SAN LUIS OBISPO COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
Department of Public Works
Wade Horton, *Director*

AGENDA

Thursday, July 20, 2017 6:30 P.M.
Oceano Community Services District

I. CALL TO ORDER AND ROLL CALL

II. ANNUAL FISCAL YEAR ROTATION - Position of Chairman and Vice-Chairman

III. PUBLIC COMMENT
This is an opportunity for members of the public to address the Committee on items that are not on the Agenda

IV. APPROVAL OF MEETING MINUTES OF MAY 18, 2017

V. OPERATIONS REPORT
A. Water Plant Operations, Reservoir Storage, Downstream Releases
B. Projected Reservoir Levels

VI. INFORMATION ITEMS
A. Climate Update
B. Cost/Benefit Analysis of Televised Meetings
C. Cloud Seeding Feasibility Report
D. Water Supply Contract Changes - Modeling Update

VII. CAPITAL PROJECTS UPDATE
A. Bi-Monthly Update

VIII. ACTION ITEMS (No Subsequent Board of Supervisors Action Required)

IX. ACTION ITEMS (Board of Supervisors Action is Subsequently Required)
A. Update on Resolution to remain under the LRRP
B. Department of Water Resources (DWR) Division of Safety of Dams (DSOD) Lopez Spillway Assessment Letter
C. Santa Maria Groundwater Modeling – Proposed Funding & Agreement

IX. FUTURE AGENDA ITEMS
A. Fall Update to Board of Supervisors
B. Lopez Lake Safe Yield

X. COMMITTEE MEMBER COMMENTS

Next Regular Meeting is Tentatively Scheduled for
Thursday, September 21, 2017 at 6:30 PM at City of Grover Beach
Agendas accessible online at SLOCountyWater.org

SAN LUIS OBISPO COUNTY FLOOD CONTROL

AND WATER CONSERVATION DISTRICT

ZONE 3 ADVISORY COMMITTEE

DRAFT MEETING MINUTES

THURSDAY May 18, 2017

I. Call to Order/Roll Call -- The Zone 3 Advisory Committee meeting was called to order at 6:33 PM at the City of Pismo Beach City Hall by Vice-Chair and Agriculture Representative, Vard Ikeda.

County Public Works Department Utilities Division Program Manager and Secretary to Zone 3 Advisory Committee, Andrea Montes, called roll. Members in attendance were:

- Kristen Barneich, City of Arroyo Grande
- Jeff Lee, City of Grover Beach
- Andrew Brunet, Oceano Community Services District (OCSD)
- Marcia Guthrie, City of Pismo Beach
- Vard Ikeda, Vice Chair and Agriculture Representative

II. Public Comment -- Chris Magdosku introduced himself as the City of Arroyo Grande Director of Public Works, replacing Geoff English who recently retired.

Member Brunet distributed a letter sent to County Counsel, Rita Neal, by OCSD Counsel as well as City of Pismo Beach. Member Brunet indicated the letter stated the County Board of Supervisors (BOS) already allocated the Fiscal Year 2017/18 water and there are no provisions for retroactive reallocations; in addition, the Low Reservoir Response Plan (LRRP) only provides for changes in allocations under the adaptive management provisions and evaporation losses.

III. Approval of Meeting Minutes of March 16, 2017--

Member Barneich motioned approval; Member Lee second. Minutes were approved.

IV. Operations Report --

A. Water Plant Operations, Reservoir Storage, Downstream Releases-- Ms. Montes indicated the Lopez Lake elevation was 499.05 feet. Storage was 30,634 acre-feet (AF), which is 62% capacity. Rainfall to date was 34.33 inches. Plant production was 4.2 million gallons per day (MGD). Downstream release was 1.7 MGD. State Water was 1.1 MGD.

No public comment was given.

B. Projected Reservoir Levels -- County Public Works Deputy Director, Mark Hutchinson, indicated the header has a non-updated revision date of March 31; however, it had been updated in May. Mr. Hutchinson reviewed that the current reservoir level is at 30,644 AF, indicating a slight decline moving forward, but that Lopez Lake continues to run well. He noted that at 30,644 AF or 62% capacity with a Low Reservoir Response Plan (LRRP) trigger of 20,000 AF, Public Works staff expects that based on historical performances of the reservoir, nearly 4,000 AF of current surface water is expected to evaporate between now and April 1, 2018 (the Lopez Water Year is April 1 through March 31). After the estimated 4,000 AF of evaporation, the Lake elevation is projected to be 6,000 AF above the LRRP trigger. Mr. Hutchinson indicated that while Lopez Creek is flowing, Arroyo Grande Creek and Upper Creek are not flowing. Because there are differences within the two watersheds, staff will track and discuss at the Zone 3 Technical Advisory Committee (TAC) level moving ahead.

Ms. Montes noted that the new County water resources real time website is www.WR.SLOCountyWater.org to see real time stream flow, rain totals, etc.

No public comment was given.

V. Information Items

A. Present 3rd Quarter FY 16/17 Budget Status -- Kristi Smith, County Public Works Finance Division and Zone 3 Accountant, presented the 3rd Quarter Fiscal Year (FY) 2016-17 Budget Status for Flood Control Zone 3 for the period through March 31, 2017 totaling 55 % of annual FY budget.

Ms. Smith reviewed graphs and indicated at 75 % of the FY:

- The first graph displayed Routine Operations and Maintenance (O&M) costs and demonstrated 67% of the OM budget had been spent, resulting in an available balance of $1.1 million for the remainder of the FY, ending June 30, 2017.

- The second graph displayed Non-Routine O&M costs and demonstrated 42% of the Non-Routine O&M budget had been spent, resulting in an available balance of $483,000 for the remainder of the FY. Ms. Smith indicated the available balance is due to the Habitat Conservation Plan (HCP) project on hold temporarily. The contract issue was resolved earlier this month and unspent balances will be carried forward into next FY so work can continue.

- The third graph displayed Capital Outlay costs and demonstrated 20% of the budget had been spent, resulting in an available balance of $664,000

of available for the remainder of the FY. Ms. Smith indicated the majority of the balance available is due to the Lopez Water Treatment Plant (LWTP) PH Suppression and Scaling Control Project.

- Ms. Smith indicated the first installment billing were mailed to Zone 3 Agencies and payments are due July 1, 2017.
- Ms. Smith provided an informational handout that is an updated version of the Committee's recommended uses of Flood Control District funded designated reserves (attached as part of the *Funding for the Santa Maria Groundwater Basin Modeling Project* staff report included in this Agenda Packet.)
- Member Lee asked if we would use savings from completed projects to work on other projects. Ms. Smith answered yes if they are in the same category.

No public comment was given.

B. Climate Update -- Ms. Montes indicated that according to the United States Drought Monitor, San Luis Obispo County has moved to an abnormally dry climate. According to the National Weather Service, there will be above average temperatures in May compared to last year. There are equal chances of below average, average, and above average rainfall compared to this time last year.

No public comment was given.

C. ECORP Habitat Conservation Plan Contract -- Mr. Hutchinson indicated the BOS approved a new contract with ECORP Consulting, Inc. ECORP is working with staff to schedule a kick-off meeting to complete the work plan and completed a recent reservoir model, working with HT Harvey & Associates in support of the Habitat Conservation Plan (HCP). He indicated a break in the HCP in order to focus on the reservoir model and use it as information for possible contract amendments and see how any change in the contract from the beginning of the reservoir, might have affected available water supplies.

The ECORP meeting was scheduled for 11AM on May 24, at the City of Pismo Beach City Hall.

No further public comments were made.

D. Castenada Request Rescinded -- Ms. Montes indicated that in September 2016, an applicant named Carlos Castaneda was looking for feedback from the Committee regarding an easement across his land that is adjacent to Lopez Recreational Area. The Committee recommended he work with the County

Planning and Building Department. He has decided not to move forward with his request.

No public comments were made.

VI. Capital Projects Update

A. Bi-Monthly Update -- Mr. Hutchinson presented a brief update of the Capital Projects.

- **Turnout Systems Control and Data Acquisition (SCADA) Project** - This project is in process. Connections are getting made to the last turnout in Oceano. All others should be up and running. This project focuses on radio communications to Oceano. The project will enable each agency to monitor the amount of water flowing through their meters from their computers rather than manually reading the meters.
- **Parking & Roadway Resurfacing Project** - In order to save money, Public Works has combined this project with the large County Road Paving Projects, to spread costs over the entire roadway project. In May/June, the Lopez Water Treatment Plant (LWTP) parking lot should be resurfaced.
- **Programmable Logic Controller (PLC) Replacement & Programming** - The PLCs operate the membrane filter racks (related to the 6th Rack Addition Project). As the 6th Rack Addition Project progressed, it was determined the five existing PLCs needed to be replaced for consistent programming and operation of all 6 racks with identical PLCs.
- **Membrane Strainer Replacement Project** - This project is related to the 6th Rack Addition Project and PLC Replacement and Programming Project. It was determined old strainers were contributing to debris contamination of the membranes. Replacing the strainers will minimize further contamination of all six racks. Engineering staff is coordinating all three projects while the Plant remains in operation.
- **Equipment Audit & Replacement** - A current effort is taking place to go through the LWTP, identifying each piece of equipment, its age, and its critical status within the Plant to replace equipment before they become inoperative and have spare parts on hand when needed. The Plant is approaching 15 to 18 years old which means major components can be expected to be replaced.

Member Lee asked if the PH suppression has stabilized. Mr. Hutchinson answered that a short-term acid injection project is being used on a regular basis. The PH has dropped and there are no issues associated with high PH levels at the Plant.

No public comment was given.

VII. Action Items -- **(No Subsequent Board of Supervisors Action Required)**
None discussed.

VIII. Action Items -- **(Board of Supervisors Action is Subsequently Required)**

A. Consideration of Board of Supervisors Action to Rescind the Local Drought Proclamation and How the Low Reservoir Response Plan (LRRP) will be affected --

Mr. Hutchinson stated that starting at the State level, the Governor rescinded the drought. Following the Governor's drought proclamation in 2014, the County declared a drought which triggered the Low Reservoir Response Plan (LRRP). The County Board of Supervisors' drought proclamation in 2014, created the County Drought Task Force, which included staff from County Public Works, County Public Health, Department of Social Services, Farm Advisor, Ag Extension, Sheriff, Office of Emergency Services and similar State agencies that met monthly.

Mr. Hutchinson indicated the County Drought Task Force informed the Board of Supervisors (BOS) of drought issues and impacts. The Group met in April and at that meeting Mr. Hutchinson informed the group that Zone 3 has a drought contingency plan linked to the County's emergency proclamation and that the Lopez Reservoir is at 62%, only 10,000 AF above LRRP trigger. He further indicated the group recommended that at the May 3 BOS meeting, the Board schedule an end to the drought proclamation during the May 23 BOS meeting, and allow the BOS Zone 3 Advisory Committee time to weigh in on the issue. The Zone 3 TAC drafted a staff report along with a letter from the Zone 3 Advisory Committee to the BOS in support of keeping the LRRP in place and explained why a water supply emergency still exists within Zone 3. Mr. Hutchinson indicated the BOS could choose to rescind the emergency for all but Flood Control Zone 3.

Member Gunthrie expressed concern regarding the anticipated 4,000 AF evaporation rate of the Lopez Reservoir through April 2018. She indicated she approved of the letter because it would benefit all Zone 3 agencies as they have become accustomed to a lower annual rainfall.

Member Barneich asked that if the rainfall is below average next year, how soon would we be back at 20,000 acre-feet elevation at Lopez Lake. Mr. Hutchinson indicated there are patterns and long-term trends to consider. Ms. Barneich expressed support of the letter due to the unknown of groundwater levels and that Lopez Lake doesn't recover as quickly as the other reservoirs.

Member Lee spoke in support the letter and inquired whether Zone 3 agencies can transfer water supplies to one another. Mr. Hutchinson indicated there are provisions in the Zone 3 water entitlement agency contracts that reference temporary or permanent changes in points of deliveries. The District must first

figure out if the system can handle it by looking at the delivery schedule. If the District can accommodate the point of delivery request, then the District allows the trade of water between the Zone 3 agencies and is otherwise uninvolved and does not change any financial billing.

Member Barneich inquired whether or not the Zone TAC or Zone 3 Advisory Committee will propose a time limit to extend the LRRP or will leave it open ended and would the BOS want a time limit.

Mr. Hutchinson indicated that while the letter did not propose an exact date, it does refer to groundwater level measurements that will be taken in October. Discussion continued regarding one-year limit versus open-ended.

Ben Fine, City of Pismo Beach Director of Public Works and City Engineer indicated he wouldn't say "extend" the LRRP for a year, but rather "re-evaluate" it in a year.

Member Lee motioned approval of the declaration of the letter provided that the letter state in the subject line and body ". . . reevaluate the Low Reservoir Response Plant at the end of the water year (March 31, 2018)." Member Barneich second. All approved.

Public Comment

Shane Taylor, City of Arroyo Grande Utilities Manager, indicated the Zone 3 TAC crafted the letter with the intent that the State Water contractors receive acknowledgement to how Zone 3 agencies handled the drought by utilizing State Water instead of Lopez Water and keeping the Lopez Water behind the dam.

