SEASIDE BASIN WATERMASTER

ANNUAL REPORT – 2009

Integral to the Superior Court Decision (Decision) rendered by Judge Roger D. Randall on March 27, 2006 is the requirement to file an Annual Report. The ruling of the Court requires that the Annual Report be prepared and filed with the Court and mailed to all the parties on or before the 15th day of November every year for the preceding Water Year. This 2009 Annual Report is being filed on or before November 15, 2009, consistent with the provisions of the Decision. This Annual Report addresses the specific Watermaster functions set forth in Section III. L. 3. x. of the Decision. In addition this Annual Report includes a section pertaining to Water Quality Monitoring and Basin Management.

A. Groundwater Extractions

The schedule summarizing the Water Year 2008-2009 groundwater production from all the producers allocated a Production Allocation in the Seaside Groundwater Basin is provided in Attachment 1, "Seaside Groundwater Basin Watermaster, Reported Quarterly and Annual Water Production From the Seaside Groundwater Basin for all Producers Included in the Seaside Basin Adjudication During Water Year 2009." For the purposes of this Annual Report the Water Year is defined as beginning October 1, 2008 and ending on September 30, 2009.

B. Groundwater Storage

Monterey Peninsula Water Management District (MPWMD), in cooperation with California American Water (CAW), operated the Seaside Basin Aquifer Storage and Recovery (ASR) testing program during Water Year (WY) 2008-2009. During WY 2008-2009, a total of 182 acre-feet (AF) of water was diverted by CAW from its Carmel River sources during periods of flow in excess of NOAA-Fisheries' recommended bypass flows, transported through the existing CAW distribution system for injection and storage in the Seaside Basin at the MPWMD's ASR Well No. 1 (formerly known as the Santa Margarita Test Injection Well) located on former Fort Ord property. This is the only reported storage of non-native groundwater into the Seaside Basin in WY 2009.

Also during WY 2008-2009, MPWMD and Cal-Am proceeded with planning and construction of facilities to allow the Phase 1 ASR Project to operate at its full design capacity of 3,000 gallons per minute (13 acre-feet per day) in WY 2009-2010. This work included final underground utility pipeline installation at the ASR site and upsized delivery pipelines to the site from the Cal-Am system. In addition, the MPWMD is proceeding with installation of a dedicated offsite monitor well to collect water quality information associated with the ASR project. Results from this installation will also benefit the Watermaster's monitoring and management program and the groundwater modeling work that is currently underway.

Based upon production reported for WY 2008-2009, the following Standard Producers are entitled to Free and Not-Free Carryover Credits in accordance with the Decision, Section III. H. 5. for WY 2010:

Producer	Free Carryover Credit	Not-Free Carryover Credit
California American	00.0 acre-feet	495.9 acre-feet
Granite Rock	40.4 acre-feet	50.5 acre-feet
DBO Development	91.6 acre-feet	101.0 acre-feet

C. Amount of Artificial Replenishment, if any, performed by Watermaster

No Artificial Replenishment of water was performed by the Watermaster for WY 2008-2009.

D. Leases or sales of Production Allocation

One sale of Production Allocation occurred during WY 2008-2009. This was the sale of 10 AF of "free" carryover credit from the Standard Production Allocation of Granite Rock to the City of Seaside for WY 2008-2009. The Watermaster CEO approved this sale via its letter July 29, 2009, in accordance with Rule 9.0 of the Watermaster's Rules and Regulations. Other than this, there have been no water leases or sales during WY 2008-2009.

E. Use of imported, reclaimed, or desalinated Water as a source of Water for Storage or as a water supply for lands overlying the Seaside Basin

Other than the water imported from the Carmel Basin for the ASR program described in **Section B** above, no imported, reclaimed or desalinated water use (either direct or for storage in the groundwater basin) has been reported to the Watermaster during WY 2008-2009.

F. Violations of the Decision and any corrective actions taken

Section III. D. of the Decision enjoins all Producers from any Over-Production beyond the Operating Yield in any Water Year in which the Watermaster declares that Artificial Replenishment is not available or possible. Section III. L. 3. j. iii. requires that the Watermaster declare the unavailability of Artificial Replenishment prior to the beginning of the Water Year so that the Producers are informed of the prohibition against pumping in excess of the Operating Yield.

The Watermaster made this declaration regarding the unavailability of Artificial Replenishment for WY 2008-2009 at its Board meeting of May, 2009. The Watermaster originally intended to issue this declaration in January, 2009. However, serious negotiations had begun prior to that between the City of Seaside and the Marina Coast Water District (MCWD) with the intention of obtaining in-lieu replenishment water from MCWD to use for irrigation of the Seaside Golf Courses. The intent of such an arrangement would have been to reduce pumping from the Seaside Groundwater Basin by providing irrigation water from the MCWD system, which draws its water from outside the Seaside Basin, to be used in lieu of the City's adjudicated groundwater rights for the golf courses. With the anticipation that these negotiations would soon be successful, the Watermaster Board temporarily deferred making this declaration.

However, by May 2009 it was apparent that even though these negotiations continued, it was very unlikely that any in-lieu replenishment water would be available during Water Year 2008-2009. Consequently, the Watermaster Board made this declaration at its meeting of May 6, 2009. In conjunction with making this declaration, the Watermaster reduced the original production allocations by 7.5%, as required under Section III.B.2 of the Decision (7.5% rather than 10%, since only three-fourths of the Water Year remained when this first reduction was imposed). In Water Year 2009-2010 this reduction will be increased to the full 10% required under that Section of the Decision. A copy of this declaration is contained in Attachment 2. Subsequent to the issuance of the May declaration, the Watermaster staff, working with attorneys from some of the Producers, revised the method of calculating carryover credits. As a result, the Board issued a revised declaration at its August 25, 2009 meeting. A copy of the revised declaration, along with the Board agenda packet which describes the revisions to the carryover credit calculation process, is also contained in Attachment 2.

Negotiations are continuing between the City of Seaside and MCWD with respect to water supply for the Seaside in lieu replenishment program for the Bayonet and Blackhorse golf courses. The Watermaster also recently entered into a memorandum of understanding with the City for the program whereby the City would be afforded a credit against its replenishment assessment liability in exchange for undertaking the proposed in lieu replenishment on behalf of Watermaster. This MOU is attached as Attachment 3. We anticipate that this program will commence operation within Water Year 2009-2010.

Total pumping for WY 2008-2009 did not exceed the Operating Yield (OY) for the Seaside Basin, but it did exceed the Natural Safe Yield (NSY) of the Basin.

CAW and the City of Seaside reported annual pumping quantities that exceeded their Standard Production NSY allocations by 1,241.3 and 131.3 acre-feet, respectively, and the City of Seaside's reported annual pumping quantity exceeded its OY 21.7 acre-feet. The City of Seaside also reported annual pumping quantities that exceeded its Alternative Production NSY by 22.9 acre-feet. The Watermaster has assessed CAW and the City of Seaside Replenishment Assessments for these over productions, as further described in **Section H**, below.

G. Watermaster administrative costs

The total estimated Administrative costs for Fiscal Year 2009 amounted to $90,000.00. This included the cost of maintaining an office and paying a part time administrator and some part time staff to take and transcribe minutes of the Watermaster Board meetings during 2009. The "Fiscal Year 2009 Administrative Fund Report" is provided as Attachment 4.

H. Replenishment Assessments

A Replenishment Assessment of $3,040 per acre-foot was established by the Watermaster Board at its October, 2008 meeting for use against Water Year 2008-2009 pumping. At its meeting of October, 2009 the Watermaster Board established a Replenishment

Assessment of $2,780 per acre-foot for use against Water Year 2009-2010 pumping. The calculations showing how this unit cost was arrived at are contained in Attachment 5.

During 2009 revisions were made to the method of calculating replenishment assessments. The following is a description of those revisions: CAW and the City of Seaside, in a joint memorandum dated December 5, 2008, included in Attachment 6, contended that Watermaster (a) had incorrectly calculated the NSY for Standard Producers because of an incorrect accounting of Carryover Credits, and (b) had incorrectly assessed for Operating Yield overproduction twice (one time as Overproduction and a second duplicative assessment for Operating Yield overproduction.).

In calculating the annual share of NSY for Standard Producers, Watermaster had in the past included carryover credits in its calculations. As a result of discussions with the City of Seaside and CAW in response to their December 5, 2008 joint memorandum, the Watermaster revised its method of calculating and accounting for each Standard Producer's share of the NSY, so that each Standard Producer's share of the NSY is kept separate and distinct from that Standard Producer's accumulated Carryover Credits. Therefore, the percentage of NSY available to Standard Producers is no longer impacted by the quantity of Carryover Credits any party has accumulated. Watermaster also determined that it had previously assessed duplicative assessments for Operating Yield Overproduction in the Replenishment Assessments charged to CAW and the City of Seaside. Watermaster also determined that Overproduction by Alternative Producers would be assessed only for that production in excess of the party's Alternative Production Allocation.

Watermaster also determined that Carryover Credits will be accounted for in two categories as follows:

(1) Carryover Credit that was part of the SPA producer's share of the NSY (i.e. "free production"), for which no replenishment assessment would have been paid had the water been produced rather than carried over, will be accounted for as a "free" Carryover Credit. No replenishment assessment will be assessed upon water extracted pursuant to this category.

(2) Carryover Credit that was part of the SPA producer's Operating Yield Allocation, but in excess of the SPA Producer's share of the NSY for the year in which the credit accrued will be accounted for as "not-free" Carryover Credits. A replenishment assessment should be assessed against water extracted pursuant to this category because the SPA Producer would have incurred a replenishment assessment for this allocation had the water been produced rather than carried over.

Watermaster accounting of Replenishment Fund Assessments has been revised consistent with the accounting corrections made by Watermaster, and the revised amounts are presented in the columns of past year assessments, and in the estimated 2009 Replenishment Fund assessment balances in the proposed Replenishment Fund Budget, contained in Attachment 7. As discussed above, the unit cost of replenishment water per acre-foot for Water Year 2009-2010 was established by the Watermaster to be $2,780.

The 2010 Replenishment Fund Budget reflects an estimated amount of funds to be collected for Overproduction at the end of Water Year 2009-2010.

Alternative and Standard Producers report their production amounts from the Basin to the Watermaster on a quarterly basis. Based upon the reported production for WY 2008-2009, CAW's Replenishment Assessment for Overproduction in excess of its share of the NSY is $3,773,464. CAW did not incur any assessment for Operating Yield Over Production in WY 2008-2009. The City of Seaside's Replenishment Assessment for its Municipal System for Overproduction in excess of its share of the NSY is $399,211 and its Replenishment Assessment for Operating Yield Over Production is $66,090. The City of Seaside's Replenishment Assessment for its Golf Course System for production in excess of its Alternative Production Allocation is $69,701. A summary of the calculations for Replenishment Assessment for Water Year 2008-2009 is contained in Attachment 6.

I. All components of the Watermaster budget

The Watermaster budget has four separate funds: Administrative Fund; Monitoring & Management–Operations; Monitoring and Management–Capital Fund and; Replenishment Fund. Copies of the Fiscal Year 2010 adopted budgets are contained in Attachment 7. The Chief Executive Officer provides monthly financial status reports to the Watermaster Board on all financial activities for each month with year-to-date totals.

J. Water Quality Monitoring and Basin Management

Water Quality Analytical Results

Groundwater quality data continued to be collected and analyzed on a quarterly basis during WY 2008-2009 from the enhanced network of monitoring wells. During the year, a new low-purge sampling method was implemented to improve the efficiency of sample collection. In addition, quarterly geophysical (induction) logging continued to be performed at the four Watermaster Sentinel wells that were installed in 2007. The induction logging results have shown very little variations and no trends since this monitoring began, indicating that the coastal water quality conditions are not changing at this sample frequency. Therefore, the recommended logging frequency is scheduled to be reduced to semi-annually at these wells in 2010.

During WY 2008-2009 an additional existing monitoring well, formerly owned by the U.S. Army and subsequently transferred to the State of California Department of Parks and Recreation, was added to the monitoring well network. This was accomplished by the application for, and subsequent issuance of, permission from the Department of Parks and Recreation to use this well to collect water level and water quality data. This well is located in the Northern Coastal Subarea near the Main Gate entrance to the former Fort Ord, just west of State Highway 1.

Data from the new monitoring well on the State Department of Parks and Recreation site, designated MW-B-23-180, is being included in the Watermaster's database and will be used in future studies and evaluations of the Basin.

Copies of the sampling results are contained in Attachment 8. Analysis of the results indicate no evidence of water quality changes indicative of seawater intrusion at the locations and depths sampled in the coastal areas of the basin.

All of the recommendations contained in the report in Attachment 8 are being actively pursued by the Watermaster. Funds to pursue these recommendations have been included in the adopted FY 2010 budgets contained in Attachment 7.

Given the observed responses collected from the geophysical logging of the Watermaster's four Sentinel Wells since their construction in 2007, i.e., two years of quarterly data showing no trends or variations in the shapes of the induction log curves, beginning in Water Year 2009-2010 the Watermaster plans to reduce the frequency of this induction logging from quarterly to semi-annually. This is supported by one of the recommendations in the WY 2008-2009 Seawater Intrusion Analysis Report discussed later in this Section. This is more conservative than a reduction to an annual frequency, justification for which will likely be provided by the groundwater modeling effort that will be completed in the early part of WY 2009-2010. That work is expected to produce model calibration work suggesting there is not a direct hydraulic connection of the main aquifer unit (Santa Margarita Sandstone) to the ocean at the ocean/continental slope interface offshore. Until such justification for further reducing the frequency of induction logging becomes available, the switch to semi-annual (as opposed to annual) is a more protective and prudent approach for the Watermaster to take in its ongoing monitoring and management of the Basin. The frequency of water sample collection from the Sentinel Wells would remain the same, i.e. on an annual basis.

Construction of New Monitoring Well in the Northern Inland Subarea

Also during WY 2009 the process of obtaining right-of-way to install one or more additional monitoring wells in the northern inland subarea of the Basin was initiated. The two landowners of the most desirable sites for the purposes of installing monitoring wells, the U.S. Department of the Interior, Bureau of Land Management (BLM), and Monterey Peninsula College (MPC) were both contacted for this purpose. Both parties were receptive to the Watermaster's request for permission to install a monitoring well on their properties.

The Watermaster selected the BLM site as the preferred site for the first monitoring well, since a well (the Camp Huffman well installed by the U.S. Army) had once been in existence very near this site. Data from that well had been used to develop some of the hydrogeologic information about the Basin that was used in the Court Adjudication process and for other hydrogeologic studies in the Basin. Hydrogeologic data obtained from installing a new well at that location would be helpful in updating information and assumptions based on the former Camp Huffman well.

The MPC site will be considered when and if an additional monitoring well in this region of the Basin is determined to be necessary for Basin management purposes. The agreement with MPC gives the Watermaster until August 2011 to prepare a design of the

monitoring well for that site, and to submit it to MPC for their review prior to installing such a well.

In August 2009 construction of the new monitoring well on the BLM site was initiated. This monitoring well was to consist of three separate but adjacent boreholes, with each borehole penetrating to a different depth. However, difficulties were encountered when the drilling of the second borehole intersected the first borehole, causing irreparable damage to the first borehole. As a result, both boreholes had to be sealed and abandoned, and the well drilling operations moved to another site on the BLM property. After going through the process of obtaining the new right-of-way necessary for the new BLM well site, field work on drilling the monitoring well at the new location resumed on October 26, 2009. Due to right-of-way restrictions, the new location required the use of a nested well configuration, with only two casings installed within a single larger borehole, with each casing perforated at a different aquifer depth. Drilling of the new well and installation of the two casings was completed on November 3, and the installation of the seals for each of the casings was completed on November 6. Development of the wells occurred during the week of November 9. The consultant that is managing this work is preparing a report describing the construction, hydrogeologic findings, and initial water quality sampling results of this project. This report is expected to be completed in December, 2009. When it is completed the report will be posted to the Watermaster's website at: http://www.seasidebasinwatermaster.org/.

Basin Management Database

Groundwater resource monitoring within the Seaside Basin is currently being conducted by numerous entities. The programs consist of: Groundwater Production Monitoring, Groundwater Level Monitoring, and Groundwater Quality Monitoring.

For successful implementation of the Seaside Basin Monitoring and Management Plan (M&MP), pertinent historical groundwater resource data obtained from the above-mentioned programs has been consolidated into a database to allow more efficient organization and data retrieval. The consolidated database allows for simple identification of differences and discrepancies of datasets compiled by the numerous entities, and to identify data gaps. In addition, the consolidated database allows pertinent groundwater data to be efficiently organized, managed and housed in a single location to facilitate:

- Ongoing data collection
- Data storage and retrieval
- Distribution of basic data to Watermaster members and interested parties
- Preparation of annual and periodic reports to the Watermaster.

Characteristics of existing wells are notated in the database, including type, location, construction details and other pertinent information.

In 2009 initial internal testing and debugging of the Database was completed, and the Database was placed on the Watermaster's website for access by all interested parties.

Several User Access Levels were created to regulate access to the information contained in the Database, so that sensitive data such as existing well locations and well construction details are only accessible to Watermaster staff or consultants who need access to that data to perform their work.

The database is being used to compile the monitoring data that is acquired and to present it in a variety of ways for use in analyzing and interpreting the data for Basin management purposes. Funds are included in the 2010 M&MP Operations Budget to make enhancements to the Database, if these are found to be necessary or desirable.

Enhanced Monitoring Well Network

The Seaside Basin M&MP called for the development of an Enhanced Monitoring Well Network. The objective of the enhanced network is to fill in data gaps in the previous monitoring well network used by the Monterey Peninsula Water Management District (MPWMD), and others, in order to improve the Basin management capabilities of the Watermaster.

Attachment 9 to the 2007 Annual Report contained a report prepared by Mr. Joe Oliver of the MPWMD describing the recommended enhanced monitoring well network. As described in the table below, all of these recommendations have now been completed.

RECOMMENDATION FROM THE ENHANCED MONITORING WELL NETWORK REPORT	**WATERMASTER ACTION TAKEN IN RESPONSE TO THE RECOMMENDATION**
Required water level and water quality data has not been provided by some of the water producers in the basin, as required by the Court order. Action to remedy this situation should be taken as soon as possible.	In early 2008 the Watermaster implemented a process of notifying individual well owners of their data reporting obligations. As a result of implementing this process, all required data is now being provided on a regular basis, and is integrated into the Watermaster's database for use in managing the Basin and preparing reports.
At least one existing well in the Dune Sand/Aromas Sand aquifer in the Northern Coastal Subarea should be added to the monitoring well network. There are several candidate wells that would be suitable for this purpose.	During 2009 the Watermaster completed the process of acquiring an existing well in the Northern Coastal Subarea for use as a long-term monitoring well. This is further described in the *Water Quality Analytical Results* section of this report. In addition, in FY 2009 the Watermaster was completing construction of a new monitoring well in the inland area near the northern basin boundary. This is further

RECOMMENDATION FROM THE ENHANCED MONITORING WELL NETWORK REPORT	WATERMASTER ACTION TAKEN IN RESPONSE TO THE RECOMMENDATION
	described in the *Construction of New Monitoring Well in the Northern Inland Subarea* section of this report.
Seven additional existing wells elsewhere in the basin should be added to the monitoring network for water level data only.	These wells have been added to the Enhanced Monitoring Well Network and data from them is being compiled in the Watermaster's database.
Seven additional wells in the Laguna Seca Subarea should be added to the monitoring well network to increase the database of water quality information from this area. These are the York School, Laguna Seca Driving Range, CAW East Fence, Laguna Seca County Park No. 4, CAW Ryan Ranch No. 7, Laguna Seca Golf No. 12, and Pasadera Main Gate wells.	These wells, with the exception of one well that is planned for destruction (CAW East Fence), have been added to the Enhanced Monitoring Well Network, and data from them is being compiled in the Watermaster's database.

The enhanced monitoring well network is being used to obtain additional data that is useful to the Watermaster in managing the Basin.

Basin Management Action Plan (BMAP)

HydroMetrics LLC was hired by the Watermaster to prepare the BMAP, as required under the Amended Court Decision through the M&MP which the Watermaster submitted to the Court, and which the Court approved.

The BMAP contains these Sections:

- Executive Summary
- The Background and Purpose of the Plan
- The State of the Basin
- Supplemental Water Supplies (long-term water supply solutions)
- Groundwater Management Actions (to be taken as interim measures while long-term supplies are being developed)
- Recommended Management Strategies
- References

The Final BMAP was approved by the Watermaster Board at its February 2009 meeting. The Executive Summary from the BMAP is contained in Attachment 9. The complete document may be viewed and downloaded from the Watermaster's website at: http://www.seasidebasinwatermaster.org/.

Seawater Intrusion Response Plan

HydroMetrics LLC was hired by the Watermaster to prepare a long-term Seawater Intrusion Response Plan (SIRP), as required in the M&MP.

The SIRP contains these Sections:

- Background and Purpose
- Consistency with Other Documents
- Seawater Intrusion Indicators and Triggers (how seawater intrusion will be detected)
- Seawater Intrusion Contingency Actions (containing a recommended set of actions to be taken in the event seawater intrusion is detected at any of the monitoring or production wells within the Basin)
- References and Appendices

The Final SIRP was approved by the Watermaster Board at its January 2009 meeting. A summary of the Seawater Intrusion Contingency Actions from the SIRP are contained in Attachment 10. The complete document may be viewed and downloaded from the Watermaster's website at: http://www.seasidebasinwatermaster.org/.

Seawater Intrusion Analysis

The Watermaster retained HydroMetrics LLC to prepare the WY 2008-2009 Seawater Intrusion Analysis Report (SIAR) required by the M&MP. The WY 2008-2009 SIAR provides an analysis of data collected during this Water Year.

The principle conclusions reported in the SIAR are that depressed groundwater levels, continued pumping in excess of recharge and fresh water inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin. However, in spite of these factors, multiple forms of analyses led to the conclusion that no seawater intrusion is currently being observed in existing monitoring wells within the Basin.

The SIAR is lengthy, but the full *Executive Summary Section* from it is provided in Attachment 11. A complete copy of the document may be viewed and downloaded from the Watermaster's website at: http://www.seasidebasinwatermaster.org/.

The Watermaster continues to analyze the data that is being gathered at the various monitoring sites in order to keep a close watch on the conditions within the Basin, as discussed under the "Enhanced Monitoring Well Network" heading above.

Production Well Flow Meter Accuracy Verification

One of the requirements in the Decision is for the Watermaster to periodically verify that the flow meters on production wells are reading accurately.

The Watermaster's Technical Advisory Committee (TAC) evaluated the water meter data submitted by each of the producing well owners and concluded that the meters were reading accurately. A report describing the TAC's methodology, findings, and conclusions is contained in Attachment 13.

Groundwater Modeling

As a result of the data obtained during Phase 1 M&MP, including constructing new coastal sentinel monitoring wells and developing a consolidated database of groundwater production, water levels, and water quality, it was concluded that at that time it was not necessary to develop a new Groundwater Model for the Basin. The basis for this decision was included in the Phase 1 documents submitted with the November 15, 2007 Annual Report. Preliminary conclusions from work performed on preparing the Basin Management Action Plan in 2008, along with comments and questions from Technical Advisory Committee and Board members, indicated that it would be desirable to update the existing Model during 2009, so that it could be used as more data becomes available.

The existing Model was described in the report titled "Groundwater Flow and Transport Model" dated October 1, 2007, and was included as an attachment to the Watermaster's 2007 Annual Report. During 2009 the existing Model was updated to address those issues discussed in a Memorandum from HydroMetrics titled "Ongoing Status of the Seaside Basin Groundwater Model" dated October 4, 2007, which were necessary to use the Model for the purposes described under tasks I.3.a.2 and I.3.a.3 of the M&MP. In conjunction with updating the existing Groundwater Model, a separate Model was developed to determine protective water levels within the Basin. The modeling work was performed by HydroMetrics LLC. [Note: Both of these referenced documents were either discussed or contained in Attachment 11 of the Watermaster's "Annual Report – 2007."]

The modeling work was undertaken to accomplish several main objectives:

(1) To develop protective water levels for selected production wells, as well as for the Basin as a whole. The conditions under which the protective water levels were developed were established by HydroMetrics with input from the TAC.
(2) To evaluate different supplemental water supply scenarios to determine such things as the most effective methods of using supplemental water sources to replenish the Basin and/or to assess the impacts of pumping redistribution. The specific conditions defining each scenario were developed by HydroMetrics with input from the TAC and the Board.
(3) To develop preliminary answers to other questions associated with Basin management. This will be undertaken as directed by the Board following completion of the modeling work authorized in 2009.

The *Seaside Groundwater Basin Modeling and Protective Groundwater Elevations* Report is lengthy, but the full Executive Summary Section from it is provided in Attachment 14. A complete copy of the document may be viewed and downloaded from the Watermaster's website at: http://www.seasidebasinwatermaster.org/.

K. Conclusions and Recommendations

The Seaside Basin Watermaster Board has worked diligently to meet all of the Court's established deadline dates. All of the Phase 1 Scope of Work activities, which are described in the "Implementation Plan for the Seaside Basin Monitoring and Management Program" dated March 7, 2007, have been completed. At the Watermaster Board meeting held on October 7, 2009 the Board adopted the budgets contained in

Attachment 7, which support carrying out all elements of the "Seaside Groundwater Basin Management and Monitoring Program Anticipated 2010 Scope of Work." That Scope of Work describes the M&MP activities that will be conducted during Fiscal Year 2010. A copy of this Scope of Work is contained in Attachment 12.

As described in **Section J** above, information from the Enhanced Monitoring Well Network is being utilized to detect any seawater intrusion. The response actions described in that Section will be implemented, if seawater intrusion is detected within the Basin.

ATTACHMENT 1

GROUNDWATER EXTRACTIONS

2009 WATER YEAR

Seaside Groundwater Basin Watermaster

Reported Quarterly and Annual Water Production (in Acre Feet) From the Seaside Groundwater Basin For All Producers Included in the Seaside Basin Adjudication

(All Values in Acre-Feet ([AF])

Producer	Type	Quarters				Annual To-Date Reported Total	Base Operating Yield Allocation	Carry Over from 2007/08
		Oct-Dec 2008	Jan-Mar 2009	Apr-Jun 2009	Jul-Sep 2009			
Coastal Subareas								
CAW (Coastal Subareas)	SPA	957.6	-	633.4	858.2	2,449.2	3,191.1	-
Seaside (Municipal)	SPA	69.9	58.6	80.0	84.9	293.4	271.7	-
Granite Rock Company	SPA	Exempt	Exempt	Exempt	Exempt	-	14.7	76.20
DBO Development No. 27	SPA	Exempt	Exempt	Exempt	Exempt	-	44.7	147.90
City of Seaside (Golf Courses)	APA	96.7	51.1	188.9	226.2	562.9	540.0	-
Sand City	APA	-	-	-	-	-	9.0	-
Security National Guaranty	APA	-	-	-	-	0.0	149.0	-
Cypress Pacific Investors*	APA	Exempt	Exempt	Exempt	Exempt	-	14.0	-
Alderwoods Group (Mission Memorial)	APA	4.2	1.6	10.4	10.1	26.4	31.0	-
Coastal Subarea Totals		***1,128.4***	***111.3***	***912.8***	***1,179.5***	***3,332.0***	***4,265.2***	***224.1***
Previous Year Totals (2008)		*1,219.2*	*318.3*	*1,019.9*	*1,684.8*	*4,242.2*	*4,611.0*	
Laguna Seca Subareas								
CAW (Inland Subareas)	SPA	121.0	76.4	141.5	177.9	516.8	270.8	-
Pasadera Country Club	APA	18.0	5.4	76.3	82.0	181.8	251.0	-
Laguna Seca/Bishop	APA	37.0	5.7	130.3	135.3	308.3	320.0	-
York School	APA	4.4	2.6	6.3	8.2	21.5	32.0	-
Laguna Seca Park (County)	APA	5.9	2.9	11.9	11.6	32.2	41.0	-
Laguna Seca Subarea Totals		***186.3***	***93.0***	***366.3***	***415.1***	***1,060.6***	***914.8***	-
Previous Year Totals (2008)		*167.2*	*107.5*	*360.3*	*394.9*	*1,029.9*	*989.0*	
Total Pumped Per Quarter		***1,314.7***	***204.3***	***1,279.0***	***1,594.6***			
					Seaside Basin Production Totals =	**4,392.6**	**5,180.0**	
					Total Production by Alternative Producers =	**1,133.2**		
					Total Production by Standard Producers =	**3,259.5**		

*Referred to as "M.E. Calabrese 1987 Trust" in Decision

ATTACHMENT 2

WATERMASTER DECLARATIONS
OF
NON-AVAILABILITY
OF
ARTIFICIAL REPLENISHMENT WATER

NOTICE TO ALL SEASIDE GROUNDWATER PRODUCERS:

The Watermaster, as of January 1, 2009 hereby declares that **NO** Artificial Replenishment Water is available:

a. The Watermaster has not secured nor is adding an equivalent amount of Non-Native water to the Basin on an annual basis.
b. The Watermaster has not secured reclaimed water in an equivalent amount and has not contracted with one or more of the Producers to utilize said water in lieu of their Prodction Allocation, with the Producer agreeing to forego their right to claim a Stored Water Credit for such forbearance; and
c. No combination of a and b has resulted in the decrease in Production of Native Water required by this decision; or
d. The Watermaster has determined that Groundwater levels within the Santa Margarita and Paso Robles aquifers are not at sufficient levels to ensure a positive offshore gradient to prevent seawater intrusion.

All producers are limited in production to the following quantities of water, inclusive of the 10% decrease in pumping:

Coastal Subarea Alternative Producers:

Seaside (Golf)	540 acre-feet
SNG	149 acre-feet
Cypress (Calabrese)	14 acre-feet
Mission Memorial (Alderwood)	31 acre-feet
Sand City	9 acre-feet

Laguna Seca Subarea Alternative Producers:

Pasadera	251 acre-feet
Bishop	320 acre-feet
York School	32 acre-feet
Laguna Seca County Park	41 acre-feet

Coastal Subarea Standard Producers:

California American Water	3191 acre-feet
Seaside (Municipal)	262 acre-feet
Granite Rock	63 acre-feet
D.B.O. Development 27	114 acre-feet

Laguna Seca Subarea Standard Producers:

California American Water	271 acre-feet

ITEM IX. D.
8/25/09

SEASIDE GROUNDWATER BASIN
WATERMASTER

TO: Board of Directors

FROM: Laura Dadiw, Assistant to the Watermaster CEO
APPROVED BY: Dewey Evans, CEO

DATE: August 25, 2009

SUBJECT: Watermaster Carryover Credit Accounting Revisions

PURPOSE:
The purpose of this item is for the Watermaster Board to be informed of the revised carryover credit accounting method and the verified pumping limits for water year 2008-09 for DBO Development LLC, Graniterock Company, and City of Seaside.

