MEETING NOTICE AND AGENDA

TECHNICAL ADVISORY COMMITTEE OF THE SEASIDE BASIN WATER MASTER

DATE: Wednesday, February 12, 2025

MEETING TIME: 1:30 p.m.

THE TECHNICAL ADVISORY COMMITTEE MEETING WILL BE CONDUCTED BY TELECONFERENCE AND WILL NOT BE HELD IN THE MONTEREY ONE WATER OFFICES. YOU MAY ATTEND AND PARTICIPATE IN THE MEETING AS FOLLOWS:
JOIN FROM A PC, MAC, IPAD, IPHONE OR ANDROID DEVICE (NOTE: ZOOM APP MAY NEED TO BE DOWNLOADED FOR SAFARI OR OTHER BROWSERS PRIOR TO LINKING) BY GOING TO THIS WEB ADDRESS:

https://us02web.zoom.us/j/86460540590?pwd=Cx2FbejSWFAQb1jg9zExGqCzR2orZx.1

If joining the meeting by phone, dial this number: +1 669 900 9128 US (San Jose)

If you encounter problems joining the meeting using the link above, you may join from your Zoom screen using the following information:
Meeting ID: 864 6054 0590
Passcode: 500590

TAC Member Teleconferencing Information is on the Next Page

OFFICERS
Chairperson: Jon Lear, MPWMD
Vice-Chairperson: Kim Shirley, City of Del Rey Oaks
MEMBERS

California American Water Company	City of Del Rey Oaks	City of Monterey
City of Sand City	City of Seaside	Coastal Subarea Landowners
Laguna Seca Property Owners	Monterey County Water Resources Agency	
Monterey Peninsula Water Management District		

The next TAC meeting will be on Wednesday March 12, 2025 at 1:30 p.m.

TAC MEMBER TELECONFERENCING INFORMATION

NAME	ENTITY	LOCATION
Amy Woodrow	Monterey County Water Resources Agency	5 Carriage Way, Durham, NH.
Kim Shirley	City of Del Rey Oaks	4 Baxter Place, Del Rey Oaks, CA
Andreas Baer	City of Seaside	Engineering Trailer, 440 Harcourt Avenue Seaside, CA
Dave Pezzini	California American Water	22625 Oak Canyon Road Salinas, CA 93908
Cody Hennings	City of Monterey	Orca Conference Room, 735 Pacific Street #B, Monterey CA
Jon Lear	Monterey Peninsula Water Management District	5 Harris Court, Bldg. G, Monterey, CA
Leon Gomez	City of Sand City	City Hall in Sand City, 1 Pendergrass Way, Sand City, CA 93955
Paul Bruno	Coastal Subarea Landowners	192 Healy Ave, Marina, CA
Eric Tynan	Laguna Seca Subarea Landowners	11528 Castro Street, Castroville, CA. 95012

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	February 12, 2025
AGENDA ITEM:	2.A
AGENDA TITLE:	Approve Minutes from the December 11, 2024 Meeting
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

Draft Minutes from this meeting were emailed to all TAC members. Any changes requested by TAC members have been included in the attached version.

ATTACHMENTS:	Minutes from this meeting
RECOMMENDED ACTION:	Approve the minutes

D-R-A-F-T
MINUTES

Seaside Groundwater Basin Watermaster
Technical Advisory Committee Meeting
December 11, 2024

Attendees: TAC Members

City of Seaside – Dan Meewis and Andreas Baer
California American Water – Tim O'Halloran
City of Monterey – Cody Hennings
Laguna Seca Property Owners – Eric Tynan
MPWMD – Jon Lear
MCWRA – Amy Woodrow
City of Del Rey Oaks – Kim Shirley
City of Sand City –Leon Gomez
Coastal Subarea Landowners – No Representative

Watermaster
Technical Program Manager-Bob Jaques

Others
MCWD – Tobias Osborne
Montgomery & Associates – Georgina King
MPWMD – Maureen Hamilton

The meeting was convened at 1:31.

1. Public Comments

There were no public comments.

2. Administrative Matters:

A. Approve Minutes from the November 13, 2024 Meeting

On a motion by Ms. Shirley, seconded by Mr. Gomez, the minutes were approved as presented with Mr. Hennings and Mr. Tynan abstaining as they had not attended that meeting.

B. Sustainable Groundwater Management Act (SGMA) Update

Mr. Jaques introduced this topic. Mr. Lear commented that the five-year Groundwater Sustainability Plan reports will soon be due. There was no other discussion on this topic.

C. Results from Fall 2024 Induction Logging of the Sentinel and Other Monitoring Wells

Mr. Jaques summarized the agenda packet materials for this item.

Mr. Lear asked if it would be desirable to go deeper in well PCA-West. Mr. Jaques said he would defer to Ms. King on that. He also asked whether it was the intent of the Watermaster to keep the PCA-West and PCA-East deep wells in the induction logging list. Mr. Jaques responded that yes the Watermaster would like to keep those in the ongoing induction logging well list.

Mr. Tynan asked if water quality samples could be obtained from those wells. Mr. Lear said that the wells are not screened at the depths of interest, so water quality samples would not be representative of the depths of interest.

D. Update on SNG Well

Mr. Jaques summarized the agenda packet materials for this item. Mr. Lear added background information on the well. The well will not be used to serve the development of the eco-resort proposed for that site, since it will be provided service by Cal Am under a wheeling agreement.

Ms. Shirley asked to get ongoing updates from legal counsel on efforts being made to have the well either repaired or destroyed to prevent cross aquifer contamination. Mr. Jaques said he would pursue this.

3. Discuss and Provide Input on the 2024 Seawater Intrusion Analysis Report (SIAR)

Mr. Jaques introduced this agenda item and Ms. King made a PowerPoint presentation on it. A copy of those PowerPoint slides is attached.

Some of the information provided during her presentation included:

- Water quality sampling shows that the chloride levels are well below drinking water standards in all of the wells that are sampled.
- Well FO-10 was video inspected yesterday by MCWD in coordination with MPWMD. The purpose is to see what needs to be done to resolve any problems that may exist at that well. Mr. Osborne reported that the video logging was only partially successful in that it was not possible to go all the way down to full depth in well FO-10 Shallow or FO-10 Deep. He will provide us a report of the video inspection when it is available.
- SBWM-1 and SBWM-2 continue to show a trend of increasing conductivity levels at depths of approximately 520 to 540 feet in SBWM-1 and 340 to 360 feet and 370 to 390 feet in SBWM-2.
- SBWM-4 continues to show increasing conductivity levels at depths between approximately 170 to 200 feet. A rough estimate of the increase in TDS at this depth at this well since the beginning of logging in 2007 is 1,000 mg/L. The Drinking Water Standard for TDS is a secondary standard of 500 to 1000 mg/L. The production wells in the basin are screened below the elevations where the conductivity increases in this well are being seen.
- Increases in conductivity are not showing up in the deeper portions of the aquifers. The zones of the increase are very porous strata which preferentially would allow seawater to intrude. Fine grained strata such as clay can show a high conductivity that is not caused by seawater. The well logs obtained during construction of these wells provided information on the different strata through which the well passes.
- Mr. Jaques suggested to Ms. King that in the future it would be helpful to use elevations rather than depths below ground surface (bgs) so that the induction logging results from the different wells can be compared more directly to each other.
- In response to a question from Ms. Shirley, Ms. King said that she did not think that leakage in the SNG well would be causing the increase in conductivity being seen in the SBWM-4 well, but that it was possible.
- Groundwater levels in the PCA-East Shallow and Deep wells are rising due to the Seaside golf courses using recycled water and some of the ASR water being left in the basin and not pumped out.
- In the Laguna Seca subarea groundwater levels are stabilizing due to reduced pumping by Cal Am.
- Protective water levels (PWLs) in all but two of the protective water level wells are below PWLs that been established for those wells. Those two are both in the Paso Robles aquifer. In the Santa Margarita aquifer all of the PWLs are below protective levels.

- Cone Penetrating Testing (CPT) involves using a small diameter device to get a water quality sample without having to actually drill a well. Mr. Jaques asked for more information on this so it could be provided at a future TAC meeting to help us see if this approach to get actual TDS measurements at the depths of interest could be performed. Ms. King said she would develop and provide that information.
- Mr. Lear reported that he is working with Pascual Benito of Montgomery and Associates on a study to see the impact on groundwater elevations and water flows when it is injected under the expanded Pure Water Monterey Project. He commented that the flow divide between the Seaside and Monterey subbasins moves with pumping and injection. He expects the study to be completed in about 4 to 6 months.

A motion was made by Mr. Tynan, seconded by Mr. O'Halloran, stating that the TAC supports the Conclusions and Recommendations in the Seawater Intrusion Analysis Report. The motion passed unanimously.

4. Discuss and Provide Input on the Preliminary Draft Watermaster 2024 Annual Report

Mr. Jaques introduced this agenda item and invited comments and any suggested revisions from TAC members.

Ms. Shirley said she appreciated having all of this information in a single document.

A motion was made by Mr. O'Halloran, seconded by Ms. Shirley, to approve the Preliminary Draft Annual Report as presented without any changes. The motion passed unanimously.

5. Schedule

Mr. Jaques summarized the agenda packet materials for this item. He noted that there would be no need for a January TAC meeting and therefore the next TAC meeting will be on February 12, 2025.

Ms. Shirley asked if the geophysical imaging work will be shown on the 2025 schedule. Mr. Jaques said he would put it in the schedule once the contract with Geophysical Imaging Partners has been developed and the timeline for the work can be identified, along with the time required to get State Parks' permission to undertake this work.

6. Other Business

There was no other business.

The meeting adjourned at 3:06 p.m.

SEASIDE GROUNDWATER BASIN

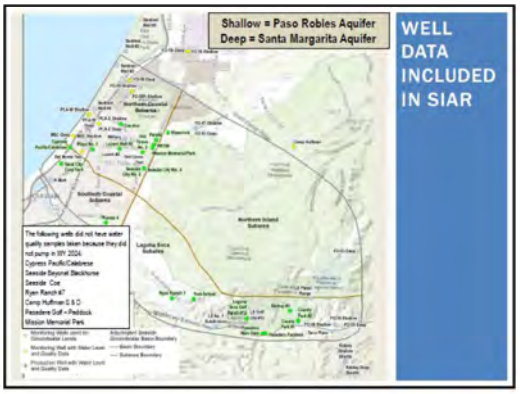
2024 SEAWATER INTRUSION ANALYSIS REPORT

MONTGOMERY & ASSOCIATES

Presented to the Seaside Basin TAC December 12, 2024

SIAR ANALYSIS

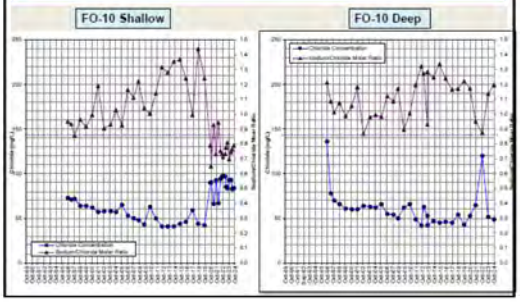
- Chloride Distribution and Na/Cl Molar Ratio
- Cation/Anions – Piper and Stiff Diagrams
- Electric Induction Logs
- Groundwater Elevations
- Protective Groundwater Elevations
- Groundwater Production



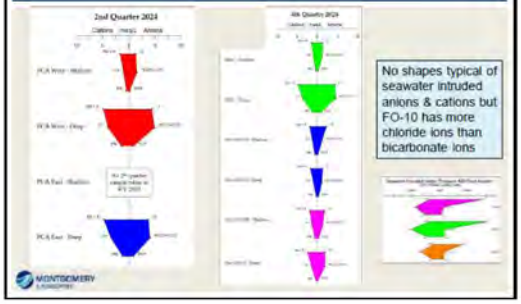
WELL DATA INCLUDED IN SIAR

CHLORIDE DISTRIBUTION IN MONITORING WELLS

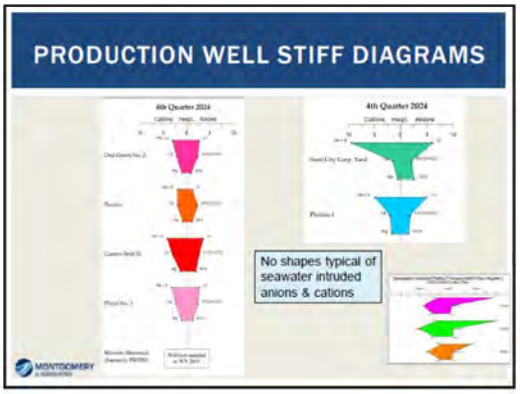
SODIUM/CHLORIDE MOLAR RATIO



MONITORING WELL STIFF DIAGRAMS



PRODUCTION WELL STIFF DIAGRAMS

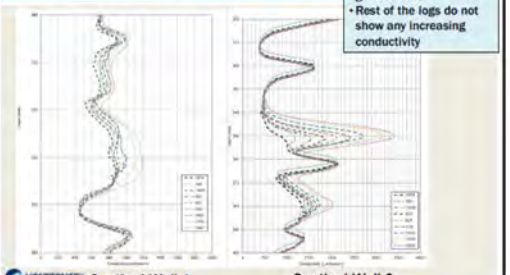


SENTINEL WELL ELECTRIC INDUCTION LOGS

One logging event performed in Oct 2024 on each sentinel well

ELECTRIC INDUCTION LOGS SENTINEL WELLS 1 AND 2

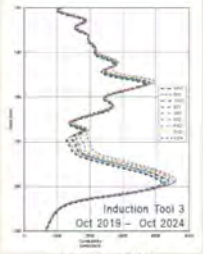
- Small conductivity increases in upper Paso Robles Formation
- Localized to coarser-grained unit
- Rest of the logs do not show any increasing conductivity