Mr. Fine indicated that more water is available to the Zone 3 agencies if they stay in the LRRP and retain water that is conserved. He referred to a graph that displayed the water levels drastically going down without conservation. Historic Lopez Lake levels show that the last rain season was an anomaly. If the same weather pattern occurs in upcoming years as in the previous five (5) years, the lake will go negative. He indicated it is too soon to come out of the LRRP.

Vice-Chair Ikeda, spoke on behalf of the farmers and indicated the groundwater wells have not come up as far as some would think and expressed interest in the well water findings and how much groundwater has recovered.

IX. Future Agenda Items --

A. LRRP
B. Funding Groundwater Modeling
C. Cloud Seeding
D. Contract Renegotiation Discussions

X. Committee Member Comments --

Member Lee indicated he would like to see discussion topic of “Fall Update to Board of Supervisors” on upcoming Zone 3 Advisory Committee Agendas under *Future Agenda Items*.

Member Barneich stated that the safe yield for Lopez Lake is based on conditions and years of graphs and data that don’t exist anymore and indicated that City of Arroyo Grande Council Members recommend the safe yield should be looked at with new data. Vice-Chair Ikeda indicated the Committee would add this to future agenda items as well.

Vice-Chair Ikeda commented on the impressive work performed by those who put the letter together and the learning opportunities the letter provides for the Zone 3 Advisory Committee Members, especially new members.

Mr. Hutchinson said the Director of County Public Works is regular convening a new work group of water managers across the county to look at regional issues from a technical perspective and indicated the Zone 3 Advisory Technical Group (TAC) and the “extraordinary” way it operates and works together served as a model for the new group.

Mr. Hutchinson further indicated, in light of the Oroville Dam spillway failure, media inquiries have been made to the County Public Works Department regarding the Lopez Dam. In corresponding with the media, Mr. Hutchinson communicated that substantial spillway repairs, changes and investigations were made as part of the Lopez Dam Seismic Remediation Upgrade in 2000-2003. Some of these repairs directly correlate to early criticisms of the Oroville Dam.

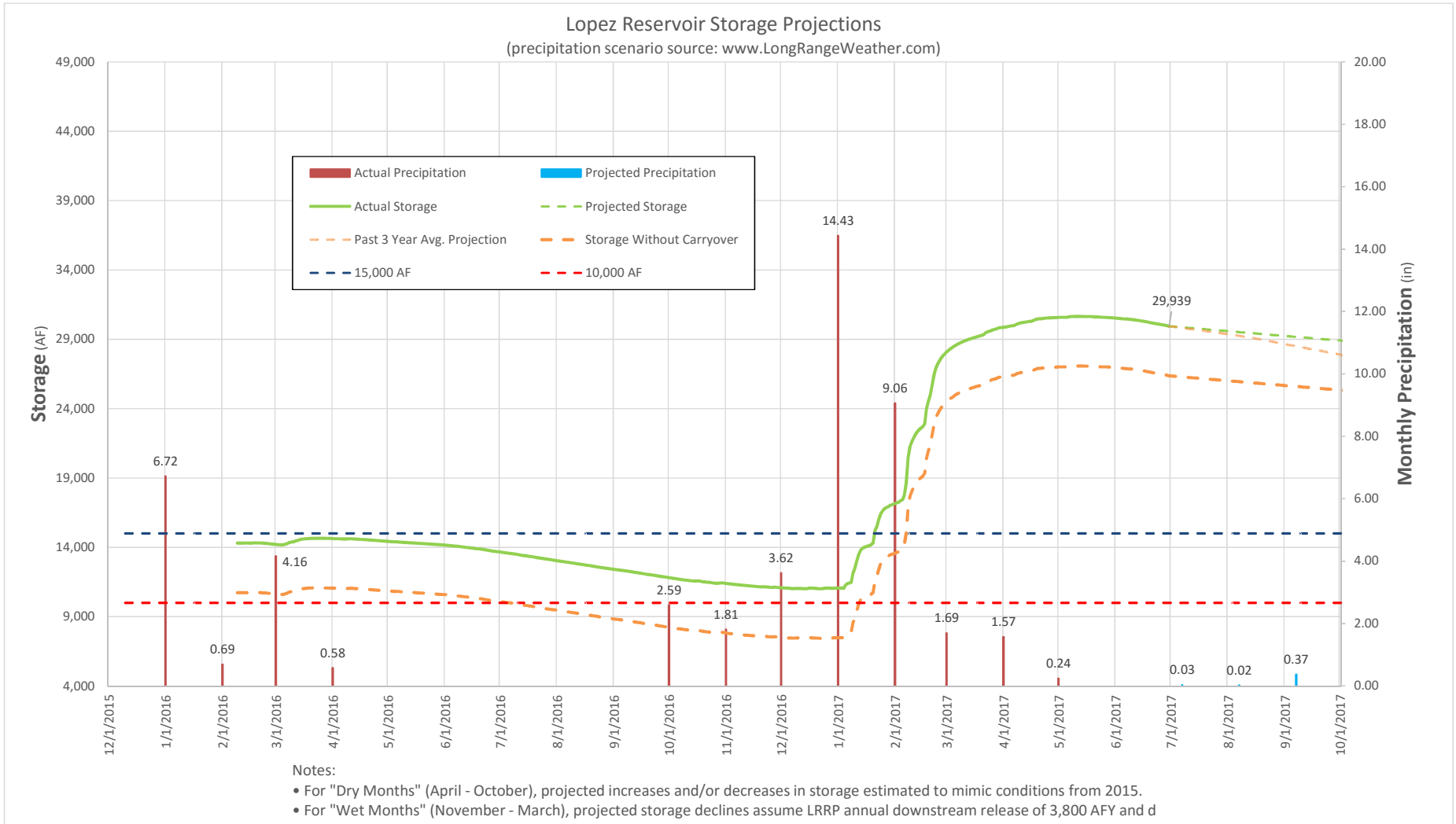
Meeting Adjourned at 8:06 PM

Next Regularly Scheduled Meeting

Next Regular Meeting is Tentatively Scheduled for Thursday, July 20, 2017 at 6:30 PM at Oceano Community Services District.

Respectfully Submitted,

Andrea M Montes
County of San Luis Obispo Public Works Department

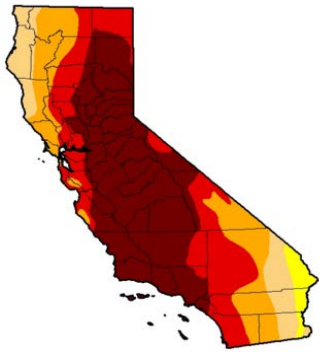


Notes:

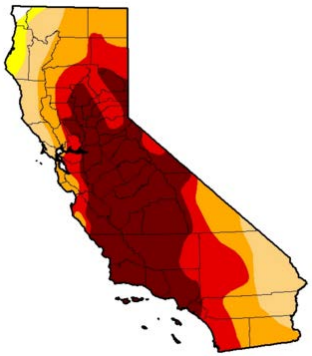
- For "Dry Months" (April - October), projected increases and/or decreases in storage estimated to mimic conditions from 2015.
- For "Wet Months" (November - March), projected storage declines assume LRRP annual downstream release of 3,800 AFY and d

U.S. DROUGHT MONITOR

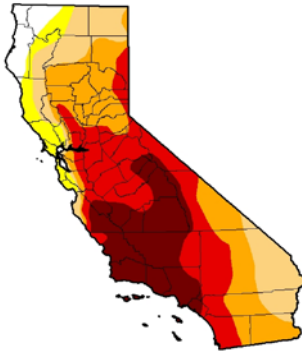
January 2016



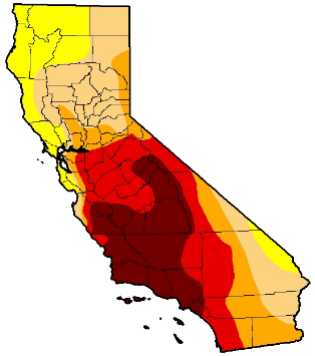
March 2016



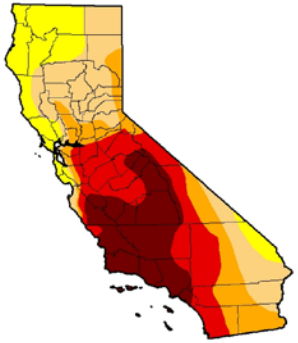
May 2016



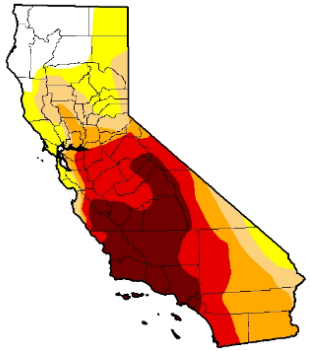
July 2016



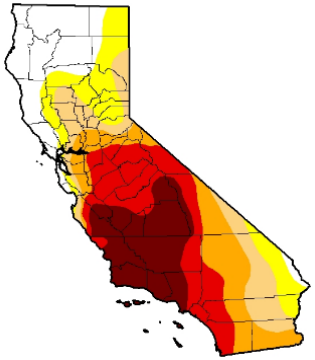
September 2016



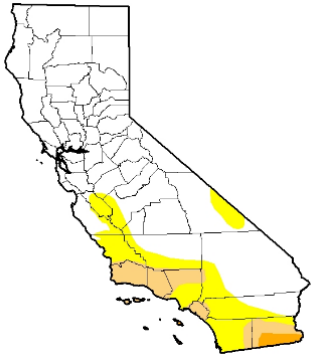
November 2016



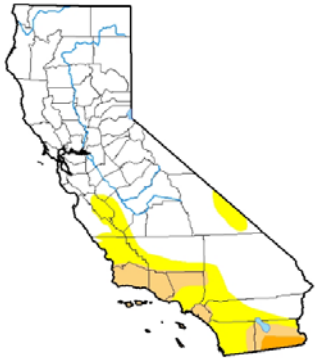
January 2017



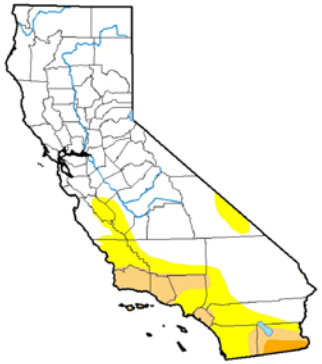
March 2017



May 2017



July 2017

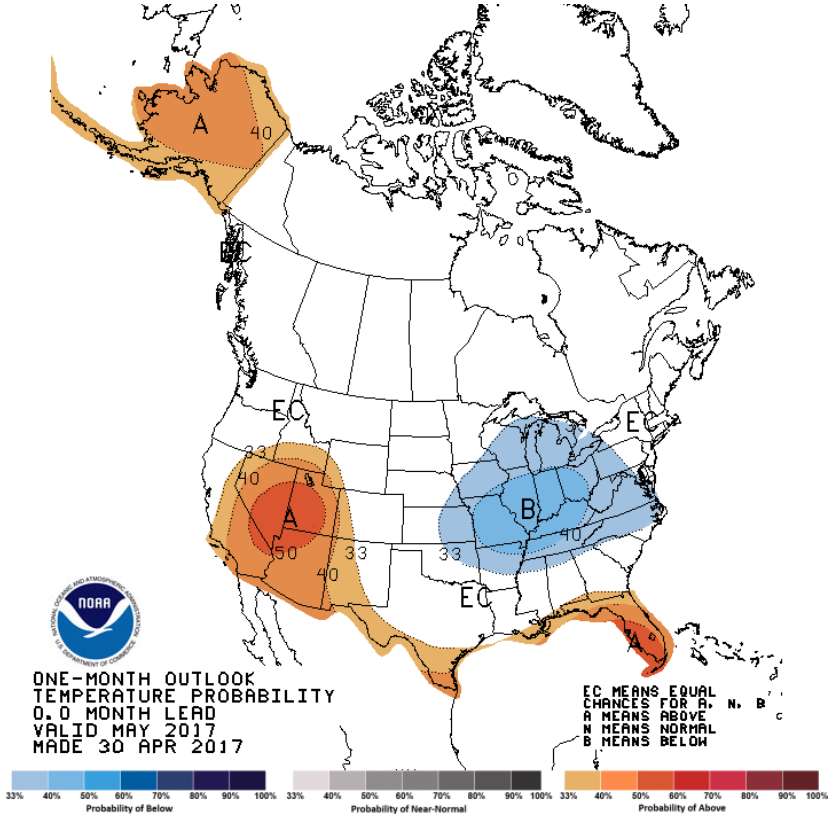


Intensity:

- D0 - Abnormally Dry
- D1 - Moderate Drought
- D2 - Severe Drought
- D3 - Extreme Drought
- D4 - Exceptional Drought