RECOMMENDATION:
This report is for informational purposes only with no recommendation made.

BACKGROUND:
Quarterly during each Water Year (October 1 – September 30), Alternative and Standard Producers defined in the Adjudication Decision ("Decision") report to Watermaster production amounts from the Seaside Groundwater Basin ("Basin"). Base Water Right or Natural Safe Yield ("NSY") allocations not pumped by Standard Producers during a given water year are termed "carryover credits" in the Decision.

The City of Seaside, in a memorandum dated November 21, 2008, contended that Watermaster had not identified separately in its accounting the Base Water Right and NSY carryover credits.

After a lengthy collaborative effort between Attorney Russ McGlothlin for City of Seaside, Attorney David Sweigert for DBO Development, and Watermaster staff, a revised carryover credit accounting method was established and pumping limits were verified for City of Seaside, DBO Development and Graniterock Company for Water Year 2008-09.

DISCUSSION:
It was determined by Watermaster staff, with significant input from the others noted above, that:

1) Carryover credits accrued in the previous water year should be classified as "free" if the producer pumped less than the NSY allocated in that year, and classified as "not free" if the producer pumped less than its total base water right for that year but not less than the producer's NSY allocation.

2) Free and not free carryover credit accounting does not increase or decrease any amount of carryover accrued from year to year, but serves only to account for the amount of free carryover that a standard producer can use or sell without having to pay a replenishment assessment.

3) NSY Allocation is separate and distinct from any carryover credits accumulated therefore the % Natural Safe Yield available to Standard Producers should remain the same each year as long as the Natural Safe Yield of the Basin is not adjusted by order or decree.

CONCLUSION:

The accounting of free and not free carryover credits is now instituted and has been applied to all Watermaster water years. It was verified for water year 2008-09 that DBO Development has a pumping limit of 192.63 acre feet and Graniterock a limit of 90.86 acre feet (base water right plus carryover accrued through time, both free and not free). The City of Seaside purchased 10 acre feet of free carryover credits from Graniterock Company during Water Year 2008-09. The City's noted pumping limit of 271.70 acre feet and Graniterock's noted limit of 90.86 acre feet include the 10 acre feet purchased/sold respectively.

FISCAL IMPACT

No immediate fiscal impact.

ATTACHMENTS:

Notice to All Seaside Groundwater Producers (notice of pumping limits for water year 2008-09)

NOTICE TO ALL SEASIDE GROUNDWATER PRODUCERS:

The Watermaster, as of January 1, 2009 hereby declares that **NO** Artificial Replenishment Water is available:

a. The Watermaster has not secured nor is adding an equivalent amount of Non-Native water to the Basin on an annual basis.
b. The Watermaster has not secured reclaimed water in an equivalent amount and has not contracted with one or more of the Producers to utilize said water in lieu of their Prodction Allocation, with the Producer agreeing to forego their right to claim a Stored Water Credit for such forbearance; and
c. No combination of a and b has resulted in the decrease in Production of Native Water required by this decision; or
d. The Watermaster has determined that Groundwater levels within the Santa Margarita and Paso Robles aquifers are not at sufficient levels to ensure a positive offshore gradient to prevent seawater intrusion.

All producers are limited in production to the following quantities of water, inclusive of the 10% decrease in pumping:

Coastal Subarea Alternative Producers:

Seaside (Golf)	540.00 acre-feet
SNG	149.00 acre-feet
Cypress (Calabrese)	14.00 acre-feet
Mission Memorial (Alderwood)	31.00 acre-feet
Sand City	9.00 acre-feet

Laguna Seca Subarea Alternative Producers:

Pasadera	251.00 acre-feet
Bishop	320.00 acre-feet
York School	32.00 acre-feet
Laguna Seca County Park	41.00 acre-feet

Coastal Subarea Standard Producers:

California American Water	3191.09 acre-feet
Seaside (Municipal)	271.70 acre-feet
Granite Rock	90.86 acre-feet
D.B.O. Development 27	192.63 acre-feet

Laguna Seca Subarea Standard Producers:

California American Water	270.83 acre-feet

ATTACHMENT 3

IN-LIEU REPLENISHMENT MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING BETWEEN THE SEASIDE BASIN WATERMASTER AND THE CITY OF SEASIDE

This Memorandum of Understanding ("MOU") is entered into between the Seaside Groundwater Basin Watermaster ("Watermaster") and the City of Seaside ("City") (individually a "Party" and together the "Parties") this _____ day of November, 2009 ("Effective Date") with respect to the following:

RECITALS

A. The amended final decision ("Decision") entered in the lawsuit, California American Water v. City of Seaside et al., Monterey Superior Court, (Case No. M 66343) governs groundwater production within the Seaside Groundwater Basin (the "Basin").

B. The City is a party to the lawsuit and received groundwater production allocation pursuant to the Decision as follows: (1) 540 acre-feet of Alternative Production Allocation[1] in relation to the City-owned Blackhorse and Bayonet Golf Courses ("Golf Courses"); and (2) Standard Production Allocation in relation to the City Municipal Water System.[2]

C. The Decision provides that any party that exceeds its allocation of Natural Safe Yield is subject to a Replenishment Assessment for each acre-foot of Over-Production during each Water Year.

D. The City presently owes certain sums to Watermaster for previously accrued Replenishment Assessments.

E. The City projects that it will continue to engage in Over-Production to supply its Municipal Water System, and potentially its Golf Course System, and therefore anticipates that it will continue to incur additional Replenishment Assessment liability.

F. The Decision obligates the Watermaster to procure new sources of water for replenishment of the Basin to offset cumulative Over-Production.

G. The Parties have identified an in lieu replenishment program ("Program") involving the Golf Courses and the City's Alternative Production Allocation associated with the Golf Courses, which is a viable means to obtain some of the replenishment water that Watermaster is obligated to procure.

H. To implement the Program, the City will obtain water supplies from the Marina Coast Water District ("MCWD"),[3] and supply the MCWD water to the City's Golf Courses for

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[1] All capitalized terms used in this MOU are to be given the same meaning as set forth in the Decision, unless otherwise described.
[2] The Standard Production Allocation is set forth as a percentage of Operating Yield of the Coastal Subarea. The City's Standard Production Allocation is roughly 10.47% of the Operating Yield.
[3] The water supply from Marina Coast Water District will initially be derived from Salinas Basin groundwater production and later reclaimed water, once available.

use in lieu of groundwater production from the Basin pursuant to the City's Alternative Production Allocation. The groundwater not produced will be deemed in lieu replenishment water.

I. The City desires to engage in the Program in exchange for a monetary credit against its Replenishment Assessment liability.

J. The Parties desire to enter into this MOU to memorialize the terms upon which the City shall engage in the Program, and the Watermaster shall provide the City with a monetary credit against its Replenishment Assessment liability.

AGREEMENT

The Parties agree as follows:

1. Term. This MOU shall commence upon the Effective Date and continue until the earlier of five (5) years from the Effective Date, or three (3) months following the end of the Water Year in which the Executive Director of Watermaster anticipates that the City shall have provided sufficient in lieu replenishment water pursuant to the Program to offset all of its then- accrued Replenishment Assessment liability.

2. Commencement and Scope of Program. The Program shall commence, if at all, only once the City deems it appropriate to commence the Program, in its sole discretion. The City shall notify the Watermaster CEO in writing of the date it intends to commence the program as far in advance as is feasible. The amount of in lieu replenishment that shall occur in any particular year pursuant to the Program, if at all, shall also be determined by the City in its sole discretion.

3. Accounting and Replenishment Assessment Credit.

3.1 Annual Accounting. During the term of this MOU, the City shall report to the Watermaster an accounting of the amount of water received from MCWD to be used in lieu of groundwater production from the Basin for the preceding calendar quarter, in writing, on or before January 15, April 15, July 15, and October 15 of each Water Year. The City shall record and report the MCWD deliveries based upon accurate meter readings. All meters used for such reporting shall be regularly calibrated and maintained by the City, or the City's representative, and at the City's expense to ensure accuracy. Prior to the commencement of the Program the City shall provide to the Watermaster an initial calibration report certifying the accuracy of the flow meter which will measure the delivery of MCWD water to the City's golf courses. When and if requested by the Watermaster, the City will perform additional calibrations to verify meter accuracy. Such requests by the Watermaster will not be made more often than once every two years, unless metering data are indicative of metering inaccuracies. If the Watermaster disputes the reported quantity of MCWD deliveries, it shall inform the City of the basis of its objection within one (1) month of receipt of the City's accounting, and the Parties shall thereafter engage in good faith negotiations to attempt to resolve the dispute. Any dispute that cannot thereby be settled shall be referred to the Court for resolution.

3.2 Calculating Credit Against City's Replenishment Assessment Liability. At the end of each Water Year, the Watermaster shall determine the cumulative gross Replenishment Assessment liability owed by the City in accord with Section 6.5 of the Watermaster's Rules and Regulations. The Watermaster shall then apply a credit against the City's gross Replenishment Assessment liability, which shall equal the amount of all MCWD deliveries to the Golf Courses for

irrigation during the proceeding Water Year, not to exceed the City's 540 acre-feet of Alternative Production Allocation, multiplied by the amount of the effective Replenishment Assessment Unit Cost for that Water Year. Watermaster shall then promptly notify the City of the cumulative net Replenishment Assessment liability owed.

4. Stay of Enforcement Proceedings for Unpaid Replenishment Assessments. Watermaster shall not bring any enforcement action against the City for non-payment of Replenishment Assessments during the term of this MOU, provided that the City commences the Program within one (1) year of the Effective Date, and continues thereafter to provide at least two hundred (200) acre-feet of in lieu replenishment water to Watermaster each calendar year thereafter pursuant to the Program.

5. Good Faith Renegotiation of Program Extension. Upon termination of the initial term of this MOU, as set forth in Section 1 above, the Parties shall engage in good faith negotiations to determine whether the Program may be extended pursuant to mutual agreeable terms. No Party shall be obligated to commit to a Program extension or any particular term of a subsequent MOU for a Program extension.

6. Miscellaneous Terms. This Agreement shall be governed by and construed in accordance with the laws of California, without regard to conflicts of law principles, with venue for all purposes to be proper only in the County of Monterey, California. If any actions are required to interpret or enforce the provisions of this Agreement, the prevailing party shall be entitled to reasonable attorneys' fees and costs. Any failure to enforce any provision of this Agreement shall not constitute a waiver thereof or of any other provision hereof. This Agreement constitutes the entire understanding and agreement of the Parties, and there have been no promises, representations, agreements, warranties or undertakings by any of the Parties, either oral or written, of any character or nature hereafter binding except as set forth herein. This Agreement may be altered, amended or modified only by an instrument in writing, executed by the Parties to this Agreement and by no other means. Each Party waives its future right to claim, contest or assert that this Agreement was modified, canceled, superseded, or changed by oral agreement, course of conduct, waiver or estoppel.

IN WITNESS WHEREOF the Parties hereby agree to perform pursuant to the terms set forth herein.

SEASIDE BASIN WATERMASTER	CITY OF SEASIDE
_____	_____
Dewey Evans, Executive Director	Ray Corpuz, City Manager
Date: November _____, 2009	Date: November _____, 2009

ATTACHMENT 4

WATERMASTER ADMINISTRATIVE COSTS

Seaside Groundwater Basin Watermaster
Fiscal Year 2009 Administrative Fund Report

	2009 Adopted Budget	2009 Income & Actual/Estimated Expenses
Assessment Income		
Dedicated Reserve	$ 25,000	$ 25,000
Est. Rollover	24,241	24,241
Est. Assessment	108,759	108,759
Totals	**$ 158,000**	**$ 158,000**
Expense		
Administrative	108,000	90,000
Legal	25,000	-
Total Expenses	133,000	90,000
Total Available	25,000	68,000
Less Dedicated Reserve	25,000	25,000
Net Available	**$ 0**	**$ 43,000**

Note: Estimated year-end expenses prepared using actual expenses through 9/30/09 and estimated expenses for 10/1/09 - 12/31/09.

ATTACHMENT 5

REPLENISHMENT ASSESSMENT UNIT COST CALCULATIONS FOR WATER YEAR 2009-2010

Status of and Comments Regarding the Projects Considered in the Water Year 2009-20010 Replenishment Assessment Unit Cost Calculations

1. Moss Landing Desalination Plant – Local Alternative: This is the only Moss Landing Desalination Plant alternative being considered in the CWP DEIR. It would produce 8,800 AFY, and all of this would be supplied to the CAW distribution system. It should not be included in the Replenishment Assessment Unit Cost calculations because the Regional Desalination project is considered to be the most viable of the desalination projects.
2. Moss Landing Desalination Plant – Regional Alternative: This alternative is not being considered in the CWP DEIR, and should therefore not be included in the Replenishment Assessment Unit Cost calculations.
3. North Marina Desalination Plant – Local Alternative: This is one of the alternative projects to the CAW Moss Landing Desalination Plant. It would be similar to the Moss Landing Desalination Plant alternative, but the desalination plant would be located in north Marina. It would produce 9,600 AFY, with 8,800 AFY going to the CAW distribution system and 800 AFY going to the Castroville Seawater Intrusion Project (CSIP) to offset groundwater taken from the Salinas Basin by the desalination plant. It should not be included in the Replenishment Assessment Unit Cost calculations because the Regional Desalination project is considered to be the most viable of the desalination projects
4. North Marina Desalination Plant – Regional Alternative: This alternative is not being considered in the CWP DEIR, and should therefore not be included in the Replenishment Assessment Unit Cost calculations.
5. MPWMD's 95-10 Desal Plant: This alternative is not being considered in the CWP DEIR, but it is still considered an active project by the MPWMD. It should not be included in the Replenishment Assessment Unit Cost calculations because the Regional Desalination project is considered to be the most viable of the desalination projects.
6. Sand City Water Supply Project: This project has been completed and is currently going through its testing phase. However, all of the water that is not needed for new connections within Sand City will be used by CAW to reduce the amount of water CAW takes from the Carmel River Basin, and thus it will not benefit the Seaside Basin. Therefore, this project should not be included in the Replenishment Assessment Unit Cost calculations.
7. Salinas River Surface Water Treatment Plant: This project is considered to be a Phase 1 component of what is now referred to simply as the "Regional Project" in the CWP DEIR. Unless it is learned that this is no longer a viable component of the Regional Project, it should continue to be included in the Replenishment Assessment Unit Cost calculations.
8. Regional Desalination: This project is the key Phase 1 component of what is now referred to simply as the "Regional Project" in the CWP DEIR. It would produce 10,500 AFY, with 8,800 AFY going to the CAW distribution system and 1,700 AFY to MCWD to offset groundwater taken from the Salinas Basin by the

desalination plant. Therefore, this project should continue to be included in the Replenishment Assessment Unit Cost calculations.

9. Regional Urban Water Augmentation Project: This project is considered to be a Phase 1 component of what is now referred to simply as the "Regional Project" in the CWP DEIR. The RUWAP is being pursued by MCWD and MRWPCA. Since it is an element of the Regional Project, it should continue to be included in the Replenishment Assessment Unit Cost calculations.
10. Seaside Aquifer Storage and Recovery Project: This project is considered to be a Phase 1 component of what is now referred to simply as the "Regional Project" in the CWP DEIR. The Seaside ASR Project is being pursued by MPWMD. When the October 2007 Replenishment Assessment Unit Cost was calculated the TAC concluded that, since all of the water production of this project will be used by CAW to reduce the amount of water CAW takes from the Carmel River Basin and thus it will not benefit the Seaside Basin, it should not be included in the calculation of the Seaside Basin Replenishment Assessment Unit Cost, and it was not included in the 2007 calculation. When the October 2008 Unit Cost calculation was prepared, this project was included in the calculation. There was no record in the TAC meeting minutes to explain why this project was included in 2008 when it had not been included in 2007. It was therefore concluded that including it in the 2008 calculation was an oversight, and that it should not be included in the Replenishment Assessment Unit Cost calculations, even though it is an element of the Regional Project.
11. MRWPCA Groundwater Replenishment Project for the Seaside Basin: Based on information provided by MRWPCA during the development of the Seaside Basin Groundwater Model in the Spring of 2009, the GWRP would be initially sized to provide 2,800 AFY to the Seaside Basin, and could potentially start-up in 2015. This estimated start-up date was based in part on the expectation that the GWRP would eventually be included as a Phase 1 component of the Regional Project. However, the CWP DEIR currently lists the GWRP as a Phase 2 component of the Regional Project, and no time schedule for implementation of Phase 2 project components was presented in the CWP DEIR. Since it is a Phase 2 component, it should not be included in the Replenishment Assessment Unit Cost calculations.
12. Seawater Conversion Vessel: This project was listed, but not included, in the Replenishment Assessment Unit Cost Calculation for Water Year 2008-2009, because there did not appear to be any sponsor for it. This appears to still be the case, so this project should not be included in the Replenishment Assessment Unit Cost calculations.
13. Pacific Grove Stormwater Project: This Project is listed in the CWP DEIR as a Phase 2 component of the Regional Project. No time schedule for implementation of Phase 2 project components was presented in the CWP DEIR. A feasibility study has reportedly been completed indicating that the City of Pacific Grove should pursue this project, which could produce an estimated 200 AFY of water. The estimated capital cost of the project, including engineering and construction, is reportedly $13.2 million in 2008 dollars. No O&M cost estimate and no contingency percentage was provided. Using the same financing assumptions as were used for the Regional Project in Table 2, the Annualized Capital Cost of

such a project, with no additional contingencies or other implementation costs added, would be approximately $868,500. With a 200 AFY production capacity, this results in a unit cost of approximately $4,340. Since it is a Phase 2 component, it should not be included in the Replenishment Assessment Unit Cost calculations.

14. Conservation: Conservation was listed, but not included in the Replenishment Assessment Unit Cost Calculation for Water Year 2008-2009, because there was no cost data for it. This appears to still be the case, so this project should not be included in the Replenishment Assessment Unit Cost calculations.

Summary of Costs of the Principal Supplemental Water Supply Projects

Project Cost Comparison

	Regional Project (RP)	CAW- North Marina Alternative (NMA)	CAW-Moss Landing (ML)	CAW Facilities (Seaside Pipeline, Terminal Res, 2 ASR Wells, 9 mgd ASR pump station, Monterey Pipeline, Valley Greens PS)	MRWPCA GWRP[10]
Capital Costs					
Base Construction Cost	**$ 108,700,000**	**$ 118,380,000**	**$ 138,100,000**	**$ 42,500,000**	**$ 44,700,000**
Most Probable Capital Cost with Contingency and other Implementation Costs	**$ 177,400,000**	**$ 200,000,000**	**$ 211,550,000**	**$ 73,200,000**	**$ 77,550,000**
Annual Costs					
Total Annual O&M Including Repair, Replacement, Power, Chemicals, and Other O&M Cost Components	**$ 12,080,000**	**$ 11,380,000**	**$ 10,950,000**	**$ 560,000**	**$ 4,450,000**
Annualized Costs					
Total Annualized Cost	**$ 24,080,000**	**$ 30,080,000**	**$ 30,750,000**	**$ 5,350,000**	**$ 9,650,000**
Production Quantites & Unit Costs of Water					
Annual Production to Customers, AFY	10,500	8,800	8,800	8,800	2,400
Production Breakdown	8,800 to CAW 1,700 to MCWD	8,800 to CAW 800 to CSIP	8,800 to CAW	8,800 to CAW	2,400 to Seaside Basin
Cost of Water ($/AF)	$ 2,290	$ 3,420	$ 3,490	$ 610	$ 4,020
Cost of Water ($/AF)					
Total Cost of Water Adjustments	$ 350	$ (30)	$ -	$ -	$ -
Cost of Water to the Seaside Basin (includes CAW's costs for CAW facilities which are needed to deliver water from the alternative projects to the CAW distribution system, and which are common to all of the Alternatives, except the GWRP which does not require the CAW facilities)	**$ 3,250**	**$ 4,000**	**$ 4,100**	**$ 610**	**$ 4,020**

Notes:

1. Cost estimates are in current, 2009 dollars.
2. Contingency not applied to O&M estimates.
3. Power costs at time of startup dependent on long-term contract rate with MRWMD or potential contract rate with PGE or current PGE rates that time.
4. Regional, NM and ML desal plants assumed to operate at same efficiency and pressures.
5. O&M costs are based on the RP producing 10,500 AFY, NMA producing 9,600 AFY, and ML producing 8,800 AFY.
6. Ground water unit cost for the MCWD ($500/AF) is based on their current groundwater supplies.
7. $300/AF for CSIP supplies is based on approximate cost for MRWPCA to produce recycled water to CSIP.
8. Membrane replacement is based on a 15 year cycled (replacing approximately 15% a year).
9. $500,000 groundwater monitoring program is a conservative placeholder until the details of the program are identified.
10. MRWPCA's Groundwater Replenishment Project (GWRP) costs taken from Project Cost Comparison prepared by RMC dated August 11, 2009 as part of RMC's work in preparing their "Draft Technical Memorandum Capital and O&M Cost Estimated Update for the Coastal Water project, August 10, 2009" which was presented to the PUC in conjunction with cost workshops.

WATER YEAR 2009-2010

ANTICIPATED UNIT COSTS OF REPLENISHMENT WATER FOR THE SEASIDE BASIN

POTENTIAL SOURCE OF REPLACEMENT WATER	POTENTIAL DATE REPLACE-MENT WATER COULD BECOME AVAILABLE	POTENTIAL VOLUME OF WATER THAT COULD BE SUPPLIED BY THE PROJECT (AFY) [10]	LEVEL OF PROJECT DEVELOP-MENT	CONTINGENCY INCLUDED IN BASE UNIT COST [9] (%)	BASE UNIT COST ($/AF)	BASE UNIT COST YEAR	ADDITIONAL CONTINGENCY ADDED TO REFLECT LEVEL OF PROJECT DEVELOPMENT [8] (%)	UNIT COST INCLUDING ADDITIONAL CONTINGENCY ($/AF)	UNIT COST INFLATED @ 3% FROM COST BASIS YEAR TO YEAR REPLACEMENT WATER COULD BECOME AVAILABLE	VOLUME-WEIGHTED AVG %	REPLENISH-MENT UNIT COST SHARE
Salinas River Surface Water Treatment Plant [5]	2014	7,500	Conceptual	30%	$1,500	2008	20%	$1,800	$2,149	38.86%	$835.22
Regional Desalination [7]	2012	8,800	Project Report	25%	$3,250	2009	5%	$3,413	$3,729	45.60%	$1,700.24
Regional Urban Water Augmentation Project [4]	2012	3,000	Design	5%	$1,200	2006	10%	$1,320	$1,576	15.54%	$245.00

Total Quantity of Replacement Water (AFY) the Listed Projects Could Cumulatively be Expected to Produce Within the Next 10 Years [6] = 19,300

Volume-Weighted Replacement Water Cost Per Acre-Foot = $2,780

FOOTNOTES:

(1) Not used.

(2) Not used.

(3) Not used.

(4) Data provided by MCWD.

(5) Data provided by MCWRA in 2008. No updated data was provided for 2009. Project has a proposed range of supply of 5,000 to 10,000 AFY. For this analysis assume 7,500 AFY.

(6) This value is the cumulative production capacity of all of the Potential Sources of Replacement Water that were evaluated, and is used only to determine the "Valued-Weighted Average." It is not the amount of water that is expected to be available to the Seaside Basin.

(7) Information and parameters for the project were taken from the CWP DEIR and supporting project cost documents prepared for the PUC by RMC Engineers.

(8) The following Contingency percentages were considered reasonable for the indicated levels of project development: Conceptual Level - 50%, Project Report Level - 30%, and Design Level - 15%. The sum of the values in the columns titled "Contingency Included in Base Unit Cost" and "Additional Contingency Added to Reflect Level of Project Development" equals the Contingency appropriate for the project's level of development.

(9) This percentage of Contingency was included in the Base Unit Cost.

(10) This is the total amount of water from each production source which could potentially come to the CAW distribution system, not just the amount of production committed to the Seaside Basin.

ATTACHMENT 6

REPLENISHMENT ASSESSMENT REVISIONS AND REPLENISHMENT ASSESSMENT CALCULATIONS FOR WATER YEAR 2009-2010

Memorandum

DATE: December 5, 2008

TO: Counsel of Record, Seaside Basin Adjudication - California American Water v. City of Seaside et al. (Super. Ct. County of Monterey, 2006, No. M66343)

FROM: Russell M. McGlothlin

RE: Watermaster Accounting Methods With Respect to Carryover Credits and Annual Replenishment Assessment Obligations

I. INTRODUCTION

California-American Water Co. (Cal Am) and the City of Seaside (Seaside) jointly submit this memorandum to solicit feedback from other counsel of record with respect to the Seaside Groundwater Basin Watermaster's (Watermaster) method for accounting for Carryover Credits and calculation of the annual Replenishment Assessment (RA) obligations. Cal Am and Seaside respectfully disagree with the method used by Watermaster in the following respects:

- Carryover – Watermaster presently includes Carryover Credits within its calculation of each Standard Production Allocation (SPA) producer's share of the available Native Safe Yield (NSY). Cal Am and Seaside contend that Carryover Credits should be accounted for separately and independently, and should have no bearing on a SPA's producer's share of NSY. Further, Carryover Credits should be accounted for in two separate categories: (1) "free" Carryover Credits that are not subject to an RA, and Carryover Credits subject to the RA (see discussion below).

- Double RA on Operating Yield Overproduction – The Decision distinguishes between Over-Production and Operating Yield Over-Production. Watermaster interprets the Decision to require that Operating Yield Over-Production be assessed a double RA. Cal Am and Seaside object to Watermaster's approach because it renders the definition of Operating Yield Over-Production superfluous, conflicts with the purpose of the RA, and is generally inconsistent with the design of the Decision's prescribed physical solution.

Cal Am and Seaside request that the other legal counsel of record in this action provide feedback on or before December 31, 2008 concerning the substance of this memorandum and the accounting approaches recommended herein.

II. DISCUSSION

A. Calculating Carryover Credit

Carryover is the amount of a SPA producer's allocation that is not extracted from the Basin in a given year. (Decision, III.A.5, p. 11.) A Carryover Credit is the quantity of water established through Carryover that a SPA producer may produce from the Basin in future years in addition to its SPA. (See Decision, III.A.6, p. 11, F, p.22, H.5, p. 27.) Because the Carryover Credit represents a portion of the Operating Yield Allocation for the year in which it accrues, the Carryover Credit should be accounted for as a portion of the Operating Yield for the year of accrual, and should have no bearing on the Operating Yield or NSY in future years.

Watermaster should account for Carryover Credits in two categories as follows:

(1) Carryover Credits that accrue from non-production of a SPA producer's share of the NSY (i.e. "free production"), for which no replenishment assessment would have been paid had the water been produced rather than carried over, should be accounted for as a "free" Carryover Credit. No replenishment assessment should be assessed upon water extracted pursuant to this category.

(2) Watermaster should separately account for Carryover Credits that accrue from non-production of a SPA producer's Operating Yield Allocation, but in excess of the SPA Producer's share of the NSY. A replenishment assessment should be assessed against water extracted pursuant to this category because the SPA Producer would have incurred a replenishment assessment for this allocation had the water been produced rather than carried over. .

This accounting approach is consistent with the Decision because the purpose of authorizing the accrual of Carryover Credits is to effectively allow storage and later use of unneeded Operating Yield/NSY[1]. Separate accounting of Carryover Credits is also consistent with the Decision's production limits. Carryover Credits resulting from un-pumped Operating Yield remains stored in the Basin, allowing additional production in future years without exceeding the cumulative production limits over multiple years.

As explained below, Watermaster currently includes Carryover Credits in its calculation of each SPA producer's share of the available NSY in future years. Cal Am and Seaside object to Watermaster's current accounting procedure because it causes Carryover Credits developed in prior years to impact the proportion of NSY available to each SPA producer during the present year.

B. RA Calculation

Cal Am and Seaside object to two aspects of Watermaster's RA calculation approach. The first concerns the inclusion of Carryover Credits in the method for calculating the RA. The second concerns the imposition of a double RA on Operating Yield Over-Production.

1. Carryover Credits and the RA Calculation

[1] NSY (initially assumed to be 3,000 afy) is a component of the Operating Yield (initially set at 5,600 afy).

In calculating each SPA producer's RA obligation each year, the Watermaster presently includes Carryover Credits in the cumulative total quantity of allowed production for each SPA producer, and then based upon this adjusted amount, determines each SPA producer's proportionate share of the available NSY (3,000 afy minus APA production). The calculation effects each SPA producer's RA obligation because no RA is incurred for production of each producer's share of the NSY. The approach used by Watermaster causes SPA producers that do not possess Carryover Credits to receive a lower amount of the available NSY, and thus increases their RA burden.

For the reasons discussed above, it is inappropriate to include Carryover Credits, which were developed in prior years, in the calculation of shares of the available NSY. Rather, each SPA producer's share of the available NSY should be determined solely on the basis of their Base Water Right as a percentage of the total of Base Water Rights held by all SPA producers. Carryover Credits should be accounted for separately.

2. Double RA on Operating Yield Over-Production

The Decision provides separate definitions for *Over-Production* and *Operating Yield Over-Production*. Over-Production is defined as production in excess of a producer's Base Water Right as applied to an initially assumed NSY of 3,000 afy. . (Decision, III.A.21, p. 14.) Operating Yield Over-Production is defined as production in excess of a producer's Operating Yield allocation. (Decision, III.A.21, 22, p. 14.) There is some ambiguity in the Decision pertaining to the application of the RA to Operating Yield Over-Production. The Decision states that an "additional" RA shall be imposed upon Operating Yield Over-Production. (Decision, III.L.j.iii, p. 33.) The Decision is unclear as to whether the term "additional" should be interpreted as either (1) a duplicative RA, or (2) another, separate RA, which is to be applied to a distinct form of over-production. Watermaster reads the term additional to require it to impose a duplicative RA on Operating Yield Over-Production, while Cal Am and Seaside interprets the term to mean another, separate RA.

Another way to pose the question is as follows: does the RA applicable to the first form of over-production (i.e., over-production between a SPA producer's share of the NSY and its Operating Yield allocation) end where Operating Yield Over-Production begins, or does the first form of over-production continue and overlap with Operating Yield Over-Production? The first interpretation would support the conclusion that Operating Yield Over-Production is subject to a distinct and separate RA. The later interpretation supports imposition of a double RA on Operating Yield Over-Production because an RA would be applied to *all* production in excess of NSY including Operating Yield Over-Production, and a second duplicative RA would apply to the subset that is Operating Yield Over-Production.