Sentinel Well 1 Sentinel Well 2

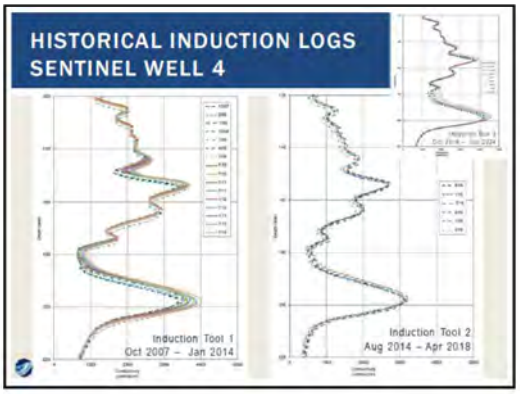
ELECTRIC INDUCTION LOGS SENTINEL WELL 4

- Located in Northern Coastal subarea with greatest groundwater extraction
- Nearby monitoring wells are screened deeper so cannot be used for verifying chloride concentrations
- Historical logs show conductivity in this zone has had increases since its installation in 2007
- Estimated TDS increase since 2007 is approx. 1,000 mg/L

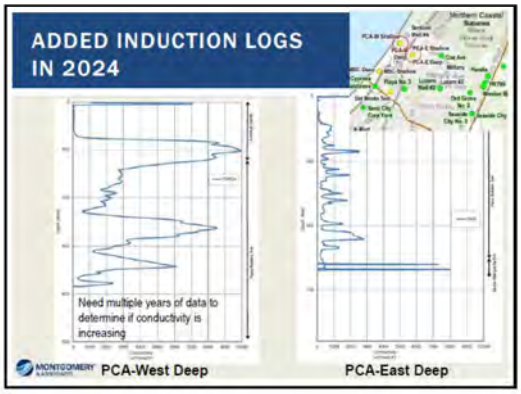


Sentinel Well 4

HISTORICAL INDUCTION LOGS SENTINEL WELL 4



ADDED INDUCTION LOGS IN 2024



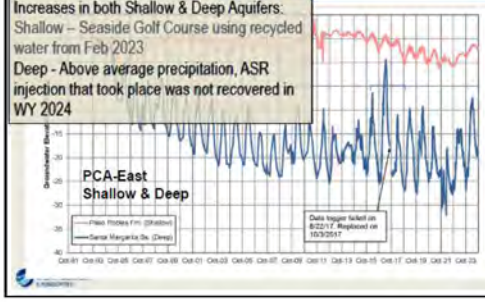
PCA-West Deep PCA-East Deep

PRECIPITATION

Above average precipitation in WY 2024

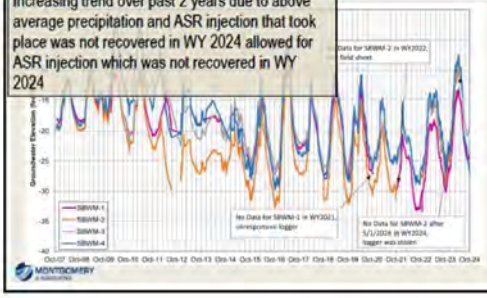
NORTHERN COASTAL GROUNDWATER ELEVATIONS

Increases in both Shallow & Deep Aquifers:
Shallow – Seaside Golf Course using recycled water from Feb 2023
Deep - Above average precipitation, ASR injection that took place was not recovered in WY 2024

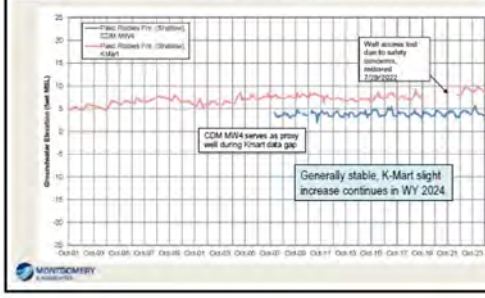


NORTHERN COASTAL GROUNDWATER ELEVATIONS

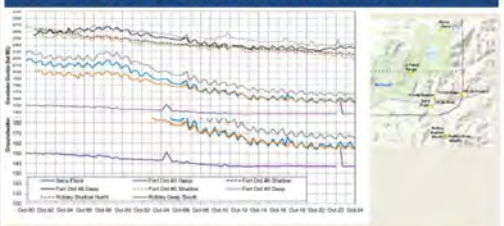
Increasing trend over past 2 years due to above average precipitation and ASR injection that took place was not recovered in WY 2024 allowed for ASR injection which was not recovered in WY 2024



SOUTHERN COASTAL GROUNDWATER ELEVATIONS



EASTERN LAGUNA SECA GROUNDWATER ELEVATIONS



FO-5 & FO-6 shallow at the eastern boundary continue to decline 0.5 ft/year
Other shallow aquifer levels have stabilized over the past 2 years

GROUNDWATER ELEVATION CONTOURS

4th Quarter – Paso Robles (Shallow) 2024

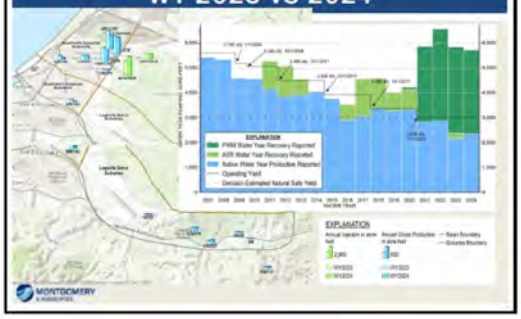
4th Quarter – Santa Margarita (Deep) 2024

PROTECTIVE GROUNDWATER ELEVATIONS

Subarea	Well	Depth	Protective Elevation, feet amsl	4th Quarter Elevation, feet amsl	Above or Below
Northern Coastal	MSC	Deep	17	-16.7	Below
		Shallow	11	2.7	Below
	PCA-W	Deep	17	-19.6	Below
		Shallow	2	2.1	Above
	Sentinel 3	Deep	4	-19.4	Below
Southern Coastal	CDM-MW4	Shallow	2	3.4	Above

Shallow = Paso Robles Aquifer
Deep = Santa Margarita Aquifer

GROUNDWATER PRODUCTION WY 2023 VS 2024



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CONCLUSIONS

Increasing conductivity measured by induction logging the Sentinel Wells indicates seawater intrusion starting in the upper Paso Robles Formation (shallow aquifer)

- Of significance is SBWM-4, in the central coastal area of the Northern Coastal subarea
- Since 2007, SBWM-4 has shown an annual increase in conductivity that roughly equates to a total dissolved solids (TDS) of 1,000 mg/L
  - Secondary Drinking Water limit of 500 mg/L
- Production wells closest to SBWM-4 :
  - Golf course Coe Ave irrigation well is 0.6 miles inland – not being pumped because now using recycled water
  - Cal-Am's Playa#3 Well is 0.8 miles to the south
  - Luzern Well #2 (0.9 miles southeast)
  - Others located over 1 mile away

MONTGOMERY & ASSOCIATES

CONCLUSIONS

Conditions in the basin that continue to provide a potential for seawater intrusion:

- All deep groundwater levels in the Northern Coastal subarea are below sea level
  - 2nd quarter (winter/spring) > 40 feet below sea level
  - 4th quarter (summer/fall) > 60 feet below sea level
- 1 of 3 shallow wells' groundwater level is below protective elevations. PCA-West Shallow is above protective elevation for the first time in 6 years
  - Northern Coastal subarea golf course pumping is the cause of groundwater levels falling below protective elevations at PCA-West Shallow over the past 6 years
- All 3 deep target monitoring wells groundwater levels remain below protective elevations

MONTGOMERY & ASSOCIATES

CONCLUSIONS

Evidence indicating seawater intrusion has not been detected in monitoring and production wells from which water quality samples are collected:

- No groundwater chemistry changes towards seawater in either shallow or deep groundwater
- Chloride concentration trends are stable for most monitoring wells
  - FO-10 Deep stiff diagram returned to historical shape after spike in WY 2022.
- Sodium/chloride molar ratios at most monitoring wells remained constant or increased over the past year. FO-10 Shallow outside the basin still has a molar ratio below 0.86

MONTGOMERY & ASSOCIATES

CONCLUSIONS

- Laguna Seca subarea shallow aquifer levels have mostly stabilized over the past 2 years
  - Cal-Am no longer pumps groundwater from Ryan Ranch and Bishop Systems
  - FO-5 & FO-6 shallow at the eastern boundary continue to decline 0.5 ft/year

MONTGOMERY & ASSOCIATES

CONCLUSIONS

- Native groundwater production in the Seaside Groundwater Basin for Water Year 2024 was 2,350 acre-feet:
  - 177 acre-feet more than Water Year 2023
  - 650 acre-feet less than the Decision-ordered Operating Yield of 3,000 acre-feet per year required since October 1, 2020

RECOMMENDATIONS

1. EKI and MCWD GSA should be informed that SBWM-1 and SBWM-2 continue to show increases in conductivity in induction logs
2. Continue induction logging PCA-West and PCA-East
3. Consider land-based subsurface electromagnetic geophysics in the vicinity of SBWM-4 and PCA-West Deep, if feasible, to see if it adds to the hydrogeologic understanding of this area
4. Verify chloride concentrations and water chemistry in the 140–200 ft zone of SBWM-4
   - New monitoring well, adapting an existing well, evaluating the feasibility of using a Cone Penetration Testing (CPT) drill rig to extract once-off samples

RECOMMENDATIONS

5. If it is found, as believed, to have a leaking casing that allows high salinity water to flow into the Paso Robles Formation, destroy the privately owned SNG Well next to PCA-West
6. Destroy and replace FO-10 Shallow and FO-10 Deep to prevent cross contamination between the Paso Robles and Santa Margarita aquifers

QUESTIONS?

7

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	February 12, 2025
AGENDA ITEM:	2.B
AGENDA TITLE:	Sustainable Groundwater Management Act (SGMA) Update
PREPARED BY:	Robert Jaques, Technical Program Manager

At the State level:
Since the last TAC meeting I have not received anything from the State that impacts the Watermaster.

At the Monterey County level:
Attached are summaries of meetings held in December 2024 and January 2025.

ATTACHMENTS:	Meeting Summaries
RECOMMENDED ACTION:	None required – information only

SUMMARY OF
PURE WATER MONTEREY, AND
SALINAS VALLEY AND
MARINA COAST WATER DISTRICT GROUNDWATER SUSTAINABILITY AGENCY ZOOM MEETINGS
IN DECEMBER 2024

Note: This is a synopsis of information from these meetings that may be of interest to the Seaside Basin Watermaster

180/400-Foot Aquifer Subbasin GSP Implementation Committee Meeting, December 5, 2024:

The principal item of interest to the Watermaster that was presented and discussed at this meeting was the *Feasibility Study Draft Summary Report on the Brackish Groundwater Restoration Project*. The topics discussed or presented included:

- This is the project to install a string of groundwater extraction wells along the coast to keep seawater from moving inland and using reverse osmosis desalination to take that water and make it available for portable use.
- This study evaluated three alternative sizes of project:
    - A small project to meet the GSP Minimum Threshold of holding seawater intrusion to 2017 levels. This would provide a significant supply to end-users but does not meet all of their water demands. End-users would maintain their existing groundwater systems to supplement supplies and to meet peak month demands. The small project would not provide any desalinated water to the Corral de Tierra area of the Monterey Subbasin.
    - A medium-size project to be a reasonable project between the small and large alternatives. This project also would provide a significant supply to end-users but does not meet all of their water demands. End-users would maintain their existing groundwater systems to supplement supplies and to meet peak month demands. The medium-size project would not provide any desalinated water to the Corral de Tierra area of the Monterey Subbasin.
    - A large project to meet the GSP measurable objective of pulling back the seawater intrusion to Highway 1. This project also would provide a significant supply to end-users and apparently would meet all of their water demands. However, end-users would need to continue to maintain their existing groundwater systems to meet peak month demands. The large project does provide desalinated water to the Toro/Corral de Tierra area of the Monterey Subbasin.
- The preliminary total project cost estimates for these projects are as follows:
    - Small project, $800 million
    - Medium-size project $1.1 billion
    - Large project, $1.5 billion
- The estimated annualized unit costs (dollars per acre foot) for these projects are as follows:
    - Small project, $2,900/AF
    - Medium-size project $2,400/AF
    - Large project, $2,700/AF
- Sarah Hardgrave stressed that they are a long way from this project being selected for implementation, but that it does appear to be the one that will best achieve the groundwater sustainability plans objectives and minimum thresholds.
- The original estimate of this project in the GSP was about $800 million. The GSP did not include three sizes of alternatives, it was a generic single alternative.
- Sarah Hardgrave reported that how the cost for these projects would get paid for will be evaluated in a future study. The cost might be shared across all of the beneficiaries, not just the individual end-users.

- The project costs were compared to some other large California water supply projects that are in some phase of being implemented. The costs for those projects were in the range of $1.5 billion to $10 billion. This comparison was intended to show that large water supply projects are very costly.
- If the project is to be implemented, efforts would be made to secure low interest loans and/or cost-sharing grants to reduce local costs. Applications for such funding are selected on a competitive basis, since many more applications are received than there are funds to use for them. Under the Water Infrastructure Improvement for the Nation Act of 2016 the U.S. Bureau of Reclamation is authorized to provide funds to help cover construction costs for desalination projects. That Act allows them to fund up to 25% of the total project cost up to a cap of $30 million per project. So even with this type of grant funding, if it was obtained, there would still be a substantial amount of local cost share that would have to be paid. In 2023 the Federal appropriation for the desalination construction program was only $12 million. However, appropriations for larger amounts are provided for in future years.

There were numerous questions from Committee members and members of the public, feasibility, practicality, how this project would be funded, etc.

Groundwater Technical Advisory Committee Meeting, December 6, 2024:

The principal item discussed at this meeting of interest to the Watermaster was the *Feasibility Study for Additional Stored Water Diversion with ASR Concept.* The concept of this project is:

- Increase Salinas River Diversion Facility (SRDF) diversions by shifting reservoir releases to winter/spring (the SRDF is the existing rubber dam on the Salinas River near the M1W Treatment Plant)
- Inject diverted surface water and extract a portion in summer for the Castroville Seawater Intrusion Project (CSIP)
- Inject more water than is extracted for CSIP
- Raise groundwater levels to halt and push back seawater intrusion

The study found that there are a number of constraints involved in trying to implement a project such as this. They include:

- Water availability and source water diversion
- Regulatory constraints
    - Water rights licenses and permits
- Operational constraints
    - Reservoir operations (seasonal releases) and diversions at SRDF
    - CSIP demands in summer
- Water quality constraints and treatment needed (permitting considerations)
- Infrastructure challenges
    - Diversion structure, water treatment, ASR wells, distribution pipelines, storage

As a result of these finding some alternatives to the original concept were evaluated. However, none of the concepts was found to be capable of meeting even the Minimum Threshold for Seawater Intrusion as set forth in the Groundwater Sustainability Plan (GSP) for the 180/400-foot Aquifer Subbasin. Also, implementing such a project would easily cost many millions of dollars.

