



Supplement to 8/21/17 MPWMD Board Packet

Attached are copies of letters received between July 11, 2017 and August 11, 2017. These letters are listed in the August 21, 2017 Board packet under Letters Received.

| Author | Addressee | Date | Topic |
|----------------------|------------------|-------------|--|
| Robert S. Jaques | David Stoldt | 7/12/17 | Recalibration and Updating of Seaside Groundwater Basin Model |
| Julie Vance | David Stoldt | 7/19/17 | Carmel River Lagoon Striped Bass Collection Coordination and Participation |
| Keith Van Der Maaten | David Stoldt | 7/24/17 | Results of Groundwater Data Collected by Helicopter |

file:///U:/staff/Boardpacket/2017/20170821/LettersRecd/LtrsRecd.docx

**Seaside Basin Watermaster
P.O. Box 51502
Pacific Grove, CA 93950
(831) 641-0113**

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JUL 17 2017

MPWMD

July 12, 2017

Monterey Regional Water Pollution Control Agency
Attention: Mr. Paul Sciuto, General Manager
5 Harris Court, Building D
Monterey, CA 93940

Monterey Peninsula Water Management District
Attention: Mr. David Stoldt, General Manager
5 Harris Court, Building G
Monterey, CA 93940

Subject: Recalibration and Updating of Seaside Groundwater Basin Model

Dear Mr. Sciuto and Mr. Stoldt:

The Seaside Basin Watermaster is considering recalibrating and updating its Seaside Groundwater Basin Model in 2018. The Model was developed for the Watermaster by our consultant, HydroMetrics WRI, and was provided to you free-of-charge for your use in performing modeling studies for your Pure Water Monterey groundwater replenishment project.

Attached is a preliminary proposal from HydroMetrics to perform this work. The proposal provides an explanation of why this work needs to be performed, and includes a preliminary estimate of approximately \$46,000 to do this work (Task 1 of their proposal).

Because the Pure Water Monterey project will need to use the Model for further studies and reporting purposes, the Watermaster's Board of Directors believes it would be appropriate for your entities to share in the cost of recalibrating and updating the Model.

This letter is a request that you provide the Watermaster with an indication of your willingness to share in these costs. Over the next two months we will be developing a firm scope-of-work and cost to have HydroMetrics perform this work, and will be presenting it our Board for approval at their October 2017 meeting.

If you have any questions regarding this request, please contact me at (831) 375-0517 or by email at bobj83@comcast.net.

Sincerely,



Robert S. Jaques
Technical Program Manager

1814 Franklin St., Suite 501
Oakland, CA 94612

Mr. Robert S. Jaques
Seaside Groundwater Basin Watermaster
83 Via Encanto
Monterey, CA 93940

March 24, 2017

Subject: Scope and Cost to Update the Seaside Basin Management Action Plan

Mr. Jaques:

Thank you for the opportunity to provide you with this scope and cost to update the Seaside Groundwater Basin's Basin Management Action Plan (BMAP). The scope we have put together addresses the BMAP items that were presented at the February 2017 Technical Advisory Committee meeting.

The Watermaster's first BMAP was completed in February 2009 (HydroMetrics LLC, 2009a). The BMAP constitutes the basic plan for managing the Seaside Groundwater Basin. The BMAP identifies both short-term actions and long-term strategies intended to protect the groundwater resource while maximizing the beneficial use of groundwater in the basin. It provides the Watermaster a logical set of actions that can be undertaken to manage the basin to its Safe Yield. Over the eight years since the BMAP was completed, the Watermaster has collected much groundwater level and quality data, and conducted various studies to improve the understanding of the basin. This improved understanding should be incorporated into an updated BMAP to facilitate ongoing responsible management of the groundwater resource.