A narrow reading of the definition of Over-Production would favor the later interpretation because the definition appears to include *all* production in excess of a producer's Base Water Right. (Decision, III.A.21, p. 14.) However, such a narrow reading would render the definition of Operating Yield Over-Production superfluous, which would violate the canon of interpretation that all terms of a judgment should be given meaning. (*People v. Landon White Bail Bonds* (1991) 234 Cal.App.3d 66, 76.)

Such an interpretation would also deviate from the practical purpose for the RA, which is to procure sufficient funds for Watermaster to secure non-native water supplies to replenish each acre-foot of production in excess of NSY, thereby ensuring that over the

long-term no greater amount of groundwater is produced from the Basin than is replenished by natural and artificial sources. (See Decision, III.L.j.iii, p. 33 [providing that the RA is to be assessed on a "per acre-foot basis on each acre foot" of Over-Production]; see also definition of Over-Production, Decision, III.A.21, p. 14 [defining Over-Production in the Basin-wide context as all production in excess of the NSY].) Double charging for each acre foot of Operating Yield Over-Production would result in greater replenishment revenue than is necessary to replenish the cumulative in excess of the NSY. Such an interpretation would conflict with the rule that each clause or term of a judgment is to be construed in relation to the entire judgment as a whole to effectuate the evident intent. (*Lazar v. Superior Court* (1940)16 Cal.2d 617, 622.)

An interpretation that results in a double assessment would also impair opportunities for practical Basin management over the long-term. Operating Yield Over-Production is not allowed by the Decision's terms unless non-native replenishment supplies are available to replenish the excess production. However, once non-native supplies are available in the future, practical strategies may be implemented to use the Basin as a means to store, treat, and deliver artificially replenished water supplies, including treated recycled water. For example once ample replenishment water is available water users could be encouraged to engage in Operating Yield Over-Production as the means to obtain their water supply requirements and then pay a single (i.e., non-duplicative) RA for the Operating Yield Over-Production. Watermaster would use the funds to procure (likely in cooperation with others) sufficient non-native replenishment water to offset the additional production. Such a strategy could be implemented as a means to avoid construction of unnecessary delivery, treatment, and storage infrastructure. As a result, the community could lower the costs of the Coastal Water Project, and make greater beneficial use of treated recycled water by realizing the additional treatment effects that result from groundwater storage of treated recycled water.

The Decision allows such future innovative water management. Such strategies are also consistent with other adjudicated groundwater basins in the State (see e.g., Mojave adjudication). However, imposition of a double RA on Operating Yield Over-Production would create a virtually insurmountable perverse incentive to such desirable water management opportunities.

III. THE WATERMASTER IS NOT AUTHORIZED TO CREATE NEW ASSESSMENTS

Cal Am and Seaside object to the double RA applied to the Operating Yield Over-Production because the Decision does not authorize such double assessment for the reasons discussed. Cal Am and Seaside have each produced groundwater in excess of their respective Operating Yield allocations, resulting in Operating Yield Over-Production when non-native replenishment supplies are presently unavailable. The Judgment is silent on the consequences for Operating Yield Over-Production when replenishment water is unavailable and therefore any response must be from the Court – not the Watermaster.

Regarding the potential for Court action, Cal Am and Seaside also ask that other legal counsel of record consider the following:

- Both entities are attempting strategies to remedy Operating Yield Over-Production in that Seaside has contracted for the purchase of surplus Carryover

Credits to offset Operating Yield Over-Production within its municipal system, and Cal Am is seeking clarification to apply water stored pursuant to its ASR program to offset its Operating Yield Over-Production;

- Payment of a single RA on Operating Yield Over-Production will raise sufficient funds to procure replenishment water when available to offset the Operating Yield Over-Production;

- Both entities are making all reasonable efforts to avoid recurrence; and

- Unauthorized double assessments are paid for by the public (Seaside citizens or Cal Am ratepayers).

IV. REQUEST FOR ACCORD AMONG THE PARTIES

Seaside and Cal Am request that the other legal counsel of record provide feedback on the substance of this memo *on or before December 31, 2008*, and to the extent there is accord, support Cal Am's and Seaside's request that Watermaster modify its accounting method with respect to Carryover Credits and the calculation of the RA, consistent with the approach recommended herein. If there is disagreement among the Parties, we believe that all would benefit from a mutual request for clarification from the Court.

WATERMASTER PRODUCER ALLOCATIONS WATER YEAR 2009
BASED ON THE CALCULATION METHOD APPROVED ON MARCH 18, 2009
INCLUDING A 10% REDUCTION FOR 75% OF THIS WATER YEAR

Initial Basin-Wide Operating Yield[1]	**5180.0**	**Coastal Operating Yield[1]**	**4265.2**
Natural Safe Yield (NSY)[2]	**3000.0**	**Laguna Seca Operating Yield[1]**	**914.8**

ALTERNATIVE PRODUCER ALLOCATIONS

Coastal Subarea[3]	Acre-Feet	Laguna Seca Subarea[3]	Acre-Feet
Seaside (Golf)	540.0	Pasadera	251.0
SNG	149.0	Bishop	320.0
Calabrese	14.0	York School	32.0
Mission Memorial (Alderwood)	31.0	Laguna Seca County Park	41.0
Sand City	9.0		
Total[1]	**743.0**	**Total[1]**	**644.0**

STANDARD PRODUCER ALLOCATIONS

Coastal Operating Yield Available to Standard Producers (AFY)			**3522.18**	**Laguna Seca Operating Yield Available to Standard Producers (AFY)**			**270.83**
Coastal Subarea	**Standard Producer Allocations**		**AFY Available to This Producer**	**Laguna Seca Subarea**	**Standard Producer Allocations**		**AFY Available to This Producer**
	Base Water Right %[4]	**Weighted %[5]**			**Base Water Right %[4]**	**Weighted %[5]**	
California American Water	77.55%	90.60%	3191.09	CAW	45.13%	100.00%	270.83
Seaside (Municipal)	6.36%	7.43%	261.70				
Granite Rock	0.60%	0.70%	24.66				
D.B.O. Development No. 27	1.09%	1.27%	44.73				
Total	**85.60%**	**100.00%**	**3522.18**	**Total**	**45.13%**	**100.00%**	**270.83**

Allocation of Available Operating Yield Among Standard Producers	**Base Water Right Available to this Producer (AF)**	**% NSY to SPA (Base Water Right ./. Total Water Right)**	**NSY Available to Producers (AF) Current Water Year**	**Free Carryover Credits from Prior Water Year**	**Not-Free Carryover Credits from Prior Water Year**	**Water Rights Transferred / Sold**	**Total Producer NSY (AF) (NSY Available + Free Carryover Credits)**	**Total Authorized Production in Current Water Year (Base Water Right Plus All Carryover)**	**Actual AFY Pumped by Producer in WY 2009**	**Free Carryover Credits to WY 2010**	**Not-Free Carryover Credits to WY 2010**
		NSY 3000 - 1110.3 = 1889.7	WY '09 APA Pumped 1,110.3 AF	(22.9 AF overproduction by City of Seaside APA not charged against NSY available to SPAs)							
California American Water	3461.92	91.27%	1724.75	0.00	0.00		1724.75	3461.92	2966.02	0.00	495.90
Seaside (Municipal)	261.70	6.90%	130.38	0.00	0.00	10.00	140.38	271.70	293.44	0.00	0.00
Granite Rock	24.66	0.65%	12.29	38.10	38.10	-10.00	40.39	90.86	0.00	40.39	50.47
D.B.O. Development No. 27	44.73	1.18%	22.28	69.31	78.59		91.60	192.63	0.00	91.60	101.03
Total	**3793.01**	**100.00%**	**1889.70**	**107.41**	**116.69**	**0.00**	**1997.11**	**4017.11**	**3259.46**	**131.98**	**647.40**

Footnotes:
(1) From page 17 of Exhibit A (Amended Decision)of Court Order filed February 9, 2007.
(2) From page 14 of Exhibit A (Amended Decision)of Court Order filed February 9, 2007.
(3) From page 21 of Exhibit A (Amended Decision)of Court Order filed February 9, 2007.
(4) From Table 1 on page 19 of Exhibit A (Amended Decision) of Court Order filed February 9, 2007.
(5) Calculated from the Base Water Right percentages in the adjacent column.
Base Water Right plus Free and Not Free Carryover Credit = 2009 Production Allocation (see 2009 Declaration)
July 2009 Graniterock transferred 10AF to City of Seaside Municipal

CALCULATION OF REPLENISHMENT ASSESSMENTS WY 2009

Using the Basin-wide methodology approved by the Court on January 12, 2007, and as shown in detail on the spreadsheet contained in this attachement, Watermaster calculated the Water Year 2009 Replenisment Assessments as follows:

2009 Replenishment Assessment Unit Charge = $3,040.00

2009 NSY Available to Standard Producers = 1,889.70 AF (3,000 AF NSY - 1,110.3 APA 2009 Production)

Standard Producers	WY 2009 Production (AF)	% of NSY Available	Volume of NSY Available (AF)	NSY Overproduction (AF)	NSY Overproduction Assessment	Operating Yield Available (AF)	Operating Yield Overproduction (AF)	Operating Yield Overproduction Assessment	Total Assessment
California American Water	2,966.02	91.27%	1,724.75	1,241.27	$ 3,773,464.41	3,461.92	0.00	$ -	$ 3,773,464.41
Seaside (Municipal)	293.44	6.90%	140.38	131.32	$ 399,210.86	271.70	21.74	$ 66,089.60	$ 465,300.46
Granite Rock	0.00	0.65%	2.29	0.00	$ -	90.86	0.00	$ -	$ -
D.B.O. Development No. 27	0.00	1.18%	22.28	0.00	$ -	192.63	0.00	$ -	$ -
Total Production	**3,259.46**	**100.00%**	**1,889.70**	**1,372.59**	**$ 4,172,675.27**	**4,017.11**	**21.74**	**$ 66,089.60**	**$ 4,238,764.87**

Alternative Producers	WY 2009 Production (AF)	% of NSY Available	Volume of NSY Available (AF)	NSY Overproduction (AF)	NSY Overproduction Assessment	Operating Yield Available (AF)	Oeprating Yield Overproduction (AF)	Operating Yield Overproduction Assessment	Total Assessment
City of Seaside (Golf Courses)	562.93	N/A	540.00	22.93	$69,701	N/A	N/A	N/A	$69,701
Total Production	**562.93**	**N/A**	**540.00**	**22.93**	**$69,701**	**N/A**	**N/A**	**N/A**	**$69,701**

ATTACHMENT 7

WATERMASTER BUDGETS

Seaside Groundwater Basin Watermaster
Fiscal Year 2010 Administrative Fund Budget

		2010 Adopted Budget
Ordinary Income/Expense		
Income		
Dedicated Reserve	$	25,000
Est. Rollover		43,000
Est. Assessment		82,000
Totals	**$**	**150,000**
Expense		
Contractual Services - Administrative		100,000
Contractual Services - Legal Advisor		25,000
Total Expenses		125,000
Total Available		25,000
Less Dedicated Reserve		25,000
Net Available	**$**	**0**

Seaside Groundwater Basin Watermaster
Fiscal Year 2010 Monitoring & Management Plan
Adopted Operations Budget

Monitoring and Management Plan Operations Budget
For Tasks to be Undertaken in 2010

Task	Subtask	Sub-Subtask	Cost Description	CONSULTANTS & CONTRACTORS[3]				Total
				MPWMD	MCWRA	Private Consultants	Contractors	
Labor								
			Technical Project Manager	$0	$0	$100,000	$0	$100,000
M.1 Program Administration								
	M.1.a		Project Budget and Controls	$0	$0	$0	$0	$0
	M.1.b		Assist with Board and TAC Agendas	$0	$0	$0	$0	$0
	M.1.c		Preparation and Attendance of Meetings[8]	$0	$0	$5,000	$0	$5,000
	M.1.d		Prepare Board/ TAC Status Updates and Reports	$0	$0	$0	$0	$0
	M.1.e		Peer Review of Documents and Reports[8]	$0	$0	$3,000	$0	$3,000
	M.1.f		QA/QC	$0	$0	$0	$0	$0
I.1 Initial Phase 1 Monitoring Well Construction (Task Completed in Phase 1)								

Seaside Groundwater Basin Watermaster
Fiscal Year 2010 Monitoring & Management Plan
Adopted Operations Budget
(Continued)

I.2 Production, Water Level and Quality Monitoring								
	I. 2. a.		Database Management					
		I. 2. a. 1.	Conduct Ongoing Data Entry/ Database Maintenance/Enhancement	$9,600	$0	$28,000	$0	$37,600
		I. 2. a. 2.	Verify Accuracy of Production Well Meters	$0	$0	$0	$0	$0
	I. 2. b.		Data Collection Program					
		I. 2. b. 1.	Site Representation and Selection[7]	$0	$0	$0	$0	$0
		I. 2. b. 2.	Collect Monthly Water Levels[6]	$3,360	$0	$0	$0	$3,360
		I. 2. b. 3.	Collect Quarterly Water Quality Samples[1][5][6]	$43,480	$0	$0	$28,000	$71,480
		I. 2. b. 4.	Update Program Schedule and Standard Operating Procedures.	$1,000	$0	$1,000	$0	$2,000
		I. 2. b. 5.	Monitor Well Construction[7]	$0	$0	$0	$0	$0
		I. 2. b. 6.	Reports	$5,680	$0	$1,000		$6,680

Seaside Groundwater Basin Watermaster
Fiscal Year 2010 Monitoring & Management Plan
Adopted Operations Budget
(Continued)

I.3 Basin Management								
	I. 3. a.		Enhanced Seaside Basin Groundwater Model	(Costs Shown in Subtasks Below)				
		I. 3. a. 1	Update the Existing Model	$0	$0	$0	$0	$0
		I. 3. a. 2	Develop Protective Water Levels	$0	$0	$25,000	$0	$25,000
		I. 3. a. 3	Evaluate Replenishment Scenarios and Develop Answers to Basin Management Questions	$0	$0	$25,000	$0	$25,000
	I. 3. b.		Complete Preparation of Basin Management Action Plan	$0	$0	$0	$0	$0
	I. 3. c.		Refine and/or Update the Basin Management Action Plan(11)	$0	$0	$25,000	$0	$25,000
	I. 3. d.		Evaluate Coastal Wells for Cross-Aquifer Contamination Potential	$5,000	$0	$0	$0	$5,000

Seaside Groundwater Basin Watermaster
Fiscal Year 2010 Monitoring & Management Plan
Adopted Operations Budget
(Continued)

I.4 Seawater Intrusion Contingency Plan								
	I. 4. a.		Oversight of Seawater Intrusion Detection and Tracking	$3,600	$0	$2,000	$0	$5,600
	I. 4. b.		Analyze and Map Water Quality from Coastal Monitoring Wells	(Costs Included Under I.4.a)				
	I. 4. c.		Annual Report- Seawater Intrusion Analysis	$0	$0	$25,000	$0	$25,000
	I. 4. d.		Complete Preparation of Seawater Intrusion Response Plan[2][8]	$0	$0	$0	$0	$0
	I. 4. e.		Refine and/or Update the Seawater Intrusion Response Plan[2][9]	$0	$0	$0	$0	$0
	I. 4. f.		If Seawater Intrusion is Determined to be Occurring, Implement Contingency Response Plan[2]	(No Costs are Included for This Task, as This Task Will Likely Not be Necessary During 2010. If it Does Become Necessary, Use of Contingency Funds or a Budget Modification Will Likely be Necessary)				
			TOTALS CONSULTANTS & CONTRACTORS	$71,720	$0	$240,000	$28,000	
							SUBTOTAL not including Technical Program Manager =	$239,720
							Contingency (not including Technical Program Manager) @ 20%[4]=	$47,944
							TPM	$100,000
							TOTAL=	**$387,664**

Footnotes:

(1) An outside contractor would be used to perform the induction logging, and potentially to also collect some water quality samples in conjunction with doing the induction logging. MPWMD is expected to perform portions of the work of this Subtask, and would likely be the party that contracts with the Contractor to perform the induction logging and sample collection work on certain of the wells.

(2) The response plan would only be implemented in the event sea water intrusion is determined to be occurring.

(3) Within the context of this document the term "Consultant" refers either to a Private Consultant providing professional engineering or other types of technical services, or to the Monterey Peninsula Water Management District (MPWMD). The term "Contractor" refers to a firm providing construction or field services such as well drilling, induction logging, or meter calibration.

(4) Due to the uncertainties of the exact scopes of some of the Tasks listed above at the time of preparation of this Budget, e.g. Tasks I.2.a.1, I.3.a, and I.3.c, it is recommended that a 20% Contingency be included in the Budget.

(5) Includes approximately $10,000 in potential well site retrofitting costs that may be necessary in order to make some of these wells available for use as monitoring wells.

(6) Does not include costs for MPWMD to collect water level data or water quality samples from wells other than those that are part of the basic monitoring well network, i.e. for private well owners who have requested that the Watermaster obtain this data for them. Costs to obtain that data are to be reimbursed to the Watermaster by those well owners, so there should be no net cost to the Watermaster for that portion of the work under these Tasks.

(7) No new monitoring wells are planned for construction in 2010.

(8) For HydroMetrics to provide hydrogeologic consulting assistance to the Watermaster, beyond that associated with performing other specified Tasks, when requested to do so by the Technical Program Manager.

(9) If work under this Task is found to be necessary, it will be funded through the Contingency line item in this Budget.

(10) Includes funds to enhance the Watermaster's Database, if necessary, to improve its usefulness and "user friendliness."

(11) If necessary to reflect knowledge gained from modeling work or other data sources.

Seaside Groundwater Basin Watermaster
Fiscal Year 2009 Monitoring & Management Plan
Adopted Capital Fund Budget

Monitoring and Management Plan Capital Budget
For Tasks to be Undertaken in 2010

The Capital projects and expenditures for 2010 are:

No Capital projects are anticipated to be undertaken in 2010, so this budget is $0.

Seaside Groundwater Basin Watermaster
Fiscal Year 2010 Adopted Replenishment Fund Budget

Seaside Groundwater Basin Watermaster

REPLENISHMENT FUND

2010 Proposed Budget

Replenishment Fund	2006	2007	2008	2009 Estimated	Totals Through WY 2009	2010 Proposed Budget	Totals Through WY 2010
Assessments:	WY 05/06	WY 06/07	WY 07/08	WY 08/09		WY 09/10	
Unit Cost:	$1,132	$1,132	$2,485	$3,040		$2,780	
California American Water							
Exceeding Natural Safe Yield Considering Alternative Producers	2,106,652	2,484,533	5,164,969	6,318,518	$ 16,074,672	5,778,119	$ 21,852,791
Operating Yield Overproduction Replenishment	-	80,938	34,045	41,648	$ 156,631	38,086	$ 194,717
Total California American	2,106,652	2,565,471	5,199,014	6,360,166	$ 16,231,303	5,816,205	$ 22,047,508
CAW Credit Against Assessment	**(465,648)**		**(12,305,924)**	**(7,106,910)**	**$ (12,771,572)**	**-**	**$ (12,771,572)**
CAW Unpaid Credit Balance			**(7,106,910)**	**(746,744)**	**-**	**-**	**$ -**
CAW Unpaid Balance	**$ 1,641,004**	**$ 2,565,471**	**$ -**	**$ -**	**$ 3,459,731**	**$ 5,816,205**	**$ 9,275,936**
City of Seaside - Municipal							
Exceeding Natural Safe Yield Considering Alternative Producers	169,201	173,742	385,642	471,778	$ 1,200,363	431,428	$ 1,631,791
Operating Yield Overproduction Replenishment	50,487	340	16,898	20,672	$ 88,397	18,904	$ 107,301
Total Municipal	219,688	174,082	402,540	492,450	$ 1,288,760	450,332	$ 1,739,092
City of Seaside - Golf Courses							
Exceeding Natural Safe Yield - Alternative Producer	-	-	131,705	161,120	$ 292,825	147,340	$ 440,165
Total City of Seaside*	219,688	174,082	534,245	653,570	1,581,585	597,672	2,179,257
City of Seaside Paid Assessments	**(219,950)**	**(182,183)**	**-**	**-**	**$ (402,133)**	**-**	**(402,133)**
City of Seaside Unpaid Balance	**$ (262)**	**$ (8,101)**	**$ 534,245**	**$ 653,570**	**$ 1,179,452**	**$ 597,672**	**$ 1,777,125**
MRWPCA GWRP Payment							**$ (100,000)**
Grand Total Replenishment Fund Balance	**$ 1,640,742**	**$ 2,557,370**	**$ 534,245**	**$ 653,570**	**$ 4,639,183**	**$ 6,413,877**	**$ 10,953,060**

ATTACHMENT 8

WATER QUALITY ANALYTICAL RESULTS

MONTEREY PENINSULA
WATER MANAGEMENT DISTRICT

5 HARRIS COURT, BLDG. G
POST OFFICE BOX 85
MONTEREY, CA 93942-0085 • (831) 658-5600
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SEASIDE BASIN WATERMASTER
MEMORANDUM 2009-03

Date: **November 2, 2009**
To: **Seaside Basin Watermaster**
From: **Jonathan Lear, PG, CHg, Senior Hydrogeologist**
Joe Oliver, PG, CHg, Water Resources Division Manager
Tom Lindberg, Associate Hydrologist

Subject: **Report of Water Year 2009, Groundwater-Quality and Groundwater-Level Data Collected for the Seaside Groundwater Basin Watermaster**

SUMMARY

This memorandum transmits and summarizes groundwater-quality and groundwater-level data collected for the Seaside Groundwater Basin Watermaster Board (Watermaster) during Water Year (WY) [1] 2009. This report incorporates the data that were collected and reported during the period from October 1, 2008 through September 30, 2009. This information is being provided to the Watermaster for information purposes, and is in compliance with the monitoring protocols described in the Watermaster's *Seaside Basin Monitoring and Management Program* (SBMMP, revision date September 5, 2006), which was prepared in response to the court decision filed March 27, 2006 (as amended by February 9, 2007 filing) in the Seaside Basin adjudication case. This document has been prepared by the Monterey Peninsula Water Management District (MPWMD) on behalf of the Watermaster.

This document is organized into the following two categories of data:

- Water-quality data collected from MPWMD Quarterly and annual wells, and Watermaster annual basin wells,
- Static water levels collected from MPWMD and other Watermaster basin wells.

[1] The WY begins on October 1, and ends September 30 of the indicated year.

WATER-QUALITY DATA: MPWMD AND OTHER BASIN WELLS

MPWMD Coastal Monitor-Well Network

Under the current monitoring program conducted for the Watermaster, the MPWMD collects *quarterly* samples from six monitor wells at three locations that are closest to the coastline, and *annually* from six additional wells at three locations that are farther from the coastline. The well numbers, names and sampling schedule for the MPWMD coastal monitor wells currently being sampled for the Watermaster are listed below.

MPWMD Coastal Monitor Wells

Well Number	Well Name	Sample Interval
15S01E15N3	MSC-Shallow	quarterly
15S01E15N2	MSC-Deep	quarterly
15S01E15F1	PCA-W-Shallow	quarterly
15S01E15F2	PCA-W-Deep	quarterly
15S01E11Pa	FO-09-Shallow	quarterly
15S01E11Pb	FO-09-Deep	quarterly
15S01E15K5	PCA-E-Shallow	annually
15S01E15K4	PCA-E-Deep	annually
15S01E23Ca	Ord Terrace-Shallow	annually
15S01E23Cb	Ord Terrace-Deep	annually
15S01E12Fa	FO-10-Shallow	annually
15S01E12Fc	FO-10-Deep	annually

These sites are shown on **Figure 1** and completion data for these wells are shown in **Table 1.** At each site, a "shallow" and "deep" monitor well have been installed (either in separate boreholes or as multiple completions in a single borehole), generally corresponding to well completions within the two principal aquifer units that have been historically recognized in the Seaside Basin, the Paso Robles Formation (QTp and QTc for undifferentiated Continental Deposits) and Santa Margarita Sandstone (Tsm), respectively. More recently, it has been recognized that the Tsm deposits transition to the Purisima Formation (Tp) in the northern coastal subarea of the Basin. The monitor wells are constructed of 2-inch PVC casing, with screens adjacent to the more permeable (i.e., based on lithologic and geophysical logging analyses) sand "packages" within each aquifer unit. The aquifer units are separated from each other in the wells by cement strata-isolation seals.

MPWMD Coastal Monitor Wells Water-Sample Collection

Water sample collection from the MPWMD coastal monitor wells for quarters 1, 2, and 3 of WY 2009 water year were accomplished by "air-lift" pumping. Annual and fourth quarter water-quality sample collections for these wells were accomplished by the Low-Flow Method. As a means to investigate alternative water-quality sampling technologies, MPWMD staff completed a test of different "low-flow" sampling methodologies at Well No. 258 (MW-B-23-180) on June, 4, 2009. Results from the methodology comparison along with cost estimates for implementation of each methodology were presented to the Watermaster Technical Advisory Committee (TAC) at the June 10, 2009 meeting. Following the recommendation of the TAC, MPWMD staff purchased a Micro Purge well sampling pump and pump controller from QED Environmental Systems, Inc. Motivation behind changing the sampling method included a desire to: (a) switch to a less invasive sampling method to prolong the life of the monitoring wells and (b) implement a less labor-intensive method that will be more cost effective to the Watermaster in the long run. Details of both sampling methodologies are discussed below.

- **Air-Lift Sampling Method**

The method utilizes a 3/4-inch PVC dedicated airline in the well, which is coupled to a portable air compressor. The wellhead configuration is fashioned after that shown in **Figure 2**. Due to the small diameter of the monitor wells, the well casing is used as the "eductor" pipe, rather than a separate eductor pipe inside the well. Through experience, it has been determined that acceptable pumping results can be achieved if the bottom of the airline is placed at a depth that gives approximately 50 percent pumping submergence (i.e., the ratio of the length of the airline below the pumping water level to the total length of the airline). The air-lift method can be inappropriate for certain groundwater-quality constituents due to chemical changes brought about by air entrainment in the purged water; however, it is considered appropriate for the suite of general minerals and trace inorganic constituents that are currently analyzed from the collected samples. This method is, however, aggressive in terms of the potential for "wear and tear" on the well components from the high-pressure air source used to lift water samples to the surface for collection.

The volume of water removed from each well prior to sampling is normally three casing volumes, as a standard sampling protocol. Sampling is supplemented by field measurement of several indicator parameters (i.e., pH, temperature, Specific Conductance) that are collected during pumping, which ensures that the groundwater quality has stabilized prior to sample collection. Upon collection of the samples, samples are handled through applicable chain-of-custody procedures and are analyzed by a State-certified water chemistry laboratory.

- **Low-Flow Sampling Method**

Low-flow/low-volume purging method is sample collection using a pumping mechanism that produces low-flow rates [less than 1 liter per minute (lpm) or less than 0.26 gallon per minute (gpm)] that cause minimal drawdown of the static water table and usually employs a flow cell in

which geochemical parameters are continuously monitored. These parameters may include dissolved oxygen content, oxidation-reduction potential (redox), conductivity, turbidity, and/or pH. The intent of this sampling protocol is to collect a representative sample from the monitored groundwater zone. A representative sample may be obtained when all the monitored chemical parameters have stabilized, thus quantitatively demonstrating that the sample being collected is in equilibrium with the groundwater system. The low-flow/low volume purging method (purging to parameter stability) tends to isolate the interval being sampled, which provides more accurate water-quality measurements and reduces the volume of purge water generated. This method has an advantage in that it can limit vertical mixing and volatilization of any volatile organic compounds (VOCs) in solution within the well casing or borehole, as compared to high-flow purging and sampling (e.g., air-lift sampling method).

Figure 3 illustrates the QED Environmental Systems, Inc. low-flow sampling equipment. The bladder pump is placed in the monitor well and powered by a fuel source of compressed gas. The peristaltic action of the pump lifts water from the well and initiates flow through the well screen at the location where the drop tube and intake assembly have been placed. An electric wire sounder is used to measure drawdown to insure minimal drawdown is caused by pumping the well. Water-quality parameters are monitored at the flow cell as the well is purged.

The low-flow/low-volume purging method of sample collection has been described in groundwater monitoring literature since the mid-1980s with a defined methodology being accepted by the U.S. EPA in 1995. These protocols are summarized below as adopted by MPWMD staff:

1. **Flow rate**

The flow rate used during purging must be low enough to avoid increasing the water turbidity. The following measures should be taken to determine the appropriate flow rate: (a) The flow rate shall be determined for each well, based on the hydraulic performance of the well; (b) The flow must be adjusted to obtain stabilization of the water level in the well as quickly as possible; (c) The maximum flow rate used should not exceed 1 liter per minute (0.26 gpm); (d) Once established, this rate should be reproduced with each subsequent sampling event; (e) If a significant change in initial water level occurs between events, it may be necessary to re-establish the optimum flow rate at each sampling event.

2. **Measurement of water level and drawdown**

Measurement of the water level in the well during purging is important when establishing the optimum flow rate for purging. The goal is to achieve a stabilized pumping water level as quickly as possible with minimal drawdown, to avoid stressing the formation and mobilizing solids, and to obtain stabilized indicator parameters in the shortest time possible.

3. **Measurement of indicator parameters**

Continuous monitoring of water-quality indicator parameters is used to determine when purging is completed and sampling should begin. Measurement of indicator parameters (dissolved oxygen content, redox potential, specific conductance, temperature and pH) is required. This is most easily performed using an in-line flow cell (closed) system attached directly to the pump discharge tubing. For turbidity measurement, a separate field nephalometer should be used.

If portable systems are used, they must be placed carefully into the well and lowered into the screen zone as slowly as possible. Placement of the portable pump can disturb the groundwater flow conditions resulting in non-equilibrium conditions. As a result, longer purge times and greater purge volumes may be necessary to achieve indicator parameter stabilization. In general, this may require that after installation, the portable pump should remain in place for a minimum of 1-2 hours to allow settling of solids and re-establishment of horizontal flow through the screen zone. If initial turbidity readings are excessive (>50 NTU), pumping should cease and the well should rest for another 1-2 hours before initiating pumping again. In wells set in very fine-grained formations, longer waiting periods may be required. Continuous water-level measurement devices are preferred, such as down-hole pressure transducers, but electronic water-level tapes can be used. The devices used must be capable of measuring to 0.01-foot precision.

