will select the appropriate MODFLOW Packages to simulate the boundary conditions. Boundary conditions will be assigned in accordance with guidance provided in ASTM Standard D5609 (Guide for Defining Boundary Conditions in Ground-Water Flow Modeling).

Aquifer Parameters

Aquifer parameters such as hydraulic conductivity/transmissivity, storativity, and porosity will initially be assigned numerical values consistent with known values. Transmissivity data, pump testing data, specific capacity data, and other data compiled in the Basin Characterization Report will be reviewed and incorporated into the model as initial estimates for hydraulic properties. Aquifer transmissivity is generally one of the most significant parameters to evaluate and adjust during the calibration process. Both zonal and smooth field (gridded/interpolated) property distributions will be considered during calibration.

CONSTRUCT INPUT FILES AND INITIAL MODEL RUN

The WSC team will construct input files and perform an initial model run. The model will be run and the initial results will be reviewed to check assumptions and data fidelity before proceeding to calibrating the model.

CALIBRATE MODFLOW

Calibration is the modeling process in which parameters are adjusted within reasonable bounds to generate a time series of water level data and other data that match historically observed water levels. Prior to performing calibration, the team will work with the GSC to develop a calibration strategy to guide and constrain the calibration process. The strategy will define the stress period and time step setup and establish reasonable bounds on all model parameters that will be varied during calibration to ensure that the calibration honors the conceptual model. If the model results suggest a material issue with the conceptual model, it will be revisited. Thus model calibration is best viewed as an iterative process. The calibration strategy will also include identification of the calibration period, and targets, which are described further below.

Calibration of the numerical model to the target data sets developed in Task 2 will consist of conducting multiple simulations of the model, using both manual and automated calibration processes. In these simulations, each model run calculates groundwater elevations, flow directions, and water budgets within the model domain. These model outputs will be compared against the respective calibration targets identified in the calibration strategy. We envision utilizing quantitative calibration targets consisting of groundwater levels, horizontal and vertical groundwater gradients, and water budget term estimates. Qualitative targets will include flow directions. Calibration will continue until the model is able to (1) replicate historically observed groundwater level elevations, gradients, etc. over time and (2) represent groundwater/surface water exchanges in a manner consistent with the conceptual model.

The historic water level data from the period of record will be reviewed with the GSC, and assessed to determine an appropriate baseline calibration period for the model. The team anticipates that the calibration period for the model will extend back at least several decades, so that different hydrologic conditions can be shown to be accurately simulated. The exact length of the calibration period will be determined based on available data, but is anticipated to incorporate at least one, and preferably several, complete wet-dry cycles, if the data support.

We recommend conducting a calibration approach that begins with a limited manual and semi-automated calibration process, followed by automated calibration using the PEST software. The team believes that a certain amount of manual calibration is warranted at the beginning of the calibration process, to ensure that key physical attributes of the shallow aquifer system are being simulated properly. This step-wise calibration approach is a key technical element of our approach, as it ensures that key attributes are well represented. With this foundation, a PEST automated calibration software can be used to refine and tighten the regional model's calibration.

All calibration efforts will be performed using consideration of the guidance contained in the DWR document "Modeling BMP" (December 2016), and the ASTM Standard D5490 (Guide for Comparing Ground-Water Flow Model Simulations to site-Specific Information").

The historical water budget analysis performed for the GSP will be incorporated into the construction of the groundwater model. The model will be used to evaluate changes in the water budget associated with various predictive scenarios established by the GSC.

When calibration is considered complete, the team will perform a series of sensitivity analyses to quantify the effects that uncertainty in parameter estimates have on the model results. Sensitivity analyses involve varying parameter estimates such as recharge, transmissivity, pumping, etc. within a range of reasonable estimates, and quantifying the range of resulting modeled water levels due to this variation. All sensitivity analyses will performed using consideration of the guidance contained in the DWR document "Modeling BMP" (December 2016), and the ASTM Standard D5611 (Guide for Conducting a Sensitivity Analysis for a Ground-Water Flow Model Application").

2.2A.6 INTEGRATED GROUNDWATER-SURFACE WATER MODEL

IDENTIFY AND IMPLEMENT MODELING PACKAGES FOR INTEGRATED MODEL

Modeling packages necessary for the final model selection will be reviewed. Modeling packages that are necessary to develop the most accurate model possible will be identified and implemented into the model.

CONSTRUCT INTEGRATED MODEL INPUT FILES AND INITIAL MODEL RUN

Input files for the final selected model will be developed. The model will be run and the initial results will be reviewed to check assumptions and data fidelity before proceeding to calibrating the model.

INTEGRATED MODEL CALIBRATION

Prior to performing calibration, the team will work with the GSC to develop a calibration strategy to guide and constrain the calibration process. The consulting team will calibrate the integrated GSFLOW model to groundwater levels and streamflow's using PEST. The model will be calibrated such that it will be a powerful and useful tool to evaluate related GSP goals.

When calibration is considered complete, the team will perform a series of sensitivity analyses to quantify the effects that uncertainty in parameter estimates have on the model results. Sensitivity analyses involve varying parameter estimates to assess the main driving factors of the system and evaluate its performance based on understanding of the conceptual model. All sensitivity analyses will be performed using consideration of the guidance contained in the DWR document "Modeling BMP" (December 2016), and the ASTM Standard D5611 (Guide for Conducting a Sensitivity Analysis for a Ground-Water Flow Model Application").

2.2A.7 SCENARIO EVALUATION

The WSC team will utilize a GSC meeting to engage the stakeholders to develop scenarios for simulation. The precise number of model scenarios to run will be determined during detailed review with the stakeholder team. The details of specific scenarios will be discussed and agreed upon at this workshop. However, it is expected that the following management variables will be incorporated into predictive model scenarios:

- Implementation of recharge projects identified as feasible in the project and management action evaluation of the GSP.
- Various options for management actions identified as feasible in the project and management action evaluation of the GSP.
- Simulation of hydrologic conditions representing various climate change scenarios required by DWR.
- A range of estimates for projected agricultural pumpage and return flow
- A range of estimates for recharge ranging from average to drought conditions
- Changes in the water budget associated with various projects and management actions.

We will use the model to evaluate the agreed-upon modeling scenarios. Model results will be analyzed to assess drawdown, travel times and capture zones (if required, utilizing MODPATH particle tracking), hydraulic gradients, flow paths, changes in storage. Evaluation of the predictive model scenarios will include, but not be limited to the following considerations:

- The effect on water levels of specific recharge projects identified during the GSP process.
- The effect on water levels of specific recharge projects identified during the GSP process.
- Additional production yield associated with groundwater recharge
- Yield or benefit associated with offsetting agricultural pumping
- Optimized municipal pumping operations
- Other considerations identified by the GSC and stakeholders as significant.

2.2A.8 FINAL MODEL REPORT

The team will provide the stakeholders with a Draft and Final Model Report to document the model construction process including assumptions, calibration procedures, and results. The memo will include discussion of the primary model parameters that were adjusted in order to achieve the final calibration. It is anticipated that discussion of horizontal and vertical transmissivity, boundary condition conductance values, recharge rates, and other model parameters will be evaluated and discussed in this memo. Sensitivity analyses will be presented to evaluate the effect of parameter estimate uncertainty on model results

TASK 2.2A DELIVERABLES

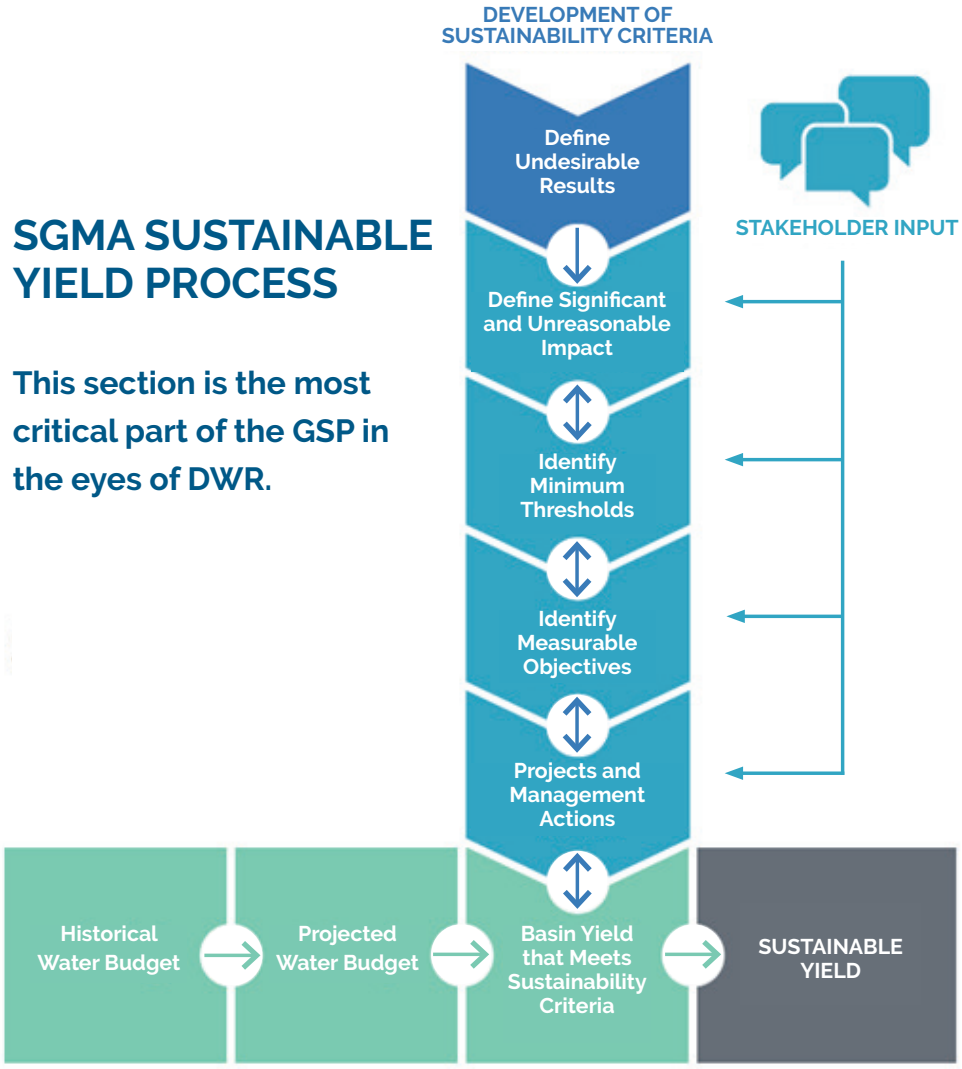
Draft GSP Section(s) and/or appropriate documentation

- Draft and Final Model Documentation
- Agendas and presentation materials.

