

SEASIDE BASIN WATERMASTER  
REQUEST FOR SERVICE

DATE: September 5, 2013

RFS NO. 2013-04

(To be filled in by WATERMASTER)

TO: Derrick Williams  
HydroMetrics LLC WRI  
PROFESSIONAL

FROM: Robert Jaques  
WATERMASTER


**Services Needed and Purpose:** Perform groundwater modeling on, and prepare certain analyses of, the Laguna Seca Subarea (see detailed Scope of Work in Attachment 1).

**Completion Date:** All work of this RFS shall be completed not later than 60 days from the date of execution of this RFS No. 2013-04, or 30 days after receipt of the data to be provided through the Watermaster by MPWMD (as described in Attachment 1), whichever is later.

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

**Total Price** Authorized by this RFS: \$ 25,060.00 (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:   
WATERMASTER Technical Program Manager

Date: 9/5/13

Authorized by:   
WATERMASTER Chief Executive Officer

Date: 9/19/13

Agreed to by:   
PROFESSIONAL

Date: 9-05-2013

# ATTACHMENT 1



519 17<sup>th</sup> Street, Suite 500  
Oakland, CA 94612

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Mr. Robert S. Jaques, Technical Program Manager  
Seaside Basin Watermaster  
83 Via Encanto  
Monterey, CA 93940

July 18, 2013

Subject: Scope and Cost Estimate to Model Laguna Seca Operational Changes and Determination of Natural and Operational Safe Yield

Dear Mr. Jaques:

HydroMetrics Water Resources Inc. is pleased to submit this scope and cost estimate for using the Seaside groundwater model to determine impacts to the Laguna Seca subarea from pumping changes, and to estimate the Natural Safe Yield and Operational Safe Yield of the subarea. The sections below outline the approach to be taken in this work for the Seaside Watermaster Technical Advisory Committee (TAC).

## **Task 1. Groundwater Modeling**

### **SUBTASK 1.1 CAL-AM DISCONTINUES LAGUNA SECA PUMPING**

The first modeling task will be to model the influence of discontinuing pumping from California American Water (Cal-Am) wells in the Laguna Seca subarea. The impacts of this operational change will be evaluated by plotting hydrographs of several key wells in the subarea to determine whether the current groundwater elevation declines stop or are altered in any way.

### **SUBTASK 1.2 ESTIMATE LAGUNA SECA NATURAL SAFE YIELD**

The second modeling task will be to determine the Natural Safe Yield of the Laguna Seca subarea. The Natural Safe Yield is the amount of groundwater that

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can theoretically be extracted from a basin without causing adverse environmental effects. We will meet with the TAC to define adverse impacts. These impacts may include reduced subsurface outflows from the Laguna Seca subarea or reduced streamflows. The Natural Safe Yield will be determined as:

$$\text{Natural Safe Yield} = \text{Aerial Recharge} + \text{Subsurface Inflow} \\ - \text{Required Subsurface Outflow} - \text{Required Streamflow}$$

Unless otherwise directed by the TAC, the latest baseline used for the recent coastal injection modeling will be used as the model run from which to estimate aerial recharge and subsurface inflow.

### **SUBTASK 1.3 ESTIMATE LAGUNA SECA OPERATIONAL SAFE YIELD**

The Operational Safe Yield is a preferable estimate of safe yield over Natural Safe Yield because it acknowledges that not all groundwater left in the basin after recharges and discharges are taken into account can be physically and realistically extracted by production wells. The amount of groundwater that can be extracted safely is a function of the wells' physical locations, and well screen and pump depths. Groundwater levels dropping below a well's screen or pump intake could cause damage to the well and/or pump.

The third modeling task estimates the Operational Safe Yield of the Laguna Seca subarea. This will be achieved by starting with the Natural Safe Yield model run obtained in the previous subtask. Using this model run as a basis, the amount of pumping in existing wells will be reduced iteratively until:

- 1) Groundwater levels stop declining,
- 2) Pumping groundwater levels remain above the well pump intake and top of screen for each well,
- 3) Subsurface outflows set in Task 1.2 are achieved, and
- 4) Streamflows set in Task 1.2 are achieved.

Our cost estimate only includes time for modeling and does not include collecting pumping drawdown, screen and pump data on each production well. We recommend that Monterey Peninsula Water Management District collect and compile the screen depth, pump depth, and pumping drawdown together with the pump rate at the time drawdown is measured for each well in the subarea. Because the model only works with static groundwater levels, the pumping drawdown will be added to the model predicted groundwater level depths to get

the "predicted" pumping groundwater depth. The pumping groundwater depth will be used to determine if the pumping groundwater level is reaching the top of the well screen or the pump intake.

## Task 2. Meetings

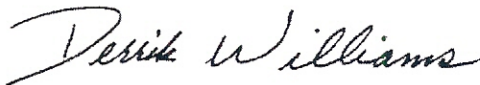
We will prepare for and attend three meetings: the first will be by telephone to finalize the modeling assumptions; the second meeting will be to present the results to the Technical Advisory Committee in person, and the third meeting will be to present results to the Watermaster Board in person.

## Task 3. Reporting

A summary technical memorandum will be prepared to document the assumptions and results of the modeling effort.

The estimated cost for the work discussed is \$25,060, as shown on the attached table.

Sincerely,



Derrick Williams, President  
HydroMetrics Water Resources Inc.



Georgina King, Project Manager  
HydroMetrics Water Resources Inc.

**Cost Estimate for Seaside Groundwater Basin Watermaster  
Laguna Seca Modeling**

Tasks	Rates	HydroMetrics WRI Labor					Labor Total (\$)	Other Direct Costs (\$)	TOTALS (\$)
		Derrick Williams President	Georgina King Senior Hydrogeologist	Stephen Hundt Staff Hydrogeologist	Hours				
		\$190	\$160	\$115					
Task 1. Groundwater Modeling									
1.1 Cal-Am discontinues Laguna Seca pumping	2	1	8	11		\$ 1,460	\$ -	\$ 1,460	
1.2 Estimate Laguna Seca Natural Safe Yield	4	8	16	28		\$ 3,880	\$ -	\$ 3,880	
1.3 Estimate Laguna Seca Operational Safe Yield	4	16	32	52		\$ 7,000	\$ -	\$ 7,000	
<i>Subtotal Task 1</i>				91		\$ 12,340	\$ -	\$ 12,340	
Task 2. Meetings									
Assume Three Meetings - First meeting to finalize model assumptions (telephone), Second to Present Results to TAC (Seaside) and, Last to Present Results to Board (Seaside)	20	8	0	28		\$ 5,080	\$ 280	\$ 5,360	
<i>Subtotal Task 2</i>				28		\$ 5,080	\$ 280	\$ 5,360	
Task 3. Reporting									
Prepare Technical Memorandum describing Assumptions and Results (Provide as MS Word and PDF)	4	24	24	52		\$ 7,360	\$ -	\$ 7,360	
<i>Subtotal Task 3</i>				52		\$ 7,360	\$ -	\$ 7,360	
<b>TOTAL</b>				171		\$ 24,780	\$ 280	\$ 25,060	

Notes

Other Direct Costs includes mileage, postage, office supplies

Estimate for MPWMD to collect and compile the screen depth, pump depth, and current pumping and static groundwater level data for each well in the Laguna Seca subarea

to be provided

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