At the time the 2009 BMAP was prepared, a groundwater model had not yet been developed for the basin, and the analysis contained in the BMAP was completed using analytical methods. Following the BMAP recommendation that a groundwater model be constructed to assist with groundwater management decisions, a calibrated model was completed in November 2009 (HydroMetrics LLC, 2009b). The model simulated

groundwater conditions in the basin between January 1987 and December 2008. In 2014, the model was updated with data through September 2013 (HydroMetrics WRI, 2014) but not recalibrated because its accuracy was still acceptable. The 2014 update found that the uncalibrated portion of the model (January 2009 – September 2013) tended to simulate higher groundwater levels than measured levels. Periodic recalibration of the model is necessary to ensure the model simulates groundwater levels within an acceptable industry standard accuracy. If simulated groundwater levels are not accurate this reduces the accuracy of all output from the model such as groundwater storage and water budget.

The scope of work provided below assumes the model will be used to develop estimates of groundwater storage, water budget, and safe yield; and to test impacts of potential management actions. The groundwater model was developed to assist in making basin management decisions, and for providing the simulated results that are required for analysis in the BMAP. As the model currently only includes input data through September 2013, groundwater storage, water budget, and safe yield estimates can only reliably be obtained from the model up through Water Year 2013. The model needs to be updated through Water Year 2016 to be used for current estimates. It is likely recalibration of the model will be required so that it more accurately simulates the historic low groundwater levels currently occurring in the basin.

The scope outlined below starts with an update and recalibration of the groundwater model, and then generally updates each of the main sections of the BMAP.

Task 1: Update Seaside Basin Groundwater Flow Model.

Subtask 1.1. Update Model Input Data.

Groundwater production, groundwater levels, injected water, and precipitation data will be sourced and compiled for input into the groundwater model. In addition to precipitation, estimates of storm water percolation, septic tank leakage, and system losses are also needed as they all contribute to the recharge of the basin. Most data are already available from MPWMD or Watermaster, but some other pumpers such as Cal Water Service and Marina Coast Water District, which do not fall under the Watermaster will be contacted for their data.

The updated model input data will be incorporated into the groundwater model. Once the model has been updated and is successfully running, hydrographs comparing measured and simulated groundwater levels will be prepared. The hydrographs produced will be the same ones used in the 2009 model report.

Subtask 1.3. Model Recalibration.

Model calibration is a process that involves varying relatively uncertain and sensitive parameters such as horizontal and vertical hydraulic conductivities, over a reasonable range of values. Calibration will be completed when simulated results match the measured data within an acceptable measure of accuracy, and when successive calibration attempts do not notably improve the calibration statistics. Estimating the effort involved in model calibration is difficult because there is no defined set of steps that can be followed. The costs provided with this scope reflect our best estimate, but additional costs may be necessary to complete calibration successfully.

Subtask 1.4. Model Update Technical Memorandum.

A Draft Technical Memorandum will be prepared documenting the model update and calibration results. After presenting the Tech Memo to the TAC and receiving comments, a Final Tech Memo will be prepared for submission to the Board. For purposes of the cost estimate, we have assumed HydroMetrics WRI will present the findings to the TAC and to the Board. One presentation will be in-person and one will be by telephone.

Task 2: Update BMAP Section 2 - State of the Seaside Groundwater Basin.

Subtask 2.1. Update Basin Conceptual Model. Since the 2009 BMAP was completed, a significant amount of modeling has been undertaken that has assisted in improving our hydrogeologic understanding of the basin. In particular, it has been found that the northern and eastern boundaries of the basin are dynamic and therefore change depending on pumping and recharge conditions. How this affects the movement of groundwater across the boundaries is important for managing the basin's groundwater resource.

Subtask 2.2. Analyze Groundwater Levels Trends. Since 2009, eight years of groundwater level data have been collected, some of it using data loggers that record groundwater levels multiple times a day. This has allowed us to vastly improve our understanding of both seasonal and long-term trends. The basin has also experienced a recent drought and Court-mandated pumping reductions. How groundwater levels have responded to these changes has also improved our understanding of the basin. Furthermore, protective groundwater elevations developed after the 2009 BMAP should be included and discussed in an updated BMAP.