TASK 2.3: SUSTAINABLE MANAGEMENT CRITERIA

This section of the GSP includes the sustainability goal, identification of undesirable results, and development of quantitative measurable objectives and minimum thresholds for the sustainability indicators that define how a GSA will measure and demonstrate sustainability. DWR considers this section of the GSP to be the most critical because it defines what will constitute sustainable management of the basin. In contrast with the basin setting, which may include considerable uncertainty, DWR will expect to see clearly stated and technically supported sustainability criteria. The approach described below satisfies the Regulations Article 5, Subarticle 3 Sustainable Management Criteria (including § 354.22, 354.24, 354.26, 354.28, 354.30).

A significant component of the GSP development process will be devoted to developing the sustainability criteria. This will be an iterative process involving technical analysis, stakeholder input, and policy decisions by the GSC. The first step will be to define what constitutes significant and unreasonable effects to beneficial uses that might be caused by chronic lowering of groundwater levels, reduction in groundwater storage, water quality degradation, or depletion of interconnected surface water. This will require input from the stakeholders and policy decisions by the GSC. Then, together we will define quantitative goals (measurable objectives and minimum thresholds in SGMA terminology) for each sustainability indicator using existing data and the groundwater model. The analysis will be augmented with hydrograph analysis and analytical



calculations, as appropriate. The measurable objectives, minimum thresholds, and anticipated costs associated with managing to meet them will be reviewed by the stakeholders and the GSC. This review may cause the GSC to revisit the prior analysis of significant and unreasonable effects. Several iterations may be necessary to arrive at consensus on the sustainability indicators. **This portion of the planning process has a significant potential for disagreement. Our team has the patience and facilitation skills needed to work through this process.**

As mentioned above, sustainability will be defined using quantitative goals called measurable objectives and minimum thresholds. This means groundwater levels, quality, etc., will be defined at specific monitoring locations to determine whether the basin is being sustainably managed.

This task includes preparation of agendas and presentation materials for meetings and workshops, as needed.

TASK 2.3 DELIVERABLES

Draft GSP Section(s) and/or appropriate documentation

- Sustainability Goals memorandum, or appropriate documentation.
- Technical memoranda outlining:
  - Processes and criteria to define undesirable results.
  - Minimum thresholds and sustainability indicators.
  - Measurable objectives.
  - Agendas and presentation materials.

TASK 2.3 MEETINGS

Sustainable Management Criteria – Management Areas – GSC.

Sustainable Management Criteria – Sustainability Goal, Measurable Objectives, Minimum Thresholds, Undesirable Results – GSC.

Sustainable Management Criteria – Sustainability Goal, Measurable Objectives, Minimum Thresholds, Undesirable Results – GSC.

Workshop 3 – GSA.

Workshop 4 – GSA.

TASK 2.4: MONITORING NETWORK

A robust groundwater monitoring program is essential to understanding of changing conditions in the Basin, the development of the GSP, and the ongoing groundwater management. There is presently one dedicated CASGEM monitoring well in the Basin. The City and the County maintain separate networks of groundwater monitoring wells. These networks will be combined to provide a greater data density in the Basin. Expansion of the monitoring network through construction of additional wells or through outfitting of existing wells with WellIntel or comparable technologies will be evaluated.

This task includes preparation of agendas and presentation materials for meetings and workshops, as needed.

MONITORING NETWORK

A monitoring network and monitoring plans will be developed to meet GSP requirements (Subarticle 4). This task will include consideration of Article 3 Technical and Reporting Standards, and will also include preparation of agendas and presentation materials for meetings and workshops, as needed.

Expansion and improvement of the monitoring network through construction of additional wells, or through outfitting existing wells with pressure transducers or sonic water measurement technology will be evaluated. This subtask will include a review of information and data pertinent to sustainable management from the various State and local monitoring programs, which can also be incorporated into the Data Management System.

Potential data needs and gap analysis will be addressed through a review of existing reports and the findings from the Counties with Stressed Basins grant work. A preliminary list of potential data needed to complete the GSP will be developed in coordination with work occurring in other subtasks.

Current groundwater monitoring is performed manually twice per year. This program could be enhanced through the use of automated data collection and transmission using technology such as that offered by the WellIntel© Groundwater Information System, or equivalent technology. WellIntel is a groundwater information system that combines next-generation acoustic measurement technology, remote telemetry, and a cloud platform, to collect accurate, consistent, and reliable groundwater-level measurements from a wide range of production and monitoring wells based on the best-available scientific methods. Use of such technology would provide greater data density faster and cheaper than the current program. Additionally, this technology could be installed on existing domestic or irrigation wells, reducing or possibly eliminating the need to drill expensive new monitoring wells.

NETWORK MONITORING AND MEASUREMENT PROGRAM

A Network Monitoring and Measurement Program will be prepared to describe the monitoring network for the management area(s) with a map showing the spatial coverage of monitoring wells by principal aquifer, for each sustainability criterion, and a table describing each monitoring point. The purpose of the monitoring network is to identify key wells that will be used for establishing minimum thresholds and measurable objectives, and a larger set of wells that will be used to define groundwater occurrence, flow direction, hydraulic gradients, changes in storage, and groundwater quality, among other factors. Data collected from the network will be used to evaluate trends of sustainability indicators and measure minimum thresholds and measurable objectives for the GSP. If improvements to the monitoring network are identified, proposals will be developed to acquire additional data to support the required cost of the implementation section of the GSP.

The Monitoring and Measurement Plan will address:

- Monitoring protocols, including technical standards and data collection methods.
- Analytical methods of water quality parameters.
- Location, rationale, and selection of representative monitoring sites, network density, and monitoring

frequency.

- Network improvement plan, including annual assessment of the monitoring network for data gaps.
- Sample constituents and water quality parameters, including list of all analytical methods.
- Subsidence measurement protocols.

WATER QUALITY MONITORING PLAN

Although the groundwater quality in the Basin is generally suitable for most uses, there are various parameters that have been observed in different parts of the Basin that may warrant inclusion in a water quality monitoring plan. We will work with the GSC to identify a network of wells to be sampled on a regular basis for water quality parameters. The water quality monitoring network will be specific to the objectives of the monitoring plan and is assumed to involve at least 10 monitoring wells within the Basin.

Total Dissolved Solids (TDS) is a basic indicator of groundwater mineralization that has been identified in some areas of the Basin in excess of drinking water standards. TDS should be monitored to identify any trends that may impact beneficial use in the future. Nitrates are a common parameter detected in areas of agricultural development, and should be included in a water quality monitoring plan. Other general mineral constituents, including chloride, sodium, sulfate, and boron, are used in developing surface water and groundwater quality objectives in the Central Coast Basin Plan (Regional Water Quality Control Board, 2017) and would be appropriate for inclusion in a monitoring program. There are also elevated selenium concentrations in the Edna Valley, and manmade compounds, such as PCE, have been identified in groundwater plumes in the City of San Luis Obispo. Strategies to identify or address trends in the detection of these and potentially other localized constituents would be considered during monitoring program development.

Recycled water is projected to be a key element of the GSP and will require an appropriate monitoring program to meet groundwater reuse regulations. The GSP water quality monitoring plan preparations will consider Constituents of Emerging Concern (CEC's) as indicator compounds of wastewater influence on groundwater.

A Water Quality Sampling Plan will be prepared to describe:

- Water quality monitoring locations.
- Monitoring protocols, including sampling methods.
- Plans for uploading the data to the Water Board's Groundwater Ambient Monitorinig and Assessment (GAMA) Program or other appropriate site(s).
- Sample constituents and water quality parameters, including list of all analytical methods.

SURFACE WATER INFLOW/OUTFLOW MONITORING PLAN

The County, through its Water Resources Division coordination with Zone 9 and the City, maintains a network of five stream gauges in the San Luis Valley part of the Basin to record heights of flow throughout the year for flood warning purposes. The gauges were constructed in November 2001, and have periods of record from that year to the present. Data from the monitoring network may be used to increase the understanding of the nature of surface water/groundwater interaction in the Basin. Continuous data monitoring of height of flow at the gages is recorded, but equivalent discharge (cubic feet per second) is not. **The team will work with the GSC to identify potential improvements to the surface water monitoring plan in the Basin.**

Some of the potential actions that the GSC could take to improve understanding of surface water/groundwater interaction in the Basin include the following:

- The existing stream gage network is located entirely in the San Luis Creek watershed. Additional gages in the Edna Valley would be useful for evaluating the water budget and management actions in that area.
- Another possibility is the installation of shallow groundwater monitoring wells paired with the stream gauges. This would provide relative elevation data between streamflow and groundwater to better characterize the direction of flow between the streambed and the aquifer.
- Theoretical stream gage rating curves could be generated using hydraulic models to allow the calculation of discharge (cubic feet per second) from gage height (elevation in feet).
- If discharge is calculated, daily stream data from the existing stream gauges may be analyzed for base flow separation. This could provide greater understanding of the losses or gains in San Luis Creek flow as water moves downstream.
- Another possibility is a synoptic low flow study, in which a series of discharge measurements is performed on a subject stream on the same day, so that changes in flow can be documented simultaneously at different areas of the stream, quantifying the amount of flow gain or loss along the reach.

These are some options for consideration of the surface water monitoring plan. The team will work with the GSC to prioritize these and other options, and determine the appropriate level of effort for completion and implementation of the GSP for the Basin.

REPRESENTATIVE MONITORING

Representative monitoring sites, such as key wells, will be identified where appropriate to allow more efficient management and consistency for measures of effectiveness in meeting sustainability indicator thresholds. Representative monitoring sites will be designated based on analysis of existing monitoring networks, monitoring needs, and basin conditions.

ASSESSMENT AND IMPROVEMENT OF MONITORING NETWORK

An assessment of the GSP monitoring network will provide an evaluation of uncertainty with respect to the primary monitoring objectives. This assessment will incorporate a data gap analysis based on the monitoring network spatial coverage, frequency, and reliability.

REPORTING MONITORING DATA TO DWR

Monitoring data will be stored in the data management system described in Task 2.5. A copy of the monitoring data will be included in the Annual Report and submitted electronically to the DWR in accordance with regulations (354.40)

If the data gap analysis determines additional monitoring wells are needed, our team has the experience to develop the wells in accordance with state and local agency requirements.