There were many questions and answers from/to members of the Committee, many pertaining to costs.

In spite of the high expected cost of this project, Sarah Hardgrave reported that once all of the feasibility studies of the various potential projects described in the GSP were completed, they would be evaluated to see if the most cost-effective approach might be to implement multiple complimentary projects of

potentially smaller sizes in order to achieve the GSP's Minimum Thresholds/Minimum Objectives at a lower cost than implementing just one of those projects.

Monterey Subbasin Implementation Committee Meeting, December 18, 2024:

Due to a Comcast outage in my area I had no internet service so I was unable to attend this meeting. However, the principal items on the agenda were:

- Discussion of *Demand Management/Planning for Uncertainty*, which was discussed at the 180/400-Foot Aquifer Subbasin GSP Implementation Committee Meeting of November 21, 2024 on which I previously reported.
- Status of the FY 2025 Work Plan for the Monterey Subbasin
- The WY 2024 Annual Report

These items do not directly impact the Watermaster.

Advisory Committee Meeting, December 19, 2024:

Again, due to a continuing Comcast outage in my area I had no internet service so I was unable to attend this meeting. However, the principal items on the agenda were:

- The meeting schedule for this Committee in 2025
- Groundwater Sustainability Fee – 5-Year Evaluation (this fee does not impact the Watermaster as it will only apply within the jurisdiction of the SVBGSA)
- Presentation on the Brackish Groundwater Restoration Project, which was similar to the presentation made at the 180/400-Foot Aquifer Subbasin GSP Implementation Committee Meeting on December 5, 2024, as described above.

SUMMARY OF PURE WATER MONTEREY, AND SALINAS VALLEY AND MARINA COAST WATER DISTRICT GROUNDWATER SUSTAINABILITY AGENCY ZOOM MEETINGS IN JANUARY 2025

Note: This is a synopsis of information from these meetings that may be of interest to the Seaside Basin Watermaster

180/400-Foot Aquifer Subbasin GSP Implementation Committee Meeting, January 16, 2025:

I did not see anything on the agenda for this meeting that would impact or be of interest to the Watermaster, so I did not attend it.

Water Quality and Operations Committee Meeting, January 22, 2025:

Information provided at this meeting included:

- As of 1/1/25 the PWM Project had injected 1,855 AF this year and the amount of water in the Operating Reserve remained at 2,189 AF.
- CSIP demand is likely to increase earlier this year due to the shortage of winter rainfall. Bayonet and Black Horse Golf Course irrigation demands will also depend on rainfall.
- The underground retention time requirement of a minimum of 4 months was met at all times. The recent retention times again ranged from 5.7 to 7.9 months.
- With regard to water quality there were some minor sampling/analysis variances associated with nitrite, but all water quality requirements including the log reduction requirements were met at all times.
- Construction of Cal Am's Extraction Wells No. 1 and 2 is nearing completion. These will increase the extraction capacity to match the increase in water injected from the PWMX Project.
- Cal Am is constructing a new well in Carmel Valley (apparently to replace an older well).
- There is no change to the schedule for construction of the PWMX Project. It is still scheduled to be completed in late 2025.

Monterey Subbasin Implementation Committee Meeting, January 29, 2025:

The agenda items at this meeting were largely progress or status reports, or discussion of topics that do not impact the Watermaster (e.g. a Water Efficiency Pilot Program). Some topics of interest:

- During the presentation on the WY 2024 Annual Report, I provided these comments: I reported that I had seen the presentation to the 180/400-foot Aquifer Committee that described the draft feasibility study of the Brackish Groundwater Restoration Project. It showed that of the three sizes of project (small, medium, and large) only the large sized project would provide any desalinated water to the Toro-Corral de Tierra subarea. No water would be provided to that subarea under the small or medium sized projects. The Monterey Subbasin GSP highlights that this subarea will struggle to achieve sustainability, and without getting an outside new source of water (such as desalinated water) it may be unable to do so. I recommended that the presentation also be made to this Committee, since the findings of the feasibility study can have significant impacts on this subbasin. Sarah Hardgrave said she agreed and that she would schedule to have the presentation made to this Committee at a future date.
- One of the attendees commented that pumping restrictions as one of the Demand Management options needs to be pursued now rather than deferred while other management actions are being evaluated. He felt that DWR will expect actions to be taken to achieve sustainability and that the other options are unlikely to be able to accomplish this.
- Patrick Breen of MCWD confirmed that he expects EKI will be updating its Monterey Subbasin groundwater model, once the Salinas Valley Integrated Hydrogeologic Model has been

completed. This would likely occur later in 2025 or in 2026. [This may impact the Watermaster's time schedule for implementing the Seaside Basin groundwater model.]

- They will be model assessing multi-project scenarios and their impacts on the Monterey Subbasin. They hope to complete the project selection process by fall of 2026. They also will be looking at how they can keep the Monterey Subbasin from losing so much water to the 180/400-foot Subbasin.
- In 2026 they do not plan to look at wastewater recycling for reuse within the Toro-Corral de Tierra subarea.
- One attendee (Tom Virsik-attorney for another GSA) felt that DWR would fairly quickly determine whether the 180/400-foot Subbasin's updated GSP shows adequate progress toward achieving sustainability.
- They may be restructuring the Advisory Committee (of which I am a member) to improve inter-subbasin coordination and communication.
- Sarah Hardgrave reported that the SVBGSA had been invited to make an informational presentation to the Watermaster's Board several months ago, and that she felt it would be good to have me update the Monterey Subbasin Committee on what the Watermaster is doing in terms of updating its model and anything else of mutual interest to the two basins.

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

**** * * AGENDA TRANSMITTAL FORM * * ****

MEETING DATE:	February 12, 2025
AGENDA ITEM:	2.C
AGENDA TITLE:	Update on SNG Well
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

As reported and discussed at several TAC meetings in prior months, the Security National Guaranty (SNG) well, located in the dunes area in the northern portion of Sand City, is believed to have a deteriorating steel casing that is allowing seawater intruded shallow groundwater to leak downward into the deeper aquifer. Because of litigation in progress the well owner reported that he was not allowed to do any work to repair or destroy the well.

In the late summer of 2024 the Watermaster Board directed its legal counsel to contact the Court where the litigation is being conducted, and to ask that the well owner be allowed to proceed with repairs or destruction of the well prior to the completion of that litigation. The Watermaster's legal counsel first contacted the attorney representing SNG in the litigation to inform them of the intent to file a request with the Court. The attorney said that they were working on investigating the well and to determine what could be done to repair or destroy it. However, many weeks have since passed and no progress on resolving the problem with the well was reported, so at its January 8, 2025 meeting the Watermaster's legal counsel said he would file the request to the Court within a week. The legal counsel has subsequently updated us saying that due to some complexities in the filing process he will be filing the papers on February 5th.

ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	February 12, 2025
AGENDA ITEM:	3
AGENDA TITLE:	Professional Services Agreement and RFS 2025-01 to Geophysical Imaging Partners to Perform Pilot Test of Subsurface Imaging in the Vicinity of Sentinel Well No. 4
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

As discussed at prior TAC meetings, the induction logging of Sentinel Well No. 4 has shown a steady increase in conductivity in some of the upper strata layers which could be an early indication of seawater intrusion. At the suggestion of Montgomery & Associates and at my request, in mid-2024 Geophysical Imaging Partners provided a Proposal to the Watermaster to conduct a pilot test of subsurface geophysical imaging in the hope that it would provide useful information regarding seawater intrusion in the vicinity of Sentinel Well No. 4. The TAC and Board approved including this work in the 2025 Monitoring and Management Program, and its associated budget.

The attached Professional Services Agreement and RFS No. 2025-01 will authorize Geophysical Imaging Partners to perform this work.

ATTACHMENTS:	1. Professional Services Agreement 2. RFS No. 2025-01
RECOMMENDED ACTION:	Approve the attached documents and forward them to the Board for their approval

PROFESSIONAL SERVICES AGREEMENT

THIS AGREEMENT TO PROVIDE PROFESSIONAL SERVICES is made and entered into on _____ by and between SEASIDE GROUNDWATER BASIN WATERMASTER, hereinafter referred to as "WATERMASTER," and Geophysical Imaging Partners, Inc., a California Corporation, hereinafter referred to as "PROFESSIONAL," as follows:

SECTION I: ADHERENCE TO TERMS OF AGREEMENT

WATERMASTER intends to literally interpret and strictly apply all terms and conditions of this Agreement. All approvals which are required to be in writing must be in writing to be valid and binding. PROFESSIONAL is encouraged to raise to WATERMASTER any questions with regard to interpretation or applicability of any provision of this Agreement before undertaking the work.

SECTION II: ENGAGEMENT

WATERMASTER hereby engages PROFESSIONAL, as an independent contractor to furnish the professional services covered by this Agreement, and the Requests for Service issued under it, in accordance with the terms and conditions set forth below, and PROFESSIONAL hereby accepts such engagement.

SECTION III: WORK ASSIGNMENTS

It is the intent of WATERMASTER and PROFESSIONAL to authorize the performance of work under this Agreement by executing a series of written work assignments setting forth the specific description, scope, and costs of the work to be performed. Such assignments shall be called "Requests for Service" (RFS) and shall be numbered consecutively. Each RFS, upon execution by PROFESSIONAL and by WATERMASTER, shall become and be considered as a part of this Agreement, and all provisions herein shall apply to said RFSs. The RFS form to be used is contained in Attachment A to this Agreement.

SECTION IV: TIME OF PERFORMANCE

A. General - Time is of the essence on the work of the RFSs issued under this Agreement. Therefore, PROFESSIONAL shall perform its services in a timely manner. Specific performance times shall be specified for each individual RFS under this Agreement. PROFESSIONAL shall make every

reasonable effort, including assigning of additional personnel to the work and/or working overtime, to complete the authorized work within these stipulated time periods. The taking of such additional measures to complete the work within the stipulated time periods will not entitle PROFESSIONAL to additional compensation, if the work is being performed under the Lump Sum Payment Method, except as provided for in Section V, Paragraph B.

B. Subcontracted Services - For subcontracted services PROFESSIONAL shall contract for and schedule such services in a timely fashion in accordance with the requirements of the work, and shall be fully responsible for the performance and quality of all work performed by its subcontractors.

C. Extensions of Time - The time of performance established for a particular RFS may be extended at any time prior to completion of the work by mutual agreement in writing between WATERMASTER and PROFESSIONAL.

SECTION V: COMPENSATION

A. General - WATERMASTER and PROFESSIONAL shall negotiate the costs and fees for each specific RFS. The method of payment of said costs and fees shall be either on a lump-sum basis or on a time-and-expense basis. The method of payment will depend on the specific conditions, the scope of work, and the services to be performed for each specific RFS.

B. Projected Cost Overruns Under Time-and-Expense Payment Method - If, at any time in the performance of the work of a specific RFS under the Time-and-Expense payment method, PROFESSIONAL has reason to believe that the costs which it expects to incur to complete the work of that RFS will exceed the total amount authorized for that RFS, PROFESSIONAL shall notify WATERMASTER in writing to that effect. The notice shall:

(1) State the reason(s) why PROFESSIONAL anticipates a cost overrun;

(2) State the estimated amount of additional funds beyond the

total amount currently authorized that will be required to complete the work authorized by the RFS; and

(3) Provide recommendations of how the overrun can be avoided;

If, after such notification, additional funds are not allotted, WATERMASTER will, if required in writing by PROFESSIONAL, terminate the work of that particular RFS pursuant to the provisions in Section VI, TERMINATION.

C. Lump-Sum Payment Method - WATERMASTER may elect to pay PROFESSIONAL a lump sum Total Price amount to be determined for a specific RFS. In addition to this lump sum amount, a Special Services allowance, as defined in this section, may also be established.

1. Lump Sum Total Price - PROFESSIONAL shall perform all work authorized by a lump sum type of RFS for the lump sum Total Price amount. No additional payments for said work will be requested by PROFESSIONAL or authorized by WATERMASTER, unless both parties agree that there is additional work, beyond the scope of services authorized by the RFS, which must also be performed. Before any such additional work is undertaken, WATERMASTER and PROFESSIONAL shall execute a separate amendment to the RFS setting forth the scope and costs of the additional work to be performed.

2. Special Services Allowance - To cover unforseen circumstances, WATERMASTER and PROFESSIONAL may negotiate a Special Services allowance. PROFESSIONAL shall provide WATERMASTER with written notification stating the reasons for requiring the utilization of any or all of the Special Services allowance. No utilization of any portion of the allowance shall occur without the prior written approval of the WATERMASTER. Special Services costs will be charged in accordance with the Time-and-Expense Payment Method as defined in Paragraph D of this section.

D. Time-and-Expense Payment Method - For tasks for which the scope of work is not readily definable, WATERMASTER may elect to pay

PROFESSIONAL on a time-and-expense basis in accordance with the PROFESSIONAL's most current Standard Schedule of Compensation. The hourly rates set forth in the Standard Schedule of Compensation shall be inclusive of all direct and indirect salary costs, overhead, fringe benefits, profit, and other costs, and shall reflect the total hourly charge for each listed job category. Other direct non-salary expenses for the performance of work authorized under the Time-and-Expense Payment Method shall be all identifiable costs directly chargeable to each RFS including, but not limited to: travel and subsistence expenses; work subcontracted to others; reproduction of plans, specifications, reports and other documents; equipment rental; and, drafting and stenographic supplies used in the work. The chargeable rate for automobile mileage for the work to be performed under this Agreement shall be stated in the RFS. Direct non-salary expenses shall be compensated for at their actual cost, unless otherwise stated in the RFS, providing they have been authorized in advance by WATERMASTER. A Total Price, which may not be exceeded without WATERMASTER's prior written approval, will be established for each specific RFS for which this payment method will be used.

F. Terms of Payment - PROFESSIONAL shall invoice WATERMASTER monthly for work completed during the previous month, unless a different invoicing frequency is agreed to by both parties to this Agreement. All invoices shall be due and payable within thirty (30) days of the date of receipt by WATERMASTER, provided all costs included in the invoice are adequately supported by documentation accompanying the invoice. If payment is not made within sixty (60) days of the date of receipt by WATERMASTER, interest on the unpaid balance will accrue beginning with the sixty-first day at the rate of 1.0 percent per month, or the maximum interest rate permitted by law, whichever is the lesser. Such interest shall become due and payable at the time said overdue payment is made.