Subtask 2.3. Update Estimates of Groundwater Storage. The updated BMAP will include updates of estimated total stored groundwater, usable storage space, and total useable storage space. The Watermaster is required under the Decision to recalculate Total Usable Storage Space and adjust the allocation as needed.

The groundwater model and protective groundwater elevations should be used to quantify these storage estimates for the Seaside Basin. The 2009 BMAP did not have the benefit of site specific protective elevations and thus used Ghyben-Herzberg generated elevations. This updated BMAP will instead use protective elevations developed using groundwater models that estimate onshore groundwater elevations that keeps the productive onshore aquifers fresh (HydroMetrics LLC, 2009b).

Subtask 2.4. Update Groundwater Budget. A current groundwater budget should be developed to enhance our understanding of the groundwater system. Similar to Subtask 2.3, the groundwater budget can be readily generated from groundwater model output. However, the groundwater model needs to be updated through September 2016 and recalibrated for it be used reliably to evaluate the current and historical water budget.

Subtask 2.5. Review Natural Safe Yield Estimates. The State of California has experienced a recent drought which has impacted natural aquifer recharge more than was anticipated in the 2009 BMAP. Also, even though pumping in recent years has been below the amounts required under the Decision, groundwater levels have continued to fall. This suggests that the Natural Safe Yield of 3,000 AFY in the Decision may be too high.

The water budget for each subarea together with the Zero Net Draft method of estimating Safe Yield will be used to reevaluate the Natural Safe Yield. The Zero Net Draft method relies on selecting a historical period of time that has the same starting and end mean depth to groundwater and comparing it to groundwater production for the same period. The groundwater production during that period can be considered a measure of the safe yield.

The reevaluated Safe Yield will be compared against other Safe Yield estimates that were included in the 2009 BMAP. If appropriate, a revised Safe Yield to replace the Decision-established Natural Safe Yield of 3,000 AFY will be provided for basin management purposes.

Task 3: Update Section 3 – Supplemental Water Supplies.

This section will be updated with current information on projects being considered to meet the long-term water needs in the Seaside Basin. Included will be MRWPCA's Pure Water Monterey groundwater replenishment project and Cal Am's Monterey Peninsula Water Supply Project (MPWSP). Recent Environmental Impact Reports will be used to update the information. If any other projects are in early planning stage, they will also be included in the update.

Task 4: Update Section 4 – Groundwater Management Actions.

This section will be updated to reflect actions and interim water supplies that have already been implemented, eliminate actions that are no longer viable, and add potential future actions and interim water supplies that could be implemented to address basin imbalances in the short-term before the long-term supply projects in Section 3 of the BMAP can be permitted, built and operated.

An example of a local management action would be to identify optimal extraction well locations such that those wells can make more efficient use of useable stored groundwater. The groundwater model is the most appropriate tool for this as it is able to simulate cumulative impacts by taking into account long-term projects and any other short-term projects while optimizing well locations.

It is beyond the scope of the BMAP update to prepare preliminary costs for potential future actions and interim water supplies. However, as cost is an important factor in deciding which actions to pursue, the Watermaster may need to engage a financial expert to provide preliminary cost estimates for those actions that do not already have cost estimates associated with them.

Task 5: Update Section 5 – Recommended Management Strategies.

After developing the groundwater management actions, we will present the results to the TAC with the purpose of soliciting input that will allow each action to be ranked in order of preference. The top actions will become recommended management strategies that the Watermaster should consider going forward.

Task 6: Prepare Draft, Final Draft and Final Updated BMAP.

A Draft Updated BMAP will be prepared that follows the format of the 2009 BMAP. After the TAC has reviewed the Draft Updated BMAP, comments received will be incorporated into a Final Draft Updated BMAP that will be presented to the Board. If comments are received from the Board, these will be included in a Final Updated BMAP. Up to 15 bound hardcopies will be provided to the Watermaster. We assume that HydroMetrics WRI will attend one TAC and one Board meeting in person to present the Updated BMAP.