OPTIONAL TASK 2.4A: DESIGN AND CONSTRUCTION OVERSIGHT OF NEW MONITORING WELL(S)

This subtask is predicated on the results of data gap analysis to determine whether an additional dedicated monitoring well or wells would be useful or needed in developing the GSP, and the installation of such well(s). The location for a new monitoring well, along with construction specifications, were developed for the Basin Characterization Report, and may be revisited for this task (two locations were selected but only one was completed during basin characterization). The new dedicated monitoring well(s) would be proposed for construction in public rights of way or on lands already owned by public or private entities such that new land purchases are not anticipated. Applicable well permitting, design, and construction standards would be followed. Upon completion, the well(s) would be incorporated into the GSP monitoring network and the CASGEM data system.

The monitoring wells would be developed in accordance with state (DWR, CASGEM and SGMA) and local agency requirements. The work associated with a new monitoring well design and oversight will include the following activities:

- Confirm preferred monitoring well location.
- Prepare appropriate CEQA documentation.
- Obtain necessary well construction permits.
- To the extent necessary to build on similar efforts conducted under the Counties with Stressed Basins grant project, develop plans and specifications to construct and develop the monitoring wells in accordance with California Well Standards Bulletin 74-90 and 74-81 and County well ordinances.
- Conduct necessary processes under required County purchasing/ bidding policies.
- Assign an on-site geologist to supervise collection and classification of samples of the cuttings in accordance with the Unified Soil Classification System per ASTM D2488.
- Conduct geophysical logging (electrical resistivity) and interpret the logs to support well design. The final design will be completed by a California-licensed professional geologist.
- Monitoring well shall be installed per the final design with an onsite geologist to supervise construction of wells.
- Complete a Water Well Drillers Report and submit copies to DWR and the local well permitting agencies.
- Survey the well location and elevation using a California-licensed land surveyor.

- To the extent feasible, install electronic monitoring equipment (transducer or its equivalent) in new monitoring wells, if the site(s) are feasible to improve data monitoring of both water level/ quality.
- Incorporate new dedicated monitoring wells into the California Statewide Groundwater Elevation Monitoring (CASGEM) data system.

This work will not include the construction of the monitoring well. The cost of monitoring well design and construction has been estimated on a per-well basis. The construction of the monitoring well will be performed by a well drilling contractor under a separate contract. Only one well is currently scoped for this subtask. However, as an optional subtask, designs and on-site oversight of additional wells may be performed upon further authorization from the County.

OPTIONAL TASK 2.4B: PASSIVE SEISMIC GEOPHYSICAL SURVEY

CHG has adopted passive seismic geophysical technology for mapping the base of permeable sediments in alluvial basins. This method relies on the fact that all materials in nature have a natural resonance frequency. When energy vibrating at this frequency interacts with the material, in this case a sediment column, the amplitude of that vibration will increase at the resonance frequency. In complex systems, this amplitude increase will occur at multiple frequencies, with each corresponding to a composition (layer) and with the highest amplitude generally corresponding to the interface between overlying unconsolidated sediments and underlying consolidated bedrock. By analyzing the amplitude and frequencies of peaks at ground surface, the depths and general composition of layers can be modeled to provide insight into subsurface conditions. CHG has performed successful passive seismic surveys in several local groundwater basins to date, including the San Luis Obispo Valley groundwater basin.

As an optional task, passive seismic surveying would be useful in filling data gaps with respect to basin boundaries, depth, and groundwater flow barriers. The methodology would helpful in identifying locations and preliminary design for new monitoring wells.

TASK 2.4 DELIVERABLES

Draft GSP Section(s) and/or appropriate documentation

- CEQA documentation for new well(s).
- Monitoring well design memorandum and Monitoring Well Completion Report (optional task).
- Monitoring Network Program technical memorandum or appropriate documentation including Water Monitoring Plan, Water Quality Sampling Plan, and Surface Water Inflow/ Outflow Monitoring Plan.
- Monitoring Network Update and data gap memorandum, or appropriate documentation.
- Agendas and presentation materials.

Innovative Approach

As an optional task, CHG can use advanced seismic geophysical technology to map the base of permeable sediments in the alluvial basin. This technology can be used to model the depths and general composition of layers to provide insight into subsurface conditions.

This data can be used to fill data gaps about basin boundaries, depth, and groundwater flow barriers.

TASK 2.5: DATA MANAGEMENT SYSTEM

Significant cost savings can be realized through the development of a SGMA-compliant DMS for the entirety of San Luis Obispo County. The County has six groundwater basins in their jurisdiction that are developing or plan to develop GSPs (Paso Robles, Atascadero, Santa Maria, Los Osos, San Luis Obispo Valley, and Cuyama Valley). Vast amounts of time and energy will be saved by building one DMS for all basins. A county-wide DMS can also reach beyond SGMA to include data from the ten groundwater basins within County boundaries that are not developing GSPs at this time (e.g., Carrizo Plain) but the County is collecting data — capturing data that would not be collected if each SGMA basin had a separate DMS. For this reason, a county-wide DMS approach was described in the three grant applications submitted by the County to fund GSP development in the Paso Robles, Atascadero, and San Luis Obispo Valley Basins. The WSC Team proposes to move forward with the county-wide DMS approach.

If there is one countywide DMS, that does not mean the County is solely responsible for population of the data. Local agencies within San Luis Obispo County can be given DMS access to their jurisdictional area to upload data for the wells in their service areas. This distributes the labor required for data collection and entry to the appropriate agencies with jurisdiction, authority, and responsibility for their areas.

The Paso Robles Subbasin has already begun the DMS process and WSC Team partner, GEI Consultants, led the data schema development and data entry process for that effort, keeping expandability for a county-wide system in mind. Our team will build on this work to develop a single schema for all County data. GEI Consultants is also tasked to build the DMS for Atascadero Basin. If a county-wide basin is decided upon, GEI will not build a separate Atascadero DMS, but will format and contribute the Atascadero data to the County DMS instead.

Development of a county-wide DMS consists of three main tasks: planning, tool development, and data population. These three tasks are described in detail below.

2.5.1 PREPARE A DATA MANAGEMENT PLAN

Development of a Data Management Plan will provide the opportunity to identify the County's needs and align them with available budget to establish priorities for the DMS and data viewer. This step is especially important for this project because one DMS is intended to meet SGMA requirements for all County basins.

Preparation of the Data Management Plan begins with a needs assessment to determine the goals of the County DMS (and thereby, the San Luis Obispo Valley Basin DMS) and to provide guidance on the central tasks and approach to efficiently produce an effective DMS. This task will be initiated with a meeting that includes key managerial and technical staff. The needs assessment will:

- Identify key questions that should be addressed before DMS development.
- Identify the expectations of the DMS development effort.
- Identify the expectations for basins (subject to SGMA or otherwise) to load their own data into the County-wide DMS.
- Decide key data components/modules to be included in the DMS.
- Evaluate opportunities to build on existing databases.
- Determine the appropriate type of database to be used to store GSP-related data based on costs, utility, and potential future SGMA-related activities.
- Review the spatial and temporal data gaps in available data sets and qualitatively estimate uncertainty for required data.
- Determine the required features and functionality to be included in the first version of the DMS.
- Define multiple levels of user access (administrative, editor, viewer, and public) and determine the level of user access for various project entities, including data review, input, and export permissions.
- Develop comprehensive QA/QC procedures for data input.
- Assess the need for automated generation of materials (time series graphs, tables, and distribution maps) for GSP annual reports and SGMA reporting.
- Assess the degree of effort to load existing or future data into the proposed DMS.
- Coordinate with the San Luis Obispo County IT department to assess software, hosting, maintenance, and deployment requirements.

2.5.2 DEVELOP THE DMS TOOL

WSC Team partner, GEI Consultants, is currently developing a SGMA-compliant DMS for the Paso Robles Subbasin, a statewide SGMA DMS for DWR, and is working with SGMA data in several other basins. The WSC Team plans to apply the same database structure used in these existing efforts to develop a web-based DMS for the County, hosted on County servers. Many of the modules, libraries, tools, and data templates to support the DMS and data viewer have already been developed and will be re-used and customized for the county-wide DMS, resulting in considerable cost savings.

The DMS will be designed to primarily support the hydrogeologic conceptual model (HCM) and groundwater conditions sections of the GSP while remaining expandable to support other GSP components such as water budgets

and groundwater modeling. The DMS will store and display information from previous, ongoing, and future hydrogeologic studies and monitoring programs. The following activities will be undertaken as a part of DMS tool development:

- Create a list of changes for the existing DMS database schema, templates, graphic user interface, reports, and other features and functions to adapt existing work for a San Luis Obispo County DMS.
- Mock-up any visual changes to the graphic user interface, tools, or functions.
- Implement the identified changes and modify the DMS design as needed.
- Integrate modules, tools, and interfaces with testing data.
- Troubleshoot, test, and fix bugs.

2.5.3 COMPILE, POPULATE, AND REVIEW DATA

The final step is to format, review, and import data to the DMS. The WSC Team will review the data and populate the DMS with formatted data in close coordination with the GSAs in the SLO Basin. Given the variability of the data types and sources, all data will have to be quality checked to verify the type of data, quality of the original data, and the number of data sources being compiled for each type. Various activities may be undertaken as needed, such as the following:

- Make data requests to agencies, companies, landowners, and other stakeholders.
- Compile subsurface information from well logs, E-logs, pumping data, and water level monitoring.
- Verify well locations/estimates of surface elevations.
- Conduct informational meetings with agencies, companies, landowners, and other stakeholders.
- Import data from state and local online databases.

Our experience has shown that it takes considerable amount of time to collect, evaluate, and compare the data from multiple sources. To streamline the process of SGMA-related data collection, we have created effective programs to download publicly available water level and water quality data into our DMS data structure. This includes downloading and importing publicly available data from sources such as CASGEM and GeoTracker. We have also developed tools and procedures to evaluate groundwater level data from public and private wells from the existing San Luis Obispo County groundwater level database. These existing tools will be utilized for the countywide DMS.

The WSC Team will work with the GSAs to establish a process to complete this task as efficiently as possible to make the best use of consultant time and agency time. We will provide a framework for each agency to collect, review, perform QA/QC, and format data into the appropriate formats for entry into the DMS. The final data entry and QA/QC process will be documented and delivered to the County in a technical memorandum (TM). This TM will establish the standards for future data entry activities.

TASK 2.5 DELIVERABLES

- Data Management Plan.
- Web-based DMS populated with collected and imported data.
- Technical memorandum/user guide to describe functions of the DMS tool.