4. Sample Collection

Water samples for laboratory analyses must be collected before water has passed through the flow-through-cell (use a by-pass assembly or disconnect cell to obtain sample). VOC samples should be collected first and directly into pre-preserved sample containers. Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence. During purging and sampling, the tubing should remain filled with water so as to minimize possible changes in water chemistry upon contact with the atmosphere.

MPWMD Coastal Monitor Wells Water-Quality Results

Water chemistry analytical results for the samples collected during WY 2009 are provided in the table in **Appendix 1**. This table and other water-level data tables in this document were prepared utilizing the "report" feature of the groundwater resources database that was created for the Watermaster in 2007.

In general, the chemical data from WY 2009 samplings of these monitor wells do not show significant changes relative to the results provided in WY 2008, and are not indicative of seawater intrusion into the basin at the locations and depths of these monitor well completions. This is consistent with the conclusions drawn in the Water Year 2009 Seawater Intrusion Analysis Report (SIAR WY2009) prepared by Hydrometrics, LLC.

Other Basin Monitor and Producer Wells Water-Quality Results

Water chemistry analytical results for the samples collected from other basin monitor wells and producer wells during WY 2009 are also provided in the table in **Appendix 1**. These include: (a) annual sample results from coastal and inland monitor wells that were added as part of the monitoring well network enhancement study that was conducted by MPWMD for the Watermaster in 2007; (b) annual sample results for the active Watermaster producer wells in the coastal subareas of the basin that are required to collect these samples under the Watermaster's MMP; and (c) annual sample results for the four dedicated coastal Watermaster Sentinel wells that were installed in 2007.

WATER-LEVEL DATA: BASIN MONITOR AND PRODUCER WELLS

Basin monitor wells and basin producer active and inactive wells with water-level data collected during all four quarters of WY 2009 are provided in **Appendix 2**. The general locations of these wells are shown on **Figure 4**. The Watermaster has requested that producers collect and report "static", i.e., non-pumping, water-level measurements. The purpose for this is so these measurements will more closely approximate ambient groundwater-level conditions, and facilitate the plotting of well water-level hydrographs. Occasionally, water-level measurements have been collected and reported while the well was in operation. In some cases, this may be due to the fact that the well can not be taken offline to collect a static water-level measurement because of pumping demand requirements. These occurrences have been recorded in the comments section of **Appendix 2**. These water-level data were collected primarily with manual water-level sounding devices by producers or by the MPWMD on behalf of the Watermaster.

These water-level data have been entered into the Watermaster database. The table in **Appendix 2** was generated by obtaining a data dump from the Watermaster database and using the report feature in MS Access. The new table format for this WY 2009 report includes additional information relative to each well and its monitoring schedule. This format will be used as a template to improve the web-based reporting feature of the database. Because this feature is still under development, future water-level tables may differ slightly from the one included in this report.

It should be noted that the table in **Appendix 2** includes the "reference-point elevations" that were recently surveyed for each well, as part of work conducted for the Watermaster. The reference point elevations were established at the water-level data collection point at each wellhead. The reference point elevations are tied to the North American Vertical Datum of 1988 (NAVD88). The measurements in NAVD88 datum have been adjusted for the Watermaster's use by subtracting 2.97 feet to conform to local Mean Sea Level (MSL) reference, based on data provided by the surveyor. The "depth to water" measurement at each well is subtracted from the

reference-point elevation to obtain the "water elevation" relative to MSL, as shown in the column to the right of the "depth to water" column of the table.

Water-level hydrographs for the MPWMD monitor wells located in the Northern Coastal Sub-Area and the Watermaster Sentinel wells are included in **Appendix 3**. The long-term hydrograph figures for the MPWMD monitor wells were generated to provide historical static water-level data for the wells with longer data records in the Seaside Groundwater Basin. The Sentinel well hydrographs were included to comply with monthly water-level reporting requirements.

CONCLUSIONS

- Due to actions by the Watermaster in WY 2008 to notify and remind basin producers of their obligations to collect required groundwater level and groundwater quality data from their wells, the availability of these data to assist in analysis of the basin's groundwater resources has greatly improved compared to prior years.
- The chemical data from WY 2009 for the MPWMD dedicated coastal monitor wells do not show significant changes relative to previous samplings, and are not indicative of seawater intrusion into the basin at the locations and depths of these monitor wells. This conclusion is supported by work completed this year for the Watermaster as documented in the WY 2009 Seawater Intrusion Analysis Report prepared by HydroMetrics, LLC.
- Based on the water-level data collected during WY 2009, water-level elevations varied from -52.86 feet mean sea level (MSLl) (Well No. 107) to +55.48 feet MSL (Well No. 177) in the coastal subareas of the basin, and from -22.37 feet MSL (Well No. 119) to +249.70 feet MSL (Well No. 139) in the inland subareas of the basin.
- Based on the long-term water-level hydrographs for coastal monitor wells presented in **Appendix 3**, the trend of declining groundwater levels is continuing in the deeper Santa Margarita aquifer monitor wells, whereas groundwater levels have generally stabilized, and in a few cases displayed an overall increase in the shallower Paso Robles aquifer.

RECOMMENDATIONS

- The newly-initiated water-quality sampling methodology (i.e., the low-flow sampling method) should continue to be employed during the upcoming year. Based on the experience and water-quality record generated by this collection method during the next year, consideration should be given to altering (i.e, reducing) the sampling frequency of selected quarterly monitor wells that continue to exhibit stable water-quality results. Where feasible, water quality at selected locations may be supplemented with continuous water-quality dataloggers to offset the reduction in sample collection frequency.
- The potential utility of deploying dedicated low-flow sampling equipment in the quarterly water-quality monitoring wells should be evaluated. Dedicated sampling equipment left in the monitoring wells may greatly reduce staff resources required to

obtain quarterly water-quality samples and result in an overall cost reduction in the long run.

- Given that the geophysical and water-quality data that have been collected since the installation of the Watermaster's coastal Sentinel Wells in 2007 have not shown any emerging trends or significant variations since this monitoring began, it is recommended that the frequency of induction logging at these sites can be reduced from quarterly to semi-annually without unduly compromising the utility of the monitoring program.

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Figures and Tables

Seaside Groundwater Basin Watermaster Data Report

Water Year 2009

SEASIDE GROUNDWATER BASIN WATERMASTER

SEASIDE COASTAL WATER QUALITY MONITOR WELL LOCATIONS

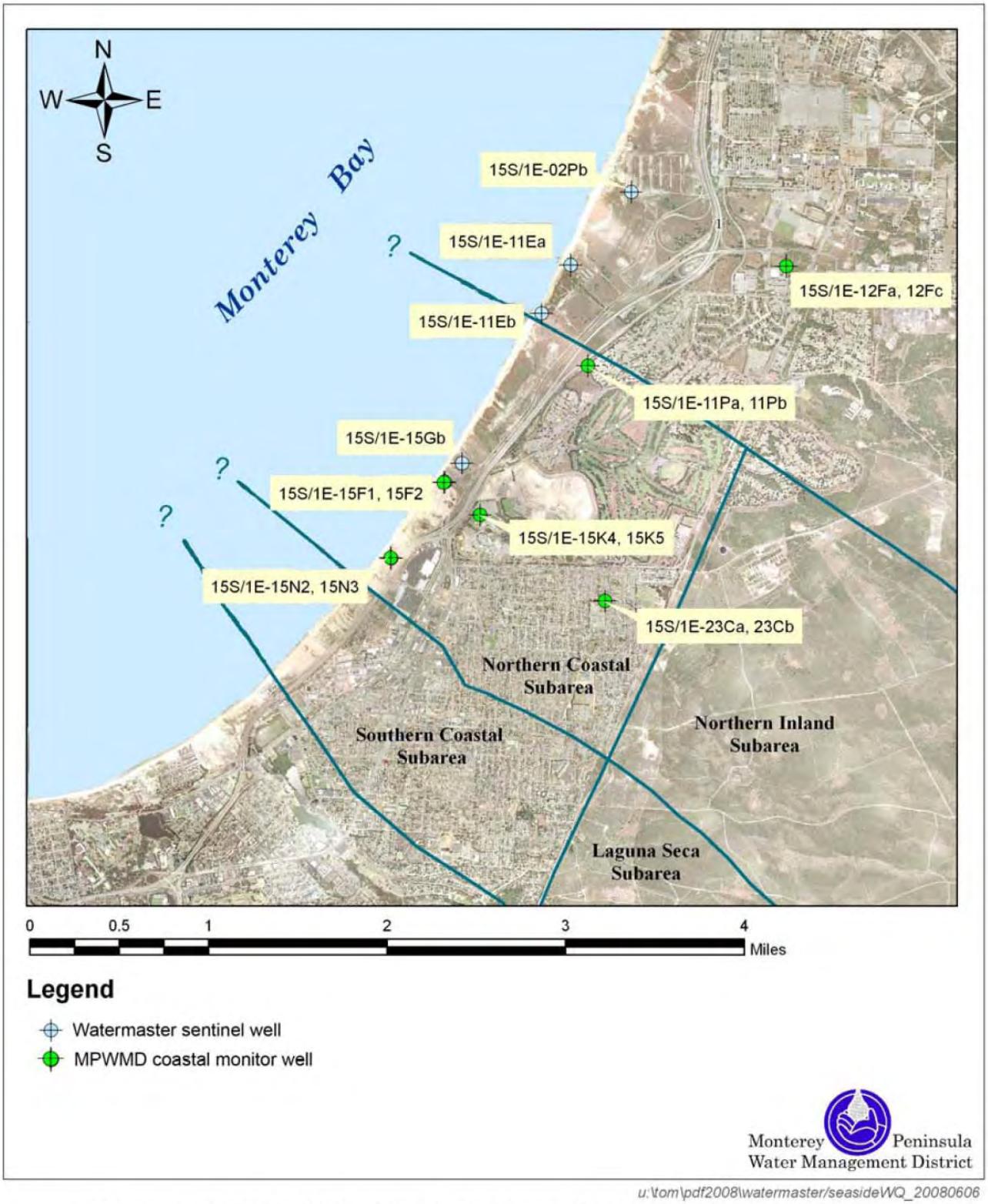


Figure 1. MPWMD Seaside Basin Coastal Monitor Well Locations.

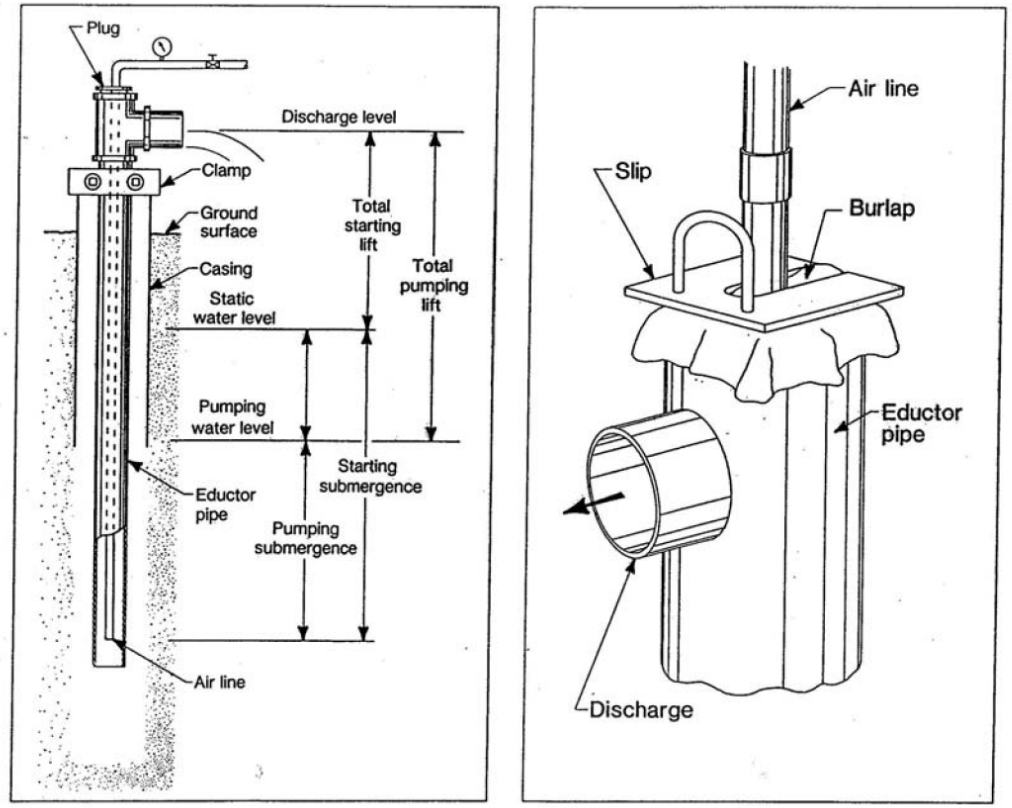


Figure 2. Diagrams illustrating the airlift-pumping method for water sample collection (from Driscoll, 1986, Figure 15.10)

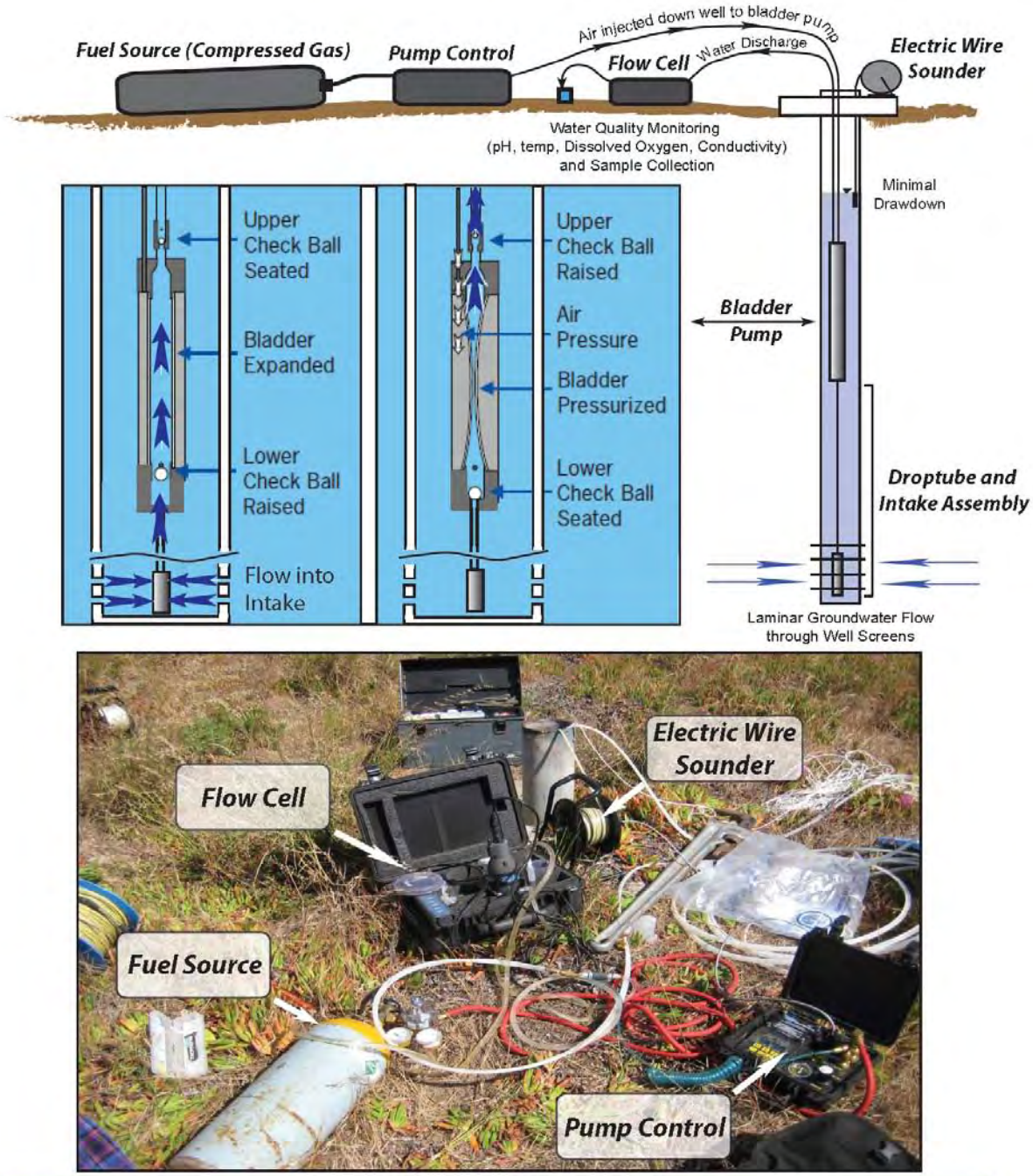


Figure 3. Low Flow Groundwater Sampling System Presented in Cartoon and Photograph

Monterey Peninsula
Water Management District

Figure 4. General locations of monitor and production wells included in this report.

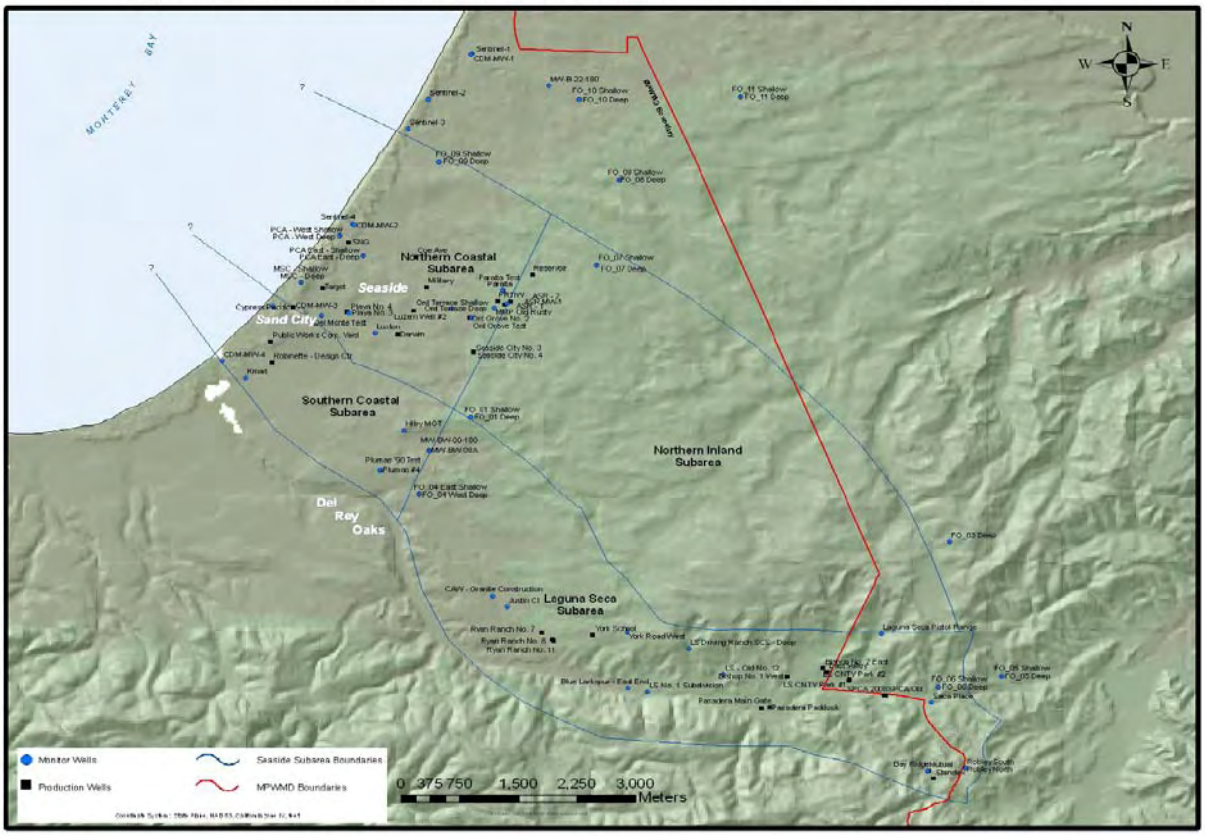


Table 1. Summary of Well Completions, MPWMD Coastal Seaside Basin Water Quality Monitor Wells.

SUMMARY OF MPWMD COASTAL SEASIDE BASIN GROUNDWATER QUALITY MONITOR WELLS

Site	Well Name	Location Description	Well Number	Date Drilled	DWR Drillers Log	Hole Depth (feet)	Well Depth (feet)	Screened Interval (feet)	Strata Seal (feet)	Casing Type	Geologic Unit	E-Log	Elevation (feet AMSL)
MSC		***former MSC mine north of Playa Ave. and west of Hwy. 1***											
	MSC-Shallow	approx. 10' S of north property line	15S/1E-15N3	5/25/1990	338413	720	695	490 - - 680	95 - 275	2" pvc	QTp	- - -	80.1
	MSC-Deep	approx. 7' E of MSC-Shallow	15S/1E-15N2	5/25/1990	338425	920	865	810 - 850	725 - 775	2" pvc	Tsm	yes	80.29
PCA WEST		***former PCA mine W of Hwy. 1***											
	PCA-W Shallow	approx. 200' SE of ocean bluff	15S/1E-15F1	3/28/1990	338400	600	585	525 - 575	120 - 150	2"pvc	QTp	- - -	64.22
	PCA-W Deep	approx. 50' E of PCA-W Shallow	15S/1E-15F2	3/90	338401	900	885	825 - 875	760 - 790	2" pvc	Tsm	yes	65.18
PCA EAST		***vacant lot NE of Seaside High baseball field***											
	PCA-E Shallow	approx. 300' E Monterey Rd, 50" N fence	15S/1E-15K5	4/16/1990	338402	863	410	350 - 400	110 - 150	2" pvc	QTp	- - -	68.51
	PCA-E Deep	(same borehole as shallow well)	15S/1E-15K4	4/16/1990	338402	863	710	650 - 700	580 - 620	2" pvc	Tsm	yes	68.54
ORD TERRACE		***Ord Terrace School property south of Ord Grove Ave.***											
	OT-Shallow	1700 block Ord Grove Ave.	15S/1E-23Ca	8/5/1999	- - -	530	340	280 - 330	0 - 260	2" pvc	upper Tsm	- - -	228.65
	OT-Deep	(same borehole as shallow well)	15S/1E-23Cb	8/5/1999	- - -	530	450	390 - 440	350 - 377	2" pvc	lower Tsm	yes	228.63
MPWMD #FO-09		***E of Hwy.1, SE of Okinawa Rd.***											
	#9-Shallow	50' east of utility service rd.	15S/1E-11Pa	8/16/1994	- - -	1,110	660	610 - 650	500 - 540	2" pvc	QTp (?)	- - -	118.89
	#9-Deep	(same borehole as shallow well)	15S/1E-11Pb	8/16/1994	- - -	1,110	840	790 - 830	700 - 765	2" pvc	Tsm (?)	yes	118.85
MPWMD #FO-10		***south of Light Fighter Drive, behind Barker Theater Building***											
	#10-Shallow	20' north of access road curb	15S/1E-12Fa	9/3/1996	- - -	1,500	650	620 - 640	480 - 500	2" pvc	QTp	- - -	200.85
	#10-Deep	(same borehole as shallow well)	15S/1E-12Fc	9/3/1996	- - -	1,500	1,420	1380 - 1410	1280 - 1300	2" pvc	Tsm (?)	yes	201.03

NOTES:

1. Official State well numbers end with a numeral; unofficial MPWMD well numbers end with a small case letter.
2. Geologic Unit refers to the unit adjacent to the screened interval: QTp = Paso Robles Formation; Tsm = Santa Margarita Sandstone.
3. Elevation refers to the water level reference point elevation surveyed by Central Coast Surveyors. For additional information, see "Documentation of 2008 Well Elevation Surveys", MPWMD Seaside Basin Watermaster Memorandum 2008-05.
4. Well completion data at site MSC are documented in "Installation of Monitoring Well Cluster, Monterey Sand Company", Staal, Gardner & Dunne, Inc. (SGD), July 1990.
5. Well completion data at sites PCA West and PCA East are documented in "Hydrogeologic Investigation, PCA Well Aquifer Test", SGD, July 1990.
6. Well completion data at site MPWMD FO-09 are documented in "Summary of 1994 Fort Ord Monitor Well Installations", MPWMD Technical Memorandum 94-07.
7. Well completion data at site MPWMD FO-10 are documented in "Summary of 1996 Seaside Basin Monitor Well Installations", MPWMD Technical Memorandum 97-04.
8. Two dashes (i.e., "- -") indicate multiple screened intervals.
9. Three dashes (i.e., "- - -") indicate not applicable or not available.

Appendix 1

Seaside Basin Groundwater Quality Monitoring Results

Water Year 2009

GROUNDWATER QUALITY MONITORING RESULTS

Water Year 2009 - 10/1/2008 through 9/30/2009

Units are milligrams per liter, unless otherwise stated.

MPWMD monitor wells and Other Basin monitor and Producer wells

Date Of Sample	Specific Conductance (micro mhos/cm)	Total Alkalinity (as CACO3)	pH (units)	Chloride	Sulfate	Ammonia Nitrogen (as NH3)	Nitrate Nitrogen (as NO3)	Total Organic Carbon	Calcium	Sodium	Magnesium	Potassium	Iron	Manganese	Orthophosphate	Total Dissolved Solids	Hardness (as CaCO3)	Boron	Bromide	Fluoride
Well Number: 101 Name: MSC-Shallow																				
7/23/2009	313	67	7.9	44	15	0.46	1	0.20	18	34	5	3.3	<0.050	0.053	<0.1	230	66	0.06	<0.2	0.14
4/24/2009	325	69	8.1	44	17	0.05	<1	<0.20	17	36	5	3.3	<0.050	<0.020	0.2	235	63	0.08	<0.2	0.16
1/28/2009	325		8.0	41	17	<0.05	<1	0.45	18	38	4	3.8	<0.100	<0.020	<0.2	230	61	0.15	0.5	0.14
10/10/2008	316	70	8.2	42	17	<0.05	<1	<0.20	17	36	4	3.8	<0.100	<0.020	<0.2	241	59	0.05	0.2	<0.18
Well Number: 102 Name: MSC-Deep																				
7/24/2009	1020	247	7.3	145	39	0.12	<1	0.86	73	108	16	5.1	0.307	0.064	0.4	620	248	0.18	0.5	0.25
4/24/2009	1024	232	8.1	152	40	0.12	<1	0.57	77	105	17	4.8	<0.050	0.096	<0.2	605	262	0.18	0.5	0.28
1/28/2009	968	226	8.1	143	42	0.07	<1	0.47	77	108	14	4.6	<0.100	0.058	<0.2	570	250	0.08	0.6	0.22
10/10/2008	963	210	8.3	150	43	0.09	<1	<0.20	73	97	13	4.9	<0.100	0.053	<0.2	586	236	0.11	0.5	0.19
Well Number: 103 Name: PCA-W Shallow																				
7/28/2009	315	72	7.3	40	11	0.05	4	<0.20	19	34	5	2.3	<0.050	<0.020	<0.1	218	68	0.08	<0.2	0.11
4/24/2009	311	66	8.2	45	11	0.05	4	<0.20	20	32	5	2.1	<0.050	<0.020	<0.2	208	71		0.2	0.11
1/28/2009	309	66	8.2	42	11	<0.05	4	0.33	18	33	5	2.2	<0.100	<0.020	<0.2	227	66	0.09	<0.2	<0.10
10/10/2008	310	67	8.2	42	11	<0.05	4	<0.20	20	34	5	2.5	0.100	<0.020	<0.2	221	71	0.05	<0.2	<0.10
Well Number: 104 Name: PCA-W Deep																				
7/28/2009	1028	248	7.2	147	40	0.10	<1	0.56	76	109	17	5.1	<0.050	0.121	<0.1	625	260	0.16	0.5	0.62
4/24/2009	964	224	8.3	146	42	0.07	<1	0.44	78	106	15	4.4	<0.050	0.053	<0.2	593	257	0.28	0.5	0.21
1/28/2009	942	206	8.0	147	40	0.08	<1	1.1	72	106	14	5.7	<0.100	0.093	<0.2	565	237	0.17	0.5	0.24
10/10/2008	984	220	8.2	154	41	0.11	1	0.30	75	101	17	5.2	<0.100	0.081	<0.2	598	257	0.14	0.5	0.25
Well Number: 105 Name: PCA-E (Multiple) Shallow																				
7/27/2009	407	98	7.6	48	15	0.22	9	<0.20	27	43	6	3.1	0.152	<0.020	<0.1	273	92	0.10	<0.2	0.16
Well Number: 106 Name: PCA-E (Multiple) Deep																				

NOTES:
(1) Maximum contaminant levels are from California Domestic Water Quality and Monitoring Regulations, Title 22, 1997.

GROUNDWATER QUALITY MONITORING RESULTS

Water Year 2009 - 10/1/2008 through 9/30/2009

Units are milligrams per liter, unless otherwise stated.

MPWMD monitor wells and Other Basin monitor and Producer wells

Date Of Sample	Specific Conductance (micro mhos/cm)	Total Alkalinity (as CACO3)	pH (units)	Chloride	Sulfate	Ammonia Nitrogen (as NH3)	Nitrate Nitrogen (as NO3)	Total Organic Carbon	Calcium	Sodium	Magnesium	Potassium	Iron	Manganese	Orthophosphate	Total Dissolved Solids	Hardness (as CaCO3)	Boron	Bromide	Fluoride
7/27/2009	926	233	7.0	127	36	0.07	<1	0.73	65	100	14	4.8	0.196	0.185	<0.1	573	220	0.16	0.5	0.22
Well Number: 109 Name: Ord Terrace-Shallow																				
7/31/2009	824	218	7.5	101	36	<0.05	4	1.3	68	81	16	4.2	0.146	0.173	<0.1	528	236	0.16	0.5	0.19
Well Number: 110 Name: Ord Terrace-Deep																				
7/31/2009	995	248	7.2	119	73	0.41	<1	4.3	87	93	19	6.4	0.845	0.076	<0.1	618	295	0.16	1.3	0.34
Well Number: 111 Name: MPWMD #FO-09-Shallow																				
8/5/2009	346	66	7.8	48	24	<0.05	<1	<0.20	28	33	3	4	<0.050	0.025	<0.1	235	82	0.24	0.2	<0.10
4/24/2009	330	63	8.1	53	12	<0.05	1	0.21	22	32	5	3.5	<0.050	<0.020	0.15	235	76	0.06	0.2	0.13
1/28/2009	328	66	8.0	48	13	<0.05	<1	0.35	22	33	5	3.8	<0.100	0.020	<0.2	230	76	0.08	<0.2	0.16
10/10/2008	336	63	8.3	50	17	<0.05	<1	<0.20	22	36	4	3.7	<0.100	<0.020	<0.2	232	71	0.08	<0.2	0.10
Well Number: 112 Name: MPWMD #FO-09-Deep																				
7/30/2009	426	89	6.3	60	18	<0.05	<1	<0.20	26	53	4	3.5	0.152	<0.020	<0.1	280	81	0.14	0.2	0.12
4/24/2009	429	89	8.2	66	14	0.05	<1	<0.20	27	50	4	3.4	<0.050	<0.020	<0.2	264	84	0.10	0.3	0.11
1/28/2009	420	90	8.2	61	14	<0.05	<1	<0.49	26	50	4	4.0	<0.100	<0.020	<0.2	247	81	0.13	<0.2	<0.10
10/10/2008	420	90	8.3	65	14	<0.05	1	<0.20	25	48	4	3.9	<0.100	<0.020	<0.2	271	79	0.09	0.3	<0.10
Well Number: 113 Name: MPWMD #FO-10-Shallow																				
8/5/2009	307	61	7.4	43	16	<0.05	2	0.43	18	29	8	2	<3.370	0.931	<0.1	225	78	0.16	<0.2	<0.10
Well Number: 114 Name: MPWMD #FO-10-Deep																				
8/5/2009	401	77	6.5	62	19	<0.05	2	1.8	23	36	11	2.8	4.410	2.060	<0.1	258	103	0.16	<0.2	0.10
Well Number: 141 Name: LS Driving Range (SCS Deep)																				
7/8/2009	1136	131	6.5	243	51	<0.05	1	0.75	38	142	26	5	0.072	0.012	0.2	667	202	0.20	0.8	0.13

NOTES:
(1) Maximum contaminant levels are from California Domestic Water Quality and Monitoring Regulations, Title 22, 1997.