Estimated Budget

The total cost to update and recalibrate the groundwater model through September 2016, and to update the BMAP is provided in Table 1.

Schedule

We expect it will take six weeks to develop the automated model update system and to update and recalibrate the groundwater model.

The Updated BMAP draft can be completed in approximately six weeks after the model update.

References

HydroMetrics LLC. 2009a. Basin Management Action Plan. Seaside Groundwater Basin, Monterey County, California, prepared for Seaside Groundwater Basin Watermaster. February.

HydroMetrics LLC. 2009b. Seaside Groundwater Basin Modeling and Protective Groundwater Elevations, prepared for Seaside Groundwater Basin Watermaster. November.

HydroMetrics WRI. 2014. Technical Memorandum – 2014 Seaside Groundwater Model Update, prepared for Seaside Groundwater Basin Watermaster. July 31.

Please call if you have any questions.

Sincerely,



Georgina King
Principal Hydrogeologist
HydroMetrics Water Resources Inc.

| Tasks | Hydro Metrics WRI Labor | | | | Labor Total | | Other Direct Costs | TOTALS |
|--|-------------------------|----------------|---------------|----------------|-------------|--------|--------------------|--------|
| | Derrick Williams | | Georgina King | | Hours | (\$) | | |
| | Principal | Hydrogeologist | Principal | Hydrogeologist | | | | |
| | \$220 | \$195 | \$130 | | | | | |
| Task 1: Update Groundwater Model & Recalibrate | | | | | | | | |
| Subtask 1.1. Update Model Input Data | 8 | 24 | 40 | 72 | \$ 11,640 | \$ | \$ 11,640 | |
| Subtask 1.2. Model Recalibration | 40 | 8 | 90 | 138 | \$ 22,060 | \$ | \$ 22,060 | |
| Subtask 1.3. Model Update and Recalibration Technical Memorandum | 12 | 28 | 32 | 72 | \$ 12,260 | \$ 200 | \$ 12,460 | |
| Subtask 2: Update Base Flow Section 2 - Data of the Reservoir and Groundwater Baseflow | 60 | 60 | | 120 | \$ 38,200 | \$ 300 | \$ 38,500 | |
| Subtask 2.1. Update Basin Conceptual Model | 1 | 8 | 2 | 11 | \$ 2,040 | \$ | \$ 2,040 | |
| Subtask 2.2. Analyze Groundwater Levels Trends | 1 | 16 | 4 | 21 | \$ 3,960 | \$ | \$ 3,960 | |
| Subtask 2.3. Update Estimates of Groundwater Storage | 4 | 4 | 16 | 24 | \$ 3,740 | \$ | \$ 3,740 | |
| Subtask 2.4. Update Groundwater Budget | 4 | 4 | 16 | 24 | \$ 3,740 | \$ | \$ 3,740 | |
| Subtask 2.5. Review of Natural Safe Yield Estimates | 4 | 10 | 16 | 30 | \$ 4,910 | \$ | \$ 4,910 | |
| Task 3: Update Base Flow Section 3 - Application of Model Outputs | 4 | 42 | 20 | 66 | \$ 23,200 | \$ | \$ 23,200 | |
| Task 4: Update Base Flow Section 4 - Groundwater Management Activities | 2 | 20 | 12 | 34 | \$ 7,220 | \$ | \$ 7,220 | |
| Task 5: Update Base Flow Section 5 - Recommendation Management Strategies | 4 | 10 | 0 | 14 | \$ 2,850 | \$ | \$ 2,850 | |
| Task 6: Prepare Draft Final Report and Final SOW | 0 | 60 | 30 | 90 | \$ 31,200 | \$ 600 | \$ 31,800 | |
| TOTAL for GROUNDWATER MODEL UPDATE | 60 | 60 | 182 | 282 | \$ 48,960 | \$ 200 | \$ 49,160 | |
| TOTAL for GRASP UPDATE | 35 | 128 | 98 | 245 | \$ 43,260 | \$ 850 | \$ 44,110 | |
| TOTAL | 96 | 188 | 240 | 524 | \$ 89,240 | \$ 800 | \$ 90,040 | |