TASK 2.6: PROJECT AND MANAGEMENT ACTIONS

DEVELOPMENT AND ASSESSMENT OF PROJECTS AND MANAGEMENT ACTIONS

The SLO Valley GSP will identify and describe management projects and actions to achieve sustainability based on the sustainability goals developed in Task 2.3. The project and management action identification and prioritization process will be stakeholder driven and focused on the cost/benefit ratio of each proposed action and the contribution to the sustainability goals. Stakeholder participation and buy-in is critical and achieving this requires a structured and transparent process to gain trust and achieve sustainability. Our approach to this process is outlined below and satisfies the Regulations Article 5, Subarticle 3 Sustainable Management Criteria (including § 354.22, 354.24, 354.26, 354.28, 354.30) .

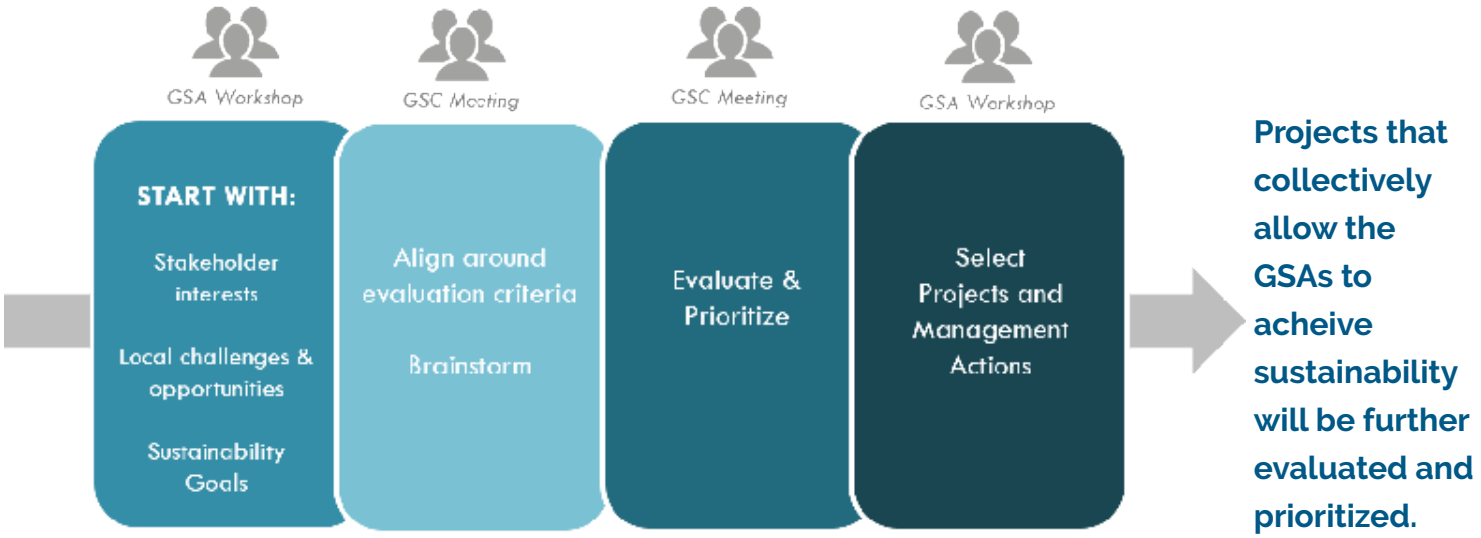
Stakeholder outreach will be facilitated through meetings with the GSC and dedicated GSA workshops targeted to engage interested parties to discuss, evaluate, and select projects and appropriate management actions. To evaluate possible projects and management actions, our approach includes identifying projects and management actions based on needs that emerge through development of the GSP. Our general strategy is to (1) identify needs, including the amount of water that is required to meet current and potential future demands and achieve sustainability, (2) configure projects to satisfy one or more of these needs, (3) quantify each project's/action's cost and contribution toward sustainability goals, (4) apply transparent evaluation process developed by stakeholders and (5) identify funding programs that align with the needs to be served by the candidate projects. One advantage of this approach is that it aims to identify multiple benefit projects; a second advantage is that it is scalable, lending itself to advancing a broad range of projects aimed at obtaining sustainable groundwater conditions.

This evaluation process will include development of a project prioritization toolset that is transparent and adaptable, so that it can be updated as conditions change and new opportunities arise. We will prepare a matrix and conduct an initial screening of the identified projects to initially rank the projects and management actions regarding their effectiveness to achieve sustainability. Projects that collectively allow the GSAs to achieve sustainability will be further evaluated and prioritized based on a number of different criteria that may include:

- Benefit to the Basin (expressed in acre-feet).
- Capital costs.
- Operation and maintenance costs.
- Permitting and environmental compliance.
- Public acceptance.
- Effectiveness for improving groundwater quality.
- Effectiveness for improving groundwater quantity.
- Ease of construction.

Potential projects/concepts that may be considered for the SLO Valley include:

- Delivery of recycled water to Edna Valley.
- Development of recharge or spreading basins along Corral de Piedras Creek in Edna Valley.
- Sentinel Peak Resources currently discharges about 500 acre-feet per year of highly treated water to Pismo Creek in Price Canyon. Relocating the outfall to an upstream location in Edna Valley could potentially provide a significant source of recharge to an area with declining water levels.



- Expand Sustainability in Practice (SIP) Certification program in the Edna Valley vineyards.
- Delivery of supplemental water to SLO Valley through the Nacimiento, Salinas, or Coastal Branch pipelines.

The prioritized projects and management actions will be further evaluated according to technical feasibility, environmental impact, and constructability. The results of this task will be presented in a planning-level feasibility report describing the identification and selection process for potential projects and management actions. This feasibility report will be included in an appendix of the GSP and used to support the GSP implementation plan.

Following the approval of the projects and management actions feasibility report, the WSC team will develop a plan of action for implementing the projects and management actions. The plan includes cost, schedule, annual reporting and a periodic assessment of progress towards sustainability.

TASK 2.6 DELIVERABLES

Draft GSP Section(s) and/or appropriate documentation.

- Projects and Management Actions Technical Memorandum.
- Plan Implementation Actions Technical Memorandum.
- Agendas and presentation materials.

TASK 2.6 MEETINGS

Projects and Management Actions to Achieve Sustainability -- Projects– GSC.

Projects and Management Actions to Achieve Sustainability -- Management Actions 1 – GSC.

Projects and Management Actions to Achieve Sustainability -- Management Actions 2 -- GSC.

Plan Implementation -- Estimate Costs – GSC.

Plan Implementation – Schedule – GSC.

Workshop 5 -- GSA.

TASK 2.7: GSP DEVELOPMENT

This task describes the scope of work for completing the draft and final GSP. We will prepare an outline for the GSP, an administrative draft of the GSP, a public review draft of the GSP, and a final draft of the GSP. Each GSP draft will include all required sections of the GSP, including appendices. Various technical memoranda representing different sections of the GSP will be prepared and provided for review as part of our scope of work described previously. Completion of this task will involve meetings with the GSA staff and GSC; work includes preparation of agendas and presentation materials for meetings and workshops, as needed.

Prepare Administrative Draft GSP: The WSC Team will prepare an administrative draft of the GSP that includes the GSP's supporting appendices. The administrative draft will be reviewed by the GSA staff members. After comments on the administrative draft are received, they will be compiled and a response to comments will be prepared. Comments incorporated into the GSP will be used to prepare the public draft of the GSP.

Prepare Public Draft and Final GSP: The WSC Team will prepare a public draft of the GSP and the GSP's supporting documentation. The public draft GSP will be circulated for public review and comment. After comments on the public draft are received, they will be compiled and a response to comments document will be prepared. Comments incorporated into the GSP will be used to prepare the final draft of the GSP. Once finalized, the GSP will be adopted by the GSAs.

TASK 2.7 DELIVERABLES

- Draft and Final GSP.
- Copy of Public Notice.
- Resolutions of GSP adoption by each GSA.
- Agendas and presentation materials.