G. Penalty for Late Performance - The PROFESSIONAL is not responsible for delays in the schedule caused by events outside PROFESSIONAL's reasonable control. However, in the event PROFESSIONAL fails to properly complete work within thirty (30) days of the date such work is due (pursuant to schedules developed in accordance with Section IV of this Agreement), because of events within PROFESSIONAL's reasonable control, WATERMASTER SHALL reduce the total compensation

established for the work of that RFS by ten percent (10%). Said reduction shall be deemed liquidated damages for the untimely performance of work required by this Agreement. PROFESSIONAL shall be deemed to have waived any claim for such amount by reason of his failure to perform in a timely fashion.

SECTION VI: TERMINATION

Notwithstanding the above, WATERMASTER reserves the right to terminate any RFS to this Agreement at any time prior to the completion of the services to be furnished by PROFESSIONAL under said RFS by giving a written Notice of Termination to PROFESSIONAL, in which event WATERMASTER shall pay PROFESSIONAL only for work done and direct costs incurred by PROFESSIONAL under said RFS prior to receipt of such notice of termination. Such costs will include reasonable costs to bring the work to a halt, and costs to deliver to WATERMASTER the documentation described in the following paragraph. Termination of a particular RFS will not affect any other operative RFS.

Upon receipt of a Notice of Termination, PROFESSIONAL shall (1) promptly discontinue all services affected (unless the notice directs otherwise), and (2) deliver to WATERMASTER all data, drawings, specifications, reports, estimates, summaries, and such other information and materials as may have been accumulated by PROFESSIONAL in performing work under this Agreement, whether completed or in process.

Upon termination WATERMASTER may take over the work and execute the same to completion by agreement with another party or otherwise. Any work taken over by WATERMASTER for completion will be completed at WATERMASTER's risk, and WATERMASTER will hold harmless PROFESSIONAL from all claims and damages arising out of improper use of PROFESSIONAL's work.

SECTION VII: WATERMASTER LIABILITY

PROFESSIONAL understands that this Agreement is with WATERMASTER alone, and that none of the members of WATERMASTER are liable for any sums which may be payable hereunder, or for any debts of WATERMASTER.

SECTION VIII: CHANGES

WATERMASTER may, at its discretion and from time to time, revise, correct, or

modify the work to be performed under an RFS. All such changes shall be made formally and in writing to PROFESSIONAL. Upon written acceptance to WATERMASTER, PROFESSIONAL shall comply with such changes. Should PROFESSIONAL determine that said changes will result in an increase or decrease in costs to PROFESSIONAL, these costs shall be evaluated by WATERMASTER and PROFESSIONAL for negotiation as to adjustment in the compensation due PROFESSIONAL, and written agreement as to said adjustment shall be reached between the parties prior to commencement of any work that will cause an increase or decrease in PROFESSIONAL's costs. Any increased costs in excess of the Total Price incurred by PROFESSIONAL prior to execution of a written agreement covering said increased costs shall not be compensable.

SECTION IX: DUTIES OF WATERMASTER

WATERMASTER agrees to perform duties in connection with this Agreement and RFS issued under it as follows:

A. To assist PROFESSIONAL in obtaining any available information concerning location and details of facilities under control of WATERMASTER that may affect the work of an RFS, and to render reasonable assistance to PROFESSIONAL;
B. To examine within a reasonable time so as not to delay the work of PROFESSIONAL, all studies, reports, sketches, drawings, specifications, cost estimates, proposals and other documents presented by PROFESSIONAL to WATERMASTER for such purpose;
C. To give prompt written notice to PROFESSIONAL whenever WATERMASTER observes or otherwise becomes aware of any defect in the work of PROFESSIONAL;

SECTION X: DATA FURNISHED BY WATERMASTER

For the purpose of aiding PROFESSIONAL in the performance of its obligations under this Agreement and RFS issued under it, WATERMASTER shall furnish PROFESSIONAL all relevant data in its possession and shall render all reasonable assistance to PROFESSIONAL in connection with its performance hereunder. WATERMASTER is responsible for the reasonable correctness of data so furnished, but it shall likewise be the responsibility of PROFESSIONAL to apply reasonable caution in its use and interpretation of the data and to promptly advise WATERMASTER of any incorrectness or suspected incorrectness in the data furnished.

WATERMASTER shall provide to PROFESSIONAL in a timely manner all materials, decisions, and direction which are necessary to the progress of the work and which are basically the prerogative of WATERMASTER, but which PROFESSIONAL is not required to determine or provide under the terms of this Agreement.

SECTION XI: RESPONSIBILITIES OF PROFESSIONAL

PROFESSIONAL is engaged to render a professional service only, and any payments made to him are compensation solely for such services as he may render and recommendations he may make in carrying out the work. PROFESSIONAL shall follow professional practices to make findings, opinions, factual presentations, and professional advice and recommendations.

PROFESSIONAL's review or supervision of work prepared or performed by other individuals or firms employed directly by WATERMASTER shall not relieve those individuals or firms of complete responsibility for the adequacy of their work.

PROFESSIONAL shall be responsible for the professional quality, technical accuracy, timely completion, and the coordination of all designs, drawings, specifications, reports and other services furnished by PROFESSIONAL under this Agreement. PROFESSIONAL shall, without additional compensation, correct or revise any errors, omissions or other deficiencies in his designs, drawings, specifications, reports and other services.

PROFESSIONAL shall perform such professional services as may be necessary to accomplish the work required to be performed under this Agreement and in accordance with this Agreement.

Approval by WATERMASTER of drawings, designs, specifications, reports, and incidental engineering work or materials furnished hereunder shall not in any way relieve PROFESSIONAL of responsibility for the technical adequacy of his work. Neither WATERMASTER's review, approval or acceptance of, nor payment for, any of the services rendered under this Agreement shall be construed as a waiver of any rights under this Agreement or of any cause of action arising out of the performance of this Agreement.

PROFESSIONAL shall be and remain liable in accordance with applicable law for all damages to WATERMASTER caused by PROFESSIONAL's negligent

performance of any of the services furnished under this Agreement. The only exception in this regard will be for errors, omissions or other deficiencies to the extent attributable to WATERMASTER, WATERMASTER-furnished data, or any third party not under the control of PROFESSIONAL. PROFESSIONAL shall not be responsible for any time delays in the project caused by circumstances beyond PROFESSIONAL's control.

SECTION XII: SUBCONTRACT

WATERMASTER has entered into this Agreement in order to receive the professional services of PROFESSIONAL. PROFESSIONAL will therefore not make an assignment to a third party of all or any portion of the services required of PROFESSIONAL under this Agreement and RFSs thereto without first obtaining the written consent of WATERMASTER. PROFESSIONAL may, however, make use of the part-time assistance of other experts possessing unique skills, the utilization of which will, in the opinion of PROFESSIONAL, enhance the quality of its service to WATERMASTER under this Agreement provided, however, that any such additional assistants, part-time or otherwise, shall be considered employees of PROFESSIONAL or of PROFESSIONAL's subcontractor(s), and the responsibility for same shall rest with PROFESSIONAL.

SECTION XIII: INDEPENDENT PROFESSIONAL

PROFESSIONAL shall perform the services hereunder as an independent contractor, and nothing herein contained shall be construed to be inconsistent with this relationship or status. The employees of PROFESSIONAL shall not be deemed to be the employees of WATERMASTER, and WATERMASTER shall have no right to control the physical conduct of PROFESSIONAL's employees.

SECTION XIV: USE OF DOCUMENTS

For all work performed under this Agreement and all RFSs thereto, PROFESSIONAL shall provide to WATERMASTER copies of all plans, drawings, specifications, studies, reports, analyses, calculations, and all other work products and supporting documentation developed in the course of performing the work authorized by these agreements. The costs for reproducing, assembling, and delivering said copies of these documents to WATERMASTER shall be considered to have been included in the price for performing each RFS, whether or not specifically stated therein. Unless stated otherwise in the RFS, one paper copy, and an electronic PDF file of each document shall be provided by PROFESSIONAL to WATERMASTER.

WATERMASTER shall have the right, and permission of PROFESSIONAL, to use any such document for any purpose which WATERMASTER deems appropriate. Use of documents for other than their intended purpose shall be at WATERMASTER's risk. WATERMASTER shall hold PROFESSIONAL harmless from all claims and damages arising out of improper use of said documents.

SECTION XV: AMENDMENTS AND SCOPE OF AGREEMENT

WATERMASTER hereby reserves the right to amend the provisions of this Agreement from time to time as may be in the best interest of WATERMASTER. Such amendments, upon acceptance by PROFESSIONAL and by WATERMASTER, shall become and be considered as part of this Agreement, and all provisions herein shall apply to such amendments.

This Agreement constitutes the entire agreement between the parties relative to the subject matters hereof, and no modifications thereof shall be effective unless and until such modifications are evidenced by written amendments, signed by both parties, to this Agreement. There are no understandings, agreements, conditions, representations, warranties, or promises with respect to the subject matter of this Agreement which are not actually contained in the Agreement, except those expressly contained in such written amendments.

SECTION XVI: SUCCESSORS AND ASSIGNS

This Agreement and all amendments thereto shall be binding upon and inure to the benefit of any successors and assigns of the respective parties hereto.

SECTION XVII: ATTORNEYS' FEES

If any legal action is necessary to enforce or interpret the terms or provisions of this Agreement and all amendments thereto, and the respective rights and duties of the parties hereunder, the prevailing party shall be entitled to reasonable attorneys' fees in addition to any other relief to which he may be entitled.

SECTION XVIII: JURISDICTION

This Agreement shall be administered and interpreted under the laws of the State of California. Jurisdiction of litigation arising from this Agreement shall be in this state. If any part of this Agreement is found to be in conflict with applicable laws, such part shall be inoperative, null and void insofar as it is in conflict with said laws,

but the remainder of the Agreement shall be in full force and effect.

SECTION XIX: INSURANCE

PROFESSIONAL shall procure and maintain for the duration of this Agreement insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by PROFESSIONAL, his agents, representatives, employees or subcontractors.

A. Minimum Scope and Limits of Insurance

PROFESSIONAL shall maintain the types of insurance with limits no less than those set forth below, and having no deductibles, except as noted.

The coverage shall be at least as broad as:

1. Insurance Services Office Commercial General Liability coverage (occurrence Form CG 0001).
2. Insurance Services Office Form No. CA 0001 covering Automobile Liability, Code 1 (any auto).
3. Workers Compensation insurance as required by the State of California and Employer's Liability Insurance.
4. Errors and Omissions Liability insurance appropriate to the consultant's profession. For architects and engineers this coverage shall be endorsed to include contractual liability.

Required coverage:

1. General Liability Insurance: Combined single limit of $1,000,000 per occurrence and $2,000,000 annual aggregate for bodily injury, personal injury, and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location, or the general aggregate limit shall be twice the required occurrence limit.

2. Automobile Liability Insurance: $1,000,000 per accident for bodily injury and property damage.

3. Employer's Liability Insurance: $1,000,000 per accident for bodily injury or disease. If PROFESSIONAL has no employees, this coverage is not required.

4. Workers' Compensation Insurance: As required by the State of California.

5. Errors and Omissions Insurance: PROFESSIONAL shall procure and maintain errors and omissions liability insurance appropriate to the type of professional services that PROFESSIONAL will be providing under this Agreement. The minimum coverage shall be $1,000,000 per claim and in the aggregate.

B. Deductibles and Self-Insured Retentions

Any deductibles or self-insured retentions must be declared to and approved by WATERMASTER before any work under this Agreement is performed.

C. Other Insurance Provisions

The general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

1. WATERMASTER, its officers, officials, employees, and volunteers are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of PROFESSIONAL; products and completed operations of PROFESSIONAL; premises owned, occupied or used by PROFESSIONAL; or, automobiles owned, leased, hired or borrowed by PROFESSIONAL. The coverage shall contain no special limitations on the scope of protection afforded to WATERMASTER, its officers, officials and employees.

2. For any claims related to this project, PROFESSIONAL's insurance coverage shall be primary insurance as respects WATERMASTER, its officers, officials, employees, and volunteers. Any insurance or self-insurance maintained by WATERMASTER, its officers, officials, employees, or volunteers shall be excess of PROFESSIONAL's insurance and shall not contribute with it.

3. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to WATERMASTER, its officers, officials and employees.

4. PROFESSIONAL's insurance shall apply separately to each insured

against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

5. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested, has been given to WATERMASTER.

6. Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

E. Acceptability of Insurers

Insurance is to be placed with insurers with a current A. M. Best's rating of no less than A:VII, unless otherwise acceptable to WATERMASTER.

F. Verification of Coverage

PROFESSIONAL shall furnish WATERMASTER with original certificates and amendatory endorsements effecting coverage required by this section. The endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. All endorsements are to be received and approved by WATERMASTER before work commences. If this is not possible due to time constraints prior to commencement of work, PROFESSIONAL may initially furnish Certificates of Insurance in lieu of endorsements, as long as the endorsements are provided within forty-five (45) days from the date of execution of this Agreement.

G. Subcontractors

PROFESSIONAL shall include all subcontractors as insureds under its policies or shall furnish separate evidence of coverage and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

SECTION XX: INDEMNIFICATION

PROFESSIONAL shall indemnify and hold harmless WATERMASTER

and its officers, officials, employees and agents from and against all losses, claims, demands, payments, suits, actions, recoveries, and judgements of every nature and description brought or recoverable against it or them by reason of any negligent act, negligent error, or negligent omission of PROFESSIONAL, his agents, or employees for work performed under this Master Agreement. The only exception in this regard will be for errors, omissions or other deficiencies to the extent attributable to WATERMASTER, WATERMASTER-furnished data or any third party not under the control of PROFESSIONAL.

SECTION XXI: WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person or by mail to the individuals and at the addresses listed below:

A. WATERMASTER: Administrative Officer
Seaside Basin Watermaster
P.O. Box 50512
Pacific Grove, CA 93950

B. PROFESSIONAL: President
Geophysical Imaging Partners, Inc.
261 Gladys Dr.
Pleasant Hill, CA 94523

IN WITNESS WHEREOF, the parties hereto have executed this Agreement consisting of thirteen (13) pages and one (1) Attachment in duplicate on the date hereinabove written.