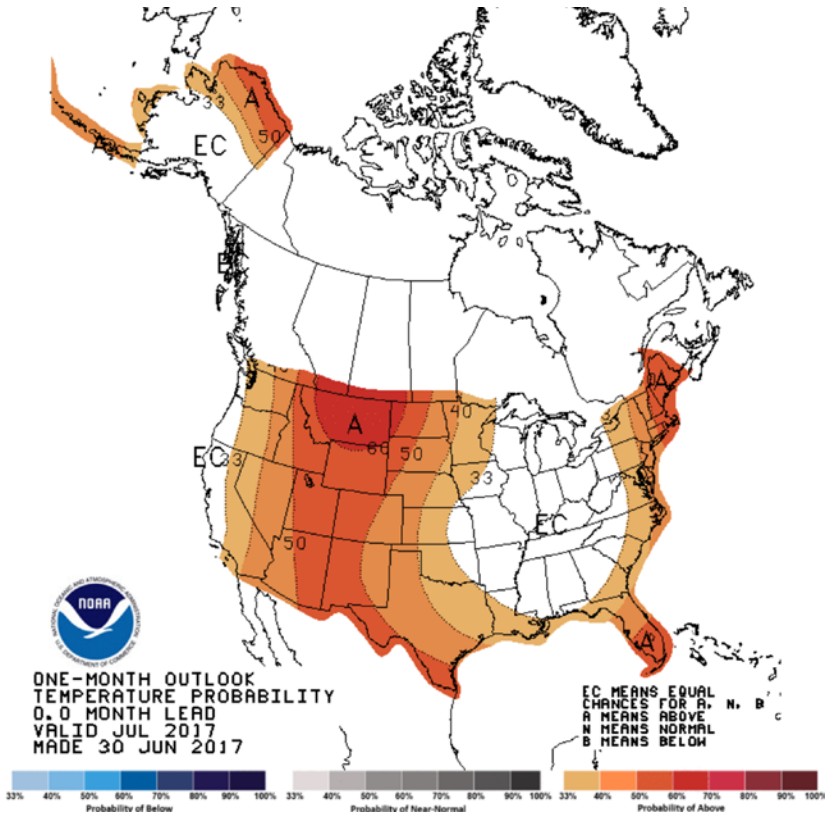
NOAA TEMPERATURE FORECAST

May



May Meeting

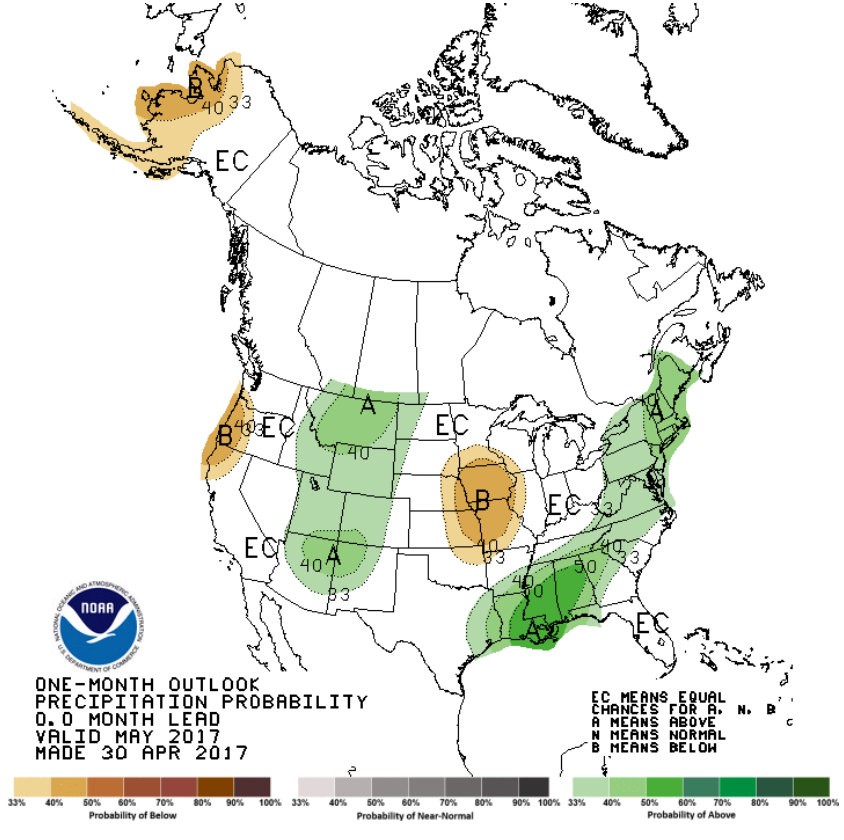
July



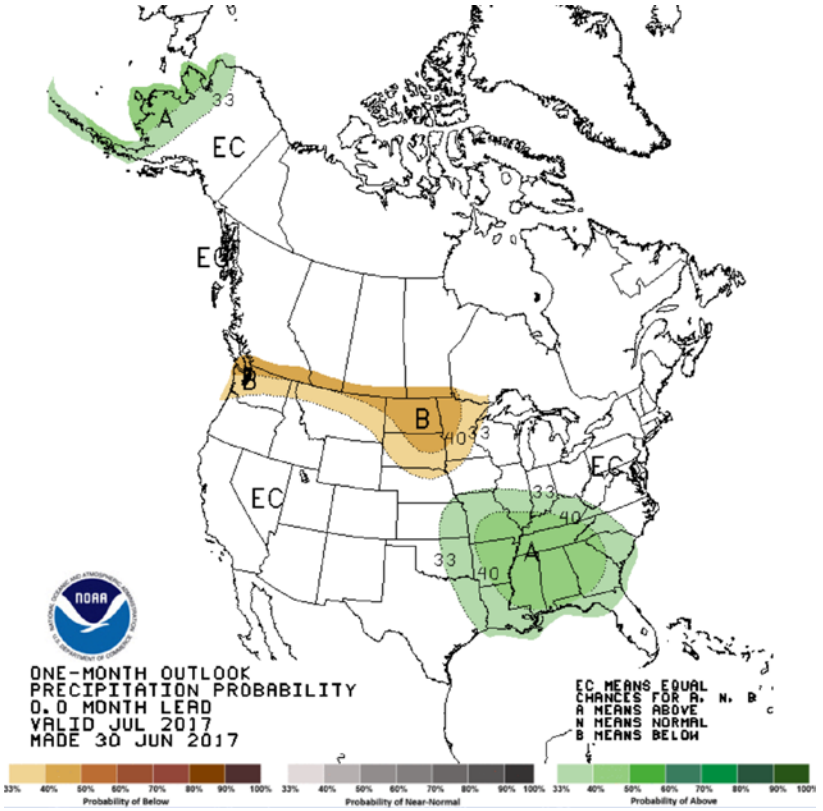
July Meeting

NOAA PRECIPITATION FORECAST

May



July



May Meeting

July Meeting

SAN LUIS OBISPO COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
Department of Public Works
Wade Horton, *Director*

TO: Zone 3 Advisory Committee

FROM: Jill Ogren, Public Works Senior Utilities Engineer

VIA: Zone 3 Technical Advisory Committee

DATE: July 20, 2017

SUBJECT: Update on ECORPS Modeling of Potential Contract Revisions

Discussion

On May 2, 2017, the Board of Supervisor approved a professional services contract with ECORPS Consulting, Inc. to continue work on the Habitat Conservation Plan a well as prepare a storage model for Lopez Reservoir. The model is intended to help with considering water supply contract amendments that could provide Lopez contracting agencies with storage rights. The following excerpt describes the objective of the evaluation:

> *"The fundamental objective of the evaluation described here is to identify potential opportunities to modify Lopez Water Project operational provisions to establish storage rights for Zone 3 Contracting Agencies that obtain supplies from the Lopez Project, which will help ensure multi-year water resource planning, in contrast to the historical/existing contracts which encourage a "use it or lose it" annual approach to water resource planning.*

The current phase of work is described in the contract is to "Develop Basic Information and Project Approach."

> *This task includes working with the District and the agencies to fully develop over-arching project objectives. Representative scenarios to quantify water supply availability under three (3) alternative scenarios that reflect differing storage rights for the Zone 3 Contracting Agencies will be determined based on water availability (storage volume, hydrology conditions, acceptable curtailments, etc.).*

At this time, the Technical Advisory Committee (TAC) is working on developing the three (3) alternative scenarios for ECORPS to evaluate. The scenarios are being refined, and should be determined at the August TAC meeting. The scenarios are based on the following two fundamental approaches to reservoir operations.

1. Options that are substantially based on the existing Lopez Contracts and which would provide each agency with the ability to store water which has been allocated in a given year for subsequent use. These options would result in incremental increases in storage, or use of storage, on an annual basis.

2. Options that are based on operational provisions of Whale Rock reservoir, which provides that all water behind the reservoir is 100% allocated and stored on behalf of each beneficiary. These options may result in more contract language changes and are being considered to determine if advantages exist in transitioning to a Whale Rock Reservoir model.

Other important issues to consider while the options are being developed include the following:

- Although agricultural beneficiaries are not project contractors, the storage options anticipate evaluating storage for "downstream releases." Agriculture and public agencies both benefit from the water supply. While it is uncertain if and how storage rights might be established, evaluating storage for public agencies and downstream beneficiaries will be important to address the interests of both groups of stakeholders.

- Contract amendments are "discretionary decisions" and environmental determinations under the California Environmental Quality Act (CEQA) are required. Likewise, evaluating storage options in the context of the Habitat Conservation Plan (HCP) will be important. Considering environmental requirements while evaluating storage options will hopefully avoid delays in environmental review and promote consistency with long-term operational issues under the HCP.

Subsequent steps by ECORPS include the following:

- Technical Evaluation

- Develop Recommendations

- Prepare Draft and Final Memorandum

SAN LUIS OBISPO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Department of Public Works
Wade Horton, *Director*

TO: Zone 3 Technical Advisory Committee

FROM: Joshua Roberts, PE

DATE: July 6, 2017

SUBJECT: Zone 3 Capital Projects Update

Project Updates:

- Turnout SCADA Project – Due to Complete July
  - Scheduling County IT SCADA User Read Only Integration
    - Data Screen complete, Log In process in development
    - Compiling data for information population
    - Data available now by request

- Parking & Roadway Resurfacing – Due to Complete Aug
  - Prep Work Complete
  - Construction to begin in June 2017 on all surfacing projects. *Requested LWTP work AFTER strainer install.*

- PLC Replacement & Programming – Due to Complete Aug
  - Working with PALL for work plan and schedule – Scheduling estimated first week of August.
  - Plan to install with strainers and 6th Rack completion

- Membrane Strainer Replacement Project – Due to Complete Aug
  - New strainers are on-site & ready to install
  - Contracting with Cushman for installation and flushing
  - Flush and inspect downstream piping
  - Adding 20" Valve Replacement

- 6th Rack Addition – Due to Complete Aug
  - Construction 80% complete
  - Completion has been delayed until Membrane strainers have been replaced
  - Approximately 2 weeks required to complete install

- Equipment Audit & Replacement - Ongoing
  - Work proposed to continue in 2017/18

Upcoming Projects (Requested FY 2017/18)**:**

- Lopez WTP Safety Upgrades
- Pressure Transducers
- Structural Assessment of Terminal Reservoir
- Cathodic Protection Survey
- Replace Membrane Feed Pumps (1 per year)
- Fault Zone Repair – Dam Left Abutment
- Repair Domestic & Fire Tanks
- Equipment Storage
- Replace Ammonia Analyzer

Deferred Projects

- Improve Boat Access (FY 2018/19)
- Power Monitoring (FY 2018/19)

SAN LUIS OBISPO COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
Department of Public Works
Wade Horton, *Director*

July 20, 2017

TO: Zone 3 Advisory Committee

FROM: Jill Ogren, Senior Utilities Engineer

DATE: July 20, 2017

SUBJECT: Update on Resolution to Allow Zone 3 to Continue to Operate Under The Low Reservoir Response Plan (LRRP)

At the May 18, 2017 Zone 3 Advisory Committee, the Committee recommended submitting a letter to the Board of Supervisors encouraging them not to terminate the Local Drought Proclamation thereby allowing Zone 3 to continue to operate under the Low Reservoir Response Plan. The letter was submitted to the Board of Supervisors at their May 23, 2017 meeting, however, the Board voted to terminate the Local Drought Proclamation. The Board at that time also directed staff to return to the Board with findings that would allow Zone 3 to remain under the LRRP even though the Drought Proclamation was terminated and the reservoir level was above 20,000 Acre-feet (triggers identified in the LRRP).

Since that time, staff has been developing the resolution in conjunction with County Counsel. It is anticipated that the resolution will be brought to the Board of Supervisors on August 22, 2017. Due to the schedule of your meetings, this item will not be brought back to Zone 3 prior to the August 22nd Board date. The board letter and resolution will be available for review to the public on August 16, 2017 via the County's website.

SAN LUIS OBISPO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Department of Public Works
Wade Horton, *Director*

TO: Zone 3 Advisory Committee

FROM: Mark Hutchinson, Deputy Director

DATE: July 20, 2017

SUBJECT: Update on the Lopez Spillway

Discussion

On February 7, 2017, the main spillway at the Oroville Dam suffered severe damage during a moderate flow release, necessitating use of the emergency spillway. By February 12 high inflows combined with damage to both the main and emergency spillways triggered an emergency evacuation order that affected over 150,000 people. An independent review panel has been convened by the Federal Energy Regulatory Commission to investigate the Oroville event. The panel's report is expected in the fall.