Date 11/3/2009

GROUNDWATER QUALITY MONITORING RESULTS

Water Year 2009 - 10/1/2008 through 9/30/2009

Units are milligrams per liter, unless otherwise stated.

MPWMD monitor wells and Other Basin monitor and Producer wells

Date Of Sample	Specific Conductance (micro mhos/cm)	Total Alkalinity (as CACO3)	pH (units)	Chloride	Sulfate	Ammonia Nitrogen (as NH3)	Nitrate Nitrogen (as NO3)	Total Organic Carbon	Calcium	Sodium	Magnesium	Potassium	Iron	Manganese	Orthophosphate	Total Dissolved Solids	Hardness (as CaCO3)	Boron	Bromide	Fluoride
Well Number: 151 Name: CAW - Military																				
7/6/2009	780	97	7.56	97.8	107.3	<1	8.9	0.59	63	68	13	0	0.35	0.045	<1	460	211	0.053	0.34	0.1
Well Number: 153 Name: CAW - Ord Grove #2																				
7/6/2009	920	186	7.08	127	64.3	0.14	6.2	0.67	65	89	18	0	<1	0.018	<1	510	236	0.146	0.47	0.2
Well Number: 156 Name: PRTIW																				
7/6/2009	637	128	7.6	75	51	<0.05	10	0.55	43	64	13	4	<0.050	<0.020	<0.1	397	161	0.12	0.2	0.13
Well Number: 159 Name: CAW - New Luzern																				
7/6/2009	900	149	7.11	129	81	0.22	23.5	0.89	62	92	16	0	<1	0.014	<1	530	221	0.127	0.45	0.2
Well Number: 162 Name: CAW-Playa #3																				
7/6/2009	880	123	6.97	126	93.4	0.11	28.8	0.98	57	89	17	0	<1	0.013	<1	520	212	0.134	0.48	0.1
Well Number: 165 Name: Public Works Corp. Yard																				
7/6/2009	1017	94	7.5	158	95	0.37	56	0.84	45	140	11	6	<0.050	0.022	<0.1	632	158	0.46	0.6	0.54
Well Number: 169 Name: CAW - Paralta																				
7/6/2009	920	228	7.24	106	71.8	<1	0.9	0.73	83	92	17	0	<1	0.03	<1	530	250	0.114	0.41	0.3
Well Number: 177 Name: CAW - Plumas #4																				
7/6/2009	1100	130	6.82	188	84.9	<1	12	0.75	50	127	24	0	<1	<1	---	600	224	0.111	0.7	0.2
Well Number: 186 Name: CAW - Darwin																				
7/6/2009	460	49	6.96	65	32	<1	38.5	0.65	20	48	9	0	0.93	0.047	<1	270	87	0.058	0.21	<1

NOTES:
(1) Maximum contaminant levels are from California Domestic Water Quality and Monitoring Regulations, Title 22, 1997.

GROUNDWATER QUALITY MONITORING RESULTS

Water Year 2009 - 10/1/2008 through 9/30/2009

Units are milligrams per liter, unless otherwise stated.

MPWMD monitor wells and Other Basin monitor and Producer wells

Date Of Sample	Specific Conductance (micro mhos/cm)	Total Alkalinity (as CACO3)	pH (units)	Chloride	Sulfate	Ammonia Nitrogen (as NH3)	Nitrate Nitrogen (as NO3)	Total Organic Carbon	Calcium	Sodium	Magnesium	Potassium	Iron	Manganese	Orthophosphate	Total Dissolved Solids	Hardness (as CaCO3)	Boron	Bromide	Fluoride
Well Number: 196 Name: MCPD #2																				
7/9/2009	522	109	6.5	87	13	<0.05	2	0.70	11	85	8	2.3	2.230	0.063	0.4	328	60	0.22	0.3	0.18
Well Number: 203 Name: New #12																				
7/6/2009	1556	246	6.8	242	203	0.35	<0.1	1.8	136	137	34	6	0.495	0.064	<0.1	1020	480	0.30	0.7	0.49
Well Number: 208 Name: Main Gate																				
7/7/2009	1631	236	7.6	267	205	0.18	<0.1	1.9	141	143	32	6	0.308	0.060	<0.1	1040	484	0.28	0.8	0.50
Well Number: 212 Name: York School 01-349																				
7/6/2009	1231	64	6.6	327	31	<0.05	<0.1	0.34	33	165	29	4	0.228	<0.020	0.4	803	202	0.18	1.0	0.17
Well Number: 213 Name: Ryan Ranch #7																				
7/7/2009	1300	219	6.62	186	147	1.4	<1	2.14	96	136	26	6	0.32	0.156	<1	780	339	0.147	0.7	0.6
Well Number: 215 Name: Ryan Ranch #11																				
7/7/2009	1500	180	6.46	293	145	0.39	1.3	2.25	96	176	28	0	0.65	0.127	<1	920	355	0.153	1.04	0.6
Well Number: 216 Name: Ryan Ranch #8																				
7/7/2009	1400	136	6.46	275	101	<1	2.2	1.91	53	189	31	0	1.55	0.032	<1	810	260	0.116	0.96	0.6
Well Number: 231 Name: Del Monte Test																				
7/6/2009	370	88	7.97	54.7	12.5	<1	0.9	0.27	19	46	7	0	2.84	0.69	<1	220	76	0.059	0.193	0.2
										Depth	of Sample Collection									
Well Number: 245 Name: Sentinel MW #1												**1390**			**1140**					
7/1/2009	411	80	8.7	57	25	---	<1	---	15	68	1	4	0.094	<0.020	<0.1	267	42		---	0.17
7/1/2009	414	82	8.6	57	24	---	<1	---	16	66	2	4	2.8	0.126	<0.1	269	48		---	0.16

NOTES:

(1) Maximum contaminant levels are from California Domestic Water Quality and Monitoring Regulations, Title 22, 1997.

GROUNDWATER QUALITY MONITORING RESULTS

Water Year 2009 - 10/1/2008 through 9/30/2009

Units are milligrams per liter, unless otherwise stated.

MPWMD monitor wells and Other Basin monitor and Producer wells

Date Of Sample	Specific Conductance (micro mhos/cm)	Total Alkalinity (as CACO3)	pH (units)	Chloride	Sulfate	Ammonia Nitrogen (as NH3)	Nitrate Nitrogen (as NO3)	Total Organic Carbon	Calcium	Sodium	Magnesium	Potassium	Iron	Manganese	Orthophosphate	Total Dissolved Solids	Hardness (as CaCO3)	Boron	Bromide	Fluoride
Well Number: 246 Name: Sentinel MW #2												**1000**			**1470**					
7/1/2009	433	85	8.4	62	22	---	<1	---	15	69	1	4	0.097	<0.020	<0.1	281	42	---	0.12	
7/1/2009	431	88	8.4	61	22	---	<1	---	15	68	1	3	0.256	<0.020	<0.1	280	42	---	0.13	
Well Number: 247 Name: Sentinel MW #3												**870**			**1275**					
7/1/2009	372	78	7.9	52	17	---	<1	---	16	53	2	3	<0.060	0.020	<0.1	243	48	---	0.12	
7/1/2009	412	84	8.0	60	17	---	<1	---	16	64	2	4	0.565	0.033	<0.1	224	48	---	0.10	
Well Number: 248 Name: Sentinel MW #4												**715**			**900**					
7/1/2009	948	241	7.5	129	40	---	<1	---	72	107	12	5	0.164	0.045	<0.1	635	229	---	0.19	
7/1/2009	1446	291	7.58	268	42	---	<1	---	76	192	21	9	0.108	0.140	<0.1	983	276	---	0.21	
4/22/2009	1417	281	7.4	260	39	---	<0.2	---	95	179	21	8.3	1.870	0.165	<0.05	818	324	1.0	0.2	

NOTES:
(1) Maximum contaminant levels are from California Domestic Water Quality and Monitoring Regulations, Title 22, 1997.

Appendix 2

Seaside Basin Groundwater Level Monitoring Results

Water Year 2009

Groundwater Level Monitoring Data

for the Seaside Groundwater Basin

Water Year 2009 Period: 10/1/08 to 9/30/09

Assembled by MPWMD for the Seaside Watermaster

Well Category: **Producer** ***Sub Area:*** **Northern Coastal**

Watermaster Well 151 CAW - Military

Monitored: Monthly
Monitored by: CAW
Aquifer: QTc

State Well No. 15S01E14N50 **Owner:** California American Water

Northern Coastal Producer **Screen:** -

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	135.8	164.6	-28.8	
11/26/2008	135.8	N/A	N/A	Well Running
12/18/2008	135.8	164	-28.2	
1/29/2009	135.8	174	-38.2	
2/26/2009	135.8	170	-34.2	
3/26/2009	135.8	172	-36.2	
4/30/2009	135.8	167	-31.2	
5/28/2009	135.8	165	-29.2	
6/25/2009	135.8	166.0	-30.2	
7/30/2009	135.8	N/A	N/A	Not Visited
8/27/2009	135.8	166	-30.20	
9/24/2009	135.8	166	-30.20	

Watermaster Well 152 Target Well

Monitored: Monthly
Monitored by: MPWMD
Aquifer: QTc/Tsm

State Well No. 15S01E22C50 **Owner:** DBO Development

Northern Coastal Producer **Screen:** 360 - 390

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	44.42	61.72	-17.3	
12/5/2008	44.42	62.03	-17.61	

1/7/2009	44.42	60.73	-16.31
1/29/2009	44.42	58.03	-13.61
3/3/2009	44.42	57.9	-13.48
3/31/2009	44.42	57.95	-13.53
4/30/2009	44.42	57.13	-12.71
5/29/2009	44.42	57.09	-12.67
6/26/2009	44.42	58.77	-14.35
8/3/2009	44.42	57.92	-13.5
8/28/2009	44.42	57.58	-13.16
9/29/2009	44.42	57.5	-13.08

Watermaster Well 153 CAW - Ord Grove #2

Monitored: Monthly
State Well No. 15S01E23B02 **Owner:** California American Water
Monitored by: CAW
Northern Coastal Producer **Screen:** - **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	292.39	N/A	N/A	Well Running
11/26/2008	292.39	N/A	N/A	Well Running
12/18/2008	292.39	334	-41.61	
1/29/2009	292.39	N/A	N/A	Well Running
2/26/2009	292.39	N/A	N/A	Well Running
3/26/2009	292.39	326	-33.61	
4/30/2009	292.39	N/A	N/A	Well Running
5/28/2009	292.39	318	-25.61	
6/25/2009	292.39	N/A	N/A	Well Running
7/30/2009	292.39	N/A	N/A	Well Running
8/27/2009	292.39	N/A	N/A	Well Running
9/24/2009	292.39	N/A	N/A	Well Running

Watermaster Well 159 CAW - New Luzern

Monitored: Monthly
State Well No. 15S01E23De **Owner:** California American Water
Monitored by: CAW
Northern Coastal Producer **Screen:** - **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	156.99	187	-30.01	
11/26/2008	156.99	187.6	-30.61	
12/18/2008	156.99	186.4	-29.41	
1/29/2009	156.99	183.6	-26.61	
2/26/2009	156.99	177	-20.01	
3/26/2009	156.99	178	-21.01	
4/30/2009	156.99	173	-16.01	
5/28/2009	156.99	177	-20.01	
6/25/2009	156.99	N/A	N/A	Well Running
7/30/2009	156.99	181	-24.01	
8/27/2009	156.99	N/A	N/A	Well Running
9/24/2009	156.99	N/A	N/A	Well Running

Watermaster Well 162 CAW-Playa #3

Monitored: Monthly
State Well No. 15S01E22B50 **Owner:** California American Water
Monitored by: CAW
Northern Coastal Producer **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	53.02	N/A	N/A	Well Running
11/26/2008	53.02	N/A	N/A	Well Running
12/18/2008	53.02	54.9	-1.88	
1/29/2009	53.02	54	-0.98	
2/26/2009	53.02	52	1.02	
3/26/2009	53.02	52	1.02	
4/30/2009	53.02	N/A	N/A	Well Running
5/28/2009	53.02	N/A	N/A	Well Running
6/25/2009	53.02	N/A	N/A	Well Running

7/30/2009	53.02	N/A	N/A	Well Running
8/27/2009	53.02	N/A	N/A	Well Running
9/24/2009	53.02	N/A	N/A	Well Running

Watermaster Well 169 CAW - Paralta

Monitored: Monthly
State Well No. 15S01E14R50 **Owner:** California American Water
Monitored by: CAW
Northern Coastal Producer **Screen:** - **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	324.49	N/A	N/A	Well Running
11/26/2008	324.49	N/A	N/A	Well Running
12/18/2008	324.49	N/A	N/A	Well Running
1/9/2009	324.49	345	-20.51	
2/26/2009	324.49	344	-19.51	
3/26/2009	324.49	343	-18.51	
4/30/2009	324.49	N/A	N/A	Well Running
5/2/2009	324.49	N/A	N/A	Well Running
6/25/2009	324.49	N/A	N/A	Well Running
7/30/2009	324.49	N/A	N/A	Not Visited
8/27/2009	324.49	N/A	N/A	Not Visited
9/24/2009	324.49	N/A	N/A	Well Running

Watermaster Well 171 PCA Production

Monitored: Monthly
State Well No. 15S01E15T51 **Owner:** Security National Guaranty Inc
Monitored by: Craig Evans
Northern Coastal Producer **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/28/2008	80	68.5	11.5	
11/29/2008	80	67.92	12.08	
12/26/2008	80	68.25	11.75	
1/27/2009	80	68.33	11.67	
2/27/2009	80	68.26	11.74	
3/26/2009	80	68.46	11.54	

4/27/2009	80	68.5	11.5
5/27/2009	80	65.3	14.7
6/24/2009	80	68.4	11.6

Watermaster Well 186 CAW - Darwin

Monitored: Monthly
State Well No. 15S01E22H01 **Owner:** California American Water
Monitored by: CAW
Northern Coastal Producer **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	134.05	115.1	18.95	
11/26/2008	134.05	N/A	N/A	Well Running
12/18/2008	134.05	114	20.05	
1/29/2009	134.05	118	16.05	
2/26/2009	134.05	111.1	22.95	
3/26/2009	134.05	118	16.05	
4/30/2009	134.05	115	19.05	
5/28/2009	134.05	116	18.05	
6/25/2009	134.05	116	18.05	
7/30/2009	134.05	115	19.05	
8/27/2009	134.05	115.2	18.85	
9/24/2009	134.05	116	18.05	

Well Category: Producer *Sub Area:* Southern Coastal

Watermaster Well 150 Cypress Pacific

Monitored: Monthly
State Well No. 15S01E22Dd **Owner:** King Venture
Monitored by: MPWMD
Southern Coastal Producer **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	50.23	46.72	3.51	
12/5/2008	50.23	46.98	3.25	
1/7/2009	50.23	46.72	3.51	

1/29/2009	50.23	46.71	3.52
3/3/2009	50.23	46.66	3.57
3/31/2009	50.23	46.56	3.67
4/30/2009	50.23	47.09	3.14
5/29/2009	50.23	46.99	3.24
6/26/2009	50.23	46.96	3.27
8/3/2009	50.23	47.01	3.22
8/28/2009	50.23	47.08	3.15
9/29/2009	50.23	47.04	3.19

Watermaster Well 165 Public Works Corp. Yard

Monitored: Monthly
State Well No. 15S01E22T59 **Owner:** City of Sand City **Monitored by:** MPWMD
Southern Coastal Producer **Screen:** - **Aquifer:** Qod/Qar/QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	47.25	41.89	5.36	
12/5/2008	47.25	41.98	5.27	
1/7/2009	47.25	42.36	4.89	
1/29/2009	47.25	42.21	5.04	
3/3/2009	47.25	42.11	5.14	
4/1/2009	47.25	42.02	5.23	
4/30/2009	47.25	42.23	5.02	
5/29/2009	47.25	42.18	5.07	
6/26/2009	47.25	42.14	5.11	
8/3/2009	47.25	42.05	5.20	
9/29/2009	47.25	42.13	5.12	

Watermaster Well 167 Robinette -Design Ctr.

Monitored: Monthly
State Well No. 15S01E22Mc **Owner:** City of Sand City **Monitored by:** MPWMD
Southern Coastal Producer **Screen:** - **Aquifer:** Qod/Qar/QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	21.31	13.63	7.68	

12/5/2008	21.31	13.83	7.48
1/7/2009	21.31	13.91	7.4
1/29/2009	21.31	13.87	7.44
3/3/2009	21.31	13.79	7.52
4/1/2009	21.31	13.56	7.75
4/30/2009	21.31	13.35	7.96
5/29/2009	21.31	13.42	7.89
6/26/2009	21.31	13.34	7.97
8/3/2009	21.31	13.33	7.98
8/28/2009	21.31	13.37	7.94

Watermaster Well 177 CAW - Plumas #4

Monitored: Monthly
State Well No. 15S01E27Jg **Owner:** California American Water
Monitored by: CAW
Southern Coastal Producer **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	161.48	110.4	51.08	
11/26/2008	161.48	N/A	N/A	Well Running
12/18/2008	161.48	109.8	51.68	
1/29/2009	161.48	110	51.48	
2/26/2009	161.48	106	55.48	
3/26/2009	161.48	107	54.48	
4/30/2009	161.48	109	52.48	
5/28/2009	161.48	107	54.48	
6/25/2009	161.48	N/A	N/A	Well Running
7/30/2009	161.48	N/A	N/A	Not Visited
8/27/2009	161.48	N/A	N/A	Not Visited
9/24/2009	161.48	N/A	N/A	Well Running

Watermaster Well 182 City #2

Monitored: Quarterly
State Well No. 15S01E23T56 **Owner:** City of Seaside
Monitored by: COS
Southern Coastal | Producer | **Screen:** - | **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
1/1/2009		N/A	N/A	Data not reported
5/1/2009	N/A	N/A	N/A	Data Not Reported
7/1/2009		N/A	N/A	Data not reported

Watermaster Well 183 City #1

Monitored: Quarterly
State Well No. 15S01E23T50 **Owner:** City of Seaside
Monitored by: COS
Southern Coastal | Producer | **Screen:** - | **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
5/1/2009	N/A	N/A	N/A	Data Not Reported

Well Category: Producer — *Sub Area:* Southern Inland

Watermaster Well 144 Laguna Seca Old No. 12

Monitored: Monthly
State Well No. 16S02E06Hb **Owner:** Laguna Seca Resorts
Monitored by: LSGR
Southern Inland | Producer | **Screen:** 120 - 480 | **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	368.02	226.4	141.62	
11/30/2008	368.02	220.1	147.92	
12/31/2008	368.02	214.4	153.62	
1/31/2009	368.02	214.6	153.42	
2/28/2009	368.02	209.6	158.42	
3/31/2009	368.02	211.6	156.42	
4/30/2009	368.02	211	157.02	
5/30/2009	368.02	221	147.02	
6/30/2009	368.02	225.9	142.12	

Watermaster Well 196 MCPD #2

Monitored: Monthly
State Well No. 16S02E05Gf **Owner:** Monterey County Parks Department
Monitored by: MCPD
Southern Inland | Producer | **Screen:** - | **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments

10/10/2008	391.04	181	210.04
11/2/2008	391.04	173	218.04
1/7/2009	391.04	172	219.04
2/6/2009	391.04	171	220.04
3/3/2009	391.04	169	222.04
5/6/2009	391.04	176	215.04
6/5/2009	391.04	195	196.04
7/1/2009	391.04	191	200.04
8/7/2009	391.04	180	211.04
9/4/2009	391.04	193	198.04

Watermaster Well 197 MCPD #1

Monitored: Monthly
State Well No. 16S02E05Ge **Owner:** Monterey County Parks Department **Monitored by:** MCPD
Southern Inland Producer **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/10/2008	392.86	194	198.86	
11/2/2008	392.86	188	204.86	
1/7/2009	392.86	186	206.86	
2/6/2009	392.86	186	206.86	
3/3/2009	392.86	186	206.86	
5/6/2009	392.86	199	193.86	
6/5/2009	392.86	210	182.86	
7/1/2009	392.86	207	185.86	
8/7/2009	392.89	207	185.86	
8/7/2009	392.86	199	193.86	
9/4/2009	392.86	208	184.86	

Watermaster Well 204 New Paddock

Monitored: Monthly
State Well No. 16S02E05Mf **Owner:** Pasadera Country Club, LLC **Monitored by:** Pasadera
Southern Inland Producer **Screen:** 306 - 498 **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments

10/31/2008	352.69	213.64	139.05
2/2/2009	352.69	213.66	139.03
3/2/2009	352.69	214.17	138.52
3/31/2009	352.69	209.68	143.01
7/1/2009	352.69	210.12	142.57
7/30/2009	352.69	209.91	142.78
8/31/2009	352.69	208.37	144.32

Watermaster Well 208 Main Gate

Monitored: Monthly
State Well No. 16S02E05Mg **Owner:** Pasadera Country Club, LLC
Monitored by: Pasadera
Southern Inland Producer **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	345.42	223.61	121.81	
2/2/2009	345.42	212.64	132.78	
3/2/2009	345.42	212.4	133.02	
3/31/2009	345.42	213.24	132.18	
7/1/2009	345.42	213.27	132.15	
7/30/2009	345.42	212.89	132.53	
8/31/2009	345.42	213.46	131.96	

Watermaster Well 209 Bishop #1 (west)

Monitored: Monthly
State Well No. 16S02E05Ea **Owner:** California American Water
Monitored by: CAW
Southern Inland Producer **Screen:** - **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	398.81	260	138.81	
11/26/2008	398.81	N/A	N/A	Well Running
12/18/2008	398.81	N/A	N/A	Well Running
1/29/2009	398.81	254	144.81	
2/26/2009	389.81	246	152.81	
3/26/2009	389.81	N/A	N/A	Well Running
4/30/2009	389.81	318	71.81	

5/28/2009	389.81	N/A	N/A	Well Running
6/25/2009	389.81	N/A	N/A	Well Running
7/30/2009	398.81	N/A	N/A	Well Running
8/27/2009	398.81	N/A	N/A	Well Running
9/24/2009	398.81	N/A	N/A	Well Running

Watermaster Well 210 Bishop #2 (east)

Monitored: Monthly
State Well No. 16S02E05Fb **Owner:** California American Water
Monitored by: CAW
Southern Inland Producer **Screen:** - **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
4/30/2009	418.34	253	165.34	
5/28/2009	418.34	242	176.34	
6/25/2009	418.34	N/A	N/A	Not Visited
7/30/2009	418.34	N/A	N/A	Not Visited
7/30/2009	418.34	N/A	N/A	Not Visited
8/27/2009	418.34	N/A	N/A	Not Visited
9/24/2009	418.34	N/A	N/A	Not Visited

Watermaster Well 212 York School 01-349

Monitored: Monthly
State Well No. 15S01E36Qa **Owner:** York School
Monitored by: MPWMD
Southern Inland Producer **Screen:** - **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/28/2008	384.3	224.68	159.62	
12/5/2008	384.3	265.15	119.15	
1/8/2009	384.3	221.33	162.97	
1/29/2009	384.3	220.73	163.57	
3/2/2009	384.3	219.58	164.72	
3/31/2009	384.3	230.65	153.65	
4/22/2009	384.3	226.73	157.57	
5/29/2009	384.3	N/A	N/A	Well Running
6/26/2009	384.3	N/A	N/A	Well Running

8/3/2009	384.3	238.68	145.62
8/27/2009	384.3	231.8	152.50
9/25/2009	384.3	223.7	160.60

Watermaster Well 213 Ryan Ranch #7

Monitored: Monthly
State Well No. 16S01E01E50 **Owner:** California American Water
Monitored by: CAW
Southern Inland Producer **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	294	N/A	N/A	Well Running
11/26/2008	294	N/A	N/A	Well Running
12/18/2008	294	N/A	N/A	Well Running
1/29/2009	294	N/A	N/A	Well Running
2/26/2009	294	N/A	N/A	Well Running
4/30/2009	294	N/A	N/A	Well Running
5/28/2009	294	N/A	N/A	Well Running
6/25/2009	294	N/A	N/A	Well Running
7/30/2009	294	233	61	
8/27/2009	294	240	54.00	
9/24/2009	294	N/A	N/A	Well Running

Watermaster Well 215 Ryan Ranch #11

Monitored: Monthly
State Well No. 16S01E01Cd **Owner:** California American Water
Monitored by: CAW
Southern Inland Producer **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	307.59	N/A	N/A	Well Running
11/26/2008	307.59	N/A	N/A	Well Running
12/18/2008	307.59	N/A	N/A	Well Running
1/29/2009	307.59	205	102.59	
2/26/2009	307.59	198	109.59	
3/26/2009	307.59	200	107.59	
4/30/2009	307.59	202	105.59	

5/28/2009	307.59	200	107.59	
6/25/2009	307.59	200	107.59	
7/30/2009	307.59	235	72.59	
8/27/2009	307.59	235	72.59	
9/24/2009	307.59	N/A	N/A	Well Running

Watermaster Well 216 Ryan Ranch #8

Monitored: Monthly
State Well No. 16S01E01T54 **Owner:** California American Water **Monitored by:** CAW
Southern Inland Producer **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	306.86	253	53.86	
11/26/2008	306.86	245	61.86	
12/18/2008	306.86	259	47.86	
1/29/2009	306.86	206	100.86	
2/26/2009	306.86	201	105.86	
3/26/2009	306.86	204	102.86	
4/30/2009	306.86	202	104.86	
5/28/2009	306.86	208	98.86	
6/25/2009	306.86	205	101.86	
7/30/2009	306.86	234	72.86	
8/27/2009	306.86	235	71.86	
9/24/2009	306.86	234	72.86	

Watermaster Well 226 Bay Ridge

Monitored: Monthly
State Well No. 16S02E09Cd **Owner:** California American Water **Monitored by:** CAW
Southern Inland Producer **Screen:** - **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	545.92	N/A	N/A	Well Running
11/26/2008	545.92	370	175.92	
12/18/2008	545.92	366	179.92	
1/29/2009	545.92	365	180.92	

2/26/2009	545.92	N/A	N/A	Well Running
3/28/2009	545.92	362	183.92	
4/30/2009	545.92	369	176.92	
5/28/2009	545.92	370	175.92	
6/25/2009	545.92	382	163.92	
7/30/2009	545.92	376	169.92	
8/27/2009	545.92	N/A	N/A	Well Running
9/24/2009	545.92	N/A	N/A	Well Running

Well Category: Monitor *Sub Area:* Northern Coastal

Watermaster Well 101 MSC-Shallow

State Well No. 15S01E15N3 **Owner:** MPWMD

Northern Coastal Monitor **Screen:** 490 - 680

Monitored: Monthly
Monitored by: MPWMD
Aquifer: QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	80.1	76.82	3.28	
12/5/2008	80.1	77.23	2.87	
1/8/2009	80.1	76.71	3.39	
1/28/2009	80.1	76.01	4.09	
3/3/2009	80.1	76.46	3.64	
3/31/2009	80.1	76.25	3.85	
4/24/2009	80.1	76.24	3.86	
5/29/2009	80.1	77.38	2.72	
6/26/2009	80.1	77.69	2.41	
7/22/2009	80.1	76.95	3.15	
8/28/2009	80.1	77.21	2.89	
9/29/2009	80.1	77.28	2.82	

Watermaster Well 102 MSC-Deep

State Well No. 15S01E15N2 **Owner:** MPWMD

Northern Coastal | Monitor | **Screen:** 810 - 850

Monitored: Monthly
Monitored by: MPWMD
Aquifer: Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	80.29	98.4	-18.11	
12/5/2008	80.29	99.6	-19.31	
1/8/2009	80.29	97.87	-17.58	
1/28/2009	80.29	94.52	-14.23	
3/3/2009	80.29	93.82	-13.53	
3/31/2009	80.29	92.31	-12.02	
4/24/2009	80.29	92.61	-12.32	
5/29/2009	80.29	94.63	-14.34	
6/26/2009	80.29	97.3	-17.01	
7/22/2009	80.29	96.51	-16.22	
8/28/2009	80.29	94.75	-14.46	
9/29/2009	80.29	96.98	-16.69	

Watermaster Well 103 PCA-W Shallow

State Well No. 15S01E15F1 **Owner:** MPWMD

Northern Coastal | Monitor | **Screen:** 525 - 575

Monitored: Quarterly
Monitored by: MPWMD
Aquifer: QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/10/2008	64.22	62.2	2.02	
1/28/2009	64.22	60.42	3.8	
4/24/2009	64.22	60.26	3.96	
7/28/2009	64.22	60.62	3.60	

Watermaster Well 104 PCA-W Deep

State Well No. 15S01E15F2 **Owner:** MPWMD

Northern Coastal | Monitor | **Screen:** 825 - 875

Monitored: Quarterly
Monitored by: MPWMD
Aquifer: Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/10/2008	65.18	87.99	-22.81	
1/28/2009	65.18	81.98	-16.8	