WATERMASTER	PROFESSIONAL
SEASIDE BASIN WATERMASTER	GEOPHYSICAL IMAGING PARTNERS, INC.
By Ian Oglesby	By Ahmad Ali Behroozmand
(Chair, Board of Directors)	(President)

ATTACHMENT A
SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: _____ **RFS NO**._____
(To be filled in by WATERMASTER)

TO: _____ **FROM**:_____

Services Needed and Purpose:

_____
_____
_____
_____

(Provide detailed scope of work description on page A-2, or attach Scope of Work marked "Attachment 1".)

Completion Date:_____ (Attach schedule marked "Attachment 2" if appropriate.)

Method of Compensation:_____(As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $_____(Cost is authorized only when evidenced by signature below.)

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date:_____.
WATERMASTER Technical Program Manager

Agreed to by: _____ Date:_____.
PROFESSIONAL

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: _____ **RFS NO.** 2025-01
(To be filled in by WATERMASTER)

TO: Ahmad-Ali Behroozmand
Geophysical Imaging Partners
PROFESSIONAL

FROM: Robert Jaques
WATERMASTER

Services Needed and Purpose: Perform a pilot geophysical survey near WATERMASTER's Sentinel Well No. 4 located in Seaside, California. See Scope of Work in Attachments 1 and 2.

Completion Date: Assuming that access permission is received from the landowners where the work is to be performed within 30 days from the date of execution of this RFS No. 2025-01, all work of this RFS shall be completed within 120 days from the date of execution of this RFS No. 2025-01. If access permission is delayed, the completion deadline will be extended accordingly. The work shall be performed in accordance with the Schedule described in Attachment 1.

Method of Compensation: Time and Materials (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $ 15,500.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 2 for Estimated Costs).

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date: _____.
WATERMASTER Technical Program Manager

Agreed to by: _____ Date: _____.
PROFESSIONAL

ATTACHMENT 1

SCOPE OF WORK

Recent data from WATERMASTER's Sentinel Well No. 4 suggests increasing salinity is occurring in some portions of the underlying strata, however the extent of potential seawater intrusion in the monitored aquifer(s) around this well is currently unknown. The purpose of the geophysical survey to be performed under this RFS No. 2025-01 is to confirm the applicability of time-domain electromagnetic (TEM) imaging as a tool to investigate the presence and map the extent of seawater intrusion in the vicinity of Sentinel Well No. 4. The Scope of Work is described in detail below in the Proposal from PROFESSIONAL dated June 2024.

PROPOSAL: sTEM GEOPHYSICAL SURVEY TO MAP SALTWATER INTRUSION

June 2024

Seaside Basin Watermaster
83 Via Encanto
Monterey, CA 93940

GEOPHYSICAL IMAGING PARTNERS

Dear Mr. Robert S. Jaques,

Following recent meetings held between Seaside Basin Watermaster (the Client), and Geophysical Imaging Partners (GIP) and Haley & Aldrich (H&A), this proposal is prepared for the Client in response to a request for a pilot geophysical survey near a sentinel well in Seaside, California. Recent data from the sentinel well suggests increasing salinity, however the extent of potential seawater intrusion in the monitored aquifer(s) around this well is currently unknown. The purpose of the geophysical surveys is to confirm the applicability of time-domain electromagnetic (TEM) imaging as a tool to investigate the presence and map the extent of seawater intrusion in the vicinity of the affected sentinel well.

Taking the scope of work and the expected geological settings into consideration, we propose a one-day preliminary geophysical survey the area near the well using the stationary time-domain electromagnetic (sTEM) method, sTEM (see Figure 1).

This pilot survey will be conducted using a sTEM system from TEMCompany, which provides point measurements down to maximum depths of 200-300 meters.

Figure 1 The sTEM system, STEM, in operation during a recent project in Livermore, California.

This pilot geophysical survey will provide an electrical resistivity model of the subsurface at each measuring point, which can then be transformed and interpreted to estimate lithology and relative pore fluid salinity. The primary objective of this initial pilot is to determine if the resulting geophysical profiles and interpretations provide meaningful insight to the Client toward understanding seawater intrusion in the study area, and warrant additional geophysical investigations.

It is not feasible to collect useful TEM data in the vicinity of powerlines and other installations due to interference from these sources. As a general rule, we will need to maintain a distance from powerlines that is similar to the depth of investigation.

Proposed sTEM sounding locations are shown in Figure 2. The number of proposed locations is higher than averaged daily coverage. We understand that vegetation can be dense in the study area, and actual survey locations may be adjusted based on local obstructions and/or access issues. Overall, we will make efforts to conduct measurements at as many locations as possible during one survey day and wherever possible near the well within the pilot study timeframe.

Our team has worked on geophysical saltwater intrusion projects in northern Monterey Bay, both by applying ground-based TEM like the proposed sTEM system and by flying offshore airborne EM (AEM) survey in 2017, as

well as the statewide AEM survey on behalf of DWR until late 2022. Furthermore, the team has recently worked on the deep aquifer study in Salinas Valley using AEM.

Existing geophysical data near the survey area will be revisited to optimize field setup and help with the interpretation of the sTEM results. Existing data include:

- ERT vertical section performed along the beach by Stanford University (2015)
- Airborne Electromagnetic (AEM) SkyTEM 2017 performed by Stanford University
- AEM SkyTEM 2019 performed by Stanford University
- AEM SkyTEM 2022 performed by DWR

A preliminary hydrogeologic interpretation of the pilot study results will be included in our final report, correlating our measured electrical resistivity profiles to known stratigraphy in the study area. We ask that the Client provide well logs, along with monitoring data and all other existing information about the affected sentinel well (and any other pertinent wells within or directly adjacent to the pilot study area). These data, along with publicly available data from the previous geophysical surveys noted above, will be used to generate a preliminary interpretation of lithology, including depth intervals corresponding to key regional aquifers. If data are able to substantiate an estimation of relative areas of higher vs lower pore fluid resistivity (correlating with salinity) within these key aquifers, a preliminary interpretation of seawater intrusion indications will also be included.

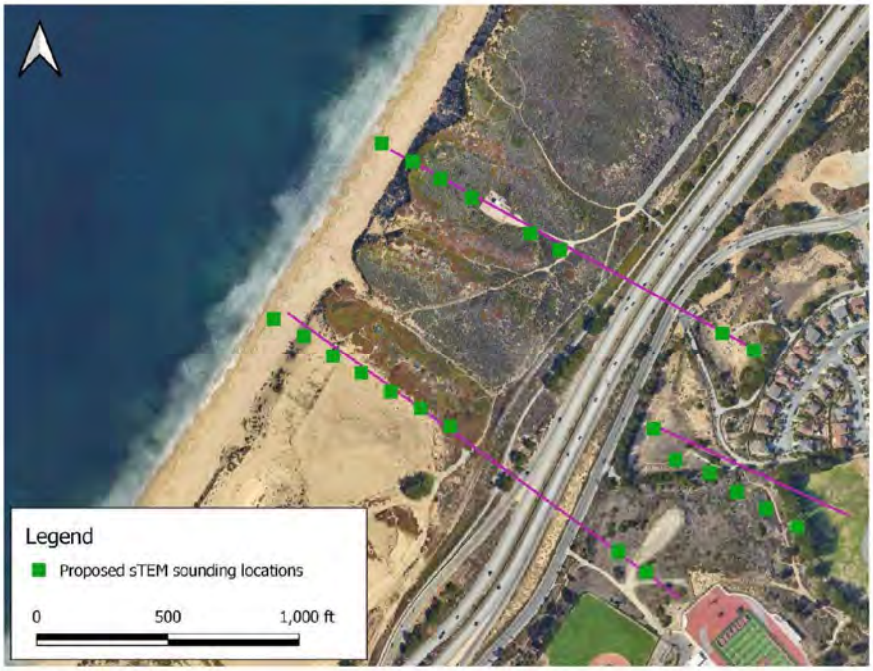

Figure 2 Proposed sTEM sounding locations.

The Stationary Time-Domain Electromagnetics (sTEM)

The sTEM is a hand carried system that involves laying out a 40 x 40 m (130x130 ft) square-shaped transmitter loop, along with a receiver placed at the center of the transmitter loop for each measurement (see Figure 3). These measurements are referred to as 'soundings' and provide subsurface information beneath the transmitter loop to depths of approximately 200-300 meters. The depth of investigation depends on the geological conditions, the water quality (salinity) and signal-to-noise ratio. In the presence of seawater in the formation, the resistivity will be in the range of 1 ohm-m. The electrically conductive saltwater will prevent the EM signal from penetrating a thick conductive layer (e.g., 100+ft) of seawater.

Depending on the distance between the soundings and the terrain, about 10-20 soundings can be conducted in a day. The instrument is lightweight and can also be hand carried in the field by a crew of two people, as illustrated in Figure 4. By hand carrying the instrument and placing only thin cables on the ground for a short period (up to 20 minutes), no damage to the environment is expected.

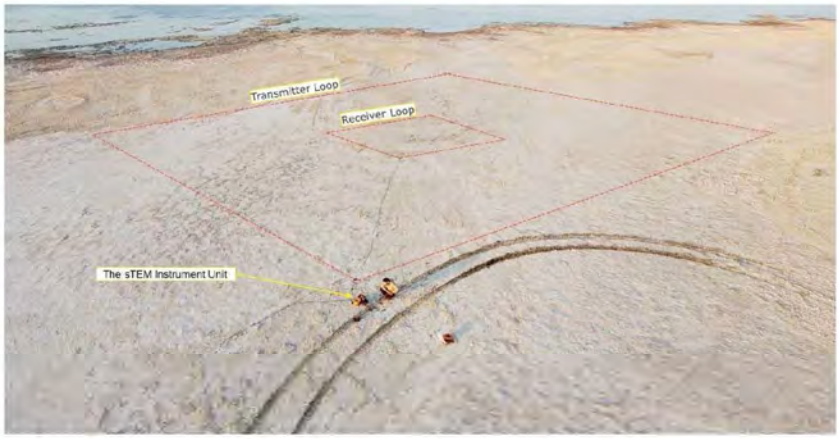

Figure 3 Configuration of the sTEM system.

sTEM data processing steps

The collected STEM data undergo the following processing steps:

1. Manually inspect each dataset for both low-moment (LM) and high-moment (HM) sounding curves.
2. Remove noisy data. The noise can be due to overhead powerlines, buried power cables, metal fences, and other man-made sources.
3. Assign a standard uniform 3% noise to all data.
4. Assign transmitter loop center coordinates (acquired in the field) and Digital Elevation Model (DEM) elevation to the sounding positions.

Figure 4 A sTEM system, STEM, being carried with a two-person team during a recent well siting project in Livermore, California.

GEOPHYSICAL IMAGING PARTNERS APS.

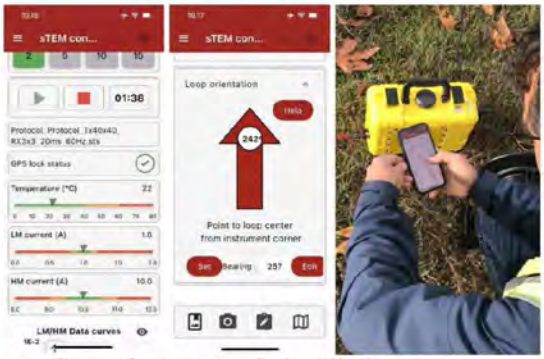

Figure 5 The user interface when operating the sTEM instrument.

sTEM data inversion steps

The processed STEM data will then be used in the following inversion scheme:

1. Define vertical constraints on the resistivities as well as the number of model layers and layer thicknesses.
2. Invert the processed data for smooth (multi-layer) resistivity models.
3. Present the results as line models. If the results are not satisfactory (e.g., due to high data residual), the inversion setup is revisited, and the data are re-inverted.
4. Calculate the data residual (data fit), which represents the difference between the observed data and the mapping of the estimated model to the data space.
5. Calculate the depth of investigation (DOI), based on a sensitivity analysis of the model.

sTEM Results

The processing and inversion of the STEM data will be performed using the software packages Aarhus SPIA (https://www.aarhusgeosoftware.dk/aarhus-spia-tem) and Aarhus Workbench (https://www.aarhusgeosoftware.dk/aarhus-workbench). The SPIA and Workbench are well-documented and technically sound software packages used for processing and inversion of ground-based and airborne electromagnetic and geoelectrical data. We utilized an application that is specifically designed for the processing and inversion of STEM data.

As described in the previous sections, the measured data are modeled to represent electrical resistivities at various depths, which can then be interpreted as lithology to get an understanding of the site geology. The inversion of STEM data results in one-dimensional (1D) resistivity models at each sounding location.

The STEM results will be presented as vertical resistivity sections, mean resistivity plan-view maps, and resistivity model reports.

GEOPHYSICAL IMAGING PARTNERS APS.

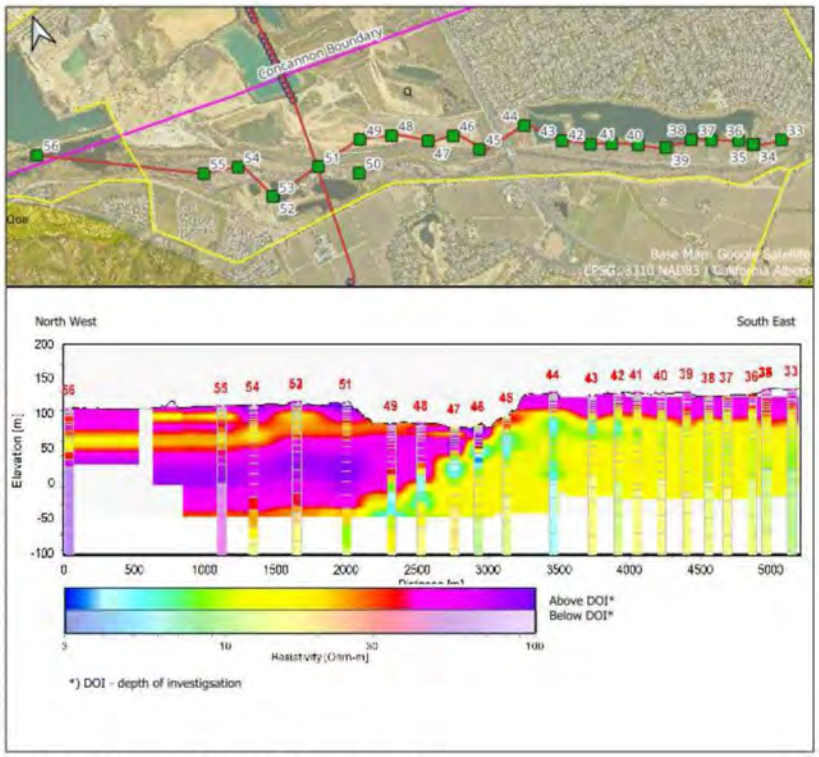

Figure 6 Example showing the sTEM models as a vertical section.