In the interim, the Governor has ordered detailed evaluations of dam appurtenant structures, such as spillways, to strengthen the State's inspection program. On June 12, 2017, the Flood Control District received a letter from the California Department of Water Resources Division of Safety of Dams (DSOD) (copy attached), directing actions to implement the Governor's order. At this time, there is no specific information on any issues associated with the spillway at Lopez Dam. The identical letter was sent to approximately 70 State regulated dams throughout California. Based on a "reconnaissance-level assessment" the letter notes that Lopez "may have potential geologic, structural, or performance issues that could jeopardize its ability to safely pass a flood event." No specific issues are identified.

The letter requires a Work Plan to be prepared and submitted by September 1, 2017. The scope of the site investigation required in the work plan is to focus on "characterization of the foundation materials underlying and adjacent to the spillway and their susceptibility to erosion and instability". Although not yet documented in any final official reports, it is evident that the foundation materials underlying the Oroville spillway likely contributed to the failure of that structure in a significant way. Therefore, one key focus of the investigation is to determine if such a failure mode could occur at Lopez.

The Department of Public Works has formed a Project Team to respond to the spillway order. Team members and their respective roles are:

Project Manager – David Spiegel, Staff Engineer. Coordinate project activities, conduct document reviews, consult with DSOD, ensure communication with management, staff and stakeholders. Control scope, schedule and budget. Prepare required Work Plan.

Consulting Engineer – (To be determined). Review documents, participate in site investigations, participate in Work Plan development and provide an independent professional review of project team actions.

Management Oversight – Mark Hutchinson, Deputy Director of Public Works. Provide overall team direction, ensure availability of resources, timely and efficient completion of team work efforts and appropriate communication. Act as agency contact person for the public and the media.

Principal Engineer – Wade Horton, Director of Public Works. Ensure consistency with all County, Department, and professional engineering best practices.

In addition, the team may seek assistance on specific issues from a number of Department staff who have expertise and/or experience with specific issues that may need to be addressed in the Work Plan.

As noted above, the DSOD letter requires the submission of a Work Plan by September 1, 2017. The Project Manager will establish communication with DSOD prior to Work Plan development to confirm our approach. We expect that DSOD may request modifications to the submitted Work Plan and will respond to those requests as they occur. Once the Work Plan is approved, a more detailed scope, schedule and budget can be developed in order to move the project forward.

Financial Implications

Costs associated with production of the Work Plan are not expected to exceed $25,000. It should be noted that Zone 3's District Funded Reserves contain approximately $300,000 designated to fund "public safety related to water quality and quantity" efforts. The funding approach will be reviewed with the Technical Advisory Committee at their regular meeting on July 6 for confirmation.

Next Steps

The project team will solicit scope and cost estimates from a qualified, independent engineer, consult with the Technical Advisory Committee, reach out to DSOD and report back to your Committee on July 20.

Attachment (1)

DEPARTMENT OF WATER RESOURCES
1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791

CF 210.129.01

JUN - 6 2017

Mr. Dean Benedix, Manager
Utilities Division
San Luis Obispo County Flood Control and Water Conservation District
County Government Center Room 207
San Luis Obispo, California 93408

Lopez Dam, No. 1055
San Luis Obispo County

Dear Mr. Benedix:

As a result of the recent major incidents at Oroville Dam, which led to significant damage and erosion of the Service and Emergency Spillways, Governor Brown issued a plan to bolster the State's dam safety program. To strengthen the State's inspection program, the Governor has ordered detailed evaluations of dam appurtenant structures, such as spillways. This new review is being expedited for dams that have large spillways and structures similar to Oroville Dam. Based on this directive, the Division of Safety of Dams is immediately conducting detailed re-evaluations of large spillways at high-hazard dams.

We completed a reconnaissance-level assessment of the spillway at Lopez Dam and have noted that the structure may have potential geologic, structural, or performance issues that could jeopardize its ability to safely pass a flood event. Therefore, we are requesting that you perform a comprehensive condition assessment of the spillway as soon as possible. This spillway may also require a site investigation to provide supporting information for completing this assessment.

Please submit a work plan by September 1, 2017, for our review and approval. The scope of the detailed condition assessment of the spillway should include an evaluation of the concrete lining, the existing drainage system, and the potential for slab undermining and hydraulic jacking. The scope of the site investigation should focus on identifying potential geologic hazards associated with the spillway, including characterization of the foundation materials underlying and adjacent to the spillway structure and their susceptibility to erosion and instability.

My staff is available to discuss with you ways to expedite development of the required assessment. The site investigation and condition assessment report must be completed expeditiously. Additionally, any known damage to the spillways must be repaired before the next flood season.

If you have any questions or need additional information, please contact Design Engineer Dino Bernardi at (916) 227-4339 or Project Engineer Daniel Meyersohn at (916) 227-4624.

Sincerely,

Michael Waggoner FM

Sharon K. Tapia, Chief
Division of Safety of Dams

SAN LUIS OBISPO COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
Department of Public Works
Wade Horton, *Director*

July 10, 2017

TO: Zone 3 Advisory Committee

FROM: Zone 3 Technical Advisory Committee

VIA: Jill Ogren, Senior Utilities Engineer

DATE: July 20, 2017

SUBJECT: Funding for the Santa Maria Groundwater Basin Modeling Project

Recommendation

1. Recommend that the Board of Supervisors of the San Luis Obispo County Flood Control and Water Conservation District (District) approve funding a portion of the Santa Maria Groundwater Basin Modeling project (Phase 1B) utilizing Zone 3 District Designated Reserves and approve a corresponding budget adjustment of $117,259.44 for FY 2017-18.

2. Recommend that the Board of Supervisors of the San Luis Obispo County Flood Control and Water Conservation District (District) execute a Cost Sharing Agreement with the City of Pismo Beach in the amount of $117,259.44 to support the Santa Maria Groundwater Basin Modeling project (SMGB) Phase 1B.

Discussion

On March 17, 2016, the Advisory Committee endorsed the FY 2016/17 Budget which included a recommendation to earmark a portion of the Zone 3 District Funded Designated Reserves for specific projects and initiatives. The specific projects/initiatives identified and their current funding and status are shown in the table below.

Estimated District Funded Designated Reserves on 3/17/2016	**~ $1,038,729**	
Designated Projects	*Estimated Funding Level*	*Notes*
Carpenter Creek Bridge	$30,000	Completed
Cloud Seeding Feasibility Study	$10,000	Completed
Santa Maria Groundwater Basin Model	$250,000	Pending request for $117,259.44 (FY 2017-18)
Arroyo Grande Creek Watershed Storm Water Resource Plan (Prop 1 Grant Match)	$250,000	Pending request for actual cost share is $189,376 (FY 2017-18)
Public Safety Related to Water Quality and Quantity	$498,000	~$280,000 allocated for pH suppression project in (FY 2016-17); potential need for ~ $25 K for spillway condition assessment work plan (FY 2017-18)
Estimated District Funded Designated Reserves on 6/30/2017	**~ $760,891**	

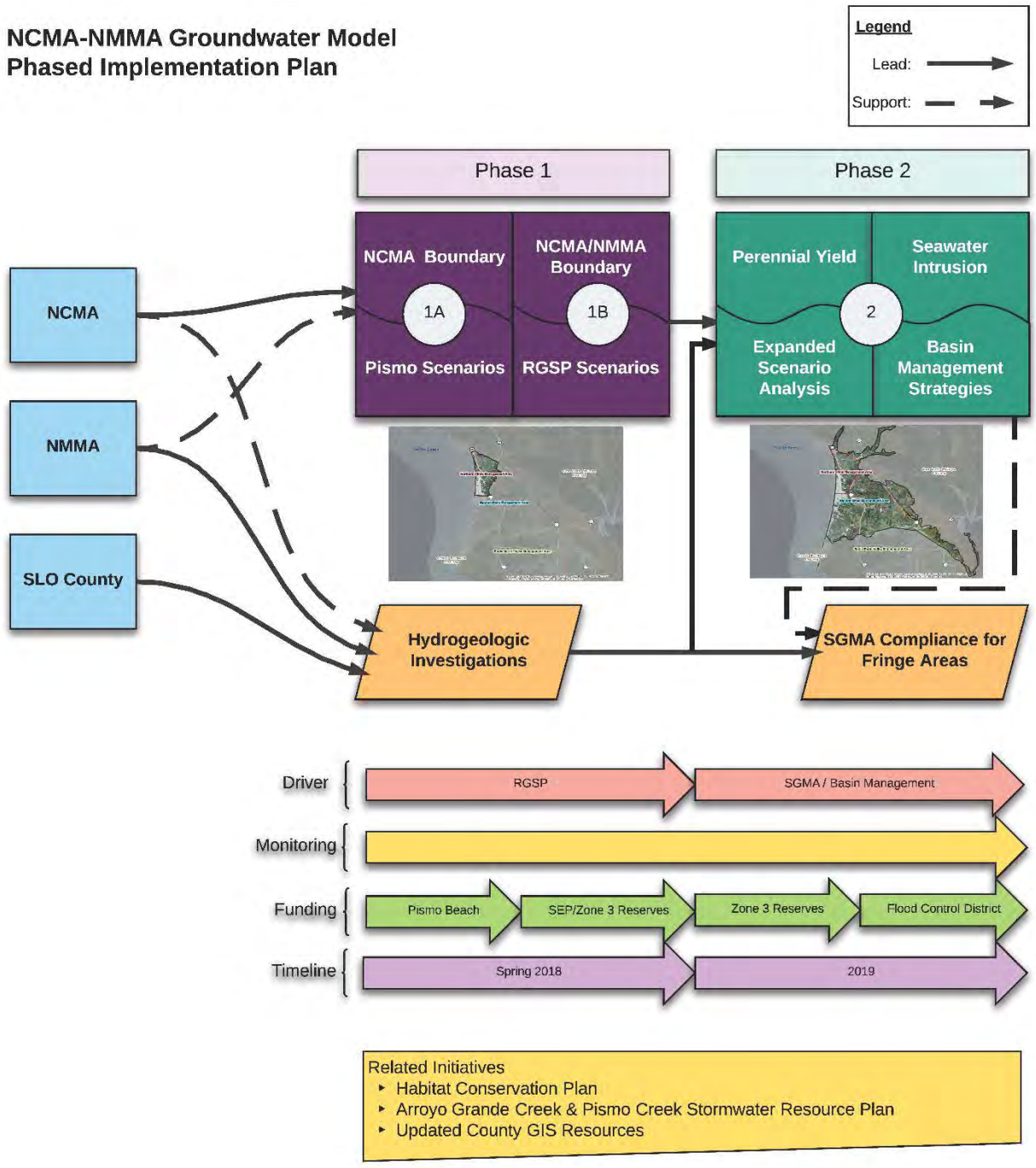
The Santa Maria Groundwater Basin Modeling has been divided into phases; 1A,1B, and 2. At this time, Phase 1B of the groundwater modeling project has been initiated with the City of Pismo Beach being the lead agency who has hired a consultant to perform the work. Zone 3 TAC is recommending that a portion of the earmarked funds designated for the Santa Maria Groundwater Basin Model be used to support this phase of the modeling associated with the Regional Groundwater Sustainability Project (RGSP) and enter into a cost sharing/reimbursement agreement with the City of Pismo Beach.

Regional Groundwater Sustainability Project

The RGSP is a regional recycled water project that includes the design, construction, and implementation of an Advanced Treatment Facility (ATF) to treat flows from the City of Pismo Beach (City) and the South San Luis Obispo County Sanitation District (SSLOCSD) wastewater treatment plants (WWTP) and produce advanced purified water to inject into the SMGB. Injecting advanced purified water will allow the project stakeholders to take water currently being discharged to the ocean and utilize it to recharge the groundwater basin, protect against seawater intrusion and more effectively manage their surface and groundwater supplies.

A key component of the planning and the design for the RGSP includes development of a groundwater model for the project area, which roughly corresponds with the Northern Cities Management Area (NCMA) and the Nipomo Mesa Management Areas (NMMA) of the SMGB. As part of the RGSP, an initial groundwater model was developed (Phase 1A) to evaluate injection and extraction scenarios for flows from the City of Pismo Beach's WWTP. This model

is now being expanded (Phase 1B) to included evaluation of additional flows from the SSLOCSD WWTP. The Phase 1A and Phase 1B groundwater models are envisioned to be the building blocks for a larger regional (Phase 2) groundwater model that will be a comprehensive water resources management tool for the SMGB. The following graphic outlines the envisioned phased development of the NCMA/NMMA Groundwater Model.



Phase 1B Modeling

The Phase 1B groundwater model includes two primary components: a) Hydrogeologic Evaluation and, b) Technical Advisory Review. The Hydrogeologic Evaluation includes the development and calibration of the groundwater model and utilization of the model to evaluate injection and extraction scenarios. The Technical Advisory Review will include participation and peer review of all aspects of the groundwater model development and scenario evaluation by a third-party hydrogeology firm with extensive knowledge of local hydrogeologic conditions. The scope of work and fee estimates for both project components are included as attachments to this staff report.

Funding

Most of the Phase 1B groundwater model effort will be funded through a cooperative agreement with the Regional Water Quality Control Board (RWQCB), SSLOCSD and the City of Pismo Beach. Included in the RWQCB's Stipulated Order No. R3-2016-0045, Settlement Agreement and Stipulation for Entry of Administrative Civil Liability Order No. R3-2012-0041 with the SSLOCSD is a provision for a Supplemental Environmental Project and allows SSCLOSD to contribute $221,962.56 toward developing a groundwater basin model for the NCMA and the NMMA of the SMGB. To fund the remaining portions of the Phase 1B Model, the Zone 3 TAC recommends utilizing $117,259.44 of the Zone 3 District Designated Reserves earmarked for the Santa Maria Groundwater Basin Modeling.