4/24/2009	65.18	80.14	-14.96
7/28/2009	65.18	82.02	-16.84

Watermaster Well 105 PCA-E (Multiple) Shallow

Monitored: Monthly
State Well No. 15S01E15K5 **Owner:** MPWMD **Monitored by:** MPWMD
Northern Coastal Monitor **Screen:** 350 - 400 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	68.51	68.34	0.17	
12/5/2008	68.51	66.87	1.64	
1/7/2009	68.51	65.62	2.89	
1/29/2009	68.51	65.42	3.09	
3/3/2009	68.51	64.89	3.62	
3/31/2009	68.51	64.59	3.92	
4/30/2009	68.51	64.82	3.69	
5/29/2009	68.51	65.42	3.09	
6/24/2009	68.51	65.8	2.71	
7/27/2009	68.51	66.87	1.64	
8/28/2009	68.51	66.8	1.71	
9/29/2009	68.51	66.41	2.10	

Watermaster Well 106 PCA-E (Multiple) Deep

Monitored: Monthly
State Well No. 15S01E15K4 **Owner:** MPWMD **Monitored by:** MPWMD
Northern Coastal Monitor **Screen:** 650 - 700 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	68.54	92.41	-23.87	
12/5/2008	68.54	92.58	-24.04	
1/7/2009	68.54	89.42	-20.88	
1/29/2009	68.54	86.37	-17.83	
3/3/2009	68.54	83.29	-14.75	
3/31/2009	68.54	81.67	-13.13	
4/30/2009	68.54	86.27	-17.73	

5/29/2009	68.54	87.08	-18.54
6/24/2009	68.54	87.63	-19.09
7/27/2009	68.54	86.78	-18.24
8/28/2009	68.54	85.98	-17.44
9/29/2009	68.54	89.78	-21.24

Watermaster Well 107 Ord Grove Test

Monitored: Monthly
State Well No. 15S01E23B1 **Owner:** California American Water
Monitored by: CAW
Northern Coastal Monitor **Screen:** 355 - 480 **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	294.14	337.28	-43.14	
12/5/2008	294.14	332.12	-37.98	
1/7/2009	294.14	325.12	-30.98	
1/29/2009	294.14	321.87	-27.73	
3/3/2009	294.14	318.28	-24.14	
3/31/2009	294.14	316.36	-22.22	
4/30/2009	294.14	339.19	-45.05	
5/29/2009	294.14	317.78	-23.64	
6/24/2009	294.14	338.77	-44.63	
7/30/2009	294.14	345	-50.86	
8/3/2009	294.14	334.09	-39.95	production well on
8/27/2009	294.14	347	-52.86	
8/28/2009	294.14	345.09	-50.95	production well on
9/24/2009	294.14	345	-50.86	
9/29/2009	294.14	344.28	-50.14	

Watermaster Well 108 Paralta Test

Monitored: Monthly
State Well No. 15S01E14Ra **Owner:** MPWMD
Monitored by: MPWMD
Northern Coastal Monitor **Screen:** 430 - 800 **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	330.72	349.11	-18.39	

1/7/2009	330.72	337.94	-7.22	
1/29/2009	330.72	335.89	-5.17	
3/3/2009	330.72	331.98	-1.26	
3/31/2009	330.72	332.83	-2.11	
4/30/2009	330.72	344.49	-13.77	
5/29/2009	330.72	345.42	-14.7	
6/23/2009	330.72	345.83	-15.11	
7/30/2009	330.72	N/A	N/A	Not Visited
8/3/2009	330.72	336.52	-5.80	
8/27/2009	330.72	340	-9.28	
8/27/2009	330.72	339.35	-8.63	
9/24/2009	330.72	345	-14.28	
9/29/2009	330.72	352.1	-21.38	

Watermaster Well 109 Ord Terrace-Shallow

Monitored: Annually
Monitored by: MPWMD
Aquifer: Tsm (upper)

State Well No. 15S01E23Ca **Owner:** MPWMD

Northern Coastal Monitor **Screen:** 280 - 330

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
7/24/2009	228.65	260.7	-32.05	

Watermaster Well 110 Ord Terrace-Deep

Monitored: Monthly
Monitored by: MPWMD
Aquifer: Tsm (lower)

State Well No. 15S01E23Cb **Owner:** MPWMD

Northern Coastal Monitor **Screen:** 390 - 440

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	228.63	266.92	-38.29	
12/5/2008	228.63	264.32	-35.69	
1/7/2009	228.63	259.19	-30.56	
1/26/2009	228.63	256.55	-27.92	
3/3/2009	228.63	252.84	-24.21	
3/31/2009	228.63	250.68	-22.05	
4/30/2009	228.63	256.47	-27.84	

5/29/2009	228.63	252.09	-23.46
6/26/2009	228.63	257.03	-28.4
7/24/2009	228.63	266.2	-37.57
8/26/2009	228.63	262.41	-33.78
9/29/2009	228.63	264.25	-35.62

Watermaster Well 111 MPWMD #FO-09-Shallow

Monitored: Monthly
Monitored by: MPWMD
Aquifer: QTc/Tp

State Well No. 15S01E11Pa **Owner:** MPWMD

Northern Coastal Monitor **Screen:** 610 - 650

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/10/2008	118.89	117.36	1.53	
10/31/2008	118.89	117.31	1.58	
12/5/2008	118.89	116.06	2.83	
1/7/2009	118.89	115.4	3.49	
1/28/2009	118.89	115.05	3.84	
3/2/2009	118.89	114.46	4.43	
3/31/2009	118.89	114.28	4.61	
4/24/2009	118.89	114.81	4.08	
5/29/2009	118.89	114.92	3.97	
6/24/2009	118.89	115.23	3.66	
8/28/2009	118.89	116.38	2.51	
9/29/2009	118.89	116.16	2.73	

Watermaster Well 112 MPWMD #FO-09-Deep

Monitored: Monthly
Monitored by: MPWMD
Aquifer: Tsm

State Well No. 15S01E11Pb **Owner:** MPWMD

Northern Coastal Monitor **Screen:** 790 - 830

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/10/2008	118.85	142.25	-23.4	
10/31/2008	118.85	142.13	-23.28	
12/5/2008	118.85	142.23	-23.38	
1/7/2009	118.85	139.42	-20.57	

1/28/2009	118.85	136.35	-17.5
3/2/2009	118.85	133.32	-14.47
3/31/2009	118.85	131.72	-12.87
4/24/2009	118.85	134.98	-16.13
5/29/2009	118.85	137.58	-18.73
6/24/2009	118.85	138.08	-19.23
7/30/2009	118.85	136.78	-17.93
8/28/2009	118.85	135.98	-17.13
9/29/2009	118.85	139.95	-21.10

Watermaster Well 113 MPWMD #FO-10-Shallow

Monitored: Monthly
State Well No. 15S01E12Fa **Owner:** MPWMD **Monitored by:** MPWMD
Northern Coastal Monitor **Screen:** 620 - 640 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	200.85	203.66	-2.81	
12/4/2008	200.85	203.7	-2.85	
1/7/2009	200.85	203.05	-2.2	
1/30/2009	200.85	202.73	-1.88	
3/2/2009	200.85	202.41	-1.56	
3/31/2009	200.85	202.36	-1.51	
4/30/2009	200.85	202.81	-1.96	
5/29/2009	200.85	202.85	-2	
6/25/2009	200.85	202.9	-2.05	
8/3/2009	200.85	202.8	-1.95	
8/27/2009	200.85	205.29	-4.44	
9/29/2009	200.85	204.81	-3.96	

Watermaster Well 114 MPWMD #FO-10-Deep

Monitored: Monthly
State Well No. 15S01E12Fc **Owner:** MPWMD **Monitored by:** MPWMD
Northern Coastal Monitor **Screen:** 1380 - 1410 **Aquifer:** Tp

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments

10/31/2008	201.03	206.55	-5.52
12/4/2008	201.03	204.68	-3.65
1/7/2009	201.03	206.29	-5.26
1/30/2009	201.03	205.11	-4.08
3/2/2009	201.03	203.96	-2.93
3/31/2009	201.03	203.66	-2.63
4/30/2009	201.03	204.58	-3.55
5/29/2009	201.03	204.64	-3.61
6/25/2009	201.03	204.7	-3.67
8/3/2009	201.03	204.6	-3.57
8/27/2009	201.03	204.43	-3.40
9/29/2009	201.03	205.92	-4.89

Watermaster Well 154 Mission Memorial Monitor

Monitored: Monthly

State Well No. 15S01E23Aa **Owner:** Mission Memorial Park **Monitored by:** MPWMD

Northern Coastal Monitor **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	315.42	350.58	-35.16	
12/5/2008	315.42	348.01	-32.59	
1/7/2009	315.42	343.09	-27.67	
1/29/2009	315.42	337.34	-21.92	
3/3/2009	315.42	333.71	-18.29	
3/31/2009	315.42	331.82	-16.4	
4/30/2009	315.42	341.9	-26.48	
5/29/2009	315.42	332.91	-17.49	
6/24/2009	315.42	343.3	-27.88	
8/3/2009	315.42	329.3	-13.88	
8/28/2009	315.42	338.46	-23.04	

9/29/2009	315.42	343.91	-28.49

Watermaster Well 163 CAW - Playa #4

Monitored: Monthly
State Well No. 15S01E22B51 **Owner:** California American Water
Monitored by: CAW
Northern Coastal Monitor **Screen:** - **Aquifer:** QTc/Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	52.53	65	-12.47	
11/26/2008	52.53	66	-13.47	
12/18/2008	52.53	65.3	-12.77	
1/29/2009	52.53	65	-12.47	
2/26/2009	52.53	60	-7.47	
3/26/2009	52.53	64	-11.47	
4/30/2009	52.53	60	-7.47	
5/28/2009	52.53	61	-8.47	
6/25/2009	52.53	62	-9.47	
7/30/2009	52.53	62.6	-10.07	
8/27/2009	52.53	62.6	-10.07	
9/24/2009	52.53	62	-9.47	

Watermaster Well 231 Del Monte Test

Monitored: Monthly
State Well No. 15S01E22Cd **Owner:** California American Water
Monitored by: CAW
Northern Coastal Monitor **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	32.62	30.3	2.32	
11/26/2008	32.62	31	1.62	
12/18/2008	32.62	30	2.62	
1/29/2009	32.62	30	2.62	
2/26/2009	32.62	30	2.62	
3/26/2009	32.62	30	2.62	
4/30/2009	32.62	30	2.62	
5/30/2009	32.62	30	2.62	

6/25/2009	32.62	30	2.62	
7/30/2009	32.62	N/A	N/A	Not Visited
8/30/2009	32.62	30	2.62	
9/24/2009	32.62	30	2.62	

Watermaster Well 243 Luxton

Monitored: Monthly
State Well No. 15S01E22Ha **Owner:** California American Water
Monitored by: CAW
Northern Coastal Monitor **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	89.12	96.8	-7.68	
11/26/2008	89.12	97.4	-8.28	
12/18/2008	89.12	97	-7.88	
1/29/2009	89.12	95	-5.88	
2/26/2009	89.12	93	-3.88	
3/26/2009	89.12	94	-4.88	
4/30/2009	89.12	94	-4.88	
5/28/2009	89.12	93	-3.88	
6/25/2009	89.12	92.5	-3.38	
7/30/2009	89.12	94	-4.88	
8/27/2009	89.12	93.4	-4.28	
9/24/2009	89.12	93.1	-3.98	

Watermaster Well 251 CDM MW-1

Monitored: Monthly
State Well No. 15S01E02Pa **Owner:** MPWMD
Monitored by: MPWMD
Northern Coastal Monitor **Screen:** - **Aquifer:** Qod/Qar

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/29/2008	93.53	90.25	3.28	
1/30/2009	93.53	90.5	3.03	
4/22/2009	93.53	91	2.53	
7/1/2009	93.53	89.5	4.03	
8/27/2009	93.53	90.37	3.16	

Watermaster Well 252 CDM MW-2

Monitored: Monthly
State Well No. 15S01E15Ga **Owner:** MPWMD **Monitored by:** MPWMD
Northern Coastal Monitor **Screen:** - **Aquifer:** Qod/Qar

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/29/2008	63.83	60.33	3.5	
2/5/2009	63.83	60.5	3.33	
4/22/2009	63.83	61.1	2.73	
7/1/2009	63.83	60.2	3.63	
8/28/2009	63.83	60.6	3.23	

Watermaster Well 254 MW-B-22-180

Monitored: Monthly
State Well No. 15S01E12Da **Owner:** U.S.A. Fort Ord **Monitored by:** MPWMD
Northern Coastal Monitor **Screen:** - **Aquifer:** Qod/Qar

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	168.1	157.04	11.06	
12/4/2008	168.1	157.1	11	
1/7/2009	168.1	157.07	11.03	
1/30/2009	168.1	157.03	11.07	
3/31/2009	168.1	157.14	10.96	
4/30/2009	168.1	157.03	11.07	
5/29/2009	168.1	157.05	11.05	
6/25/2009	168.1	157.14	10.96	
8/3/2009	168.1	157.08	11.02	
8/27/2009	168.1	157.21	10.89	
9/25/2009	168.1	157.23	10.87	

Watermaster Well 258 MW-B-23-180

Monitored: Monthly
State Well No. 15S01E11Ba **Owner:** U.S.A. Fort Ord **Monitored by:** MPWMD
Northern Coastal Monitor **Screen:** - **Aquifer:** Qod/Qar

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
1/30/2009	113.81	109.75	4.06	
4/22/2009	113.81	110	3.81	

6/4/2009	113.81	110.15	3.66
7/1/2009	113.81	110.1	3.71

Well Category: Monitor — *Sub Area:* Northern Inland

Watermaster Well 115 MPWMD #FO-01-Shallow

Monitored: Quarterly
State Well No. 15S01E26Ba **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** 310 - 320 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	362.61	201.72	160.89	
1/21/2009	362.61	201.79	160.82	
4/21/2009	362.61	201.72	160.89	
9/15/2009	362.61	200.9	161.71	

Watermaster Well 116 MPWMD #FO-01-Deep

Monitored: Quarterly
State Well No. 15S01E26Bb **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** 450 - 460 **Aquifer:** Tm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	362.57	338.25	24.32	
1/21/2009	362.57	338.23	24.34	
4/21/2009	362.57	338.02	24.55	
9/15/2009	362.57	338.58	23.99	

Watermaster Well 118 MPWMD #FO-07-Shallow

Monitored: Monthly
State Well No. 15S01E13La **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** 600 - 640 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	473.44	458.72	14.72	
12/4/2008	473.44	458.69	14.75	
1/1/2009	473.44	458.44	15	
1/7/2009	473.44	458.19	15.25	
1/30/2009	473.44	458.18	15.26	
3/2/2009	473.44	457.88	15.56	

4/1/2009	473.44	458.3	15.14
4/30/2009	473.44	459.13	14.31
5/29/2009	473.44	459.22	14.22
6/23/2009	473.44	459.53	13.91
7/31/2009	473.44	459.94	13.50
8/28/2009	473.44	460.28	13.16
9/29/2009	473.44	460.16	13.28

Watermaster Well 119 MPWMD #FO-07-Deep

Monitored: Monthly
Monitored by: MPWMD
Aquifer: Tsm

State Well No. 15S01E13Lb **Owner:** MPWMD

Northern Inland Monitor **Screen:** 800 - 840

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	473.44	496.97	-23.53	
12/4/2008	473.44	496.79	-23.35	
1/7/2009	473.44	493.64	-20.2	
1/12/2009	473.44	493.2	-19.76	
1/30/2009	473.44	491.4	-17.96	
3/2/2009	473.44	488.09	-14.65	
4/1/2009	473.44	487.59	-14.15	
4/30/2009	473.44	491.84	-18.4	
5/29/2009	473.44	492.61	-19.17	
6/23/2009	473.44	492.92	-19.48	
7/31/2009	473.44	495.81	-22.37	
8/28/2009	473.44	490.86	-17.42	
9/29/2009	473.44	494.78	-21.34	

Watermaster Well 120 MPWMD #FO-08-Shallow

Monitored: Monthly
Monitored by: MPWMD
Aquifer: QTc

State Well No. 15S01E12Qa **Owner:** MPWMD

Northern Inland Monitor **Screen:** 740 - 780

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	378.04	375.99	2.05	

12/4/2008	378.04	375.99	2.05
1/8/2009	378.04	375.99	2.05
1/30/2009	378.04	375.71	2.33
3/2/2009	378.04	375.29	2.75
4/1/2009	378.04	374.98	3.06
4/30/2009	378.04	373.03	5.01
5/29/2009	378.04	375.34	2.7
6/23/2009	378.04	375.45	2.59
8/3/2009	378.04	376.2	1.84
8/27/2009	378.04	375.24	2.80
9/29/2009	378.04	376.73	1.31

Watermaster Well 121 MPWMD #FO-08-Deep

Monitored: Monthly
State Well No. 15S01E12Qb **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** 900 - 940 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	378.1	400.3	-22.2	
12/4/2008	378.1	400.16	-22.06	
1/8/2009	378.1	397.39	-19.29	
1/30/2009	378.1	395.38	-17.28	
3/2/2009	378.1	392.32	-14.22	
4/1/2009	378.1	391.57	-13.47	
4/30/2009	378.1	395.35	-17.25	
5/29/2009	378.1	396.18	-18.08	
6/23/2009	378.1	396.45	-18.35	
8/3/2009	378.1	395.33	-17.23	
8/27/2009	378.1	395.03	-16.93	
9/29/2009	378.1	398.23	-20.13	

Watermaster Well 122 MPWMD #FO-11-Shallow

Monitored: Monthly
State Well No. 15S02E7Ba **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** 700 - 730 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	332.93	340.55	-7.62	
12/4/2008	332.93	340.84	-7.91	
1/7/2009	332.93	340.53	-7.6	
1/30/2009	332.93	340.44	-7.51	
3/2/2009	332.93	340.14	-7.21	
3/31/2009	332.93	340.1	-7.17	
4/30/2009	332.93	341.28	-8.35	
5/29/2009	332.93	341.4	-8.47	
6/25/2009	332.93	341.49	-8.56	
8/3/2009	332.93	341.21	-8.34	
8/27/2009	332.93	343.34	-10.41	
9/29/2009	332.93	343.75	-10.82	

Watermaster Well 123 MPWMD #FO-11-Deep

Monitored: Monthly
State Well No. 15S02E7Bb **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** 1090 - 1120 **Aquifer:** Tp

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	332.96	330.79	2.17	
12/4/2008	332.96	330.87	2.09	
1/7/2009	332.96	330.53	2.43	
1/30/2009	332.96	330.06	2.9	
3/2/2009	332.96	329.74	3.22	
3/31/2009	332.96	329.64	3.32	
4/30/2009	332.96	330.2	2.76	
5/29/2009	332.96	330.6	2.36	
6/25/2009	332.96	330.68	2.28	

8/3/2009	332.96	330.2	2.76
8/27/2009	332.96	331.44	1.52
9/29/2009	332.96	331.83	1.13

Watermaster Well 188 ASR - 1

Monitored: Quarterly
State Well No. 15S01E23Ad **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/29/2008	337.23	370.28	-33.05	
9/24/2009	337.23	367.78	-30.55	

Watermaster Well 256 ASR - 2

Monitored: Quarterly
State Well No. 15S01E23Af **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	356	388.48	-32.48	
1/12/2009	356	379.71	-23.71	
9/24/2009	356	385.36	-29.36	

Watermaster Well 257 ASR MW-1

Monitored: Quarterly
State Well No. 15S01E23Ae **Owner:** MPWMD **Monitored by:** MPWMD
Northern Inland Monitor **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	338.28	371.53	-33.25	

Well Category: Monitor — *Sub Area:* Southern Coastal

Watermaster Well 124 Plumas '90 Test

Monitored: Monthly
State Well No. 15S01E27J6 **Owner:** MPWMD **Monitored by:** MPWMD
Southern Coastal Monitor **Screen:** 430 - 470 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	157.83	104.91	52.92	
12/5/2008	157.83	104.82	53.01	
1/7/2009	157.83	104.18	53.65	
1/29/2009	157.83	104.1	53.73	

3/3/2009	157.83	104.07	53.76
4/1/2009	157.83	103.11	54.72
4/30/2009	157.83	103.59	54.24
5/29/2009	157.83	103.69	54.14
6/25/2009	157.83	103.38	54.45
8/3/2009	157.83	104.95	52.88
8/28/2009	157.83	105.25	52.58
9/29/2009	157.83	106.22	51.61

Watermaster Well 238 CDM MW-4

Monitored: Monthly
State Well No. 15S01E21Ka **Owner:** MPWMD **Monitored by:** MPWMD
Southern Coastal Monitor **Screen:** - **Aquifer:** Qod

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	18.69	14.83	3.86	
12/5/2008	18.69	14.47	4.22	
1/7/2009	18.69	14.79	3.9	
1/29/2009	18.69	15.21	3.48	
3/3/2009	18.69	14.91	3.78	
3/31/2009	18.69	15.36	3.33	
4/30/2009	18.69	15.73	2.96	
5/29/2009	18.69	15.54	3.15	
6/26/2009	18.69	15.23	3.46	
8/3/2009	18.69	15.25	3.44	
8/31/2009	18.69	15.21	3.48	
9/29/2009	18.69	15.14	3.55	

Watermaster Well 239 CDM MW-3

Monitored: Monthly
State Well No. 15S01E22De **Owner:** MPWMD **Monitored by:** MPWMD
Southern Coastal Monitor **Screen:** - **Aquifer:** Qod

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	33.81	31.41	2.4	

12/5/2008	33.81	31.18	2.63
1/7/2009	33.81	30.59	3.22
1/29/2009	33.81	31.78	2.03
3/3/2009	33.81	30.64	3.17
3/31/2009	33.81	31.98	1.83
4/30/2009	33.81	32.31	1.5
5/29/2009	33.81	32.36	1.45
6/26/2009	33.81	33.48	0.33
8/3/2009	33.81	32.49	1.32
8/28/2009	33.81	32.13	1.68
9/29/2009	33.81	32.06	1.75

Watermaster Well 240 MW-BW-08-A

Monitored: Monthly
State Well No. 15S01E26Fb **Owner:** U.S.A. Fort Ord **Monitored by:** MPWMD
Southern Coastal Monitor **Screen:** - **Aquifer:** Qod/Qar

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	205.18	58.81	146.37	
12/4/2008	205.18	58.7	146.48	
1/7/2009	205.18	58.79	146.39	
1/30/2009	205.18	58.88	146.3	
3/2/2009	205.18	58.89	146.29	
4/1/2009	205.18	58.79	146.39	
4/30/2009	205.18	58.8	146.38	
5/29/2009	205.18	58.84	146.34	
6/25/2009	205.18	58.92	146.26	
7/31/2009	205.18	63.2	141.38	
8/28/2009	205.18	57.95	147.23	

Watermaster Well 241 MW-BW-09-180

Monitored: Monthly
State Well No. 15S01E26Fa **Owner:** U.S.A. Fort Ord **Monitored by:** MPWMD
Southern Coastal Monitor **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/31/2008	206.22	204.41	1.81	
12/4/2008	206.22	204.42	1.8	
1/7/2009	206.22	204.64	1.58	
1/30/2009	206.22	204.71	1.51	
3/2/2009	206.22	204.64	1.58	
4/1/2009	206.22	204.77	1.45	
4/30/2009	206.22	204.93	1.29	
5/29/2009	206.22	204.96	1.26	
6/25/2009	206.22	205.03	1.19	
7/31/2009	206.22	205.34	0.88	
8/28/2009	206.22	205.29	0.93	

Watermaster Well 244 Hilby MGT

Monitored: Monthly
State Well No. 15S01E26Da **Owner:** California American Water **Monitored by:** CAW
Southern Coastal Monitor **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/30/2008	248.04	244	4.04	
11/26/2008	248.04	243	5.04	
12/18/2008	248.04	N/A	N/A	Well Running
1/29/2009	248.04	243	5.04	
2/26/2009	248.04	241	7.04	
3/26/2009	248.04	242	6.04	
4/30/2009	248.04	244	4.04	
5/28/2009	248.04	244	4.04	
6/25/2009	248.04	244	4.04	
7/30/2009	248.04	244	4.04	

8/27/2009	248.04	244	4.04
9/24/2009	248.04	244	4.04

Well Category: Monitor — *Sub Area:* Southern Inland

Watermaster Well 127 MPWMD #FO-03-Deep

State Well No. 15S02E33Ca **Owner:** MPWMD
Southern Inland Monitor **Screen:** 630 - 640

Monitored: Quarterly
Monitored by: MPWMD
Aquifer: Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	774.74	635.49	139.25	
1/21/2009	774.74	635.82	138.92	
4/21/2009	774.74	635.9	138.84	
9/15/2009	774.74	636.25	138.49	

Watermaster Well 129 MPWMD #FO-04-Shallow (E)

State Well No. 15S01E26Na **Owner:** MPWMD
Southern Inland Monitor **Screen:** 260 - 300

Monitored: Quarterly
Monitored by: MPWMD
Aquifer: QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	168.23	110.23	58	
1/22/2009	168.23	109.18	59.05	
4/21/2009	168.23	109.13	59.1	
9/15/2009	168.23	111.91	56.32	

Watermaster Well 130 MPWMD #FO-04-Deep (W)

State Well No. 15S01E26Nb **Owner:** MPWMD
Southern Inland Monitor **Screen:** 500 - 560

Monitored: Quarterly
Monitored by: MPWMD
Aquifer: Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	167.44	111.29	56.15	
1/22/2009	167.44	110.33	57.11	
4/21/2009	167.44	109.68	57.76	
9/15/2009	167.44	111.7	55.74	

Watermaster Well 131 MPWMD #FO-05-Shallow

Monitored: Quarterly
State Well No. 16S02E04Ha **Owner:** MPWMD **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** 690 - 730 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	478.97	244.69	234.28	
1/23/2009	478.97	240.79	238.18	
4/23/2009	478.97	242.03	236.94	
6/26/2009	478.97	243.77	235.2	
9/16/2009	478.97	245.64	233.33	

Watermaster Well 132 MPWMD #FO-05-Deep

Monitored: Quarterly
State Well No. 16S02E04Hb **Owner:** MPWMD **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** 1147 - 1187 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	479.29	308.42	170.87	
1/23/2009	479.29	304.92	174.37	
4/23/2009	479.29	306.49	172.8	
6/26/2009	479.29	309.3	169.99	
9/16/2009	479.29	311	168.29	

Watermaster Well 133 MPWMD #FO-06-Shallow

Monitored: Quarterly
State Well No. 16S02E04Fa **Owner:** MPWMD **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** 650 - 690 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	470.13	232.01	238.12	
1/23/2009	470.13	230.03	240.1	
4/23/2009	470.13	230.71	239.42	
6/26/2009	470.13	231.96	238.17	
9/16/2009	470.13	232.77	237.36	

Watermaster Well 134 MPWMD #FO-06-Deep

Monitored: Quarterly
State Well No. 16S02E04Fb **Owner:** MPWMD **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** 1050 - 1090 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	470.63	229.82	240.81	

1/23/2009	470.63	226.2	244.43
4/23/2009	470.63	227.21	243.42
6/26/2009	470.63	229.98	240.65
9/16/2009	470.63	231.93	238.70

Watermaster Well 135 Justin Court (RR M2S)

Monitored: Quarterly
State Well No. 15S01E35Jb **Owner:** California American Water **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** 135 - 155 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/28/2008	240.28	142.48	97.8	
1/21/2009	240.28	142.31	97.97	
4/22/2009	240.28	142.37	97.91	
6/29/2009	240.28	142.46	97.82	
9/15/2009	240.28	142.66	97.62	

Watermaster Well 136 LS Pistol Range (Mo Co TH-1)

Monitored: Quarterly
State Well No. 15S02E32Ra **Owner:** County of Monterey **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** 430 - 470 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	514.39	285.63	228.76	
1/21/2009	514.39	285.01	229.38	
4/22/2009	514.39	284.39	230	
9/15/2009	514.39	285.47	228.92	

Watermaster Well 137 York Rd-West (Mo Co MW-1 D)

Monitored: Quarterly
State Well No. 15S01E36Rb **Owner:** County of Monterey **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** 560 - 600 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/28/2008	490.28	310.62	179.66	
1/21/2009	490.28	310.63	179.65	
4/22/2009	490.28	310	180.28	
6/26/2009	490.28	311.36	178.92	
9/15/2009	490.28	313.27	177.01	

Watermaster Well 138 Seca Place (Mo Co MW-2)

Monitored: Quarterly
State Well No. 16S02E04Lc **Owner:** County of Monterey
Monitored by: MPWMD
Southern Inland Monitor **Screen:** 930 - 980 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	427.58	256.97	170.61	
1/21/2009	427.58	256.8	170.78	
4/22/2009	427.58	252.19	175.39	
6/26/2009	427.58	256.97	170.61	
9/16/2009	427.58	260.41	167.17	

Watermaster Well 139 Robley Shallow (North) (Mo Co MW-3S

Monitored: Quarterly
State Well No. 16S02E09Bb **Owner:** County of Monterey
Monitored by: MPWMD
Southern Inland Monitor **Screen:** 380 - 420 **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	566.54	322.8	243.74	
1/21/2009	566.54	323.01	243.53	
4/22/2009	566.54	316.89	249.65	
6/26/2009	566.54	316.91	249.63	
9/15/2009	566.54	316.84	249.70	

Watermaster Well 140 Robley Deep (South) (Mo Co MW-3D)

Monitored: Quarterly
State Well No. 16S02E09Bc **Owner:** County of Monterey
Monitored by: MPWMD
Southern Inland Monitor **Screen:** 750 - 800 **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/27/2008	566.44	382.99	183.45	
1/21/2009	566.44	377.42	189.02	
4/22/2009	566.44	378.83	187.61	
6/26/2009	566.44	383.78	182.66	
9/15/2009	566.44	386.13	180.31	

Watermaster Well 141 LS Driving Range (SCS Deep)

Monitored: Quarterly
State Well No. 16S02E06C2 **Owner:** County of Monterey
Monitored by: MPWMD
Southern Inland Monitor **Screen:** - **Aquifer:** QTc

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
1/21/2009	491	329.23	161.77	

4/22/2009	491	328.95	162.05
5/4/2009	491	330.98	160.02
6/26/2009	491	330.63	160.37
7/8/2009	491	330.98	160.02
9/15/2009	491	333.39	157.61

Watermaster Well 142 LS No. 1 Subdivision

Monitored: Quarterly
State Well No. 16S02E06M1 **Owner:** Laguna Seca Resorts **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** - **Aquifer:** Tsm