TASK 2.7 MEETINGS

Administrative Draft GSP– GSC

Final GSP – GSC

Grant Completion -- GSC

Workshop 6 -- GSA

Workshop 7 -- GSA

TASK 3: COORDINATION & COMMUNICATION

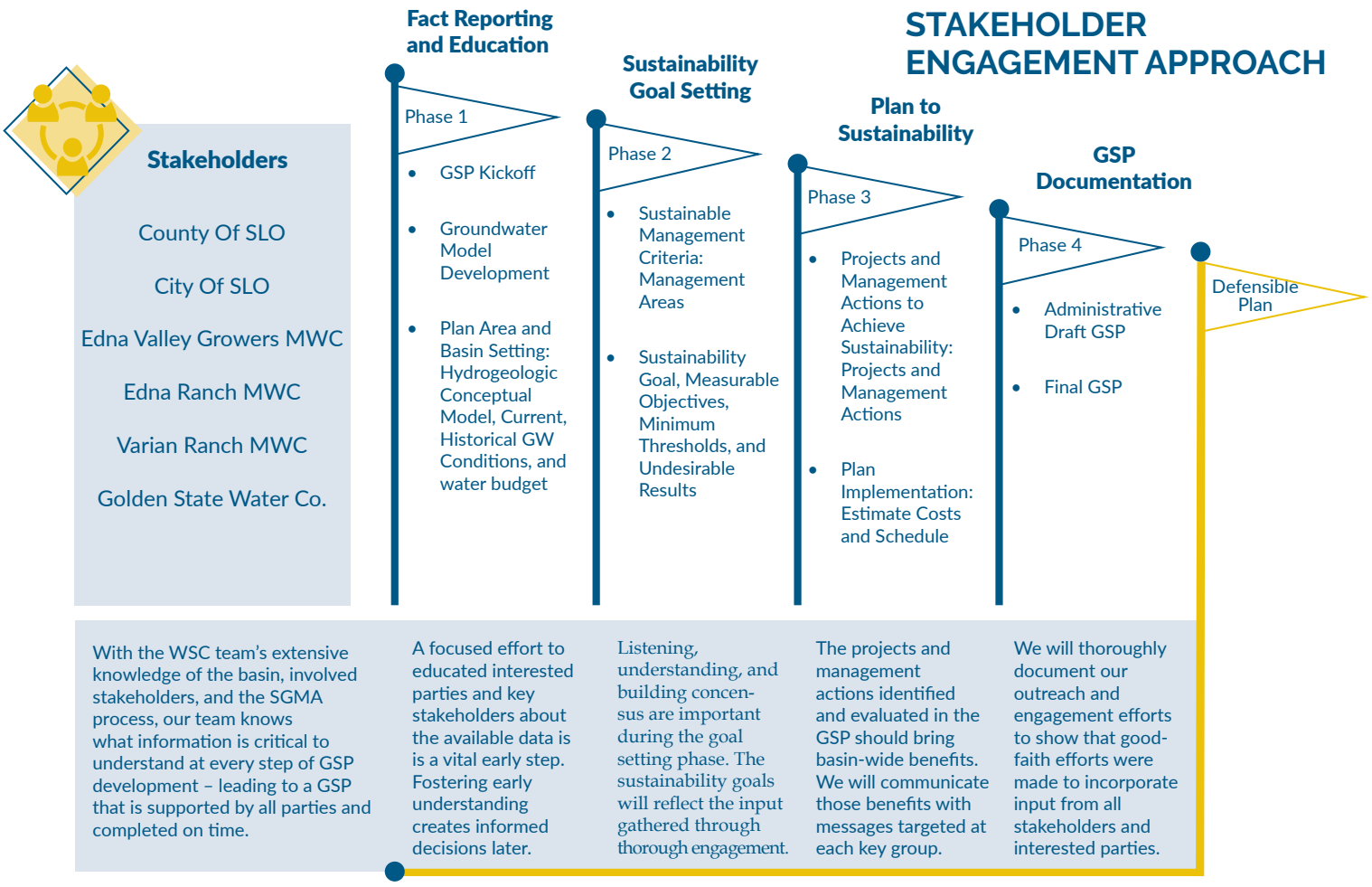
TASK 3.1: COMMUNICATION AND ENGAGEMENT

WSC's team will leverage the combined strengths of its strategic communications staff and GEI's GCP to carry out the coordination and communication described in the C&E Plan in Task 2.1. Our approach will encourage active involvement from all stakeholders and interested parties throughout the process with the goal of a GSP that better serves the sustainability of the Basin and the communities that rely on it.

MEETINGS

WSC's Project Manager, Michael Cruikshank, will support meeting facilitation and stakeholder outreach throughout the process. Michael will be supported by WSC's strategic communications team, including Kirk Barron, who is a former newspaper reporter with extensive experience writing easy-to-understand stories about complex public meetings. Their roles will change depending on the type of meeting, and the stage of the project:

- **Bi-monthly GSC Meetings.** In WSC's proposed accelerated GSP schedule, there would be an estimated 15 GSC meetings. The GSC meetings are held bi-monthly on the second Wednesday from 3:30 to 5:30 p.m. WSC will support County staff with the development of meeting agendas, presentation materials, educational materials, GCP website updates, and meeting summaries for the meetings to keep stakeholders informed and engaged.



- **Quarterly GSA Workshop Meetings.** Public GSA workshop meetings will be held quarterly in the evening after a GSC meeting to help facilitate more public involvement. WSC's team will coordinate meetings, develop presentations and agendas, and meeting summaries for the quarterly GSA Coordination Meetings. Public meetings will be held in the evenings to make it easier for people to attend.

- **Inter-basin Coordination.** During the process of developing the GSP, we will evaluate the need for inter-basin coordination meetings. If it is determined that there is a need, WSC anticipates holding meetings approximately annually across the GSP development schedule. Los Osos Groundwater Basin is the only potential connection to the SLO Basin that may require such meetings.

NOTICE AND COMMUNICATION

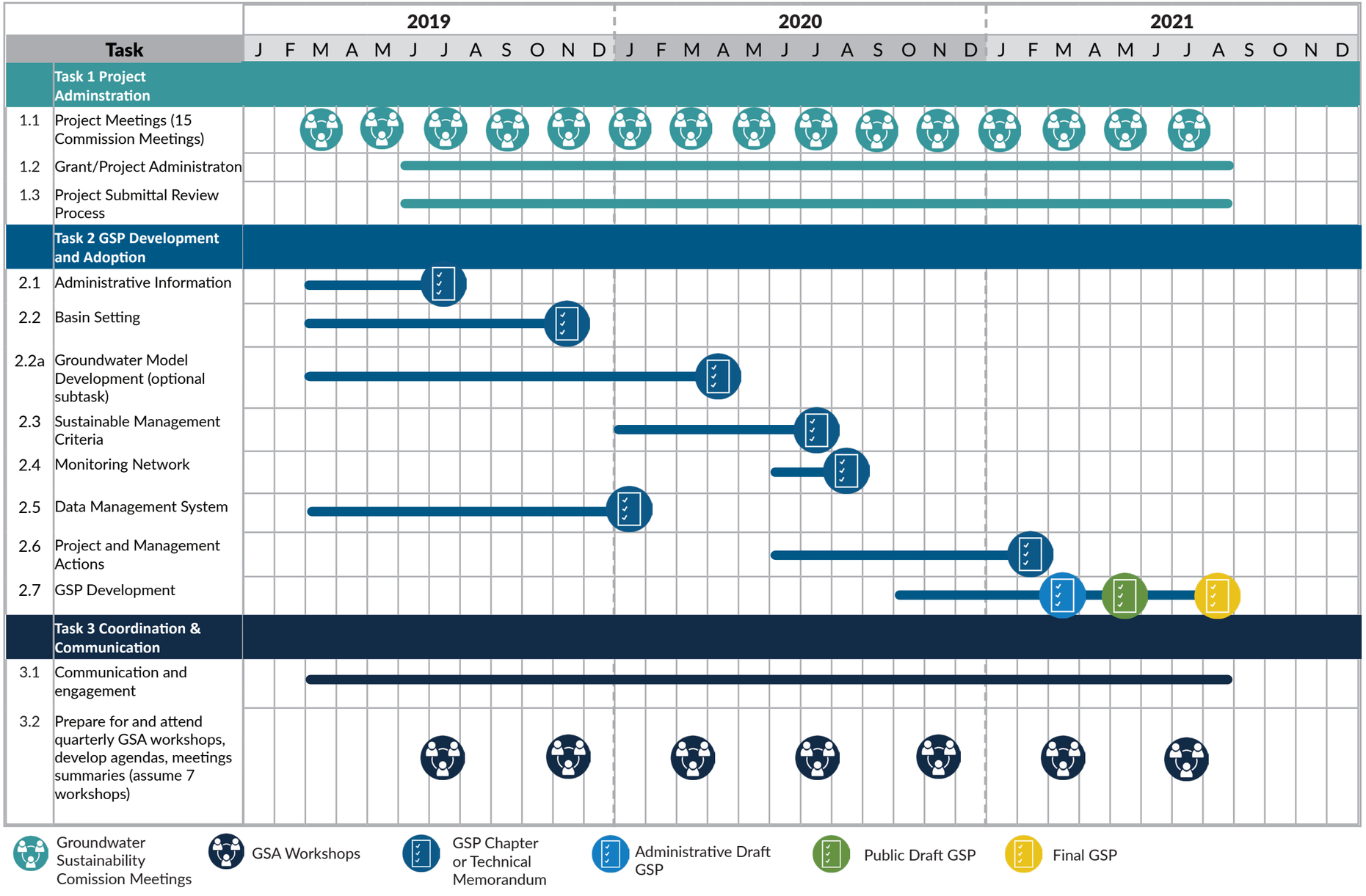
The GCP tool developed by GEI and currently being used in the Paso Robles Basin will be used by WSC's team in the SLO Basin. Contact information for all known stakeholders will be uploaded to the GCP at the start of the project and any other agencies or interested parties can easily sign up to receive notices and project communications. The master contact list in the GCP will be used to alert all stakeholders, agencies, and interested parties about meetings, key milestones, comment periods, surveys, and all other communications.

The GCP will serve as a repository for all GSP communication, including meeting minutes, summaries, and public comments. The GCP includes a master calendar that will be populated with all meetings. Each meeting will have an event page that will be updated with all pertinent information and relevant documents such as agendas, summaries, and reports. The GCP will house and organize all information throughout the project, and will be used to produce reports about the coordination and communication efforts during the GSP development as required by SGMA.

TASK 3.1 DELIVERABLES

- GSA meeting agendas/summaries of key issues/decisions.
- Inter-basin meeting agendas/summaries of key issues/decisions.
- List of public meetings.

PROJECT SCHEDULE



Client County of SLO
Project SLO Basin GSP
Cost Proposal
Date Jan-19

WSC
WATER SYSTEMS CONSULTING, INC.