The table below outlines the costs associated with the Phase 1B Model, the proposed funding sources and the requested amount of Zone 3 Designated Reserve Funding.

Phase 1B Model Contracts	Estimated Costs	Funding Sources	
		SSLOCSD SEP Funds	Zone 3 Reserves
Phase 1B Hydrogeologic Evaluation	$281,177.00	$221,962.56	$59,214.44
Technical Advisory Review	$58,045.00		$58,045.00
Total	$339,222.00		**$117,259.44**

The City of Pismo Beach will be the contracting agency for the Phase 1B Groundwater Model and will enter into a cost sharing/reimbursement agreement with the District to obtain the requested Zone 3 District Designated Reserves.

Attachments:

Attachment 1 - WSC's Phase 1B Hydrogeologic Evaluation Scope of Work & Fee Estimate
Attachment 2 - GSI Water Solutions Technical Advisory Review Scope of Work & Fee Estimate

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ATTACHMENT 1 – WSC'S PHASE 1B HYDROGEOLOGIC EVALUATION SCOPE OF WORK AND FEE ESTIMATE

WSC
WATER SYSTEMS CONSULTING, INC.

7/5/2017

City of Pismo Beach
760 Mattie Road
Pismo Beach, CA 93449

SUBJECT: PHASE 1B HYDROGEOLOGIC EVALUATION PROPOSAL - REGIONAL GROUNDWATER SUSTAINABILITY PROJECT

Dear Ben,

Water Systems Consulting, Inc. (WSC) is pleased to provide this proposal to perform the Phase 1B Hydrogeologic Evaluation. As part of the Regional Groundwater Sustainability Project, an initial groundwater model was developed (Phase 1A) to evaluate injection and extraction scenarios for flows from the City of Pismo Beach's WWTP. This model is now being expanded (Phase 1B) to included evaluation of additional flows from the SSLOCSD WWTP. The Phase 1A and Phase 1B groundwater models are envisioned to be the building blocks for a larger regional (Phase 2) groundwater model that will be a comprehensive water resources management tool for the SMGB. This letter outlines WSC's proposed scope of services and budget for this effort.

Thank you for the opportunity to provide you with this proposal. Please feel free to contact us if you have any questions or would like to discuss any aspect of our proposal in greater detail. We can be reached at (805) 457-8833; Jeff is ext. 101 and Daniel is at ext. 104. We look forward to hearing from you.

Sincerely,

Water Systems Consulting, Inc.

Jeff Szytel, PE
President

Daniel Heimel, PE
Project Manager

PO Box 4259 | San Luis Obispo, CA 93403 | Phone: (805) 457-8833 | Fax: (805) 888-2764 | www.wscinc.com

Phase 1B Hydrogeologic Evaluation Scope

TASK 9.0 HYDROGEOLOGIC ANALYSIS

Expansion of the Phase 1A groundwater modeling effort to include evaluation of the treatment and injection of flows from the District WWTP (Phase 1B).

9.1 Numerical Flow Model

- Assist the City in procuring consultant services for the Phase 1B Hydrogeologic Analysis. Procurement assistance is anticipated to include: preparation of an RFP; coordination with prospective consultants; review of proposals, interviews, and scope negotiation assistance.
  - (1) As per the direction of the City, WSC assisted the City in the selection of Geoscience for the Phase 1B Hydrogeologic Consultant services through a competitive procurement and based on a best value selection.
- Provide support and coordination during hydrogeologic efforts for the Program. Tasks will include:
  - (1) Provide existing and available information and studies to Geoscience.
  - (2) Research, compile and provide other available information requested by Geoscience.
  - (3) Provide support throughout the development of Phase 1B Groundwater Model.
  - (4) Review and provide comments on Phase 1B Hydrogeologic Evaluation deliverables.

9.2 Phase 1B Hydrogeologic Evaluation

- See Appendix A for Geoscience's Phase 1B Hydrogeologic Evaluation scope.

Phase 1B Hydrogeologic Evaluation Budget Estimate

Table 1. Proposed Phase 1B Hydrogeologic Modeling Fee

Task No.	Task Description	WSC Fee	Geoscience Fee	Total
9.1	Numerical Flow Model	$29,700		$29,700
9.2	Phase 1B Hydrogeologic Evaluation		$251,477	$251,477
			Total	**$281,177**

Appendix A. Geoscience's Phase 1B Hydrogeological Evaluation

5

Section 5 — Scope of Services

Task 0.0 Project Management

Subtask 0.1 — Invoices and Progress Reports

We will prepare invoices and progress reports on a monthly basis and submit them to WSC.

Subtask 0.2 — Project Team Update Meetings

We will plan, organize, and conduct periodic progress meetings with the Project Team. These progress meetings are assumed to last two hours each, and are intended to update the RGSP Project Team on the status of the project. It is anticipated that Project Team Update Meetings will be required for the following project milestones:

- Project Kick-off,
- Data Assessment,
- Conceptual Model,
- Model Calibration,
- Draft Model Report, and
- Final Model Report.

We will prepare draft meeting minutes for the meetings and submit them to the Project Team for review. Finalized meeting minutes will be submitted following incorporation of any comments from the Project Team.

Subtask 0.3 — Status Update Conference Calls

We will also participate in bi-weekly status update conference calls with WSC and other members of the Project Team, as appropriate, to provide project status updates and coordinate project efforts. The purpose of the bi-weekly conference calls is to:

- Review project progress,
- Review project schedule,
- Develop and review project approach and methodologies (e.g., model approach and verification),
- Review outstanding data needs and current action items list,
- Discuss current and planned activities, and
- Review project results and deliverables.

We will prepare draft meeting minutes for the bi-weekly conference calls and submit them to the Project Team for review. Finalized meeting minutes will be submitted following incorporation of any comments from the Project Team.

Subtask 0.4 — Regional Board Update Meetings
We will also provide periodic updates to the Regional Board on the status of the project. It is anticipated that Regional Board updates will occur at the following key project milestones:

- Project Kick-off,
- Data Assessment,
- Draft Model Report, and
- Final Model Report.

We will document the comments and action items from these meetings and submit them to the Project Team and Regional Board.

Subtask 0.5 — Presentations
We will prepare and deliver presentations for RGSP stakeholder meetings, participating agency City Council/BOD meetings, and other venues, as required for the project.

Deliverable for Task 0.0: Presentation slides (at least 3 days prior to each meeting). Draft and Final meeting minutes, including action item assignments and key decisions, for each meeting and bi-weekly conference call.

Task 1.0 Data Assessment

Subtask 1.1 — Data Review
We will collect and review existing studies and datasets to evaluate the applicability of the available data. These studies include, but are not limited to:

- Santa Maria Groundwater Basin Characterization and Planning Activities Study Report (Fugro 2015),
- NCMA, NMMA, and SMVMA Annual Reports,
- Water Balance Study for the Northern Cities (Todd Engineers 2007),
- DWR Hydrogeological Studies (1958, 1970, 1975, 1979, and 2002), and
- Historical groundwater, surface water, water quality, and climate data from public and private water agencies.

The area for which data will be collected will cover the entire Santa Maria Groundwater Basin (i.e., Phase 2 Groundwater Model). We already have an extensive in-house database for this area which was largely created during our review of groundwater models (including models developed by CH2M Hill and Luhdorff and Scalmanini Consulting Engineers, respectively) for the Santa Maria Groundwater Litigation (Santa Maria Valley Water Conservation District v. City of Santa Maria et al., Case No. CV 770214).

Subtask 1.2 — Gap Analysis
We will identify any data gaps that may limit the ability to develop the Phase 1B and Phase 2 groundwater models. Recommendations for additional data collection that could assist in groundwater model development will also be made.

Subtask 1.3 — Water Quality Characterization

The groundwater quality data collected in Subtask 1.1 will be compiled for use in characterizing the ambient groundwater quality within and around the proposed injection and extraction zone for the RGSP. Anticipated sources of water quality data will likely include, but are not limited to:

- NCMA/NMMA Groundwater Monitoring Programs,
- Municipal well water quality data, and
- SWRCB's Geotracker (GAMA) Groundwater Information System.

Water Quality Objectives (WQOs) for the Santa Maria Groundwater Basin are reported in the 2016 Water Quality Control Plan, Central Coast Basin (Basin Plan). The constituents reported in Table 3-8 of the Basin Plan. However for this project, in the addition to the Table 3-8 WQOs, MCLs, and SMCLs, and Agricultural WQOs will be used as appropriate to evaluate water quality. The specific WQOs to be used for this project will be recommended to the RWQCB based on background water quality and the anticipated effluent water quality.

The available historical water quality data will be examined to evaluate groundwater quality trends and seasonal water quality changes for non-project conditions. Ambient groundwater concentrations will be prepared for the suite of constituents as approved by the RWQCB. Anticipated effluent constituents will be the focus for calculating ambient concentrations in groundwater to provide baseline conditions and potential use of assimilative capacity in the basin prior to implementation of the project. We anticipate that the number of ambient water quality calculations will be consistent with similar projects using subsurface injection for recycled water recharge As an example, the Anti-degradation Analysis for the Pure Water Monterey Groundwater Replenishment Project (Project) considered 14 parameters in the analysis.

The current ambient water quality in the study area for the RWQCB approved list of constituents of concern will be determined by the median concentrations of those constituents. The medians will be used instead of arithmetic averages because: 1) well medians can be reliably calculated for datasets with mixed censored and non-censored data (detects and non-detects) and 2) well medians allow for use of the entire water quality dataset while minimizing the skewing effect of potential data outliers, and do not rely on parametric statistical methods that assume normal data distribution to remove potential outliers.

Median concentrations will be calculated from the water quality data from each well for the last five years or over at least three data sets. Each well data series will include the

sample size (data series plots), min, max, average, and 25th and 90th percentiles. The statistical data will be illustrated on data plots and included as an Appendix in the report. Using median concentrations for each well will account for seasonal variations or outliers at the location of the wells. The median concentrations from each well will then be contoured for each sub-area: Upper and Lower Guadalupe, Lower Nipomo, Santa Maria, and Orcutt individually. The Lower Guadalupe Sub area is defined as the aquifer beneath a depth of 80-feet below ground surface in the Upper and Lower Guadalupe area. Contouring the median concentrations will allow for inclusion of spatial variations in sub-area water quality. Evaluation of the Lower Guadalupe Sub-area will be conducted using water quality (WQ) data from wells with well screens in the representative portion of the aquifer. The average (ambient) concentration for each sub-area will be calculated from the concentration contours. The assimilative capacity for each sub-area will then be considered to be the difference between the WQO and the ambient concentration for individual that sub-area. Well locations and median concentration contours will be provided as maps for each constituent and for each sub-area.

We recognize that the three management zones created within the boundaries of the Santa Maria Groundwater Basin (DWR Basin 3-12) from the adjudication do not specifically match the Santa Maria Ground Water Sub-Areas, Appendix A-34 of the "Water Quality Control Plan for the Central Coast Basin." The A-34 sub-area map includes the Upper and Lower Guadalupe, Lower Nipomo, Santa Maria, and Orcutt Sub-areas. The Lower Guadalupe Sub-area is defined as the aquifer beneath a depth of 80-feet below ground surface.

The current ambient water quality will also be compared to Table 3-8 WQOs, DDW Title 22 Primary, and Secondary MCLs. The "WQO" for the project will be considered lowest assigned regulatory value for the specific constituent. The evaluation of the Assimilative Capacity will be conducted for each individual sub-area based on the WQOs assigned for the project. The anti-degradation analysis will consider the water quality changes to each individual sub-area from the project in light of the WQOs assigned for the project constituents. In the project area where there is no assigned WQO (such as much of the Northern Cities Management Area), the project team will discuss an appropriate assumed WQO with the RWQCB to be used for the analysis.

The median concentrations will be reported along with the WQOs to determine if assimilative capacity is available for each constituent, and if so, the magnitude of the current assimilative capacity available for each constituent. The anticipated water quality provided by the project engineering team will be used as input water quality for the project to assess project impacts on assimilative capacity and water quality trends in the future.

Subtask 1.4 — Monitoring Plan

We will develop recommendations to modify and/or supplement the existing County of San Luis Obispo, NCMA, NMMA, and water purveyor monitoring plans to improve understanding of basin hydrogeology.

Subtask 1.5 — Database

We will develop a comprehensive database to include all the geohydrologic data collected for the Project. The data will be checked for QA/QC and loaded to the database. The types of data include:

- Well information (e.g., well name, well type, well status, well X coordinate, well Y coordinate, ground surface elevation, distance from reference point to ground surface reference point type, depth of well casing, depth intervals of well perforations);
- Groundwater pumping;
- Precipitation;
- Streamflow;
- Groundwater recharge;
- Evaporation;
- Water level data including well name, measurement date/time, depth from reference point to water level, activity of well during measurement (e.g. static, pumping), and measurement method;
- Various GIS coverages and/or shape files, including ground surface elevation (topography), water features (rivers, streams, recharge basins), geologic faults, land use maps, and soil types.

Deliverable for Task 1.0: Database of all geohydrologic data.