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/28/2008	277.13	119.83	157.3	
1/21/2009	277.13	120.82	156.31	
4/22/2009	277.13	121.13	156	
6/26/2009	277.13	122.17	154.96	
9/15/2009	277.13	123.83	153.30	

Watermaster Well 143 Blue Larkspur-East End

Monitored: Quarterly
State Well No. 16S01E01Hx **Owner:** Laguna Seca Resorts **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** - **Aquifer:**

Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/28/2008	253.29	96.92	156.37	
1/21/2009	253.29	97.72	155.57	
4/22/2009	253.29	98.11	155.18	
6/26/2009	253.29	99.28	154.01	
9/15/2009	253.29	101.9	151.39	

Watermaster Well 242 CAW-Granite Construction

Monitored: Quarterly
State Well No. 15S01E35Jc **Owner:** California American Water **Monitored by:** MPWMD
Southern Inland Monitor **Screen:** - **Aquifer:** Tsm

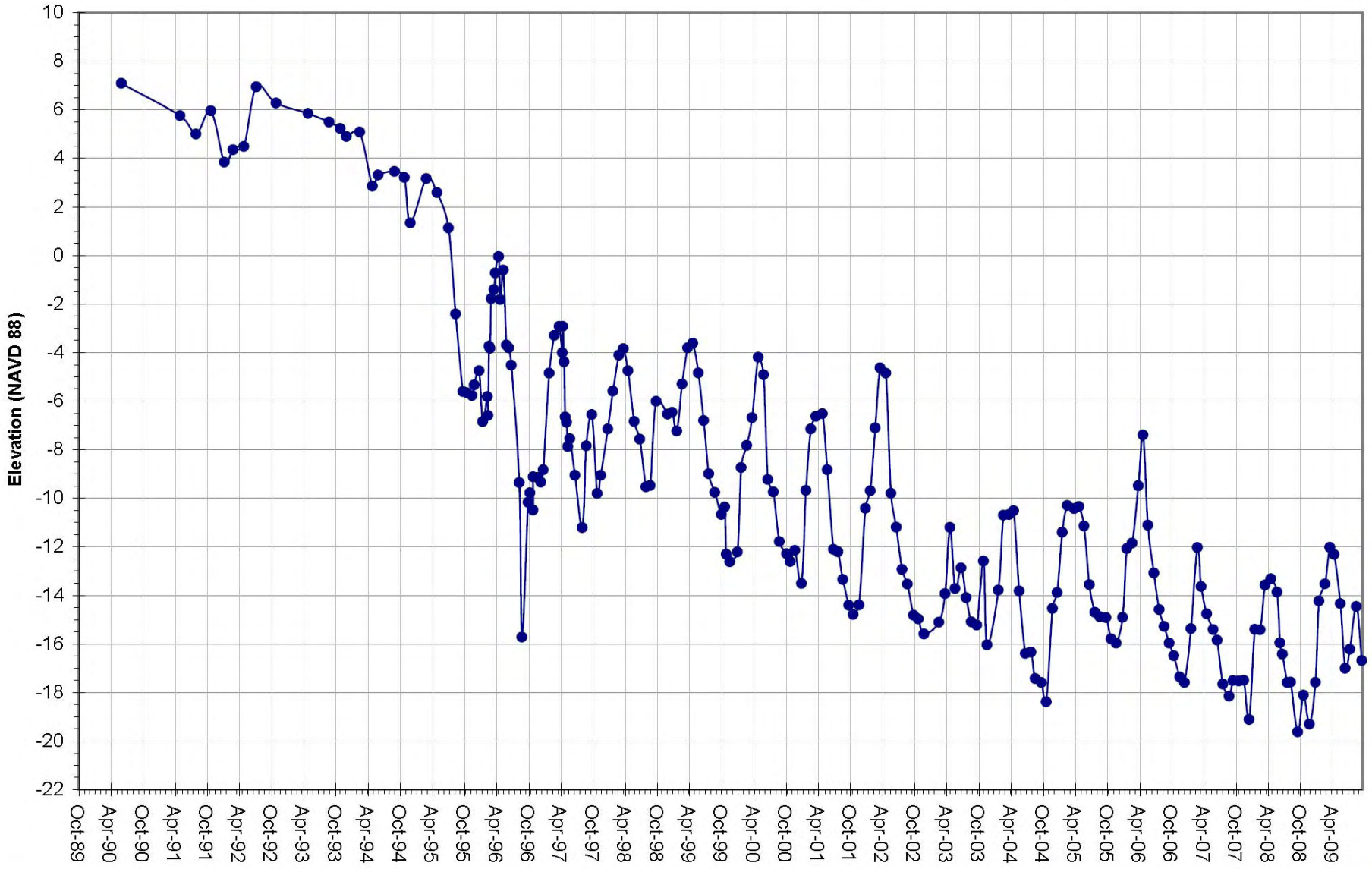
Date Measured	Reference Point	Depth to Water	Static Water Level	Comments
10/28/2008	226.43	134.09	92.34	
1/21/2009	226.43	134.17	92.26	
4/22/2009	226.43	134.11	92.32	

6/29/2009	226.43	134.31	92.12
9/15/2009	226.43	134.28	92.15

Appendix 3

Selected Hydrographs

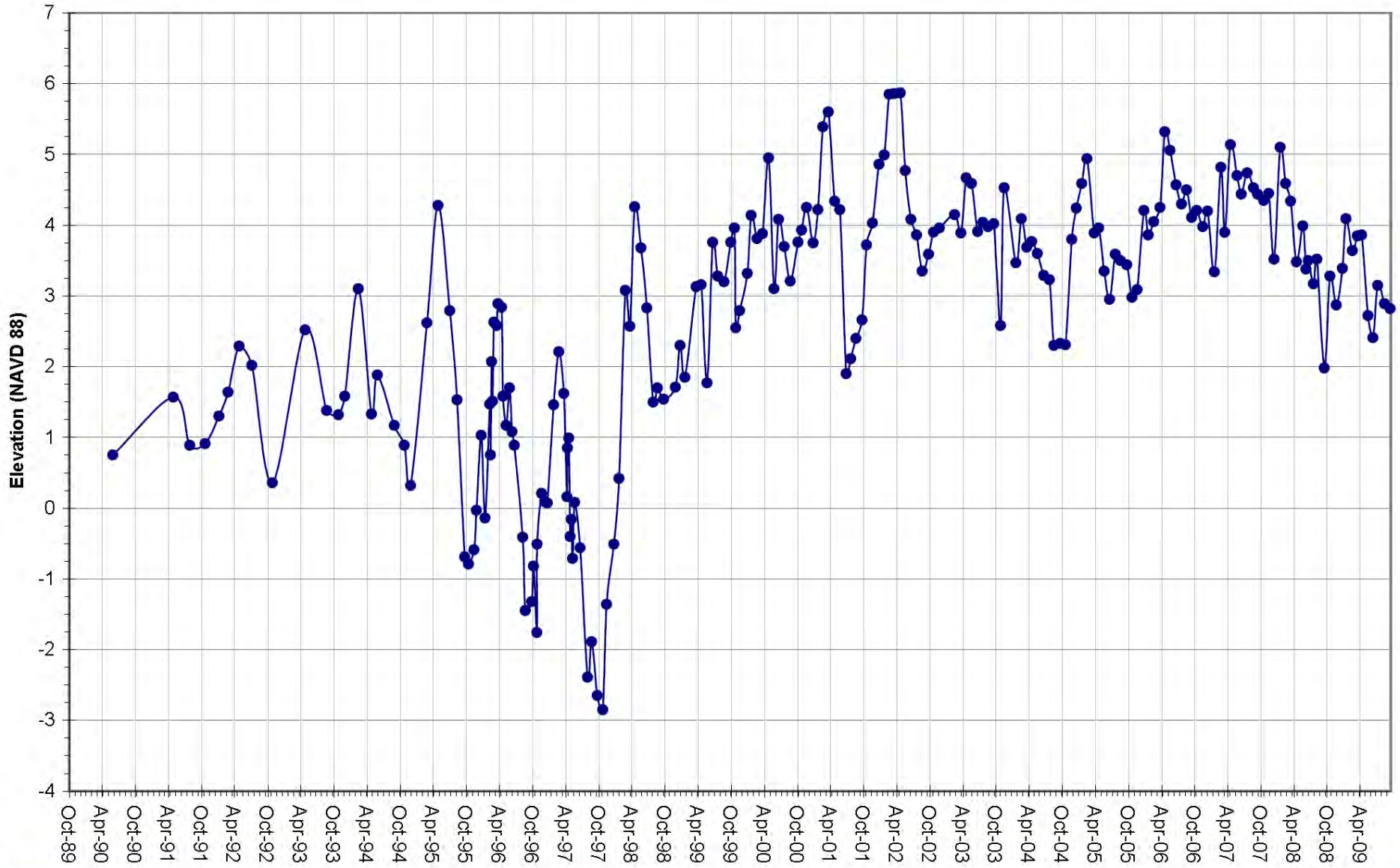
Water Year 2009



Monterey Peninsula
Water Management District

Watermaster Well Number 102 - MSC-Deep (15S/1E-15N2)

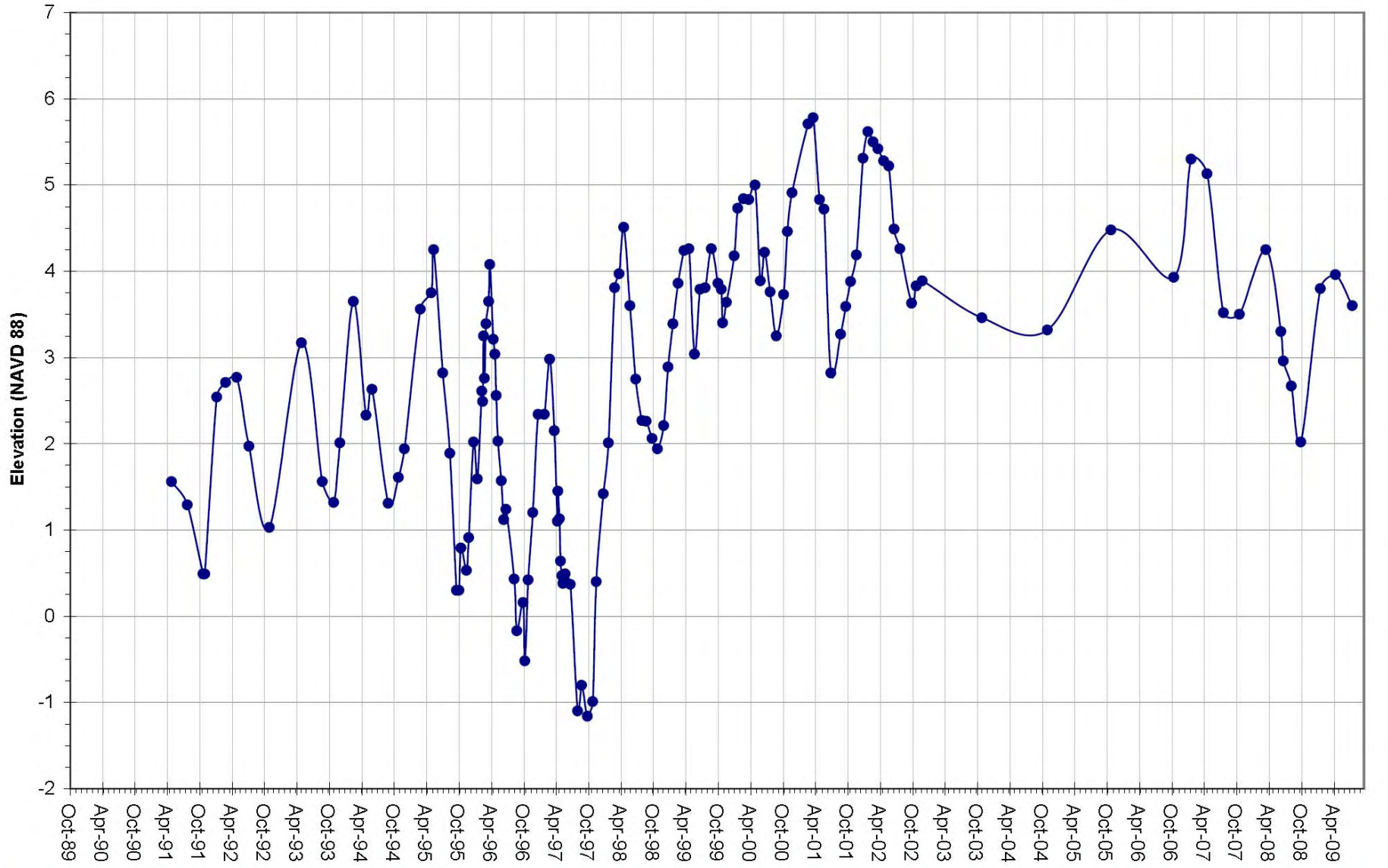
Screened from 810-850 in the Santa Margarita Formation (Tsm)
Wellhead Elevation 80.29 MSL
DWR Driller Log No. 338425
Datasource: MPWMD



Monterey Peninsula
Water Management District

Watermaster Well Number 101 - MSC-Shallow (15S/1E-15N3)

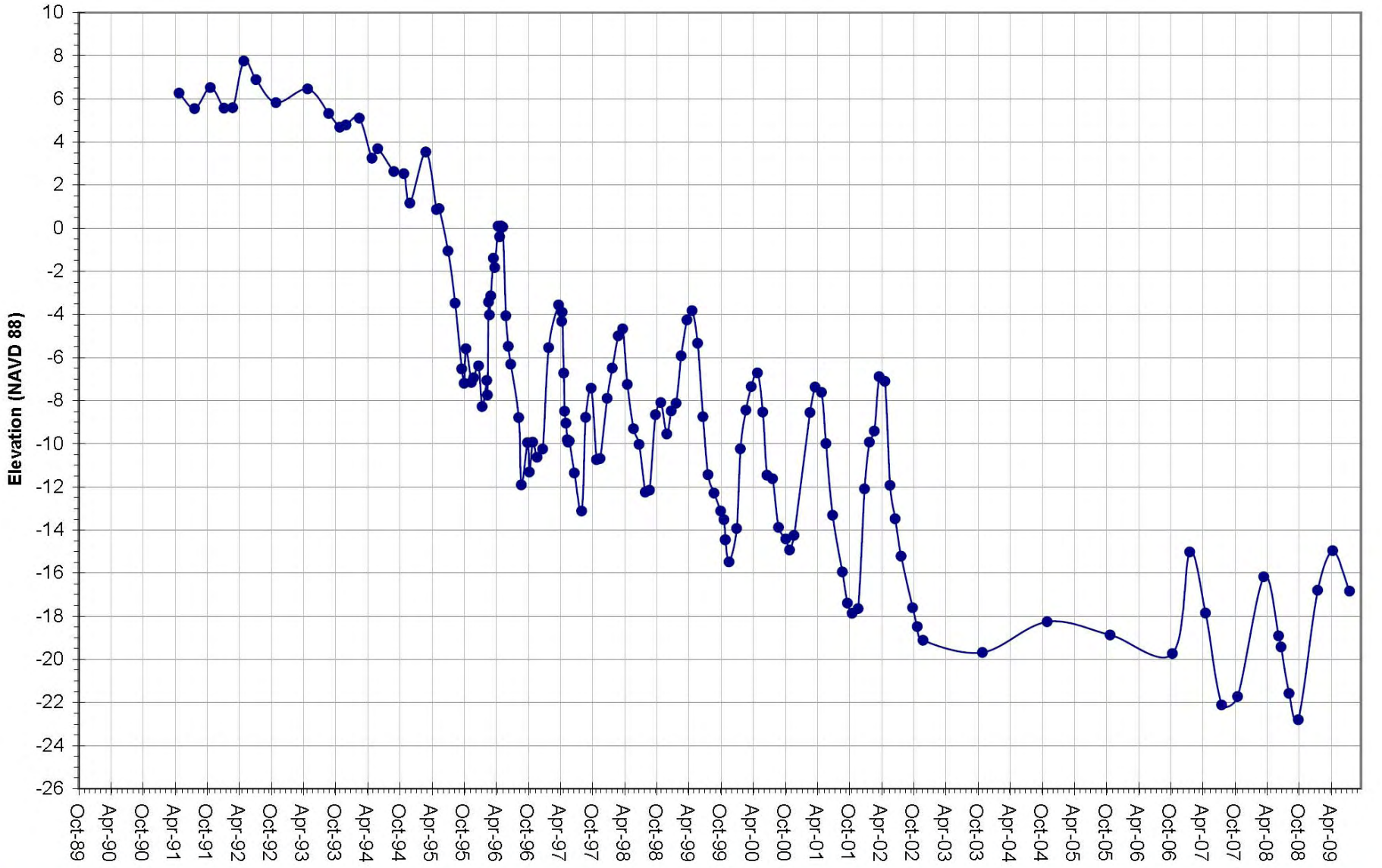
Screened from 490-680 in the Paso Robles Formation (QTp)
Wellhead Elevation 80.1 MSL
DWR Driller Log No. 338413



Monterey Peninsula
Water Management District

Watermaster Well Number 103: PCA West (Shallow) (15S/1E-15F1)

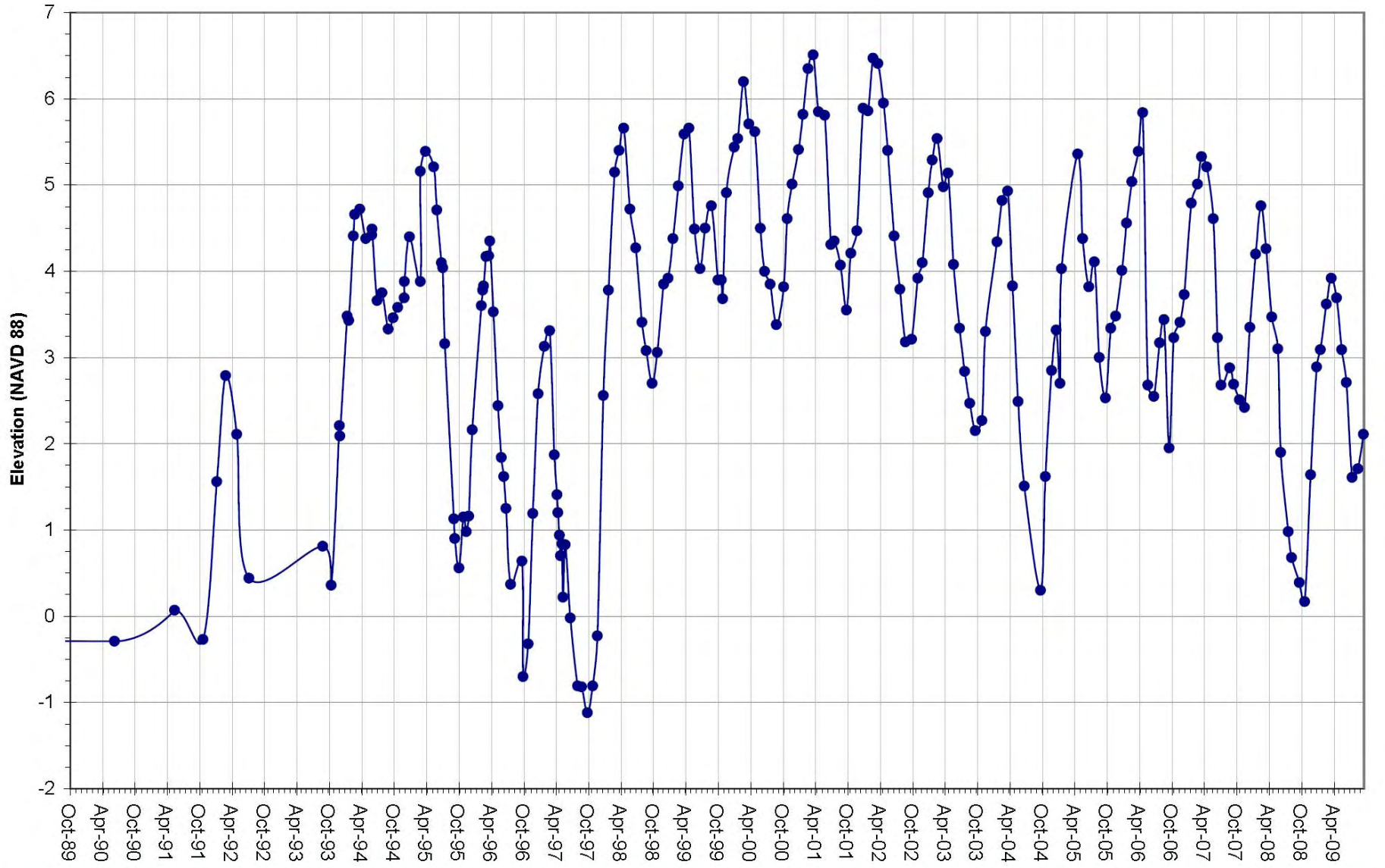
Screened from 525-575 in the Paso Robles Formation (QTp)
Wellhead Elevation 64.22 MSL
DWR Driller Log No. 338400
Datasource: MPWMD



Monterey Peninsula
Water Management District

Watermaster Well No. 104 - PCA West (Deep) (15S/1E-15F2)

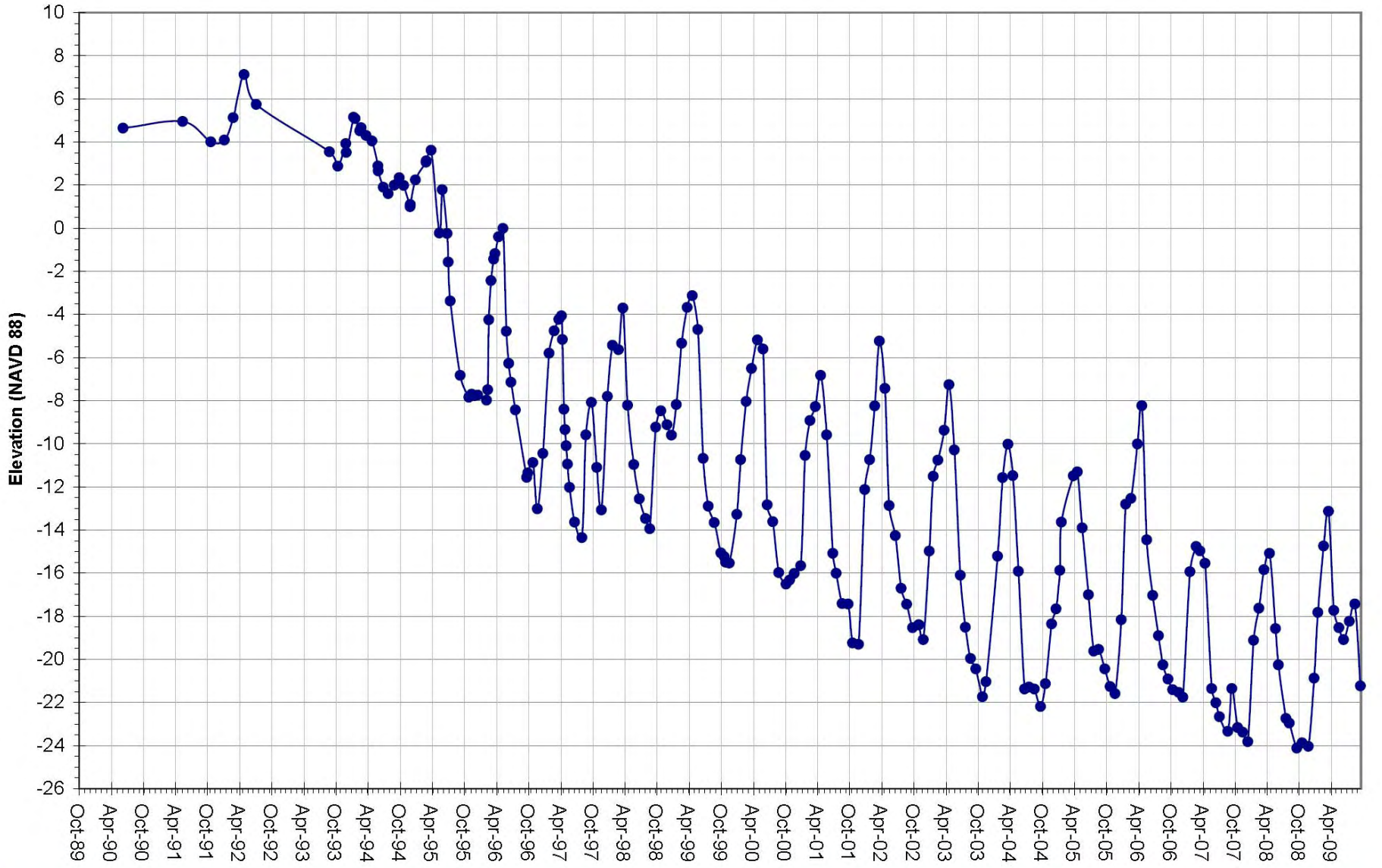
Screened from 825-875 in the Santa Margarita Formation (Tsm))
Wellhead Elevation 65.18 MSL
DWR Driller Log No. 338401
Datasource: MPWMD



Monterey Peninsula
Water Management District

Watermaster Well No. 105 - PCA East (Shallow) (15S/1E-15K5)

Screened from 350-400 in the Paso Robles Formation (QTp)
Wellhead Elevation 68.51 MSL
DWR Driller Log No. 338402
Datasource: MPWMD



Monterey Peninsula
Water Management District

Watermaster Well No. 106 - PCA East (Deep) (15S/1E-15K4)

Screened from 650-700 in the Santa Margarita Formation (Tsm)
Wellhead Elevation 68.54 MSL
DWR Driller Log No. 338402
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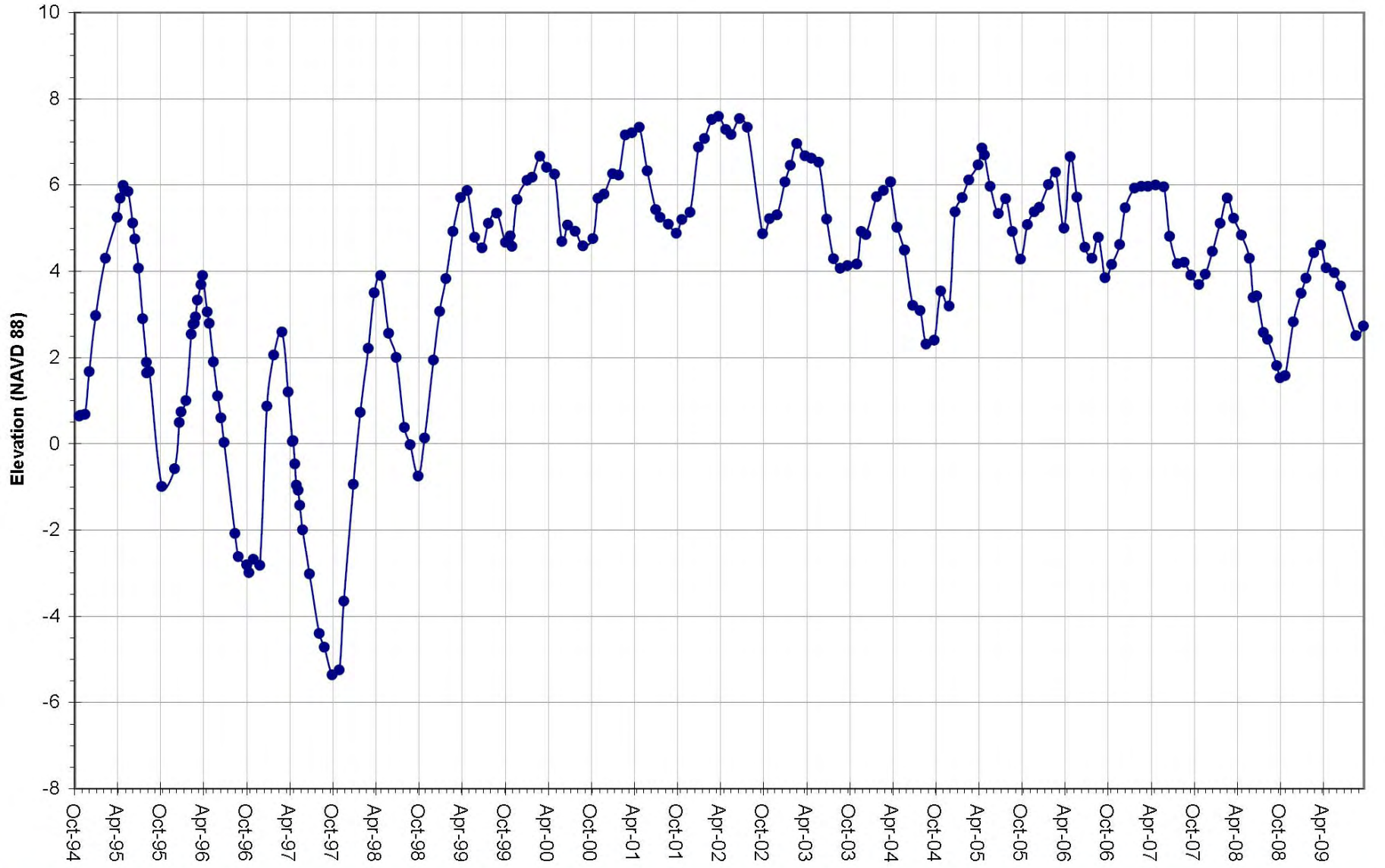
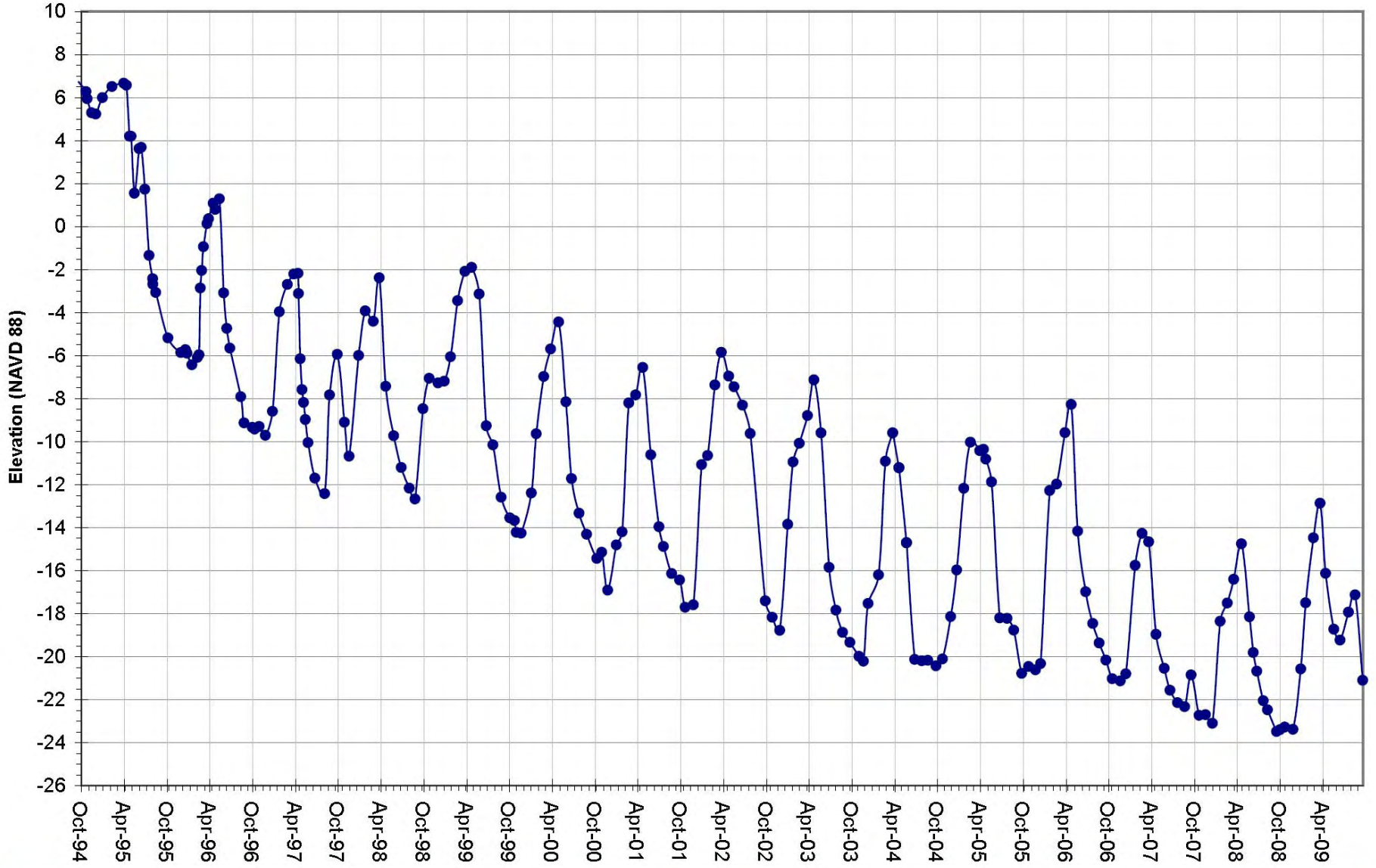