Data Deliverables

The following files will be provided as project deliverables.

1. Raw data, including files extracted from the instruments and supporting configuration files.
2. A GERDA Firebird database containing the acquired data, processed data, and the inverted model results.
3. ArcGIS layers, which include:
    a. Layout: ArcGIS shape files ("*.shp") containing general information about the surveyed area (AOI, well locations etc.) and location of the collected data.
    b. Georeferenced TIFF files for mean resistivity slices
    c. Model Sections: ArcGIS shape files ("*.shp") providing location information for the vertical sections presented in this report.

4. Google Earth KMZ files.
5. The project report, delivered as a PDF file.

The project report contains basic interpretations of the data based on our general understanding of the geological and hydrogeological settings in the study area, with specific correlations to data provided by the Client on the affected sentinel well and any other pertinent wells within the pilot study area. We will participate in one or two meetings to discuss the interpretations further.

Time schedule

We are prepared to discuss the project timeline and schedule the fieldwork according to the needs. Initial inversion results will be shared within two-three weeks after demobilization. A virtual meeting will be held with the Client to present the results. The final project deliverables will be provided within 4-8 weeks after demobilization. Please do not hesitate to reach out if you would like to discuss the project plan further.

Team

Ahmad-Ali Behroozmand, Max Halkjaer and Jesse Crews will be in charge of the field operations and managing data processing, inversion, and reporting of results. The team members bring years of experience in TEM investigations covering any aspect from the theoretical geophysical background, hardware and software utilized for data processing and inversion, and interpretation of the results. You can find their resumes in Appendix 2.

Budget

The table below provides cost estimates for the project, which will be invoiced as a lump sum. The cost estimates are provided according to the above-mentioned plan. Should the proposed plan require adjustments, we are happy to discuss it with the Client and modify the budget accordingly.

Tasks	Price (USD)
Mob/demob[1]	1,500
1 day of STEM survey ($9,000/day)[2]	9,000
Integration with AEM results and report[3]	5,000
Total (USD)	**15,500**

[1]*Includes instrument preparation, hotels, car rental, gasoline for the car, insurance, time while traveling, software license (SPIA, Workbench), and per diem.*

[2]*Includes fieldwork, data processing and inversion.*

[3]*Includes presentation of the results to the Client, preparing standard data report and other project deliverables.*

Appendix 1 – TEM Theory

For decades electromagnetic (EM) methods have been used worldwide for cost effective mapping of the subsurface materials for different applications. More recently, the accuracy of the instruments and their ability to obtain information about aquifers and hydrogeological properties has improved significantly. As a result, the TEM method is now one of the most efficient geophysical technologies for groundwater investigations.

Principles of TEM

The physical principle of the TEM is based on the electromagnetic induction phenomenon. The ground is first energized by a primary magnetic field generated by a direct current injected in a transmitter (Tx) loop. When the current stabilizes, the transmitter is turned off abruptly. During this rapid decay of the current an electromotive force results in short-duration eddy currents whose strength is largest in conductive parts of the ground. The EM induction phenomenon generates what is called the secondary magnetic field, which is measured just after the end of the turn-off using an induction receiver coil located in the center of the Tx loop (central loop configuration like STEM) or outside the Tx loop (off-set configuration like tTEM). The actual measurement is the time derivative of the magnetic flux passing through the receiver coil (dB/dt).

Just after the current in the Tx loop is turned off, the eddy currents in the ground will be close to the surface, and the measured signal primarily reflects the resistivity of the top layers. At later times the current will run deeper in the ground, and the measured signal contains information about the resistivity of the deeper layers. This is why the method is referred to as time-domain EM or TEM. Measuring the dB/dt in the receiver coil (also called a "sounding") will therefore provide information about the resistivity as a function of depth.

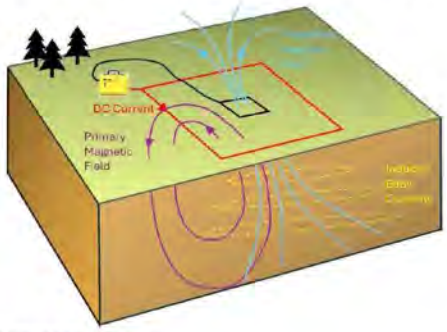

Figure 7 Basic principles of a TEM measurement.

The transmitter magnetic moment (Tx loop area x current x number of wire turns) and the signal-to-noise ratio (SNR) determine the depth of investigation (DOI). A stronger magnetic moment enables deeper penetration of the magnetic fields and thus greater DOI. The SNR depends on the ground electrical resistivity and ambient noise. The higher the SNR, the greater the DOI.

More information about the principles of the TEM method can be found in Ward and Hohmann (1988).

Noise in TEM data

TEM data are comprised of different type of noise components. Noise can cause bias signals and affect the depth of investigation and if not properly identified and removed, can result in incorrect geological and hydrological interpretations. The different sources of noise include: (1) Galvanic coupling caused by the electromagnetic signal induced in a metal object, such as a metal pipe, metal fence or the loop, following the ground-wire through the power-masts to the ground, (2) Capacitive coupling caused by the induced EM signal in an insulated installation such as a power cable, (3) Coherent noise from electrical powerlines, (4) Atmospheric noise, and (5) Instrument internal noise.

References

Ward SH, Hohmann GW (1988) Electromagnetic theory for geophysical applications. In: Nabighian MN (ed) Electromagnetic methods in applied geophysics, vol 1. SEG, Tulsa, pp 131–311.

Appendix 2 – Resumes

MAX HALKJAER

Mr. Halkjaer is a highly experienced geophysicist with multiple AEM, tTEM, FloaTEM, and other geophysical assignments successfully completed within California as well as globally. He holds a Master's degree in geology and geophysics from the University of Aarhus and has 28 years of experience in groundwater management, particularly with the application of geophysical methods.

Since 2016 he has served as a principal Hydro-geophysicist, focusing on projects in California.

In California, he has been the project director and principal geophysicist on the DWR state-wide Airborne Electromagnetic (AEM) survey project. Mr. Halkjaer also acted as the project manager on two of the three pilot projects under the Stanford Groundwater Architecture Project (GAP). The scope of these projects was to test the use of AEM and integrate the data with borehole information to create more solid Hydrogeologic Conceptual Models (HCM).

As a researcher at Aarhus University, he developed time domain electromagnetic (TEM) instrumentation and software for processing and inversion of TEM data. In 2004, he co-founded SkyTEM Surveys ApS and served as the managing director of the company until 2012. He has been responsible for a number of large AEM and ground-based projects with a focus on groundwater mapping across the world, including Australia, SE-Asia, Europe, and North America.

Mr. Halkjaer has extensive experience working with a variety of geophysical methods for groundwater investigations, geotechnical applications, environmental studies, and mineral exploration.

CERTIFICATES

First Aid, CPR, and AED Training certificate. Defensive Driving certificate. Firefighting certificate. Preventing Sexual Harassment and Discrimination. Maintain a drug-free work site.

PUBLICATIONS AND PRESENTATIONS

Mr. Halkjaer has co-authored numerous publications, and he has given numerous presentations at conferences.

SELECTED PROJECTS

California Statewide Airborne Electromagnetic (AEM) Surveys (2021-2022)
Client: CA Department of Water Resources
AEM surveys to map groundwater aquifers in all SGMA medium- and high-priority basins.
Role: Project Director and Principal Geophysicist | Technical expert and advisor | Data Quality Assurance - Quality Control

SPECIAL COMPETENCIES

- Hydro-geophysics
- Geophysics for geotechnic
- Geophysical methods: electromagnetic (EM), magnetics, gamma ray spectrometer (GRS)
- Innovation

PROJECT ASSIGNMENTS

- Project Director
- Principal geophysicist
- Member of technical advisory committees

TOTAL YEARS OF EXPERIENCE

28

EDUCATION

M.Sc/1995/Geology and Geophysics
University of Aarhus, Aarhus, Denmark

GAP: Airborne Electromagnetic Project pilot studies in California, Indian Wells Valley and Paso Robles, Stanford University (2017-2020)
Client: Stanford University, DWR, Indian Wells Valley Water District, San Luis Obispo County, the Danish EPA.
Digitization of well information. AEM geophysical survey for groundwater basin characterizations. Integrated interpretation.
Role: Project manager| AEM planning

Petaluma and Sonoma valleys groundwater investigations, Santa Rosa, CA (2021-2022)
Client: Sonoma County Water Agency
gTEM and ERT geophysical investigations for further characterization of the basin for refining the basin hydrogeologic conceptual model.
Role: Principal Geophysicist

Salinas Valley Deep Aquifer Study using AEM, Monterey, CA (2022-2023)
Client: Salinas Valley Basin Groundwater Sustainability Agency
AEM geophysical surveys in the Salinas Valley, CA, to investigate the deep aquifers in the region.
Role: Survey design and interpretation.

Geophysical investigations for siting production wells, Brenda, Arizona (2023)
Client: Private
Groundbased TEM geophysical survey for improved understanding of the groundwater basin to find optimal drilling locations.
Role: Project planning | data acquisition, analysis and interpretation

MAR site investigations along Cosumnes River, Sacramento, CA (2020-2022)
Client: Sacramento Area Flood Control Agency
tTEM and ERT geophysical investigation to map paleochannels and assess potential MAR sites.
Role: Principal Geophysicist and interpretation

Kern Fan Shallow Hydrogeological assessment, Bakersfield, CA (2021)
Client: Rosedale-Rio Bravo Water Storage District
tTEM geophysical investigation to assess potential MAR sites.
Role: Project manager | data acquisition, analysis and interpretation

Surface water Groundwater study, Silkeborg, Denmark (2021)
Client: The Danish EPA and Silkeborg Waterworks
FloaTEM geophysical investigation on lakes and rivers to map variations in the hydraulic connectivity as input to a numerical groundwater model.
Role: Project manager | Skipper, data acquisition, analysis, and interpretation

Yolo bypass shallow hydrogeological assessment, Yolo County, CA (2020-2021)
Client: CA Department of Water Resources
tTEM geophysical investigations to characterize the shallow subsurface on both sides of a levee structure.
Role: Project Manager, Project planning | data acquisition, analysis and interpretation.

Salton Sea Hydrogeological investigations, Salton Sea, CA – Two projects (2020-2021)
Clients: Department of Water Resources and Imperial Irrigation District
gTEM and tTEM geophysical surveys to investigate the geology and hydrology of three areas around the Salton Sea in California.
Role: Project planning |analysis and interpretation

MAR basin investigations, Orange County, CA (2020-2021)
Client: Orange County Water District
GCM geophysical surveys at existing infiltration basins to improve understanding of the shallow subsurface hydrogeology.
Role: Principal Geophysicist and interpretation

HCM development with support from AEM in Santa Ynez, Santa Barbara County, CA (2020-2021)
Client: Santa Barbara County, GSI, SYRWCD
AEM surveying and interpretation.
Role: Principal Geophysicist, Hydrogeological interpretations

AEM survey along the Pismo Beach to assess saltwater intrusion, Santa Maria County, CA (2020)
Client: WSI, City of Prismo Beach
AEM surveying and interpretation.
Role: Principal Geophysicist, Hydrogeological interpretations

AHMAD ALI BEHROOZMAND, PHD, PGP

Dr. Behroozmand is a Professional Geophysicist (#1106) in the State of California, holds a PhD degree in Geophysics and specializes in the field of Hydro-geophysics. Ahmad has more than 15 years of professional experience in the development and application of airborne, ground-based and logging geophysical methods for subsurface characterization. He has been involved in numerous groundwater-related projects worldwide and in California in compliance with the SGMA program, including the DWR State-wide Airborne Electromagnetics (AEM) Survey Project and the Stanford Groundwater Architecture Project (GAP).

Ahmad has a strong background in project management, as well as in the acquisition, processing and inversion, and interpretation of geophysical data.

As a research scientist at Stanford University and Aarhus University, Dr. Behroozmand conducted fundamental research in hydro-geophysics within the framework of different research projects. The results of his research have been published as peer-reviewed scientific journal articles and presented at numerous conferences. He has taught university courses at graduate and undergraduate levels, advised students and served as a scientific journal editor and reviewer.

Ahmad's work in California has focused on different applications, including large-scale groundwater basin characterizations, local-scale subsurface characterization, assessment of managed aquifer recharge sites, and levee projects, among others.

With a strong belief in teamworking, Dr. Behroozmand has, during his career, developed collaborations with governmental agencies, water stakeholders, and other private sectors to identify and develop solutions for improved groundwater management.

SPECIAL COMPETENCIES

- Hydro-geophysics
- Geophysical methods: airborne, ground-based, waterborne, logging
- Acquisition, Processing & inversion, and Interpretation of geophysical data
- GIS

PROJECT ASSIGNMENTS

- Project Manager
- Senior Geophysicist
- Project Planning
- Data Collection
- Data Interpretation and reporting

TOTAL YEARS OF EXPERIENCE

15

EDUCATION

PhD, Geophysics

PUBLICATIONS

22 Peer-Reviewed Journal Articles | 40+ Peer-Reviewed Conference Presentations | 1,072 ISI Citations | H-index: 12 | Google Scholar

SELECTED PROJECTS

California Statewide Airborne Electromagnetic (AEM) Surveys (2021-2022)
Client: CA Department of Water Resources
AEM surveys to map groundwater aquifers in all SGMA medium- and high-priority basins.

Role: Key project member | AEM data acquisition coordinator | Data acquisition, analysis and interpretation | Project planning

Petaluma and Sonoma valleys groundwater investigations, Santa Rosa, CA (2021-2022)
Client: Sonoma County Water Agency
gTEM and ERT geophysical investigations for further characterization of the basin for refining the basin hydrogeologic conceptual model.
Role: Project planning | data acquisition, analysis and interpretation

Salinas Valley Deep Aquifer Study using AEM, Monterey, CA (2022-2023)
Client: Salinas Valley Basin Groundwater Sustainability Agency
AEM geophysical surveys in the Salinas Valley, CA, to investigate the deep aquifers in the region.
Role: Data acquisition, analysis and interpretation.