Task 2.0 Conceptual Model

Subtask 2.1 — Model Extent and Boundary Conditions

We will develop recommendations for expanding the extent of the existing Phase 1B hydraulic model to allow for the evaluation of injection and extraction scenarios that include water from both the City of Pismo Beach and SSLOCSD WWTPs. The recommended model area will be appropriate for the accurate representation of current and future conditions. Boundaries of the model will be selected which are reasonable and can be accurately simulated to match observed real-world conditions.

Subtask 2.2 — Water Balance

The groundwater budget (also known as the water balance or hydrologic balance) for the model area is a critical aspect of the conceptual model. Inflow terms for the Phase 1B model area include recharge from precipitation, percolation of stream flow, return flows from agricultural and municipal

water use, and subsurface inflows. Outflow terms include groundwater pumping and subsurface outflow. The inflows and outflows will be quantified for the transient calibration period. The changes in groundwater storage will be calculated based on the Equation of Hydrologic Equilibrium (i.e., Inflow = Outflow +/- Change in Groundwater Storage) for the same period of time.

Data on inflow to the groundwater basin will be obtained from the SMBC evaluation of stream infiltration, NCMA's 2007 Water Balance Study, NMMA's Percolation Past Root Zone analysis, NCMA and NMMA Annual Reports, and other available resources. Groundwater production from municipal and private wells will be documented and simulated appropriately in the model. Historical municipal pumping rates will be collected and compiled. We will also develop estimates of private and agricultural groundwater use on a time interval that matches previously completed irrigation requirement analyses.

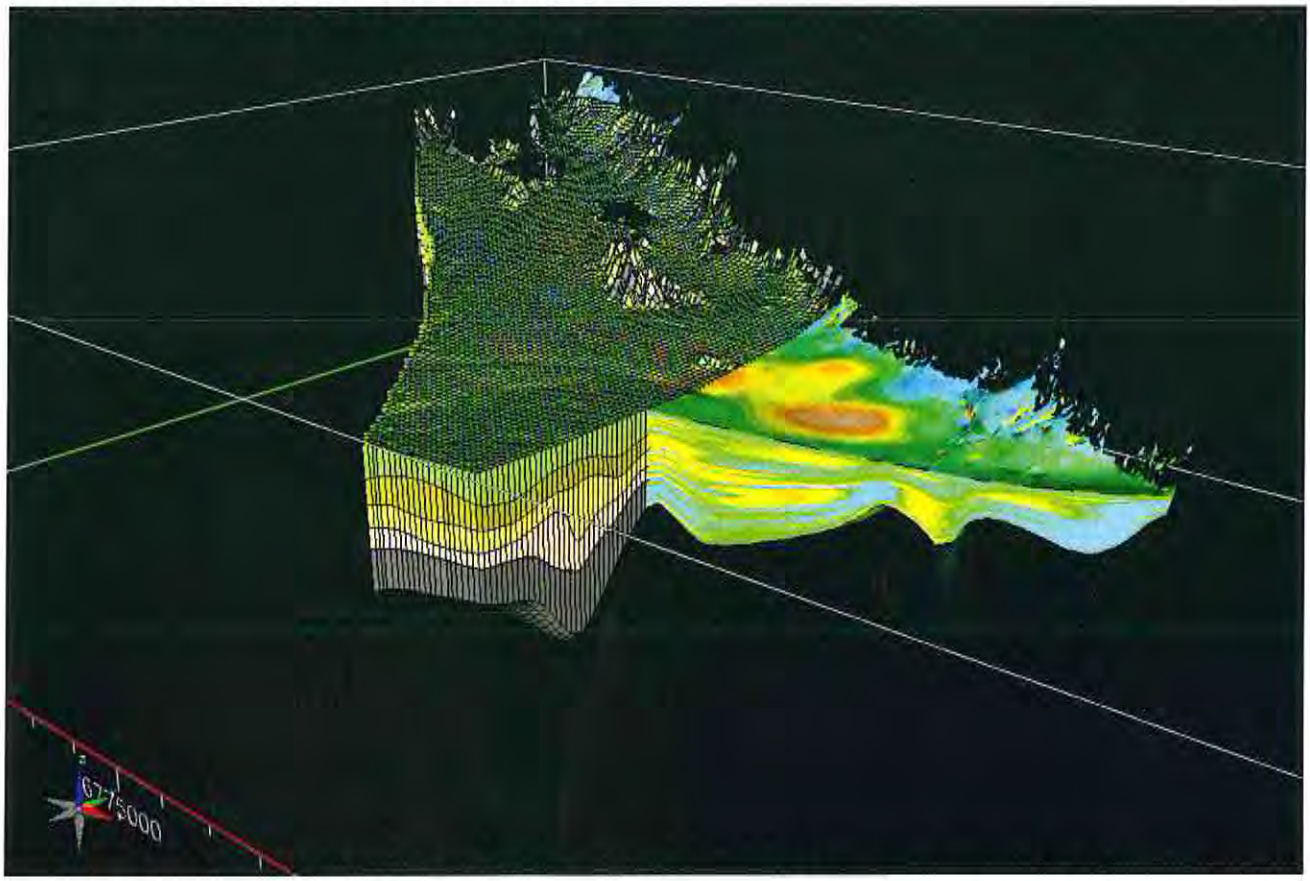
Changes in groundwater storage will also be calculated based on the observed changes of water levels, assumed effective porosity, and area to validate the water budget analysis.

Subtask 2.3 — Development of a 3-Dimentional Lithologic Model

The first step of the 3-Dimensional lithologic model is to define the top and bottom surfaces of the lithologic model. For the purpose of the Phase 1B model, the top surface will represent land surface elevations and the bottom surface will be the base of the Careaga Formation. The land surface elevations of the Phase 1B model will be obtained from the USGS DEM files. The base of the Careaga Formation will be delineated using well logs and the geologic cross-sections developed in the Santa Maria Basin Characterization (SMBC) study completed by Fugro in 2015.

The second step is to prepare categorical lithology values for wells using recorded lithology from driller's logs and geophysical logs. The categorical lithology log values are applied to logged intervals in each well based on the 14

Example of Model Layers Derived from Lithologic Model



[1]Petrel is a 3-Dimensional geological modeling software developed by Schlumberger. It allows the integration and the interpretation of various geological and geophysical data (lithological logs, cross-sections, downhole geophysical logs, seismic, etc.) to produce realistic 3-Dimensional geological and lithological models.

categories recognized within the Unified Soil Classification System (USCS) scale (a scale that approximates grain size distribution). With this method, larger category values are associated with larger grain sizes.

The third step is to estimate the type of lithology at each cell of a 3-Dimensional mesh (typically 50 ft x 50 ft x 5 ft in width x length x height). This mesh will conform to the base of the Careaga Formation and to the top of the model (ground surface). Estimation of the subsurface lithology needs to be statistically robust so that the uncertainty of the estimate at each cell can and will be derived. The geostatistical approach known as ordinary kriging will be used to model the variation of the lithologic data in wells and to guide the estimation of lithologic properties for a mesh containing on the order of several million cells. This work will be carried out using the Petrel program[1]. Model layer boundaries will be delineated based on the results of the lithologic model, as well as the results from water level, water quality, and water budget analyses. The following Figure shows an example of model layers derived from the lithologic model.

Subtask 2.4 — Estimation of Hydraulic Conductivity Values
To estimate hydraulic conductivity values, a weighted average lithologic value of each model cell for each model layer will first be calculated, based on the results from the lithologic model. This will be done by summing the thicknesses of each lithologic category and determining a weighted average based on classification type and thickness for each flow model cell in each model layer, respectively. Secondly, a hydraulic conductivity multiplier will be calculated based on the relationship between the weighted average lithology values and hydraulic conductivity estimates. The hydraulic conductivity estimates will be derived based on the results from the SMBC Pump Testing and other available data sources. Finally, the hydraulic conductivity values for each of the model cells of each layer will be calculated as the product of weighted lithologic value and hydraulic conductivity multiplier.

Vertical hydraulic conductivity values will initially be assumed to be a ratio of the horizontal hydraulic conductivity values. These values will then be adjusted during the flow model and solute transport model calibration.

Subtask 2.5 — Estimation of Storativity Values
Storativity values will initially be estimated based on production well pump tests within the study area. In addition, literature values and values from the previous models in the Santa Maria Groundwater Basin will be used as initial storativity for the model. Estimated storativity will be adjusted within prescribed limits during transient calibration to achieve an acceptable match in the seasonal head fluctuation or amplitude on the calibration hydrographs.

Subtask 2.6 — Conceptual Model
We will develop the geologic and hydrogeologic conceptual model of the study area based on the results from Subtasks 2.2 through 2.5. The conceptual model will include documentation of geology and hydrostratigraphy, aquifer geometries and continuity, hydraulic properties including permeability and storage properties, and groundwater inflows and outflows. Groundwater inflows and outflows will be dependent upon the model area and boundary conditions, but will include recharge from precipitation and return flows, surface water infiltration, inflow from upgradient areas of the basin, and sufficient outflow to maintain the seawater/freshwater interface offshore. Importance will be placed on the source and reliability of information and the methods used to develop the information, as well as the validity of the information and its pertinence to the development of the hydrogeologic conceptual model. Special emphasis will be placed on geologic features that might serve to compartmentalize the aquifer system, including fine-grained lithologic units, faults, fractures, mineralization, and other geologic features that might impede groundwater flow and influence groundwater chemistry.

Subtask 2.7 — Conceptual Model TM (TM No. 1)
We will prepare a draft Conceptual Model TM (TM No. 1) that summarizes the Data Assessment and proposed model extents/boundary conditions, water balance, 3-Dimentioal lithologic model, estimation of hydraulic conductivity values, and estimation of storativity values and other related components. We will clearly document methodologies and assumptions utilized to develop the Conceptual Model.

The draft Conceptual Model TM will be submitted to the Project Team for review. We will also prepare a final Conceptual Model TM that incorporates comments from the Project Team on the draft Conceptual Model TM.

Deliverable for Task 2.0: Draft and Final Conceptual Model TM (TM No. 1).

Task 3.0 Model Construction

Subtask 3.1 — Final Model Code Selection, Model Domain, Model Layer and Grid Design
The Phase 1B model will be constructed based on the approved model computer code, model domain, number of model layers, and cell sizes by the Project Team. Criteria to consider when designing the model parameters include:

- Phase 1B model will be a three-dimensional model that will represent groundwater flow in the aquifers, and will account for variable aquifer thicknesses and hydraulic properties, leakage and three-dimensional flow between

heterogeneous aquifers.

- Model layering will be dependent upon the quality and availability of geologic information, well construction details, and groundwater monitoring results including vertical variations in hydraulic head and salinity with depth. The number of layers will provide as much model accuracy in the simulation of three-dimensional flow as is practical given the available data. Maps of aquifer layer geometries and hydrogeologic cross-sections will be provided to the Project Team.
- Model grid spacing will also be appropriately defined to accurately represent boundary conditions, recharge sources, and production wells.
- Both zonal and smooth field distributions of input parameters such as aquifer layer elevations, hydraulic properties including permeability, and recharge sources will be evaluated, and, if appropriate, both approaches to provide accurate representations of these variables will be used. Sources and sinks, including recharge and pumping, over the transient simulation period will also be appropriately quantified.

Based on the above criteria and review of the RFP and associated data, it is anticipated that the Phase 1B model will be a 14-layer model (at least) with a uniform cell size equal to or less than 100 ft x 100 ft. The proposed model computer code will be SEAWAT Version 4. The SEAWAT Version 4 is a replacement of SEAWAT-2000. This program was developed by the United States Geologic Survey (Langevin et al. 2008) to simulate three-dimensional, variable density, groundwater flow and solute transport in porous media. The source code for SEAWAT Version 4 was developed by combining MODFLOW and MT3DMS into a single program that solves the coupled flow and solute transport equations. Since MODFLOW is the computer code used for the Phase 1A model, SEAWAT is a logical code choice for the variable-density modeling option. Based on our experience in similar modeling projects, the effort and complexity involved in converting MODFLOW to SEAWAT Version 4 is minimal. Although the flow equation of SEAWAT Version 4 is still formulated in terms of equivalent freshwater head, input and output are entered or written in terms of the head in the aquifer, rather than equivalent freshwater head. The only disadvantage of using SEAWAT is the longer execution time. However, SEAWAT Version 4 allows for faster execution time with program redesign.

The transient calibration period will cover a 20- to 30-year hydrologic period that includes both wet and dry year cycles with average precipitation approximately the same as the long-term average to cover the period from 1991 to 2014.

The transient model calibration run will be simulated with a monthly stress period (Note: The stress period for the Phase 1A model is semi-annual).

We will make test runs with different cell sizes to ensure the execution time of the model run is manageable and in accordance with RFP requirements. Since layer elevations and aquifer parameters will be derived from the lithologic model, cell-by-cell data for different cell sizes can be generated easily.

Subtask 3.2 — Model Construction
The Phase 1B model will be constructed based on the approved model computer code, model domain, orientation, model layer, and cell size. Key model aquifer parameters such as hydraulic conductivity, storativity, effective porosity, and model layer elevations will be assigned to each of the model cells based on results from Task 2.0. Maximum and minimum values will be established for use in the calibration process. MODFLOW modules such as Recharge (RCH), Streamflow-Routing (SFR), Well (WEL) and General Head Boundary (GHB) packages will be prepared based on water levels and inflow/ outflow terms compiled for Task 2.0.