Task No.	Task Description	WSC											GSI											CHG											GEI										Stillwater			ALL FIRMS			
		Principal	Senior Hydrogeologist	Senior Engineer I	Staff Geologist	Assistant Engineer	Communications Support	Clerical/ Admin	Total Labor Hours	Total Labor	Expenses	Fee	Principal Geohydrologist	Supervising Modeler	Supervising Hydrogeologist	Project Hydrogeologist	Staff Geologist	Total Labor Hours	Total Labor	Expenses	Fee	Principal	Senior Hydrogeologist	Project Geologist	Staff Env Scientist/ GIS	Staff Geologist II	Staff Geologist I	Total Labor Hours	Total Labor	Expenses	Fee	Grade 8	Grade 6	Grade 5	Grade 4	Grade 3	Administrative Staff	Total Labor Hours	Fee	Professional	Total Labor Hours	Fee	Total Labor Hours	Total Labor	Expenses	Total Fee
Billing rates, $/hr		*$280*	*$210*	*$210*	*$145*	*$135*	*$115*	*$110*					*$275*	*$237*	*$237*	*$171*	*$127*					*$176*	*$165*	*$149*	*$132*	*$132*	*$116*					*$303*	*$227*	*$199*	*$169*	*$151*	*$112*			*$193*						
1.0	**Project Administration**	**28**	**450**	**0**	**0**	**40**	**120**	**30**	**668**	**$ 124,840**	**$ 5,000**	**$ 129,840**	**40**	**0**	**340**	**0**	**0**	**380**	**$ 91,410**	**$ -**	**$ 91,410**	**100**	**0**	**0**	**0**	**0**	**0**	**100**	**$ 17,600**	**$ -**	**$ 17,600**	**36**	**0**	**0**	**0**	**0**	**0**	**36**	**$ 10,890**	**24**	**24**	**$4,620**	**1208**	**$ 249,360**	**$ 5,000**	**$ 254,360**
1.1	Attend Project Meetings (15 bi-monthly commission meetings)	20	120				90		230	$ 41,150	$ 1,600	$ 42,750	20		90			110	$ 26,785		$ 26,785	20						20	$ 3,520	$ -	$ 3,520	8						8	$ 2,420	8	8	$1,540	**376**	**$ 75,415**	**$ 1,600**	**$ 77,015**
1.1.1	Internal Communication Meetings (30 monthly meetings)		104				30		134	$ 25,290	$ 1,000	$ 26,290	20		120			140	$ 33,880		$ 33,880	40						40	$ 7,040	$ -	$ 7,040	8						8	$ 2,420	8	8	$1,540	**330**	**$ 70,170**	**$ 1,000**	**$ 71,170**
1.1.2	Weekly project update teleconference		90						90	$ 18,900	$ 800	$ 19,700			90			90	$ 21,285		$ 21,285	40						40	$ 7,040	$ -	$ 7,040	20						20	$ 6,050	8	8	$1,540	**248**	**$ 54,815**	**$ 800**	**$ 55,615**
1.1.3	Project Administration		120					30	150	$ 28,500	$ 1,100	$ 29,600			40			40	$ 9,460		$ 9,460							0	$ -	$ -	$ -							0	$ -		0	$0	**190**	**$ 37,960**	**$ 1,100**	**$ 39,060**
1.1.4	Grant Administration		8			40			48	$ 7,080	$ 300	$ 7,380						0	$ -	$ -	$ -							0	$ -	$ -	$ -							0	$ -		0	$0	**48**	**$ 7,080**	**$ 300**	**$ 7,380**
1.1.5	Project Submittal Review Process	8	8						16	$ 3,920	$ 200	$ 4,120						0	$ -	$ -	$ -							0	$ -	$ -	$ -							0	$ -		0	$0	**16**	**$ 3,920**	**$ 200**	**$ 4,120**
2	**Plan Development**	**8**	**280**	**124**	**103**	**162**	**144**	**0**	**821**	**$ 140,445**	**$ 5,700**	**$ 146,145**	**105**	**0**	**495**	**171**	**44**	**815**	**$ 180,664**	**$ 1,600**	**$ 182,264**	**68**	**284**	**164**	**164**	**0**	**0**	**680**	**$ 104,830**	**$ -**	**$ 104,830**	**24**	**380**	**140**	**100**	**480**	**40**	**1164**	**$ 215,006**	**156**	**156**	**$ 30,030**	**3636**	**$ 670,975**	**$ 7,300**	**$ 678,275**
2.1	Introduction and Administrative Information Chapter	0	38	0	0	0	32	0	70	$ 11,660	$ 500	$ 12,160	8	0	48	0	0	56	$ 13,552	$ 100	$ 13,652	0	0	0	0	0	0	0	$ -	$ -	$ -	8	40	120	0	60	20	248	$ 46,662	0	0	$0	**374**	$ 71,874	$ 600	**$ 72,474**
2.1.1	Prepare Executive Summary and Description of Plan Area		8				8		16	$ 1,680	$ 100	$ 1,780	4		24			28	$ 6,776	$ 100	$ 6,876							0	$ -	$ -	$ -							0	$ -		0	$0	**36**	$ 8,456	$ 200	**$ 8,656**
2.1.2	Prepare Stakeholder Communication Plan		4				24		28	$ 3,600	$ 100	$ 3,700			8			8	$ 1,892	$ -	$ 1,892							0	$ -	$ -	$ -	8		80			20	108	$ 20,592		0	$0	**144**	$ 26,084	$ 100	**$ 26,184**
2.1.3	Groundwater Communication Portal		2				8		10	$ 1,340	$ 100	$ 1,440						0	$ -	$ -	$ -							0	$ -	$ -	$ -		40	40		60		140	$ 26,070		0	$0	**150**	$ 27,410	$ 100	**$ 27,510**
2.1.4	Prepare Agendas and presentation materials for GSP Kickoff Meeting		16						16	$ 3,360	$ 100	$ 3,460			8			8	$ 1,892	$ -	$ 1,892							0	$ -	$ -	$ -							0	$ -		0	$0	**24**	$ 5,252	$ 100	**$ 5,352**
2.1.5	Prepare Draft GSP Sections		8						8	$ 1,680	$ 100	$ 1,780	4		8			12	$ 2,992	$ -	$ 2,992							0	$ -	$ -	$ -							0	$ -		0	$0	**20**	$ 4,672	$ 100	**$ 4,772**
2.2	Basin Setting	0	61	0	15	0	24	0	100	$ 17,745	$ 600	$ 18,345	20	0	79	87	0	186	$ 39,017	$ 300	$ 39,317	40	184	100	100	0	0	424	$ 65,450	$ -	$ 65,450	0	0	0	0	0	0	0	$ -	12	12	$2,310	**722**	$ 124,522	$ 900	**$ 125,422**
2.2.1	Hydrologic Conceptual Model		4						4	$ 840	$ -	$ 840	4		8	4		16	$ 3,674	$ -	$ 3,674	4	4					8	$ 1,364	$ -	$ 1,364							0	$ -	4	4	$770	**32**	$ 6,648	$ -	**$ 6,648**
2.2.2	Groundwater Conditions		4						4	$ 840	$ -	$ 840			8	4		12	$ 2,574	$ -	$ 2,574	4	4					8	$ 1,364	$ -	$ 1,364							0	$ -		0	$0	**24**	$ 4,778	$ -	**$ 4,778**
2.2.3	Water Budget		24						24	$ 5,040	$ 200	$ 5,240	4		8	8		20	$ 4,356	$ -	$ 4,356	24	160	100	100			384	$ 58,674	$ -	$ 58,674							0	$ -	8	8	$1,540	**436**	$ 69,610	$ 200	**$ 69,810**
2.2.4	Management Areas		4						4	$ 840	$ -	$ 840	4		24	16		44	$ 9,504	$ 100	$ 9,604	4	4					8	$ 1,364	$ -	$ 1,364							0	$ -		0	$0	**56**	$ 11,708	$ 100	**$ 11,808**
2.2.5	Identification of Data Gaps		2						2	$ 420	$ -	$ 420			8	8		16	$ 3,256	$ -	$ 3,256		8					8	$ 1,320	$ -	$ 1,320							0	$ -		0	$0	**26**	$ 4,996	$ -	**$ 4,996**
2.2.6	Prepare Technical Memorandum for Basin Setting		8						8	$ 1,680	$ 100	$ 1,780	4		8	32		44	$ 8,448	$ 100	$ 8,548	4	4					8	$ 1,364	$ -	$ 1,364							0	$ -		0	$0	**60**	$ 11,492	$ 200	**$ 11,692**
2.2.7	Prepare Agendas and presentation materials for 3 GSC Meetings		15		15		24		54	$ 8,085	$ 300	$ 8,385	4		15	15		34	$ 7,205	$ 100	$ 7,305							0	$ -	$ -	$ -							0	$ -		0	$0	**88**	$ 15,290	$ 400	**$ 15,690**
2.3	Sustainable Management Criteria	0	47	0	15	0	24	0	86	$ 14,805	$ 700	$ 15,505	20	0	120	40	0	180	$ 40,700	$ 500	$ 41,200	8	32	0	0	0	0	40	$ 6,688	$ -	$ 6,688	0	0	0	0	0	0	0	$ -	28	28	$5,390	**334**	$ 67,583	$ 1,200	**$ 68,783**
2.3.1	Develop Processes and criteria to define undesirable results		8						8	$ 1,680	$ 100	$ 1,780	4		24	8		36	$ 8,140	$ 100	$ 8,240	2	8					10	$ 1,672	$ -	$ 1,672							0	$ -	8	8	$1,540	**62**	$ 13,032	$ 200	**$ 13,232**