Geophysical investigations for siting production wells, Brenda, Arizona (2023)
Client: Private
gTEM geophysical surveys for improved understanding of the groundwater basin to find optimal drilling locations.
Role: Project planning | data acquisition, analysis and interpretation

MAR site investigations along Cosumnes River, Sacramento, CA (2020-2022)
Client: Sacramento Area Flood Control Agency
tTEM and ERT geophysical investigation to map paleochannels and assess potential MAR sites.
Role: Project planning | data acquisition, analysis and interpretation

MAR site investigations in Kings County, CA – Two projects (2021-2022)
Client: Kings County Water District
tTEM geophysical investigation to investigate multiple potential MAR sites within the Kings County of California.
Role: Project manager | data acquisition, analysis, and interpretation

Kern Fan Shallow Hydrogeological assessment, Bakersfield, CA (2021)
Client: Rosedale-Rio Bravo Water Storage District
tTEM geophysical investigation to assess potential MAR sites.
Role: Project planning | data acquisition, analysis and interpretation

MAR site investigations in Santa Clarita, CA (2021)
Client: Santa Clarita Valley Water Agency
tTEM geophysical investigation to investigate recharge potential at a study site.
Role: Project manager | data acquisition, analysis, and interpretation

Yolo bypass shallow hydrogeological assessment, Yolo County, CA (2020-2021)
Client: CA Department of Water Resources
tTEM geophysical investigations to characterize the shallow subsurface on both sides of a levee structure.
Role: Project planning | data acquisition, analysis and interpretation.

Salton Sea Hydrogeological investigations, Salton Sea, CA – Two projects (2020-2021)
Clients: Department of Water Resources and Imperial Irrigation District
gTEM and tTEM geophysical surveys to investigate the geology and hydrology of three areas around the Salton Sea in California.
Role: Project planning | data acquisition, analysis and interpretation

MAR basin investigations, Orange County, CA (2020-2021)
Client: Orange County Water District
GCM geophysical surveys at existing infiltration basins to improve understanding of the shallow subsurface hydrogeology.
Role: Project planning | data acquisition

GAP: Airborne Electromagnetic Project Implementation, Indian Wells Valley, Stanford University (2015-2017)
Client: Indian Wells Valley Water District
Pilot testing of gTEM and NMR geophysical methods. AEM geophysical survey for groundwater basin characterizations.
Role: Project planning | acquisition, analysis and interpretation of NMR, TEM and AEM data.

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	February 12, 2025
AGENDA ITEM:	4
AGENDA TITLE:	RFS No. 2025-03 to Montgomery & Associates to Update the Seawater Intrusion Response Plan
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

The approved 2025 Monitoring and Management Plan, and its accompanying budget, includes a Task to update the Watermaster's existing Seawater Intrusion Response Plan (SIRP). The TAC reviewed and approved Montgomery & Associates' June 24, 2024 proposal to perform this work (which is in Attachment 1 of this RFS No. 2025-03) at its August 14, 2024 meeting.

The attached RFS No. 2025-03 to Montgomery & Associates will authorize them to perform that work.

ATTACHMENTS:	RFS No. 2025-03
RECOMMENDED ACTION:	Approve RFS No. 2025-03 and forward it to the Board for their approval

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: To be Filled In

RFS NO. 2025-03
(To be filled in by WATERMASTER)

TO: Georgina King
Montgomery & Associates
PROFESSIONAL

FROM: Robert Jaques
WATERMASTER

Services Needed and Purpose: Update WATERMASTER's Seawater Intrusion Response Plan. See Scope of Work in Attachment 1.

Completion Date: PROFESSIONAL shall complete the work of this RFS No. 2025-3 within four months from the date it receives a Notice to Proceed from the Watermaster.

Method of Compensation: Time and Materials (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $ 25,481.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 1 for Estimated Costs).

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date:_____.
WATERMASTER
Technical Program Manager

Agreed to by: _____ Date:_____.
PROFESSIONAL

ATTACHMENT 1

SCOPE OF WORK

This RFS No. 2025-03 authorizes PROFESSIONAL to prepare an updated Seawater Intrusion Response Plan (SIRP) to replace the original SIRP that was prepared by HydroMetrics LLC in 2009. The detailed Scope of Work of this RFS No. 2025-03 is described in the attached Proposal from Montgomery & Associates dated June 24, 2024, which also provides a Schedule and Cost Estimate to perform the work . As part of the work of this RFS No. 2025-03 PROFESSIONAL will make two presentations on the updated SIRP, one to WATERMASTER's Technical Advisory Committee, and one to WATERMASTER's Board of Directors, both of which will be made by teleconference (Zoom). Under this RFS No. 2025-03 PROFESSIONAL will edit the draft updated SIRP to reflect requests made from WATERMASTER's Technical Advisory Committee and its Board of Directors and provide a final version of the updated SIRP to WATERMASTER.

MONTGOMERY & ASSOCIATES
Water Resource Consultants

Groundwater experts since 1984

June 24, 2024

Mr. Bob Jaques
Seaside Watermaster Technical Program Manager
83 Via Encanto
Monterey, CA 93940

SUBJECT: SCOPE TO UPDATE SEASIDE BASIN SEAWATER INTRUSION RESPONSE PLAN

Dear Mr. Jaques

Montgomery & Associates (M&A) is pleased to present this scope of work to update the Seaside Basin (Basin) Seawater Intrusion Response Plan (SIRP).

Background

The SIRP, prepared in February 2009, is the Seaside Basin Watermaster's contingency plan for responding to seawater intrusion in the Basin, should it occur. The SIRP was developed as part of the Watermaster's implementation of the Seaside Basin Monitoring and Management Program. The SIRP details the indicators of seawater intrusion and action levels that trigger response measures, and recommended actions to be taken when seawater intrusion is observed.

At the June 2024 Technical Advisory Committee (TAC) meeting, there was consensus to update the SIRP per recommendations included in the TAC meeting packet. This scope of work is based on those recommendations, except for developing Protective Water Levels (PWLs) for major production wells. That recommendation is excluded from the scope because to reverse the current onshore groundwater flow direction, PWLs in production wells need to be well above sea level. This is impractical since pumping levels induced by production wells in the Northern Coastal subarea are up to 50 feet below sea level, even with operation of Pure Water Monterey.

MONTGOMERY & ASSOCIATES

Scope of Work

Task 1. Update SIRP Figures, Tables, and Appendices

Update Figure 1: Wells with Historical Water Quality Data, Table 1: Chloride Threshold Values and Trend Analysis and Table 2: Sodium/Chloride Molar Trend Analysis with additional data and wells. A statistical analysis of chloride concentration and Sodium/Chloride Molar Ratios is needed to update the 2 tables and will be described in Appendix C. M&A will compile all chloride and sodium data for existing and new monitoring wells and use the Mann-Kendall statistical approach to objectively determine if trends are increasing, stable or decreasing.

The update will include replacing the following appendices with updated versions incorporating all available data and updated analysis:

Appendix B: Historical Chloride Concentration Graphs
Appendix C: Statistical Trend Analysis
Appendix D: Historical Sodium/Chloride Molar Ratio Graphs
Appendix E: Piper Diagrams for Seaside Groundwater Basin Wells
Appendix F: Stiff Diagrams for Seaside Groundwater Basin Wells

For efficiency, Appendices B, D, E and F will be updated based on Water Year 2024 Seawater Intrusion Analysis Report content with some minor adjustments to display SIRP-specific information.

Task 2. Revise List of Tasks in Contingency Action No. 4 on Pumping Redistribution Plan

Revise the list of tasks in the 2009 SIRP's Contingency Action No. 4 to make the Action more practical and straightforward to implement. For this task, M&A proposes to develop a number of options to present at a future TAC meeting to solicit feedback from TAC members on preferred options.

Task 3. Incorporate Geophysical Data as a Seawater Intrusion Indicator and Trigger

Establish an approach to incorporate repeatable geophysical measurements and data at monitoring wells as a seawater intrusion indicator and trigger.

Task 4. Prepare Updated SIRP

M&A will prepare a draft updated SIRP for review by the TAC. After incorporating comments from the TAC and Technical Program Manager, a Board draft SIRP will be prepared and included in the Board's meeting packet. Board comments will be addressed in the final updated SIRP. M&A will email the Technical Program Manager PDF and Word versions of the final updated SIRP.

Task 5. TAC and Board Meetings

Georgina King will prepare for and remotely attend two TAC meetings. The first TAC meeting will be to present options for revising the Contingency Action No. 4 on Pumping Redistribution Plan. The second TAC meeting will be to present the draft SIRP updates. Georgina King will also remotely present the SIRP updates to the Board.

Project Budget and Schedule

We understand this work shall be undertaken in 2025. It is anticipated that the work can be completed within a three-month period, though the timing may depend on the scheduling of TAC and Board meetings. We can begin work immediately following notice to proceed.

Total estimated costs to update the SIRP is $25,481 as detailed in the attached cost table.

Please feel free to contact us with any questions about the proposed scope of work and budget.

Sincerely,
MONTGOMERY & ASSOCIATES

Georgina King, P.G., C.Hg.
Principal Hydrogeologist

MONTGOMERY & ASSOCIATES

Table 1. Cost Estimate for Seawater Intrusion Response Plan Update

		Montgomery & Associates Labor						Other Direct Costs	TOTALS
		Scientist VII	Scientist VII	Scientist III	Technical Editor	Labor Total			
		C. Tana	G. King						
Task	Hourly Rates	$265	$265	$172	$86	Hours	($)	($)	
1	Update SIRP Figures and Tables	0	20	30	0	50	$10,460	$0	$10,460
2	Revise List of Tasks in Contingency Action No. 4 on Pumping Redistribution Plan	3	10	0	0	13	$3,445	$0	$3,445
3	Incorporate Geophysical Data as a Seawater Intrusion Indicator and Trigger	4	12	8	0	24	$5,616	$0	$5,616
4	Prepare Updated SIRP	0	8	4	4	16	$3,152	$0	$3,152
5	TAC and Board Meetings	0	8	4	0	12	$2,808	$0	$2,808
	Total	**7**	**58**	**46**	**4**	**115**	**$25,481**	**$0**	**$25,481**

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SEASIDE BASIN WATER MASTER TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	February 12, 2025
AGENDA ITEM:	5
AGENDA TITLE:	Status Report on Montgomery & Associates' Recommendations on the Best Approach to be Used in Updating the Seaside Basin Groundwater Model
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

Pascual Benito is the Montgomery & Associates staff person who will be preparing his recommendations on how best to update the existing Seaside Basin groundwater model. His report was scheduled to be provided to us in late January of 2025. However, he reports that he has discovered, while talking to the Salinas Valley Groundwater Sustainability Plan (GSP) modeling group that the USGS Salinas Valley Integrated Hydrogeologic Model (SVIHM) has not actually been released publicly yet and there is still no model documentation that has been put out for review. The current schedule has the model being released publicly in early 2025, although Mr. Benito has not heard a precise date. He also learned that when it does get released, the Montgomery & Associates Salinas Valley modeling team is going to be conducting a detailed review of the model along with recommending (and it seems even possibly developing and incorporating) some updates to the model before use of the model for additional Sustainable Groundwater Management Work.

Given that there is not an urgent need to update or adopt a new Seaside Basin model immediately, Mr. Benito feels it would make the most sense and be most cost-efficient to wait until the SVIHM is officially released and the model review/update for use by the Salinas Valley Basin and Marina Coast Water District Groundwater Sustainability Agencies has been completed. That could change how he will evaluate the SVIHM model in comparison to other options. It might also change our wanting to review the Monterey Subbasin model (developed for Marina Coast Water District by EKI) because his understanding is that EKI would have preferred to use the SVIHM for the Monterey Subbasin GSP, and only needed to create the Monterey Subbasin model because the SVIHM was not yet ready for use. So we will need to know if the Monterey Subbasin Model is going to be retained long-term, or whether EKI will be switching to the new updated SVIHM.

Abby Ostovar of Montgomery and Associates, who is part of the Salinas Valley modeling team, will have more information on the SVIHM release in the next week or two. That would provide a better sense of the timelines. In any case it sounds like it would likely still be in the first half of this year. Mr. Benito went on to say that he can at least continue to work on the review portions he has already started with respect to the Sea Water Intrusion model, but his recommendation is that we pause and wait until the SVIHM is released and more fully vetted and there is more clarity on what things might change in terms of Monterey Subbasin model usage so that his evaluations and recommendations will not be out-of-date from the get-go. I concur with Mr. Benito.

ATTACHMENTS:	None
RECOMMENDED ACTION:	Approve Mr. Benito's recommendation to delay completion of his work on this until the unresolved related modeling issues have been resolved

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE
* * * AGENDA TRANSMITTAL FORM * * *

MEETING DATE:	February 12, 2025
AGENDA ITEM:	6
AGENDA TITLE:	Discuss How to Verify Chloride Concentrations and Water Chemistry in the 140 to 200 Foot Zone of Sentinel Well No. 4
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

One of the recommendations in the 2024 Seawater Intrusion Analysis Report (SIAR), is that options for verifying seawater intrusion occurring in the Paso Robles Formation at or near Sentinel Well No. 4 (SBWM-4) continue be evaluated in WY 2025. The SIAR goes on to say that this may involve finding a site for a new monitoring well, adapting an existing well, evaluating the feasibility of using a Cone Penetration Testing (CPT) drill rig to non-intrusively collect once-off groundwater quality samples at specified depths without needing a permanent well, or some other solution. The fall 2024 induction logging results at SBWM-4 show that conductivity has been stable over the past year, however the Watermaster should continue to conduct induction logging at PCA-W Deep and PCA-E Deep and explore options to see if it would be feasible to monitor groundwater quality in the affected zone.

I sent the attached email to our consultants and others who may have expertise and/or experience in these various options. The responses I received are shown below:

Martin Feeney: The CPT device can be fitted with a conductivity sleeve that will give a continuous recording of pore fluid it encounters. He used this on Sand City's desalination plant project with great results. However, this was to depths less than 100 feet. He is not sure if the CPT can go as deep as required in this instance. He hasn't used one for at least a decade. He also said that all of the Sentinel Wells have deep concrete seals (as much as 800 feet, depending on the well) that extend to 20 feet above the perforations. Although one might devise a way to perforate the well at the appropriate depth, there is concrete behind the casing so that won't work.