Task 4.0 Model Calibration and Sensitivity Analysis

Subtask 4.1 — Model Calibration Plan TM (TM No. 2)
We will prepare a model calibration plan TM (TM No. 2) for the Project Team to review. This plan will include the objective of the calibration, calibration strategy and approach, steady-state calibration period, transient calibration period (e.g., a 20- to 30-year hydrologic period that includes both wet and dry year cycles with average precipitation approximately the same as the long-term average), transient calibration stress period, selection of calibration targets, and critical input parameters (and anticipated range of parameter values) which may be adjusted during model calibration. Quantitative techniques, including calculating residuals for potentiometric head, streamflow, and TDS (using residual statistics such as maximum and minimum residual, residual mean, weighted residuals, and second order statistics), assessing correlation among residuals (listings, scattergrams, spatial correlation plots, temporal correlation), and calculating flow residuals (water budget and mass balance, vertical gradients, and groundwater flow paths) will be used. Qualitative considerations during calibration will include assessment of general flow features, comparison with distinct and similar hydrologic conditions, and input hydraulic properties.

The model calibration plan will be prepared using the guidelines documented in "Standard Guide for Comparing Ground-Water Flow Model Simulations to Site-Specific

Information (ASTM 1993), "Standard Guide for Calibrating a Ground-Water Flow Model Application" (ASTM 1996), and "Guidelines for Evaluating Ground-Water Flow Models" (USGS 2004).

Subtask 4.2 — Model Calibration
Steady-state model calibration will be conducted based on the approved model calibration plan. The calibration results will be summarized in the form of maps, figures, and tables, as specified in the calibration plan.

Transient model calibration will also be conducted based on the approved flow model calibration plan. Particularly, a MODPATH particle tracking simulation with the final flow model calibration field will be conducted to verify that the groundwater pathways and velocities appear reasonable based on the conceptual hydrogeologic representation. In addition, qualitative and quantitative calibration evaluations will be summarized in the form of maps, figures, and tables, as specified in the calibration plan. Initial water levels of the transient model calibration will be based on steady-state calibration heads or contour maps constructed based on observed heads, or some other hybrid approach depending on the results of the steady-state model calibration.

Subtask 4.3 — Sensitivity Analysis of Model Calibration
As part of the model calibration procedure, we will perform a sensitivity analysis of the groundwater model which will identify key model parameters that cause the most changes in the model results. In the sensitivity analysis, each of the input parameters will be iteratively altered by a factor to determine its effect on the model output. Model parameters that cause significant changes in model results will be investigated thoroughly to identify model uncertainty.

Subtask 4.4 — Model Calibration TM (TM No. 3)
We will prepare a Draft Model Calibration TM (TM No. 3) which documents model construction and calibration procedures and results for the Project Team to review.

The comprehensive report will include the following key components:

- Overview of the conceptual model,
- Detailed description of the model domain, grid, and boundary conditions used for both steady state and transient calibrations,
- Summary of model input parameters,
- Description of model calibration procedures and results, and
- Any potential limitations of the model pertaining to the appropriateness of its use as a predictive tool for assessing various types of future scenarios going forward.

The model report will include figures of all pertinent model layer and aquifer parameters from the final transient model calibration run, including, but not limited to:

- Contoured top and bottom elevations for the aquifer layers,
- Contoured thickness (isopach) maps for each model layer, including the intervening aquitard layers,
- Horizontal hydraulic conductivity values for each aquifer layer, including a summary table showing the average and range in horizontal and vertical hydraulic conductivity values for each model layer,
- Storativity values for each of the aquifer layers, including a summary table showing the average and range in storativity values for each model layer,
- Effective porosity values for each of the aquifer layers, including a summary table showing the average and range in effective porosity values for each model layer, and
- Dispersivity values for each of the aquifer layers, including a summary table showing the average and range in dispersivity values for each model layer.

We will prepare a Final Model Calibration TM that incorporates comments from the Project Team on the Draft Model Calibration TM.

Deliverable for Task 4.0: Draft and Final Model Calibration Plan TM (TM No. 2) and Draft and Final Model Calibration TM (TM No. 3).

Task 5.0 Scenario Evaluation

Subtask 5.1 — Scenario Development Workshop
We will plan, schedule, and lead a workshop with the Project Team to develop RGSP scenarios for simulation. The purpose of the Scenario Development Workshop will be to develop an initial list of scenarios to be evaluated and the parameters/constraints that will govern their evaluation (e.g., minimum/maximum water levels, groundwater gradients, production/demand limitations, etc.).

Subtask 5.2 — Scenario Development
We will develop an agreed upon list of scenarios for simulation of the phased implementation of RGSP (i.e., Phase 1 City of Pismo Beach flows, Phase 2 City of Pismo Beach flows, and SSLOCSD flows). It is envisioned that the RGSP scenarios will include, but not be limited to, evaluation of the following:

- Seawater intrusion barriers,
- Inland injection,
- Travel time under various pumping scenarios,

[2] SEAWAT was developed by the USGS to simulate three-dimensional, variable density, groundwater flow and solute transport in porous media.

[3] MODPATH is a post-processing package developed to compute three-dimensional flow paths (i.e., particle tracking) using output from the groundwater flow model.

- Yield and/or benefit of groundwater injection,
- Injection well location and spacing,
- Yield and/or benefit of offsetting agriculture pumping,
- Benefit of additional extraction wells,
- Optimized municipal pumping operations, and
- Evaluation of the NCMA Deep Well Index.

Subtask 5.3 — Scenario Evaluation
We will utilize the calibrated groundwater model to evaluate the agreed upon modeling scenarios. These model runs will use the SEAWAT[2] and MODPATH[3] computer codes.

As the details of the scenarios are developed, hydrologic impacts of each scenario will be evaluated, including:

- Potential for decreased drawdown in critical coastal areas and decelerated seawater intrusion, and
- Groundwater travel times, flow paths, changes in groundwater storage, opportunities for additional yield, groundwater injection and extraction efficiency, and hydraulic capture zones.

Additional sensitivity analyses will be performed on these predictive simulations.

Subtask 5.4 — Scenario Results Review Workshop
We will plan, schedule, and lead a workshop with the Project Team to review the results of the scenario evaluation.

Task 6.0 Model Report

Subtask 6.1 — Admin Draft Report
We will prepare an Admin Draft Report that compiles the TMs from the Phase 1B Hydrogeologic Evaluation. This Admin Draft Report will be submitted to the Project Team for review.

Deliverable for Subtask 6.1: An electronic copy of the Admin Draft Report.

Subtask 6.2 — Draft Report
Based on comments provided by the Project Team on the Admin Draft Report, we will prepare a Draft Report incorporating all of the comments received. This Draft Report will be submitted to the Project Team for review.

Deliverable for Subtask 6.2: An electronic copy of the Draft Report.

Subtask 6.3 — Final Report
Based on comments received from the Project Team and at public presentations, we will prepare a Final Report for the Phase 1B Hydrogeologic Evaluation.

Deliverable for Subtask 6.3: An electronic copy and ten (10) hard copies of the Final Report for distribution to the Project Team, and electronic copies of all relevant calculation and modeling files.

Task 7.0 Anti-Degradation Analysis (Optional)

The State anti-degradation policies require, in part, that where surface waters are of higher quality than necessary to protect beneficial uses, the high quality of those waters must be maintained unless otherwise provided by the policies. The State anti-degradation policy is titled the Statement of Policy with Respect to Maintaining High Quality Waters in California, codified in 23 CCR §2900, and is commonly known as "Resolution 68-16."

The State anti-degradation policy applies to groundwater and surface water whose quality meets or exceeds water quality objectives. The State policy establishes a two-step process to determine if discharges that will degrade water quality are allowed. The first step states that where a discharge will degrade high quality water, the discharge may be allowed if any change in water quality:

- Will be consistent with the maximum benefit to the people of the State,
- Will not unreasonably affect present and anticipated beneficial uses of such water, and
- Will not result in water quality less than that prescribed (e.g., by water quality objectives).

The second step is that any activities that result in discharge to high quality waters are required to use the best practicable treatment or control (BPTC) necessary to avoid pollution or nuisance and to maintain the highest water quality consistent with the maximum benefit to the people of the State.

The State anti-degradation policy further establishes that if the discharge, even after treatment, unreasonably affects beneficial uses or does not comply with applicable provisions of the Basin Plan, the discharge would be prohibited.

Using data collected during Subtask 1.3, we will evaluate constituent sources that result in groundwater impacts to determine the potential level of degradation, if any, occurring within the groundwater basins and the proximity to the proposed project locations. For this part of Task 7, we will determine:

- Whether an anti-degradation analysis is required for the project,
- If the anti-degradation analysis can be simplified (if it is found that no significant degradation of ground water quality is likely to occur), and
- The definition of the threshold for significant degradation (per the Recycled Water Policy).

Subtask 7.1 — Evaluation of Need for Anti-Degradation Analysis
In accordance with the Recycled Water Policy, if the data show that potential significant degradation is likely, we will carry out the following actions for the anti-degradation analysis:

1. Determine background groundwater quality (constituent by- constituent, to be completed under Subtask 1.3);

2. If no significant degradation of groundwater quality compared to background is shown, then no anti-degradation analysis is required;

3. If groundwater quality degradation is identified, then determine whether management practices meet BPTC;

The analyses conducted for Subtask 1.3 will be used to address steps 1 through 3 above. After completion of steps 1 through 3, we will meet with the Project Team to discuss the results and potential mitigation. Should any analysis indicate greater than significant degradation, we will proceed with the following steps as necessary:

4. If BPTC is not met, alter management practices to achieve BPTC;

5. Compare groundwater quality degradation identified to the significance threshold for groundwater quality degradation (see below);

6. If groundwater quality degradation is not significant, then stop. "The non-significant degradation is allowable and no further justification is needed";

7. If groundwater quality degradation is determined to be significant from initial assessments, then evaluate the need for additional ground water characterization;

8. If the final determination is that ground water quality degradation is significant, then a detailed anti-degradation analysis with socioeconomic justification is required.

This task will provide an estimated level of effort required to complete the anti-degradation analysis if it is determined that groundwater quality degradation is significant.

Subtask 7.2 — Threshold of Significance
We will define the threshold of significant degradation. Some levels of degradation may be small enough that such "non-significant" degradation of ground water quality is allowable given the benefit to the region and the state from the use of recycled water.

The Policy, in the absence of an adopted Salt and Nutrient Management Plan, defines thresholds of significance for groundwater recharge and landscape irrigation projects in terms of use of available assimilative capacity. Available assimilative capacity is defined, constituent-by-constituent, as the difference between ambient background water quality (e.g., high quality water) and the minimum water quality required by Basin Plan. The thresholds of significance are:

1. Less than 10 percent use of available assimilative capacity by a single project and/or

2. Less than 20 percent use of available assimilative capacity by multiple projects.

All of the basic data for this determination will be collected as a part of Subtask 1.3.

The calibrated Phase 1B groundwater model (a variable-density flow and solute transport model) will be used carry out the anti-degradation analysis. Project impacts will be compared to groundwater quality changes anticipated under "no project" conditions. In addition, if required by the client, the travel time and percentage of recycled water in the groundwater basin will be provided to meet Title 22 Engineering requirements for recycled water projects.

Subtask 7.3 — Anti-Degradation Analysis TM (TM No. 4)
The anti-degradation analysis will be memorialized in both a draft and final TM (TM No. 4), and will be included as an appendix in the Phase 1B Report.

ATTACHMENT 2 – GSI WATER SOLUTIONS TECHNICAL ADVISORY REVIEW SCOPE OF WORK AND FEE ESTIMATE

GSI
Water Solutions, Inc.

June 28, 2017

Water Systems Consulting, Inc.
805 Aerovista Lane, Suite 201
San Luis Obispo, California 93401

Attention: *Daniel Heimel*

Subject: **Proposal**
Technical Advisory Review
Phase 1B Hydrogeologic Evaluation for the Regional Groundwater Sustainability Project

Dear Mr. Heimel,

Thank you for the opportunity to submit this proposal for services related to the Phase 1B Hydrogeologic Evaluation of the Regional Groundwater Sustainability Project (RGSP). As we have discussed in several meetings and conversations, our role would be to assist the City of Pismo Beach (City), Water Systems Consulting, Inc. (WSC), the South San Luis Obispo County Sanitation District (SSLOCSD), the San Luis Obispo County Flood Control and Water Conservation District (District) and other stakeholders in a technical advisory review capacity. As appropriate, we will also work directly with your modeling consultant, Geoscience Support Services, to provide constructive, technical review as well as local knowledge and perspective.

We have learned in previous basin analyses, particularly complex investigations involving groundwater flow modeling, that a focused integrated technical review of the consultant's work throughout the course of the project inevitably results in a better deliverable. At various times we have participated in this process in both the roles of the primary modeling consultant and as the technical reviewer, and our experience is that the additional cost of the role has always been beneficial to the client and end-users.