2.3.2	Develop minimum thresholds and sustainability Indicators		8						8	$ 1,680	$ 100	$ 1,780	4		24	8		36	$ 8,140	$ 100	$ 8,240	2	8					10	$ 1,672	$ -	$ 1,672							0	$ -	6	6	$1,155	**60**	$ 12,647	$ 200	**$ 12,847**
2.3.3	Develop measurable Objectives		8						8	$ 1,680	$ 100	$ 1,780	4		24	8		36	$ 8,140	$ 100	$ 8,240	2	8					10	$ 1,672	$ -	$ 1,672							0	$ -	6	6	$1,155	**60**	$ 12,647	$ 200	**$ 12,847**
2.3.4	Prepare technical Memorandum for Sustainable Management Criteria		8						8	$ 1,680	$ 100	$ 1,780	4		24	8		36	$ 8,140	$ 100	$ 8,240	2	8					10	$ 1,672	$ -	$ 1,672							0	$ -	8	8	$1,540	**62**	$ 13,032	$ 200	**$ 13,232**
2.3.5	Prepare Agendas and presentation materials for 3 GSC Meetings		15		15		24		54	$ 8,085	$ 300	$ 8,385	4		24	8		36	$ 8,140	$ 100	$ 8,240							0	$ -	$ -	$ -							0	$ -		0	$0	**90**	$ 16,225	$ 400	**$ 16,625**
2.4	Monitoring Network	0	32	0	0	0	0	0	32	$ 6,720	$ 400	$ 7,120	8	0	16	0	0	24	$ 5,984	$ -	$ 5,984	20	68	64	64	0	0	216	$ 32,692	$ -	$ 32,692	0	0	0	0	0	0	0	$ -	92	92	$17,710	**364**	$ 63,106	$ 400	**$ 63,506**
2.4.1	Monitoring Network		8						8	$ 1,680	$ 100	$ 1,780	2		4			6	$ 1,496	$ -	$ 1,496	4	24	24	24			76	$ 11,396	$ -	$ 11,396							0	$ -	8	8	$1,540	**98**	$ 16,112	$ 100	**$ 16,212**
2.4.2	Water Quality Monitoring Plan		8						8	$ 1,680	$ 100	$ 1,780	2		4			6	$ 1,496	$ -	$ 1,496	4	24	24	24			76	$ 11,396	$ -	$ 11,396							0	$ -		0	$0	**90**	$ 14,572	$ 100	**$ 14,672**
2.4.3	Surface Water Inflow/Outflow Monitoring Plan		8						8	$ 1,680	$ 100	$ 1,780	2		4			6	$ 1,496	$ -	$ 1,496	4	4					8	$ 1,364	$ -	$ 1,364							0	$ -	60	60	$11,550	**82**	$ 16,090	$ 100	**$ 16,190**
2.4.4	Prepare Technical Memorandums for Monitoring Network		8						8	$ 1,680	$ 100	$ 1,780	2		4			6	$ 1,496	$ -	$ 1,496	8	16	16	16			56	$ 8,536	$ -	$ 8,536							0	$ -	24	24	$4,620	**94**	$ 16,332	$ 100	**$ 16,432**
2.5	Data Management System	0	8	0	0	0	0	0	8	$ 1,680	$ -	$ 1,680	0	0	0	0	0	0	$ -	$ -	$ -	0	0	0	0	0	0	0	$ -	$ -	$ -	16	340	20	100	420	20	916	$ 168,344	8	8	$1,540	**932**	$ 171,564	$ -	**$ 171,564**
2.5.1	Prepare Data Management Plan		4						4	$ 840	$ -	$ 840						0	$ -	$ -	$ -							0	$ -	$ -	$ -	8	20	20	20		20	88	$ 16,566		0	$0	**92**	$ 17,406	$ -	**$ 17,406**
2.5.2	Develop DMS Tool		0						0	$ -	$ -	$ -						0	$ -	$ -	$ -							0	$ -	$ -	$ -	8	300			400		708	$ 130,680		0	$0	**708**	$ 130,680	$ -	**$ 130,680**
2.5.3	Compile, Population and Review Data		4						4	$ 840	$ -	$ 840						0	$ -	$ -	$ -							0	$ -	$ -	$ -		20		80	20		120	$ 21,098	8	8	$1,540	**132**	$ 23,478	$ -	**$ 23,478**
2.6	Projects and Management Actions Chapter	8	39	124	58	162	40	0	431	$ 71,350	$ 2,900	$ 74,250	25	0	144	44	0	213	$ 48,433	$ 400	$ 48,833	0	0	0	0	0	0	0	$ -	$ -	$ -	0	0	0	0	0	0	0	$ -	8	8	$1,540	**652**	$ 121,323	$ 3,300	**$ 124,623**
2.6.1	Develop and Assessment of Projects and Management Actions	4	10	40		40			94	$ 17,020	$ 700	$ 17,720	8		40	10		58	$ 13,365	$ 100	$ 13,465							0	$ -	$ -	$ -							0	$ -		0	$0	**152**	$ 30,385	$ 800	**$ 31,185**
2.6.2	Develop an Implementation Program	4	5	40		40			89	$ 15,970	$ 600	$ 16,570	4		40			44	$ 10,560	$ 100	$ 10,660							0	$ -	$ -	$ -							0	$ -	8	8	$1,540	**141**	$ 28,070	$ 700	**$ 28,770**
2.6.3	Prepare Projects and Management Actions Technical Memorandum		2	20	10	30			62	$ 10,120	$ 400	$ 10,520	8		24	10		42	$ 9,581	$ 100	$ 9,681							0	$ -	$ -	$ -							0	$ -		0	$0	**104**	$ 19,701	$ 500	**$ 20,201**
2.6.4	Prepare Plan Implementation Technical Memorandum		2	4	8	12			26	$ 4,040	$ 200	$ 4,240						0	$ -	$ -	$ -							0	$ -	$ -	$ -							0	$ -		0	$0	**26**	$ 4,040	$ 200	**$ 4,240**
2.6.5	Prepare Agendas and presentation materials for 5 GSC Meetings		20	20	40	40	40		160	$ 24,200	$ 1,000	$ 25,200	5		40	24		69	$ 14,927	$ 100	$ 15,027							0	$ -	$ -	$ -							0	$ -		0	$0	**229**	$ 39,127	$ 1,100	**$ 40,227**
2.70	GSP Development	0	55	0	15	0	24	0	94	$ 16,485	$ 600	$ 17,085	24	0	88	0	44	156	$ 32,978	$ 300	$ 33,278	0	0	0	0	0	0	0	$ -	$ -	$ -	0	0	0	0	0	0	0	$ -	8	8	$1,540	**258**	$ 51,003	$ 900	**$ 51,903**
2.7.1	Prepare Administrative Draft		24						24	$ 5,040	$ 200	$ 5,240	8		40	0	20	68	$ 14,190	$ 100	$ 14,290							0	$ -	$ -	$ -							0	$ -	4	4	$770	**96**	$ 20,000	$ 300	**$ 20,300**
2.7.2	Prepare Public draft and Final GSP		16						16	$ 3,360	$ 100	$ 3,460	8		24	0	12	44	$ 9,394	$ 100	$ 9,494							0	$ -	$ -	$ -							0	$ -	4	4	$770	**64**	$ 13,524	$ 200	**$ 13,724**
2.7.3	Prepare Agendas and presentation materials for 3 GSC Meetings		15		15		24		54	$ 8,085	$ 300	$ 8,385	8		24	0	12	44	$ 9,394	$ 100	$ 9,494							0	$ -	$ -	$ -							0	$ -		0	$0	**98**	$ 17,479	$ 400	**$ 17,879**
3.0	**Coordination and Communication**	**0**	**102**	**0**	**0**	**0**	**324**	**0**	**426**	**$ 58,680**	**$ 2,400**	**$ 61,080**	**0**	**0**	**56**	**0**	**0**	**56**	**$ 13,244**	**$ 200**	**$ 13,444**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$ -**	**$ -**	**$ -**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$ -**	**0**	**0**	**$0**	**482**	**$ 71,924**	**$ 2,600**	**$ 74,524**
3.1	Prepare for and attend 7 GSA Workshops		28				28		56	$ 9,100	$ 400	$ 9,500			28			28	$ 6,622	$ 100	$ 6,722							0	$ -	$ -	$ -							0	$ -		0	$0	84	$ 15,722	$ 500	**$ 16,222**
3.2	Prepare Agendas and Materials for 7 GSA Workshops		14				56		70	$ 9,380	$ 400	$ 9,780			28			28	$ 6,622	$ 100	$ 6,722							0	$ -	$ -	$ -							0	$ -		0	$0	98	$ 16,002	$ 500	**$ 16,502**
3.3	Prepare Outreach Materials for the 15 GSC Meetings		60				240		300	$ 40,200	$ 1,600	$ 41,800						0	$ -	$ -	$ -							0	$ -	$ -	$ -							0	$ -		0	$0	300	$ 40,200	$ 1,600	**$ 41,800**
	Column Totals	**36**	**832**	**124**	**103**	**202**	**588**	**30**	**1915**	**$ 323,965**	**$ 13,100**	**$ 337,065**	**145**	**0**	**891**	**171**	**44**	**1251**	**$ 285,318**	**$ 1,800**	**$ 287,118**	**168**	**284**	**164**	**164**	**0**	**0**	**780**	**$ 122,430**	**$ -**	**$ 122,430**	**60**	**380**	**140**	**100**	**480**	**40**	**1200**	**$ 225,896**	**180**	**180**	**$ 34,650**	**5326**	**$ 992,259**	**$ 14,900**	**$ 1,007,159**