Notes:

Other direct costs include travel expenses, office supplies, photocopies, postage, and equipment rental



State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Central Region
1234 East Shaw Avenue
Fresno, CA 93710
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



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July 19, 2017

Mr. Dave Stoldt
General Manager
Monterey Peninsula Water Management District
Post Office Box 85
Monterey, CA 93942-0085

Dear Mr. Stoldt:

Re: Carmel River Lagoon Striped Bass Collection Coordination and Participation

As you are aware the Department planned and partnered with your agency on the above referenced project. Unable to conduct seining in the closed lagoon on July 11, 2017, we were able to conduct one seine haul on July 12, 2017 under near perfect lagoon conditions. Throughout out the planning staff coordinated with Mr. Kevan Urquhart of your staff to determine the optimal conditions for this activity. In addition, at the Department's request your fisheries staff provided essential and invaluable labor and resources for this effort.

I would like to take this opportunity to thank you for allowing your staff (Kevan Urquhart, Cory Hamilton, Daniel Atkins, Matt Lyons, and Mark Bekker) to participate in this event. In addition I would like to thank you for providing District equipment.(e.g. ATV, seine, boat, etc.) for this effort. Without the District's cooperation and coordination, the event would not have been executed as efficiently as it was. We were able to remove 62 striped bass from the lagoon and released 16 heathy steelhead smolts.

If you have any questions, you may reach me at (559) 243-4005, Ext. 154 or you may contact Margaret Paul, Senior Environmental Supervisor, by phone at (831) 649-2882, or by email at margaret.paul@wildlife.ca.gov.

Sincerely,

Julie Vance
Regional Manager

ec: Dean Marston
Margaret Paul
Dennis Michniuk



MARINA COAST WATER DISTRICT

11 RESERVATION ROAD, MARINA, CA 93933-2099

Home Page: www.mcwd.org

TEL: (831) 384-6131 FAX: (831) 883-5995

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JUL 28 2017

MPWMD

July 24, 2017

Dave Stoldt, General Manager
Monterey Regional Water Management District
5 Harris Court, Building G
Monterey, CA 93940

Subject: Results of Groundwater Data Collected by Helicopter

Dear Mr. Stoldt,

MCWD engaged Stanford University's Department of Geophysics to map the groundwater aquifers that supply 100% of our water to better understand the complicated geology in and around the District's service area and the extent to which seawater has or has not intruded into the aquifers. In May, you may recall helicopters flying over our region collecting data. Using airborne electromagnetic (AEM) survey equipment, researchers were able to send electrical impulses 1,000 feet into the ground to develop an extensive 3-D model of our groundwater basins. By collecting 375 miles of data, we will have a much more complete picture to guide future decisions.

I encourage you to attend the **August 7th joint MCWD/GSA Board meeting** where a presentation will be given on the initial results and analysis. The data generated from this important study will inform the development of our Groundwater Sustainability Plan and serve as a critical baseline to measure the progress of reaching sustainability goals and meeting the requirements of the Sustainable Groundwater Management Act. This study also provides additional information on the groundwater impacts from the proposed Monterey Peninsula Water Supply Project. Those impacts and the existing groundwater conditions south of the Salinas River were inadequately addressed in the CPUC's DEIR/EIS released earlier this year.

MCWD/GSA Joint Board Meeting

August 7, 2017

6:30 p.m.

Marina City Council Chambers

211 Hillcrest Avenue

Marina, California

I hope you will consider attending our meeting to learn more.

Regards,

Keith Van Der Maaten, General Manager