Based on our conversations with you, we propose to utilize Paul Sorensen and Dave O'Rourke throughout the project to maintain continuity and consistency of effort. As the hydrogeologist for the Northern Cities Management Area (NCMA) and project manager and lead investigator for the Santa Maria Groundwater Basin Characterization Project, Paul has a thorough knowledge of the geology and hydrogeology of the basin, as well as the objectives and concerns of the City and stakeholders. Dave O'Rourke is a Supervising Hydrogeologist with GSI with 25 years of groundwater flow modeling experience, with the ability to critically assess and review the technical modeling aspects of the work.

We have reviewed the Geoscience scope of services and have followed it closely to develop our proposed scope of work. The intent is that Paul will participate in most of the meetings, status update conference calls, deliverable reviews, and general project update discussions. Dave will focus on the technical aspects of the modeling work and therefore will participate in only the meetings and discussions related to the model framework, construction, calibration, and scenario development, as well as deliverables review.

5855 Capistrano Avenue, Suite C Atascadero, CA 93422 P: 805.460.4621 info@gsiws.com www.gsiws.com

SCOPE OF WORK

The following headings outline follow the Geoscience scope of services. Each section briefly describes our proposed level of effort; the hours associated with each task are reflected in the attached fee estimate spreadsheet.

Task 0.0 Project Management

Subtask 0.2 – Project Team Update Meetings. The Geoscience scope of services includes 6 formal meetings intended to update the RGSP Project Team on the status of the project, including:

- Project Kick-off
- Data Assessment
- Conceptual Model
- Model Calibration
- Draft Model Report, and
- Final Model Report.

Based on our conversations with you, we propose to attend 5 of the meetings, excluding the Final Model Report meeting. Assuming that we have been closely involved throughout the project, we will not be required at the final presentation of the end-product.

Subtask 0.3 – Status Update Conference Calls. Geoscience proposes to participate in bi-weekly status update conference calls with WSC and other members of the Project Team to:

- Review project progress
- Review project schedule
- Develop and review project approach and methodologies (model approach and verification)
- Review outstanding data needs and current action items list
- Discuss current and planned activities, and
- Review project results and deliverables.

The project schedule calls for project completion in 7 months, which would result in approximately 14 conference calls (maximum). We have budgeted for Paul to participate in all of the calls to maintain consistency and assist you with managing the project workflow. We have planned for Dave to participate in one-half of the number of conference calls, participating primarily when conceptual modeling and detailed flow modeling issues are going to be discussed.

Subtask 0.4 – Regional Board Update Meetings. Geoscience proposes 4 meetings with the Regional Board, including:

- Project Kick-off
- Data Assessment
- Draft Model Report, and
- Final Model Report.

We have budgeted for Paul to attend one of the Regional Board meetings (likely the kick-off meeting), based on the assumption that if we have participated in all of the other meetings for which we have budgeted that our role in the Regional Board meetings would be relatively limited.

Subtask 0.5 – Presentations. Geoscience proposes to deliver presentations for RGSP stakeholder meetings, City Council/BOD meetings and other venues as needed. We have not proposed to participate in any of these meetings.

Task 1.0 Data Assessment

The Data Assessment task as outlined by Geoscience includes the normal data collection, compilation, and review tasks. It also includes a data gap analysis, water quality characterization, recommendations for a monitoring plan, and development of a comprehensive database. Although there is not a formal deliverable for this task, we have budgeted a nominal amount of time to interact with Geoscience to assist the data assessment task, review the database, and provide input into the data gap analysis and the monitoring plan.

Task 2.0 – Conceptual Model

The Task 2.0 Conceptual Model task is a critical step in the project, involving decisions on several factors that will have important implications and ramifications during model development. Potentially, our input in this task will be particularly valuable because of our familiarity with the local geology and hydrogeology, especially with respect to the model extent and boundary conditions, the water balance, and the conceptual model. We have budgeted time for review and to provide comments on the Draft Conceptual Model TM, and then nominal time to review the Final Conceptual Model TM.

Task 3.0 – Model Construction

Although the model construction task is clearly a critical component to the project, we do not anticipate expending any time specifically to this task. Our input during Task 2.0-Conceptual Model as well as our participation in the meetings and project status update conference calls will be sufficient to adequately address this task. Furthermore, many potential comments that we may have during this process will also be addressed in the model calibration and sensitivity analysis (Task 4.0).

Task 4.0 – Model Calibration and Sensitivity Analysis

Model calibration is a vital step in the success of the project and warrants a detailed review. Geoscience has proposed submitting a Draft and Final Model Calibration Plan as well as a Draft and Final Calibration TM. The Model Calibration Plan is intended to lay out the calibration objectives, strategy and approach, calibration period, targets, and critical input parameters. Because of the importance of the calibration process, which sets the stage for credibility of the modeling work, we are proposing a detailed review of the draft plan with a nominal review of the final plan.

Similarly, the planned Model Calibration TM by Geoscience is a critically important step in the overall project. This document will discuss the hydrogeologic conceptual model, the model domain and boundary conditions used in model development, summarize the model input parameters, and will present several graphics showing key model layer and parameters used in the model. As with the Model Calibration Plan, we are proposing a detailed review of the draft Model Calibration TM, with a nominal review of the Final TM.

Task 5.0 – Scenario Evaluation

Geoscience plans to conduct 2 workshops with the RGSP Project Team to (1) develop the list of scenarios to be simulated and the constraints for each scenario, and (2) to present the results of the scenario assessment. We propose to attend each of these 2 workshops to provide input to WSC and the City for these important workshops.

Task 6.0 – Model Report

The Geoscience agreement calls for an Administrative Draft Report, a Draft Report, and a Final Model Report. We believe that our input and review is particularly important in the Admin Draft and Draft report subtasks; only nominal time is proposed for a review of the Final Model Report.

ESTIMATED FEES

A detailed cost estimate spreadsheet of the estimated hours assigned to each task and subtask is attached, as well as a summary spreadsheet. As described, according to the tasks, subtasks, and deliverables proposed by Geoscience, our estimated fee to provide technical advisory review to WSC, the City of Pismo Beach, and other stakeholders, is $58,045.

It should be noted, however, that, if Geoscience actually performs the agreed-upon work in the 7 months currently indicated in the schedule, that it is very unlikely that our entire budget will be expended. A 7-month completion schedule is extremely ambitious and included in these 7 months are 6 Project Team Update Meetings, 14 Status Update Conference Calls, 4 Regional Board Update Meetings, 2 Workshops, and 9 interim or Final TMs. There will be, by necessity, a lot of overlap of meetings, conference calls, workshops, deliverables, etc. during the 7-month schedule, so it is unlikely that all of the conference calls, for instance, will be held. As such, we will bill you for only the tasks performed. If the project extends beyond the 7-month schedule, however, our proposed budget will cover this contingency.

If you have any questions, please do not hesitate to call.

Sincerely,
GSI WATER SOLUTIONS, INC.

Paul A. Sorensen

Paul Sorensen. PG, CHG
Principal Hydrogeologist

Table 1
GSI Budget Detail
City of Pismo Beach/WSC
Phase 1B Technical Advisory Review

		Staff	*Sorensen*	*O'Rourke*	*Admin*		
		Title	*Principal*	*Supervising Hydro*			
		Company	*GSI*	*GSI*	*GSI*		
		Hourly Rate	$235.00	$215.00	$95.00	Task Hours	Budget Totals
Task 0.0 Project Management							
Labor	Subtask 0.1 Project Management		12		4	16	3,200
	Subtask 0.2 Project Team Update Meetings		20	25		45	10,075
	Subtask 0.3 Status Update Conference Calls		14	7		21	4,795
	Subtask 0.4 Regional Board Update Meetings		3	0		3	705
	Subtask 0.5 Presentations		0	0		0	0
	Total Budgeted Hours per Individual		49	32	4	85	18,775
Expenses	Subtask 0.1 Project Management						0
	Subtask 0.2 Project Team Update Meetings						200
	Subtask 0.3 Status Update Conference Calls						0
	Subtask 0.4 Regional Board Update Meetings						
	Subtask 0.5 Presentations						
						Task Expense Total	$200
	Task Total		49	32	4	85	$18,975
Task 1.0 Data Assessment							
Labor	Review deliverable for Task 1.0		4	18		22	4,580
	Total Budgeted Hours per Individual		4	18	0	22	4,580
Expenses	Expenses						100
						Task Expense Total	$100
	Task Total		4	18	0	22	$4,680
Task 2.0 Conceptual Model							
Labor	Draft Conceptual Model TM (w/comments)		8	24		32	7,040
	Final Conceptual Model TM		2	4		6	1,330
	Total Budgeted Hours per Individual		10	28	0	38	8,370
Expenses	Expenses						100
						Task Expense Total	$100
	Task Total		10	28	0	38	$8,470
Task 3.0 Model Construction							
Labor			0	0		0	0
	Total Budgeted Hours per Individual		0	0	0	0	0
Expenses							
						Task Expense Total	$0
	Task Total		0	0	0	0	$0
Task 4.0 Model Calibration and Sensitivity Analysis							
Labor	Draft Model Calibration Plan TM (w/comments)		4	8		12	2,660
	Final Model Calibration Plan TM		0	2		2	430
	Draft Model Calibration TM (w/comments)		4	24		28	6,100
	Final Model Calibration TM		0	4		4	860
	Total Budgeted Hours per Individual		8	38	0	46	10,050
Expenses	Expenses						100
						Task Expense Total	$100
	Task Total		8	38	0	46	$10,150
Task 5.0 Scenario Evaluation							
Labor	Subtask 5.1 Scenario Development Workshop		8	8		16	3,600
	Subtask 5.4 Scenario Results Review Workshop		8	8		16	3,600
	Total Budgeted Hours per Individual		16	16	0	32	7,200
Expenses	Expenses						200
						Task Expense Total	$200
	Task Total		16	16	0	32	$7,400
Task 6.0 Model Report							
Labor	Subtask 6.1 Admin Draft Report		4	8		12	2,660
	Subtask 6.2 Draft Report		2	8		10	2,190
	Subtask 6.3 Final Report		2	4		6	1,330
	Total Budgeted Hours per Individual		8	20	0	28	6,180
Expenses							
						Task Expense Total	$0
	Task Total		8	20	0	28	$6,180
Task 7.0 Anti-Degradation Analysis (optional)							
Labor	Subtask 7.3 Anti-Deradation Analysis TM		2	8		10	2,190
	Total Budgeted Hours per Individual		2	8	0	10	2,190
Expenses							
						Task Expense Total	$0
	Task Total		2	8	0	10	$2,190
	Task Total		0	0	0	0	$0
	Project Total Hours		63	76	4	145	
Cost Summary							
	Total Labor Costs						$57,345
	Total Expenses						$700
	Project TOTAL						**$58,045**

Table 2
GSI Budget Summary
Phase 1B Technical Advisory Review

Task 0.0 Project Management		Hours	Labor	Expense	Subtotal
Subtask 0.1 Project Management		16	$3,200	$0	$3,200
Subtask 0.2 Project Team Update Meetings		45	$10,075	$200	$10,275
Subtask 0.3 Status Update Conference Calls		21	$4,795	$0	$4,795
Subtask 0.4 Regional Board Update Meetings		3	$705	$0	$705
Subtask 0.5 Presentations		0	$0	$0	$0
	Task 0.0 Totals	**85**	**$18,775**	**$200**	**$18,975**
Task 1.0 Data Assessment					
Review deliverable for Task 1.0		22	$4,580	$100	$4,680
	Task 1.0 Totals	**22**	**$4,580**	**$100**	**$4,680**
Task 2.0 Conceptual Model					
Draft Conceptual Model TM (w/comments)		32	$7,040	$100	$7,140
Final Conceptual Model TM		6	$1,330		$1,330
	Task 2.0 Totals	**38**	**$8,370**	**$100**	**$8,470**
Task 3.0 Model Construction					
	0	0	$0	$0	$0
	Task 3.0 Totals	**0**	**$0**	**$0**	**$0**
Task 4.0 Model Calibration and Sensitivity Analysis					
Draft Model Calibration Plan TM (w/comments)		12	$2,660	$0	$2,660
Final Model Calibration Plan TM		2	$430	$0	$430
Draft Model Calibration TM (w/comments)		28	$6,100	$0	$6,100
Final Model Calibration TM		4	$860	$100	$960
	Task 4.0 Totals	**46**	**$10,050**	**$100**	**$10,150**
Task 5.0 Scenario Evaluation					
Subtask 5.1 Scenario Development Workshop		16	$3,600	$0	$3,600
Subtask 5.4 Scenario Results Review Workshop		16	$3,600	$200	$3,800
	Task 5.0 Totals	**32**	**$7,200**	**$200**	**$7,400**
Task 6.0 Model Report					
Subtask 6.1 Admin Draft Report		12	$2,660	$0	$2,660
Subtask 6.2 Draft Report		10	$2,190	$0	$2,190
Subtask 6.3 Final Report		6	$1,330	$0	$1,330
	Task 6.0 Totals	**28**	**$6,180**	**$0**	**$6,180**
Task 7.0 Anti-Degradation Analysis (optional)					
Subtask 7.3 Anti-Deradation Analysis TM		10	$2,190	$0	$2,190
	Task 7.0 Totals	**10**	**$2,190**	**$0**	**$2,190**
Total Labor Costs					**$57,345**
Total Expenses					**$700**
PROJECT TOTAL					**$58,045**