Note: The expenses were estimated at 4%. Effort will be made to keep travel costs low by sharing costs with other local projects.

Client County of SLO
Project SLO Basin GSP
Cost Proposal
Date Jan-19

WSC
Water Systems Consulting, Inc.

Task No.	Task Description	WSC											GSI										CHG										GEI								Stillwater			ALL FIRMS			
		Principal	Senior Hydrogeologist	Senior Engineer I	Staff Geologist	Assistant Engineer	Communications Support	Clerical/ Admin	Total Labor Hours	Total Labor	Expenses	Fee	Principal Geohydrologist	Supervising Modeler	Supervising Hydrogeologist	Project Hydrogeologist	Staff Geologist	Total Labor Hours	Total Labor	Expenses	Fee	Principal	Senior Hydrogeologist	Project Geologist	Staff Env Scientist/ GIS	Staff Geologist II	Staff Geologist I	Total Labor Hours	Total Labor	Expenses	Fee	Grade 8	Grade 6	Grade 5	Grade 4	Grade 3	Administrative Staff	Total Labor Hours	Fee	Professional	Total Labor Hours	Fee	Total Labor Hours	Total Labor	Expenses	Total Fee
2.2a	**Groundwater-Surface Water Model Development**	**0**	**48**	**52**	**76**	**0**	**0**	**0**	**176**	$ 32,020	$ 600	$ 32,620	**0**	**48**	**0**	**64**	**64**	**176**	$ 30,360	$ 300	$ 30,660	**32**	**0**	**0**	**0**	**0**	**0**	**32**	$ 5,632	$ -	$ 5,632	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$ -	**16**	**16**	$ 3,080	**400**	$ 71,092	$ 900	$ 71,992
2.2a.1	Data Compilation and Review	0	8	16	60	0	0	0	84	$ 13,740	$ -	$ 13,740	0	8	0	8	8	24	$ 4,268	$ -	$ 4,268	8	0	0	0	0	0	8	$ 1,408	$ -	$ 1,408	0	0	0	0	0	0	0	$ -	16	16	$3,080	**132**	$ 22,496	$ -	**$ 22,496**
2.2a.2	Conceptual Model	0	8	16	16	0	0	0	40	$ 7,360	$ 200	$ 7,560	0	16	0	32	32	80	$ 13,288	$ 200	$ 13,488	8	0	0	0	0	0	8	$ 1,408	$ -	$ 1,408	0	0	0	0	0	0	0	$ -	0	0	$0	**128**	$ 22,056	$ 400	**$ 22,456**
2.2a.2.1	Model Extent/Boundary Conditions		4	8	8				20	$ 3,680	$ 100	$ 3,780		8		16	16	40	$ 6,644	$ 100	$ 6,744	4						4	$ 704	$ -	$ 704							0	$ -			$0	**64**	$ 11,028	$ 200	**$ 11,228**
2.2a.2.2	Geologic Structure Mapping and Characterization		4	8	8				20	$ 3,680	$ 100	$ 3,780		8		16	16	40	$ 6,644	$ 100	$ 6,744	4						4	$ 704	$ -	$ 704							0	$ -			$0	**64**	$ 11,028	$ 200	**$ 11,228**
2.2a.3	Model Construction Approach and Code Selection	0	32	20	0	0	0	0	52	$ 10,920	$ 400	$ 11,320	0	24	0	24	24	72	$ 12,804	$ 100	$ 12,904	16	0	0	0	0	0	16	$ 2,816	$ -	$ 2,816	0	0	0	0	0	0	0	$ -	0	0	$0	**140**	$ 26,540	$ 500	**$ 27,040**
2.2a.3.1	Code Selection Criteria and Results		24	12					36	$ 7,560	$ 300	$ 7,860		8		8	8	24	$ 4,268	$ -	$ 4,268	8						8	$ 1,408	$ -	$ 1,408							0	$ -			$0	**68**	$ 13,236	$ 300	**$ 13,536**
2.2a.3.2	Define Model Grids		8	8					16	$ 3,360	$ 100	$ 3,460		16		16	16	48	$ 8,536	$ 100	$ 8,636	8						8	$ 1,408	$ -	$ 1,408							0	$ -			$0	**72**	$ 13,304	$ 200	**$ 13,504**
2.2a	**Groundwater-Surface Water Model Development (Optional)**	**0**	**152**	**136**	**336**	**0**	**0**	**0**	**624**	$ 109,200	$ 3,300	$ 112,500	**16**	**554**	**0**	**274**	**156**	**1000**	$ 201,872	$ 1,100	$ 202,972	**42**	**0**	**0**	**0**	**0**	**0**	**42**	$ 7,392	$ -	$ 7,392	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$ -	**24**	**24**	$ 4,620	**1690**	$ 323,084	$ 4,400	$ 327,484
2.2a.4	Surface Water Model Development	0	24	120	224	0	0	0	368	$ 62,720	$ 2,500	$ 65,220	0	64	0	0	32	96	$ 19,184	$ -	$ 19,184	4	0	0	0	0	0	4	$ 704	$ -	$ 704	0	0	0	0	0	0	0	$ -	24	24	$4,620	**492**	$ 87,228	$ 2,500	**$ 89,728**
2.2a.4.1	Land Surface and Climate Data Preparation		8	24	60				92	$ 15,420	$ 600	$ 16,020		16			8	24	$ 4,796	$ -	$ 4,796							0	$ -	$ -	$ -							0	$ -	8	8	$1,540	**124**	$ 21,756	$ 600	**$ 22,356**
2.2a.4.2	Land Use Analysis		8	40	40				88	$ 15,880	$ 600	$ 16,480		16			8	24	$ 4,796	$ -	$ 4,796							0	$ -	$ -	$ -							0	$ -		0	$0	**112**	$ 20,676	$ 600	**$ 21,276**
2.2a.4.3	Construct Surface Water Model Input Files and Initial Model Run			16	24				40	$ 6,840	$ 300	$ 7,140		16			8	24	$ 4,796	$ -	$ 4,796							0	$ -	$ -	$ -							0	$ -	16	16	$3,080	**80**	$ 14,716	$ 300	**$ 15,016**
2.2a.4.4	Calibrate Surface Water Model		8	40	100				148	$ 24,580	$ 1,000	$ 25,580		16			8	24	$ 4,796	$ -	$ 4,796	4						4	$ 704	$ -	$ 704							0	$ -			$0	**176**	$ 30,080	$ 1,000	**$ 31,080**
2.2a.5	Groundwater Model Development	0	56	0	0	0	0	0	56	$ 11,760	$ 500	$ 12,260	0	220	0	100	56	376	$ 76,164	$ 700	$ 76,864	8	0	0	0	0	0	8	$ 1,408	$ -	$ 1,408	0	0	0	0	0	0	0	$ -	0	0	$0	**440**	$ 89,332	$ 1,200	**$ 90,532**
2.2a.5.1	Define Model Layers, Boundary Conditions, and Aquifer Parameters		8						8	$ 1,680	$ 100	$ 1,780		120			52	36	208	$ 41,800	$ 400	$ 42,200	4						4	$ 704	$ -	$ 704							0	$ -			$0	**220**	$ 44,184	$ 500	**$ 44,684**
2.2a.5.2	Construct Groundwater Model Input Files and Initial Model Run		8						8	$ 1,680	$ 100	$ 1,780					8		8	$ 1,364	$ -	$ 1,364							0	$ -	$ -	$ -							0	$ -			$0	**16**	$ 3,044	$ 100	**$ 3,144**
2.2a.5.3	Calibrate Groundwater Model		40						40	$ 8,400	$ 300	$ 8,700		100			40	20	160	$ 33,000	$ 300	$ 33,300	4						4	$ 704	$ -	$ 704							0	$ -			$0	**204**	$ 42,104	$ 600	**$ 42,704**
2.2a.6	Integrated Groundwater-Surface Water Model Development	0	16	16	16	0	0	0	48	$ 9,040	$ 300	$ 9,340	0	110	0	54	28	192	$ 38,764	$ 400	$ 39,164	6	0	0	0	0	0	6	$ 1,056	$ -	$ 1,056	0	0	0	0	0	0	0	$ -	0	0	$0	**246**	$ 48,860	$ 700	**$ 49,560**
2.2a.6.1	Identify and Implement Modeling Packages for Integrated Model		4	8	8				20	$ 3,680	$ 100	$ 3,780		60			26	18	104	$ 20,900	$ 200	$ 21,100	4						4	$ 704	$ -	$ 704							0	$ -			$0	**128**	$ 25,284	$ 300	**$ 25,584**
2.2a.6.2	Construct Integrated Model Input Files and Initial Model Run		8						8	$ 1,680	$ 100	$ 1,780					8		8	$ 1,364	$ -	$ 1,364							0	$ -	$ -	$ -							0	$ -			$0	**16**	$ 3,044	$ 100	**$ 3,144**
2.2a.6.3	Calibrate Integrated Model		4	8	8				20	$ 3,680	$ 100	$ 3,780		50			20	10	80	$ 16,500	$ 200	$ 16,700	2						2	$ 352	$ -	$ 352							0	$ -			$0	**102**	$ 20,532	$ 300	**$ 20,832**
2.2a.7	Scenario Evaluation	0	16	0	16	0	0	0	32	$ 5,680	$ -	$ 5,680	0	100	0	40	20	160	$ 33,000	$ -	$ 33,000	8	0	0	0	0	0	8	$ 1,408	$ -	$ 1,408	0	0	0	0	0	0	0	$ -	0	0	$0	**200**	$ 40,088	$ -	**$ 40,088**
2.2a.8	Final Modeling Report	0	40	0	80	0	0	0	120	$ 20,000	$ -	$ 20,000	16	60	0	80	20	176	$ 34,760	$ -	$ 34,760	16	0	0	0	0	0	16	$ 2,816	$ -	$ 2,816	0	0	0	0	0	0	0	$ -	0	0	$0	**312**	$ 57,576	$ -	**$ 57,576**
2.4a	**Monitoring Well (Optional)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$ -	$ -	$ -	**0**	**0**	**0**	**0**	**0**	**0**	$ -	$ -	$ -	**0**	**28**	**0**	**0**	**66**	**0**	**94**	$ 13,332	$ 53,900	$67,232	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$0**	**0**	**0**	**$0**	**94**	$ 13,332	$ 53,900	$ 17,232
2.4.a1	Confirm preferred location								0	$ -	$ -	$ -						0	$ -	$ -	$ -		4					8	$ 1,188	$ -	$1,188							0	$0		0	$0	**8**	$ 1,188	$ -	**$ 1,188**
2.4.a2	CEQA documentation/permits								0	$ -	$ -	$ -						0	$ -	$ -	$ -		8			8		16	$ 2,376	$ -	$2,376							0	$0		0	$0	**16**	$ 2,376	$ -	**$ 2,376**
2.4.a3	Well specifications								0	$ -	$ -	$ -						0	$ -				4			12		16	$ 2,244	$ -	$2,244							0	$0		0	$0	**16**	$ 2,244	$ -	**$ 2,244**
2.4.a4	Log cuttings								0	$ -	$ -	$ -						0	$ -	$ -	$ -					12		12	$ 1,584	$ 200	$1,784							0	$0		0	$0	**12**	$ 1,584	$ 200	**$ 1,784**
2.4.a5	E-log, final design								0	$ -	$ -	$ -						0	$ -	$ -	$ -		4					4	$ 660	$ -	$660							0	$0		0	$0	**4**	$ 660	$ -	**$ 660**
2.4.a6	Construction monitoring								0	$ -	$ -	$ -						0	$ -	$ -	$ -					12		12	$ 1,584	$ -	$1,584							0	$0		0	$0	**12**	$ 1,584	$ -	**$ 1,584**
2.4.a7	Wellhead survey								0	$ -	$ -	$ -						0	$ -	$ -	$ -					2		2	$ 264	$ 2,500	$2,764							0	$0		0	$0	**2**	$ 264	$ 2,500	**$ 2,764**
2.4.a8	Furnish and install transducer or equivalent								0	$ -	$ -	$ -						0	$ -	$ -	$ -					8		8	$ 1,056	$ 1,200	$2,256							0	$0		0	$0	**8**	$ 1,056	$ 1,200	**$ 2,256**
2.4.a9	Well Construction Contractor (Estimated at $50,000, not included)								0	$ -	$ -	$ -						0	$ -	$ -	$ -							0	$ -	$ -	$ -							0	$0		0	$0	**0**	$ -	$ -	**$ 0**
2.4.a10	Reporting								0	$ -	$ -	$ -						0	$ -	$ -	$ -		8			8		16	$ 2,376	$ -	$2,376							0	$0		0	$0	**16**	$ 2,376	$ -	**$ 2,376**
2.4b	**Passive Seismic Geophysical Survey (Optional)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$ -	$ -	$ -	**0**	**0**	**0**	**0**	**0**	**0**	$ -	$ -	$ -	**4**	**12**	**116**	**8**	**50**	**50**	**240**	$ 33,341	$ -	$33,341	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$0**	**0**	**0**	**$0**	**240**	$ 33,341	$ -	$ 33,341
2.4.b1	Project definition and data point layout								0	$ -		$ -						0	$ -		$ -	2	4	12				18	$ 2,794	$ -	$2,794							0	$0		0	$0	**18**	$ 2,794	$ -	**$ 2,794**
2.4.b2	Data collection								0	$ -								0	$ -	$ -	$ -			8		50	50	108	$ 13,563	$ -	$13,563							0	$0		0	$0	**108**	$ 13,563	$ -	**$ 13,563**
2.4.b3	Data processing								0	$ -		$ -						0	$ -		$ -		4	80				84	$ 12,540	$ -	$12,540							0	$0		0	$0	**84**	$ 12,540	$ -	**$ 12,540**
2.4.b4	Reporting								0	$ -	$ -	$ -						0	$ -	$ -	$ -	2	4	16	8			30	$ 4,444	$ -	$4,444							0	$0		0	$0	**30**	$ 4,444	$ -	**$ 4,444**
	Subtotal (Optional Tasks)	**-**	**152**	**136**	**336**	**-**	**-**	**-**	**624**	$ 109,200	$ 3,300	$ 112,500	**16**	**554**	**-**	**274**	**156**	**1,000**	$ 201,872	$ 1,100	$ 202,972	**46**	**40**	**116**	**8**	**116**	**50**	**376**	$ 54,065	$ 53,900	$ 107,965	**-**	**-**	**-**	**-**	**-**	**-**	**-**	$ -	**24**	**24**	$ 4,620	**2,024**	$ 369,757	$ 58,300	$ 378,057
	Total (Tasks 2.2a, 2.4a, 2.4b)																																												**$450,049**

Note: The expenses were estimated at 4%. Effort will be made to keep travel costs low by sharing costs with other local projects.