Gus Yates: Given that Sentinel Wells 1, 2 and 4 all have intervals with gradually increasing conductivity, seawater intrusion is the logical source. The leaky casing at the SNG well would not affect all three of those wells. If we think intrusion is the source, then perhaps we don't need a water quality sample. In that case, we might want to use surface geophysics to better define the locations and rates of conductivity increases. For example, a survey transect along the bike trail parallel to the west side of Hwy 1 would be completely non-invasive and wouldn't need anyone's permission. One survey would produce a 2-D slice image of conductivity distribution with depth, and repeat surveys would show where and how fast conductivity is changing.

Methods include electrical resistivity tomography (ERT), electromagnetic induction (EMI), Transient electromagnetic (TEM) and time domain electromagnetic induction (TDEM—equivalent to TEM, I think). Joint inversion of two methods is sometimes recommended for improved resolution. I would start by getting a recommendation from Rosemary Knight at Stanford.

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE
* * * AGENDA TRANSMITTAL FORM * * *

AGENDA ITEM:	6 (Continued)

This approach could be useful but would not provide the water quality data on which the management triggers are based.

Georgina King: Added that a HydroPunch would be used in conjunction with CPT to extract groundwater samples.

Amy Woodrow: I don't know that I have much to add in addition to what others have provided on this question. Of the options you provided, I think exploring the possibility of collecting one-time samples might be the way to go, at least until data suggest that more frequent sampling or data collection might be needed.

My conclusions and recommendations are:

- Finding a site for a new monitoring well: The cost of installing a new monitoring well, and the difficulty in finding a site to do so, is not justified by the value of the data that would be obtained from it. Therefore, I do not recommend pursuing this approach.
- Adapting an existing well: There does not appear to be any feasible approach to adapting any of the nearby existing wells to enable a water quality sample to be collected from the depth zone of interest. Therefore, I do not recommend pursuing this approach.
- Evaluating the feasibility of using a Cone Penetration Testing (CPT) drill rig to non-intrusively collect once-off groundwater quality samples: This approach appears to be the most feasible. I recommend that the cost and ability to obtain permission to utilize this approach be investigated, and results of that investigation be brought back to the TAC for further consideration. In conjunction with this, the value of obtaining a single water quality sample using this technique should also be evaluated. A video showing what the CPT equipment looks like and how it operates can be seen at this link: https://www.youtube.com/watch?v=paRRQmoyI4U&ab_channel=GeoprobeSystems

ATTACHMENTS:	Email with questions sent to consultants and others
RECOMMENDED ACTION:	Provide input to the Technical Program Manager as to what action the TAC recommends be taken on this matter

January 21, 2025 Email Sent to Consultants and Others

As you are probably already aware induction logging has detected a steady increase in conductivity in our Sentinel Well No. 4 (SBWM-4) in recent years. The attached document shows the depth zone where we are seeing this increase. It is in the 140 to 200 foot depth zone. When Martin Feeney put in SBWM-4 in 2007, his report included this brief description:
SBWM-4 — As with the other wells, the induction log reveals a thin layer of fresh water overlying saline water with the Dune Sands/Beach Deposits to a depth of approximately 100 feet. Below this depth the materials become clay and there are no additional zones of increased conductivity uncorrelated with clay zones.

The 2024 *Seawater Intrusion Analysis Report* (SIAR) prepared by Montgomery & Associates, with Georgina King as the principal author, includes this discussion regarding the induction logging results for SBWM-4:
Evaluation of SBWM-4 conductivity data collected prior to 2019 indicates conductivity has been increasing within this zone from at least 2007 when induction logging started. An estimate of the total dissolved solids (TDS) increase associated with the logged change in conductivity in SBWM-4 since 2007 is approximately 1,000 mg/L. The Secondary Drinking Water limit is 500 mg/L. This indicates a significant salinity increase in the upper Paso Robles Formation. An induction log performed on monitoring well PCA-West Deep—located 780 feet southwest of SBWM-4—to verify increasing conductivity in this area does indicate high salinity within the upper Paso Robles Formation. However, several years of logs are needed to compare against the first baseline before it can be determined if conductivity is increasing at that well too.

One of the recommendations in the, is that options for verifying seawater intrusion occurring in the Paso Robles Formation at or near SBWM-4 continue be evaluated in WY 2025. This may involve finding a site for a new monitoring well, adapting an existing well, evaluating the feasibility of using a Cone Penetration Testing (CPT) drill rig to non-intrusively collect once-off groundwater quality samples at specified depths without needing a permanent well, or some other solution. The fall 2024 induction logging results at SBWM-4 show that conductivity has been stable over the past year, however the Watermaster should continue to conduct induction logging at PCA-W Deep and PCA-E Deep and explore options to see if it would be feasible to monitor groundwater quality in the affected zone

The SNG well and the PCA-West Shallow and Deep wells are the only wells in the vicinity of SBWM-4.

Of the three options mentioned in the SIAR, here are my thoughts:

1. Finding a site for a new monitoring well: State Parks has jurisdiction over the land where SBWM-4 is located, and is unlikely to give us permission to install another monitoring well near SBWM-4. It is on the SNG land the PCA-West monitoring wells are already located. So if a new monitoring well site were needed, it might be easiest to try to get permission from the SNG property owners to let another monitoring well be installed there. However, litigation over that site is currently in progress and that could make getting permission granted. Also, the most recent monitoring well we put in cost us over $200K, so that would be a very costly undertaking.
2. Adapting an existing well: In order to get a water quality sample from the desired zone of interest I assume there would need to be a well with perforations at that depth. None of the existing wells in the vicinity of SBWM-4 have perforations in this depth zone, they are all perforated deeper. I am not aware of any way to adapt one of the existing wells to enable a water quality sample representative of the depth zone of interest to be collected.

3. Evaluating the feasibility of using a Cone Penetration Testing (CPT) drill rig to non-intrusively collect once-off groundwater quality samples: I have very limited knowledge of CPT technology, other than what I have learned from Googling the topic. Apparently it is able to collect water quality samples from the depth zone of interest. Again, it is doubtful that permission could be obtained from State Parks to do a CPT near SBWM-4, so the more likely site would be on the SNG land. I have no idea what this would cost. Also, only a single water quality sample could be collected during each CPT event.

I would appreciate your thoughts and opinions on the following:

1. Do you know of any way one of the existing wells could be adapted to collect a water quality sample from the desired depth zone of interest?
2. Do you think the CPT approach would be a suitable way of collecting such a water quality sample?
3. Given that the CPT approach would only yield one data point (one water quality sample), would that limited data justify the cost and effort of using that approach?
4. How important do you feel it would be to get an actual water quality sample from the desired depth zone of interest, given that we are already obtaining induction logging data from it? In other words do we really need an actual water quality measurement (e.g. chloride level) to make informed basin management decisions?

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE
* * * AGENDA TRANSMITTAL FORM * * *

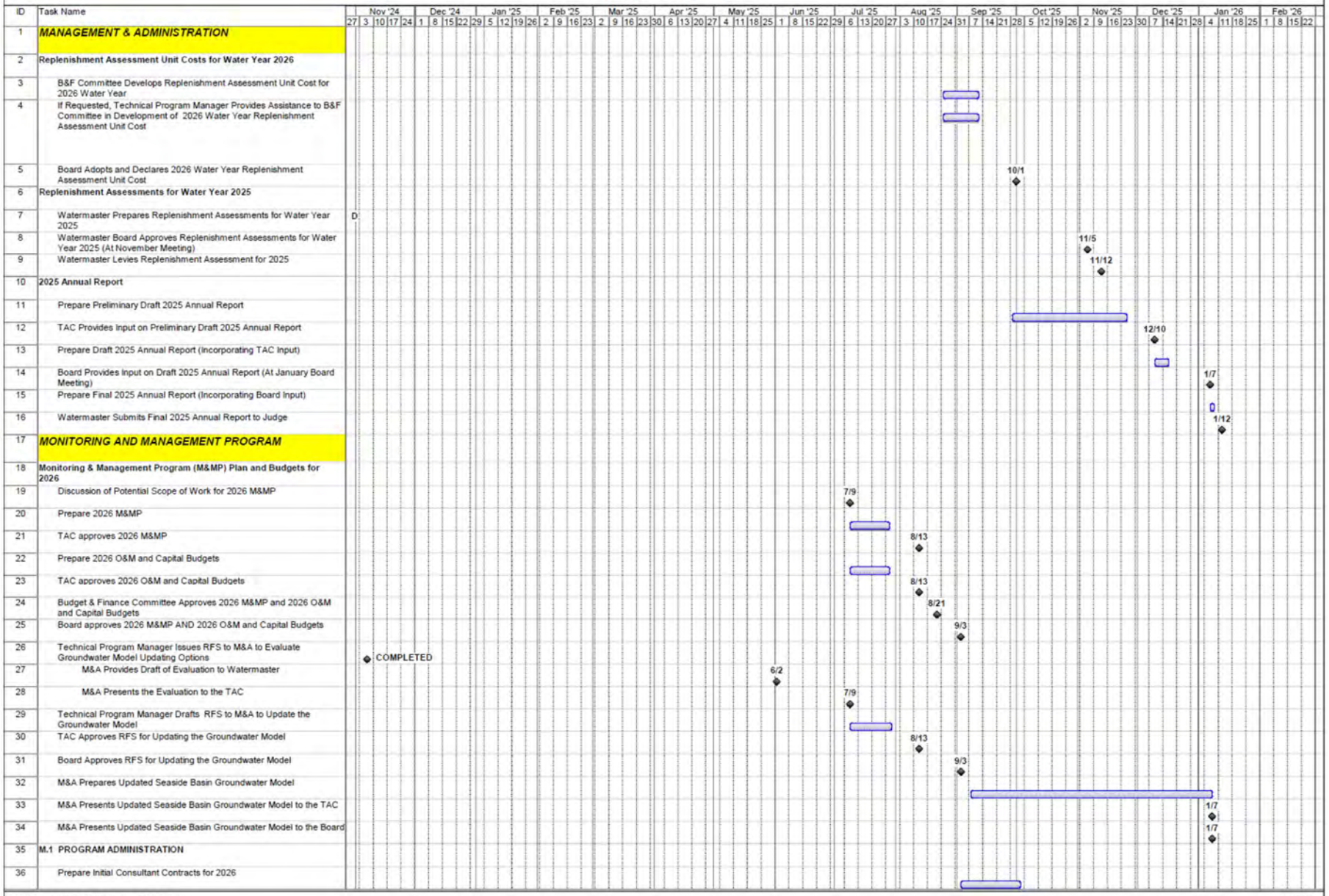
MEETING DATE:	February 12, 2025
AGENDA ITEM:	7
AGENDA TITLE:	Schedule
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:
As a regular part of each monthly TAC meeting, I will provide the TAC with an updated Schedule of the activities being performed by the Watermaster, its consultants, and the public entity (MPWMD) which are performing certain portions of the work.

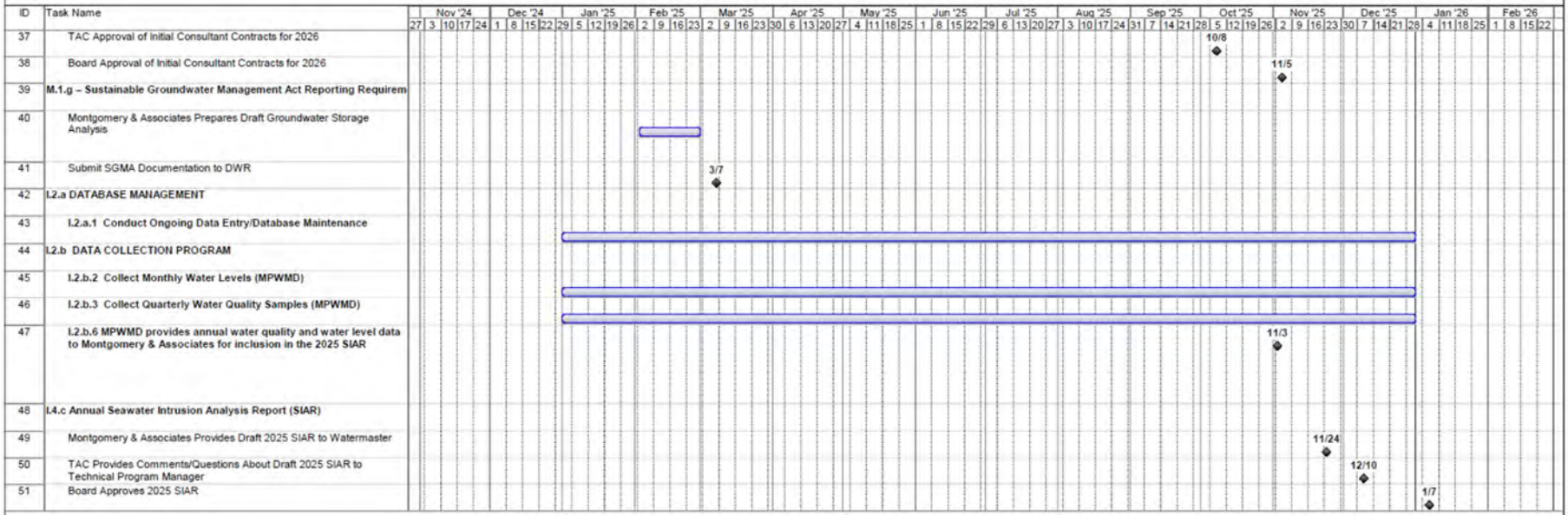
Attached is the updated schedule for 2025 activities,

ATTACHMENTS:	Updated Schedule of 2025 Activities
RECOMMENDED ACTION:	Provide Input to Technical Program Manager Regarding Any Corrections or Additions to the Schedule

Seaside Basin Watermaster
2025 Monitoring and Management Program
Work Schedule



Seaside Basin Watermaster
2025 Monitoring and Management Program
Work Schedule



SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	February 12, 2025
AGENDA ITEM:	8
AGENDA TITLE:	Other Business
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:
The "Other Business" agenda item is intended to provide an opportunity for TAC members or others present at the meeting to discuss items not on the agenda that may be of interest to the TAC.

ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only