Monterey Peninsula
Water Management District

Watermaster Well No. 111 - MPWMD FO-09 (shallow) (15S/1E-11Pa)

Screened from 610-650 in the Paso Robles (QTp)
Wellhead Elevation 118.89 MSL
DWR Driller Log No. N/A
Datasource: MPWMD



Monterey Peninsula
Water Management District

Watermaster Well No. 112 - MPWMD FO-09 (Deep) (15S/1E-15Pb)

Screened from 790-830 in the Santa Margarita Formation (Tsm)
Wellhead Elevation 188.85 MSL
DWR Driller Log No. N/A
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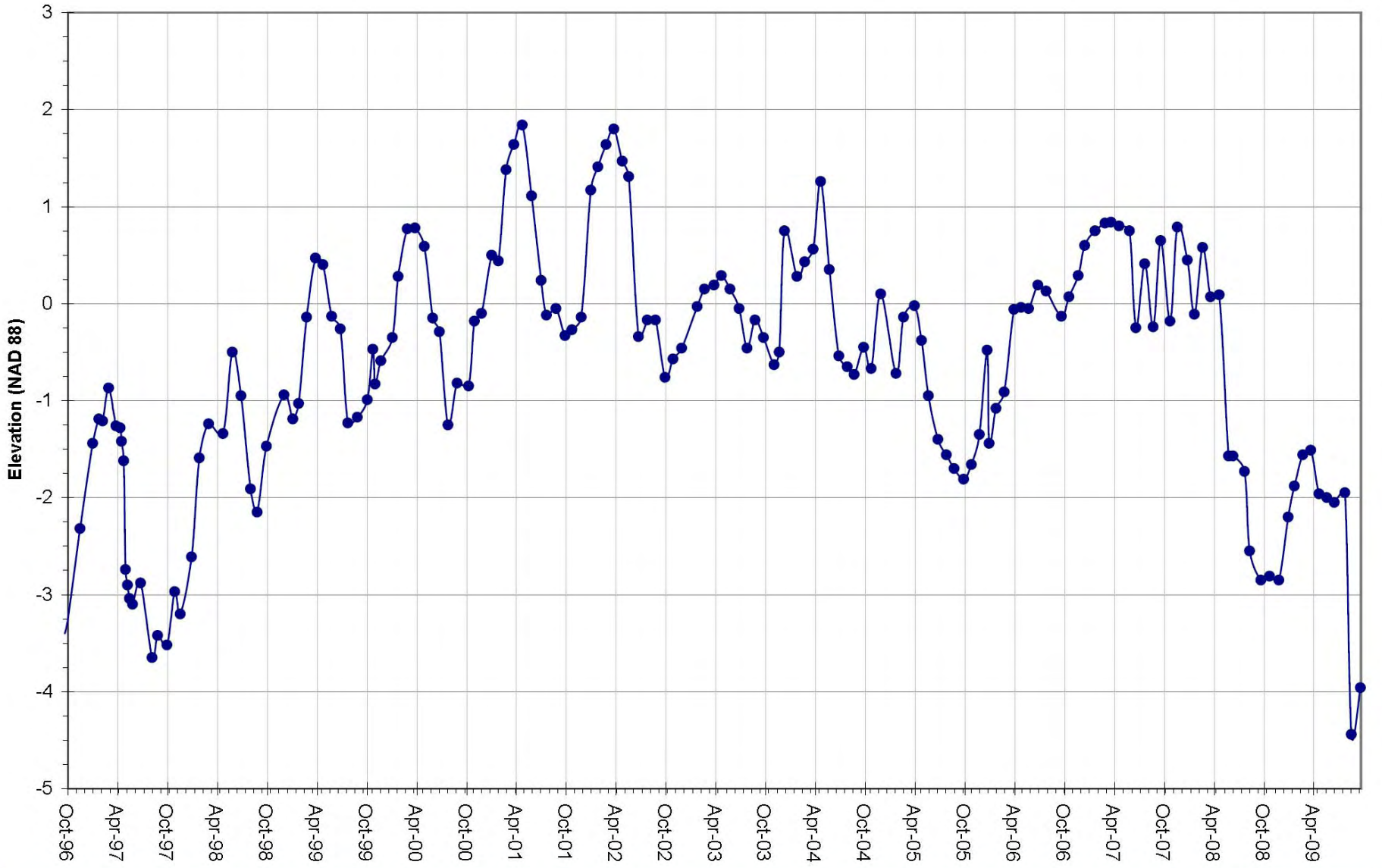
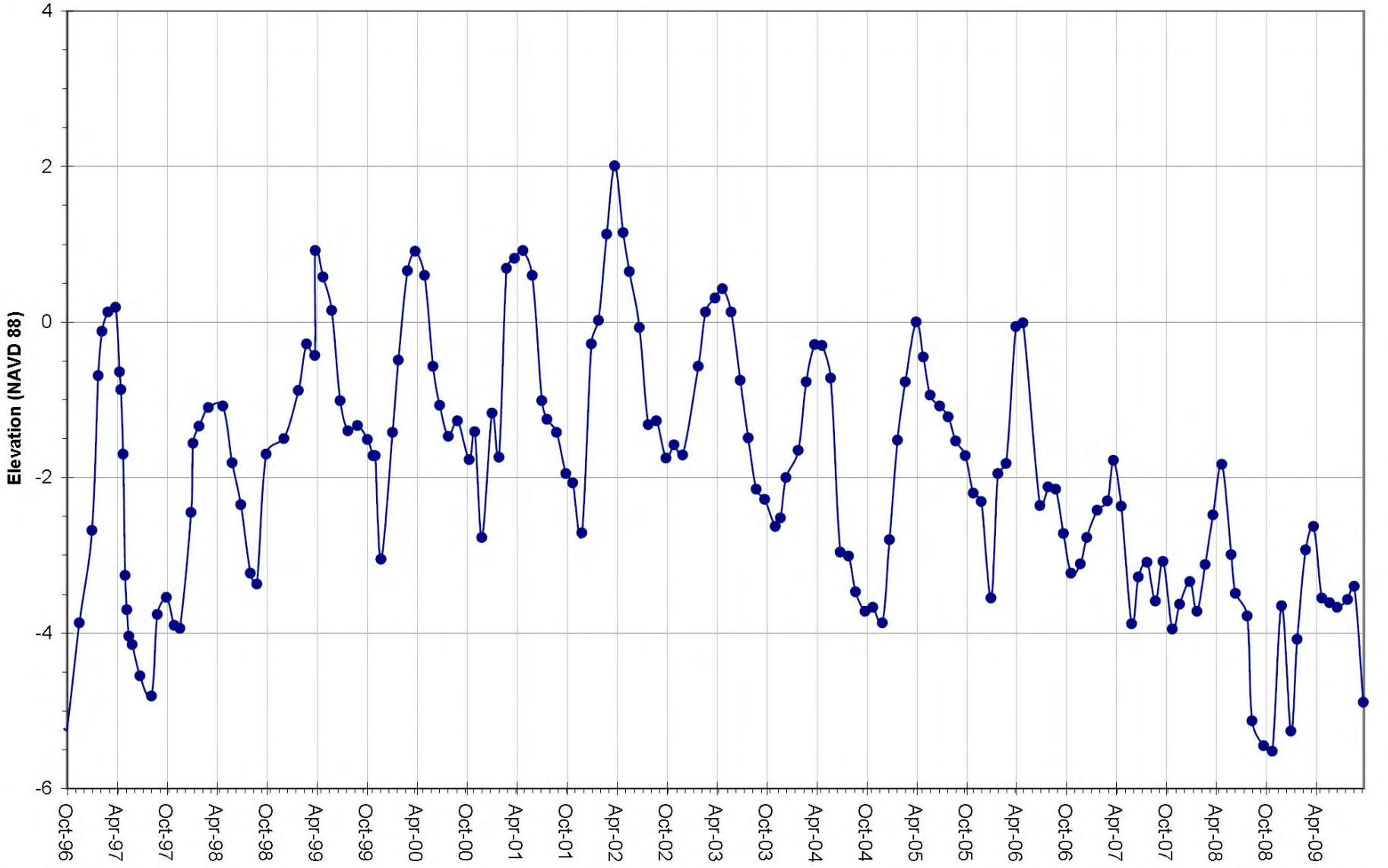


Monterey Peninsula
Water Management District

Watermaster Well No. 113 - MPWMD FO-10 (Shallow) (15S/1E-11Fa)

Screened from 480-500 in the Paso Robles (QTp)
Wellhead Elevation 200.85 MSL
DWR Driller Log No. N/A
Datasource: MPWMD



Monterey Peninsula
Water Management District

Watermaster Well No. 114 - MPWMD FO-10 (Deep) (15S/1E-15Fc)

Screened from 790-830 in the Santa Margarita Formation (Tsm)
Wellhead Elevation 201.03 MSL
DWR Driller Log No. N/A
Datasource: MPWMD

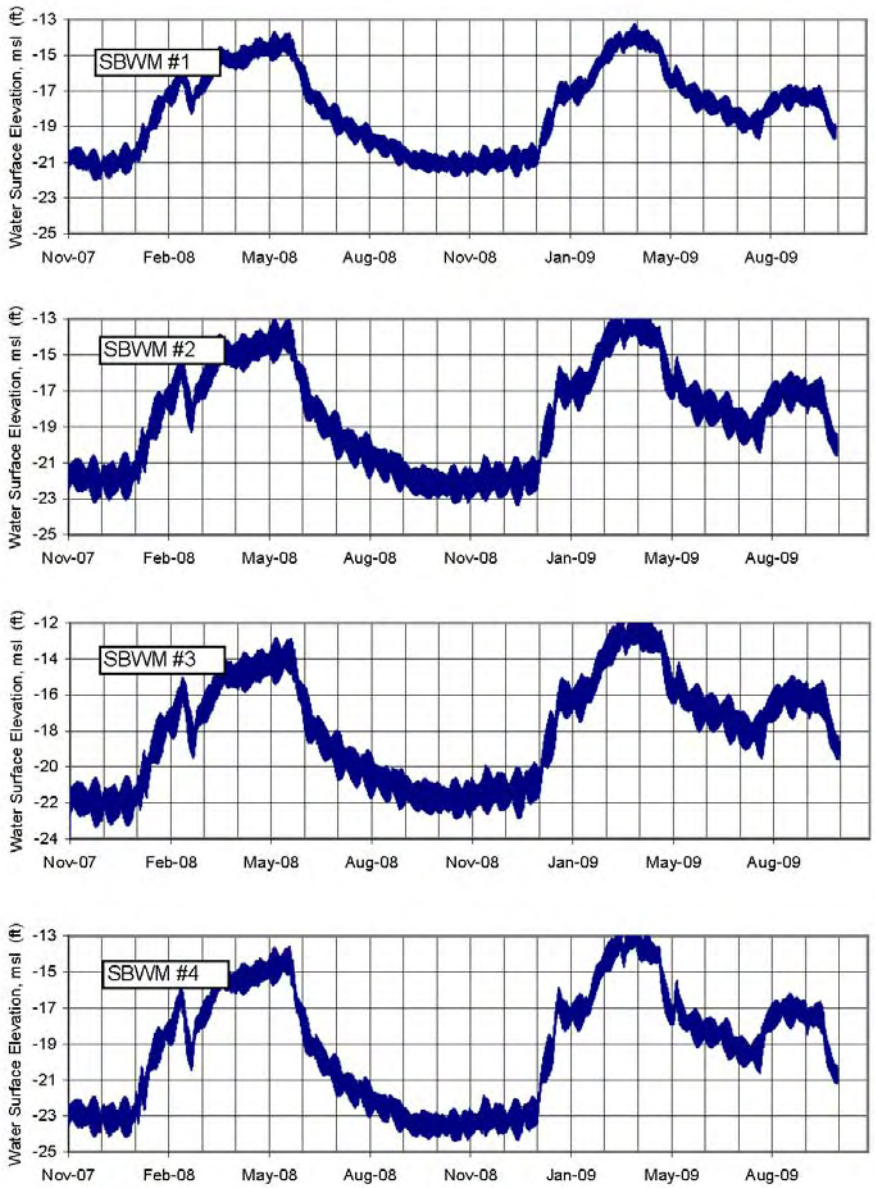


FIGURE 1
SBWM Sentinel Wells -
Continuous Water Level Record

ATTACHMENT 9

EXECUTIVE SUMMARY FROM THE BASIN MANAGEMENT ACTION PLAN (BMAP)

EXECUTIVE SUMMARY

INTRODUCTION

It is the Seaside Groundwater Basin's court-appointed Watermaster's role to administer and enforce the provisions of the Amended Decision (California American Water v. City of Seaside et al., 2007). One provision of the Amended Decision was the requirement to develop a Monitoring and Management Plan (M&MP). The Seaside Basin M&MP was subsequently developed in May 2006, and included general suggestions for a Basin Management Plan. This current document constitutes the Basin Management Plan outlined in the M&MP.

STATE OF THE SEASIDE GROUNDWATER BASIN

The Seaside Groundwater Basin as delineated in Exhibit B of the original Decision (March 2006) is bound by the Pacific Ocean, faults, bedrock, and a groundwater flow divide on the northern boundary. The Basin is subdivided internally by the Laguna Seca Anticline which separates the northern and southern subbasins. This feature, including the segment of the Ord Terrace Fault that offsets the anticline, forms a subsurface hydraulic barrier to groundwater flow. The Amended Decision subdivides the subbasins into coastal and inland subareas even though groundwater flow is continuous between coastal and inland subareas.

The Seaside Groundwater Basin comprises three aquifers: a deep aquifer, a shallow aquifer, and surficial Aromas Sands. The deep aquifer generally consists of the Purisima Formation and Santa Margarita Sandstone. The shallow aquifer refers collectively to numerous discontinuous lenses of sand and gravel in the depth interval of the Paso Robles Formation overlying the Santa Margarita Sandstone and below the surficial Aromas Sand layer.

Much of the *Total Stored Groundwater* in the Seaside Groundwater Basin is not easily extracted due to the clustered location of wells in the Basin. The Basin's *Usable Stored Groundwater*, which is a subset of *Total Stored Groundwater*, is estimated to be at most 72,000 acre-feet as of fall 2007. In the unsaturated portion above the *Total Stored Groundwater* there is at most approximately 52,030 acre-feet of *Total Usable Storage Space*. Of this 52,030 acre-feet of *Total Usable Storage Space*, 31,770 acre-feet are in the Coastal and Northern Inland Subareas and 20,260 acre-feet are in the Laguna Seca Subarea. The total actual and potential groundwater

storage in the Seaside Groundwater Basin is approximately 124,000 acre-feet (*Total Stored Groundwater* plus *Total Usable Storage Space*). These initial storage estimates, as required by the Amended Decision, will be revised as improved tools for estimating storage become available.

Over the last five years since the last comprehensive study was completed, groundwater levels in much of the Seaside Groundwater Basin have continued the downward trend documented previously. This is reflected in the annual estimated loss of stored groundwater of between 1,300 and 1,430 acre-feet per year. The declines confirm that the current basinwide Operating Yield of 5,600 acre-feet per year exceeds the basinwide Natural Safe Yield of 3,000 acre-feet per year (as both set forth in the Amended Decision) plus approximately 1,000 acre-feet per year needed to prevent seawater intrusion. While no seawater intrusion or operational problems have been reported as a result of these lowering groundwater levels, this trend is not sustainable over the long-term.

SUPPLEMENTAL WATER SUPPLIES

Long-term supplemental supplies will be needed in order to be able to reduce pumping in the Seaside Groundwater Basin to the Safe Yield, and to provide water which can be used to replenish the Basin. Developing these supplemental supplies is the strategy that will have the greatest impact on the Basin and allow for its long-term management and use in the future. The initial feasibilities of a number of supplemental supplies have been evaluated by various project proponents. Most of these supplies are being evaluated as parts of other larger programs. Many of the proposed supplemental supply projects are designed to provide up to 2,000 acre-feet per year of supplemental supply to Seaside Groundwater Basin for offsetting existing pumping, with one project proposing to provide up to 6,700 acre-feet per year. A supplemental supply of 2,000 acre-feet per year is below the 2,600 acre-feet of annual over-production, calculated as the difference between the current Operating Yield of 5,600 acre-feet and the Court's initially assumed Natural Safe Yield of 3,000 acre-feet per year. Therefore it is doubtful that any single supplemental supply project, other than combined Monterey Regional Water Supply Program projects, will be adequate for long-term basin management; project capacity of the supplemental supplies should be increased or projects combined, and coupled with demand reduction, to provide adequate supply.

Providing supplemental supplies on the order of 2,600 acre-feet per year will have the effect of halting water level decline, but will still leave groundwater levels below sea level. Supplemental supplies in excess of 2,600 acre-feet will be needed for a period of years to raise groundwater levels to protective levels. It is recommended that a groundwater model be used to evaluate the effectiveness of each supplemental supply and its impacts on groundwater levels. Furthermore, the model can be used to improve and refine the estimate of the amount of supplemental water needed to increase groundwater levels to protective levels.

All of the supplemental projects, except one, are physical projects with capital costs associated with them. The exception is water conservation which does not produce additional supply but rather results in a demand reduction. Water conservation should be given high priority with respect to Seaside Groundwater Basin Watermaster's (Watermaster) support of projects that reduce the amount of groundwater pumped from the Seaside Groundwater Basin.

GROUNDWATER MANAGEMENT ACTIONS

A number of immediate actions could be implemented by various water agencies to initially meet requirements of the Amended Decision to reduce the Operating Yield by 10 percent triennially, as well as to delay the onset of seawater intrusion and maximize the use of existing groundwater. Any action that would assist in appropriate management of the Seaside Groundwater Basin should be encouraged and supported by the Watermaster.

Of the near-term management actions reviewed, the following appear to be the most cost-effective and most likely to be implemented, and provide the greatest benefit to the Seaside Groundwater Basin in the short-term:

1. Irrigate the Bayonet and Blackhorse Golf Courses with water from the Ord Community Water System,
2. Reactivate the Marina Coast Water District Desalination Plant,
3. Provide Interties Between CAW's Main, Bishop Ranch, and Ryan Ranch Water Systems,
4. Install new inland and coastal subarea wells in coordination with the Watermaster, and
5. Sand City Desalination Plant.

The recommended interim actions are not intended to provide long-term solutions for restoring groundwater levels in the Seaside Groundwater Basin, although many interim solutions will have long-term benefits.

OTHER RECOMMENDATIONS

This BMAP identifies other basin management issues that need to be addressed and pursued by the Watermaster. One such issue is the dynamic nature of the Basin's northern boundary. This boundary (flow divide), although delineated in the Amended Decision will change location over time in response to changes in pumping in the Seaside area, Marina, the Salinas Valley and the lower El Toro Creek area. Given that this boundary is controlled by hydraulic factors, it is possible that if pumping in the Seaside area ceased completely and groundwater levels recovered to a certain point, groundwater in the northern portion of the Basin might flow into the Salinas Valley. Similarly, increased pumping in the Seaside Groundwater Basin might capture groundwater from the Salinas Valley.

Whatever management strategies are ultimately recommended, their impacts need to be assessed before implementation. Issues such as the fate of water that is recharged in the Basin at different locations, pumping redistribution, and establishing protective groundwater levels need to be addressed. For example, it will be important to know if recharge water will be lost to the ocean or the Salinas Valley, and whether the extraction wells in the Basin are located in the correct places to recover stored water. In order to assess these impacts, the most efficient method would be groundwater modeling. The model would be a management tool with which informed decisions regarding the management of the Basin can be made, assist in a better understanding of basin impacts from supplemental supplies on the groundwater basin, and to develop a plan for how the supplemental water could be best used to benefit the Seaside Groundwater Basin and water purveyors. A calibrated model should be developed in order to be ready to evaluate Basin impacts of planned supplemental supply projects and other management actions in a timely manner.

Selecting, evaluating and developing supplemental supplies for the Seaside Groundwater Basin should be done as expeditiously as possible. The Watermaster can support this by facilitating between parties, providing data and information on the Basin, and ensuring that Material Injury does not result from any of the proposed projects.

Managing the Basin requires evaluating impacts associated with implemented strategies. Monitoring of groundwater levels, quality and production are the means by which this can be done. The Watermaster should continue to install monitoring wells and continue with its monitoring program. In locations where the Watermaster determines additional data are needed, the monitoring network should be expanded.

ATTACHMENT 10

CONTINGENCY ACTIONS FROM THE SEAWATER INTRUSION RESPONSE PLAN

SECTION 4
SEAWATER INTRUSION CONTINGENCY ACTIONS

It is not possible to halt and reverse seawater intrusion unless supplemental supplies are available. Until these supplies are secured, the Watermaster should implement containment strategies to reduce the magnitude and extent of seawater intrusion, if it is observed. By containing seawater intrusion, the Watermaster will: (1) help preserve productive use of the Seaside Groundwater Basin; and (2) facilitate the restoration of the Seaside Groundwater Basin water quality by limiting the extent and spread of the intrusion. The purpose of this section of the SIRP is to develop a containment strategy and actions that can be implemented in the event that seawater intrusion is observed in the Seaside Groundwater Basin.

4.1 GEOGRAPHIC AREA COVERED BY CONTINGENCY ACTIONS

The contingency actions described in Section 4.2 are only triggered by seawater intrusion occurring inside the Seaside Groundwater Basin boundary as illustrated on Figure 1. Some wells monitored by the Watermaster, such as the FO-10 shallow and deep wells, may be located outside the Seaside Groundwater Basin boundary. Seawater intrusion observed at wells outside the adjudicated boundary should not necessarily trigger the actions listed in Section 4.2, but should trigger a review of the data by the Watermaster to assess necessary actions to prevent Material Injury to the Seaside Groundwater Basin.

4.2 ACTIONS ADDRESSING OBSERVED SEAWATER INTRUSION

The specific actions that should be implemented if seawater intrusion is detected, as defined by the triggers in Section 3.2, are as follows.

ACTION 1: VERIFICATION

Wells with water quality indicative of seawater intrusion shall be re-sampled as soon as possible. The re-sampling should include the full suite of major cations and anions, which will allow all of the indicators listed in Section 3 to be verified. Laboratory analyses should be conducted with an expedited turnaround time. If re-sampling these wells verifies the presence of seawater intrusion in the Seaside Groundwater Basin, Actions 2 through 5 should be implemented.

ACTION 2: DECLARATION OF SEAWATER INTRUSION

If the verification confirms that seawater intrusion has occurred within the Seaside Groundwater Basin, the Watermaster shall issue a Declaration of Seawater Intrusion within 15 calendar days of verification.

ACTION 3: NOTIFICATION

Within 10 calendar days following the Watermaster's Declaration of Seawater Intrusion, all groundwater producers in the Seaside Groundwater Basin, MPWMD, and all other interested entities within the Seaside Groundwater Basin shall be formally notified. The Watermaster shall notify all parties that the SIRP contingency actions have been triggered, and will identify the well(s) that triggered the SIRP contingency actions.

ACTION 4: PUMPING REDISTRIBUTION PLAN

The pumping redistribution plan is designed to contain observed seawater intrusion, and to protect production wells until a supplemental water supply is obtained. The pumping redistribution plan consists of the following eight activities that will be implemented. Many of these activities should be applied iteratively.

- **Discontinue or substantially reduce pumping the Impacted Well(s)**. If seawater intrusion has been declared for a production well, pumping at this well shall be discontinued or substantially reduced as soon as possible, but no longer than 30 calendar days after the Declaration of Seawater Intrusion. If seawater intrusion has been declared for only monitoring wells, this activity is unnecessary.

All of the following activities shall be initiated within 90 calendar days after the Declaration of Seawater Intrusion:

- **Identify At Risk Well(s) where seawater intrusion might occur**. At Risk Wells are production wells that have the potential to become impacted by seawater intrusion based on their proximity to the Impacted Well(s), local groundwater gradients, and other conditions.

- **Identify and/or install additional monitoring wells**. The Watermaster will evaluate the benefit of installing additional groundwater monitoring wells to evaluate the movement of seawater intrusion towards the At Risk Well(s). If this evaluation concludes that monitoring wells should be installed, the Watermaster will pursue installation of these wells with due diligence.

- **Estimate the groundwater conditions that protect production wells**. The Watermaster shall estimate the maximum acceptable groundwater gradient between the Impacted Well(s) and the At Risk Well(s) that prevents seawater intrusion from reaching the At Risk Wells before a supplemental supply is obtained, currently estimated to be 2015. The Watermaster should further estimate the expected total dissolved solids (TDS) and chloride concentrations over time that might be observed at existing or new monitoring wells under this maximum groundwater gradient.

- **Identify and evaluate production wells' influence on observed seawater intrusion**. All production wells in the Seaside Groundwater Basin shall be evaluated and ranked for their influence on the groundwater gradients that are causing seawater intrusion and migration. The Watermaster shall estimate one or more recommended pumping scenarios that will achieve the maximum acceptable gradient between Impacted and At Risk well(s).

- **Increase monitoring frequency**. The Watermaster should increase the monitoring frequency of the Impacted Well(s), monitoring wells, and At Risk Well(s) to evaluate the progress of the seawater intrusion. Groundwater elevations at these wells should be measured monthly, and groundwater samples should be collected from these wells and analyzed monthly for major cations and anions. The groundwater gradient should be analyzed every month to confirm that the pumping reduction is having the planned effect.

- **Re-evaluate the Operating Yield**. In accordance with the Amended Decision, the Watermaster should re-evaluate the Operating Yield to prevent further Material Injury.

The following activity shall be initiated within 90 calendar days of the Water master Board adopting recommendations from the previous activities:

- **Modify pumping to achieve the desired groundwater gradient**. Groundwater pumping at the most influential production wells should be modified to achieve the groundwater gradient calculated above.

ACTION 5: FOCUS SUPPLEMENTAL SUPPLIES TO HALT AND REVERSE SEAWATER INTRUSION

When a supplemental water supply becomes available for Seaside Groundwater Basin replenishment, the Watermaster will seek to have the supplemental water used strategically to protect the Seaside Groundwater Basin from further seawater intrusion, and to restore the Basin to pre-seawater intruded conditions. Supplemental supplies should be used to both offset pumping that causes the observed seawater intrusion, and to raise groundwater levels to reverse seawater intrusion.

ATTACHMENT 11

EXECUTIVE SUMMARY
FROM THE
2009 SEAWATER INTRUSION ANALYSIS REPORT

Executive Summary from the *Water Year 2009 Seawater Intrusion Analysis Report* prepared by HydroMetrics LLC

Continued pumping in excess of recharge and fresh water inflows, pumping depressions near the coast, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin. Fortunately, no seawater intrusion is currently observed in existing monitoring wells. This report addresses the potential for, and extent of, seawater intrusion in the Seaside Groundwater Basin. A number of different tools and analyses are used to investigate for evidence of seawater intrusion.

- Piper diagrams for water samples for Water Year 2009 from depth discreet monitoring wells show no apparent geochemical evolution towards seawater.

- No water samples analyzed in Stiff diagrams are indicative of incipient seawater intrusion.

- The only MPWMD monitoring wells displaying increasing chloride levels are the deep PCA East and FO-10 wells. Stiff and Piper diagrams for these wells do not indicate seawater intrusion, and it is likely that the increase is merely a localized fluctuation that is unrelated to seawater intrusion. No additional monitoring is warranted.

- No wells display decreasing sodium/chloride ratios that would indicate seawater intrusion.

- Maps of chloride concentrations do not show chlorides increasing towards the coast.

- Although production wells have a different water quality than the monitoring wells, probably as a result of their being screened across both shallow and deep zones, the water quality are not indicative of seawater intrusion.

- Groundwater production in the Seaside Groundwater Basin decreased in Water Year 2009 by 697.3 acre-feet, representing a 13 percent reduction from Water Year 2008's production. This reduction in groundwater withdrawal brings the basin closer to hydrologic balance which is necessary to prevent seawater intrusion.

Based on the findings of this report, the following recommendations should be implemented to continue to monitor and track potential seawater intrusion.

1. **Semi-Annual Water Quality Sampling in Well SBWM-4**
   It is recommended that semi-annual samples continue to be collected at sentinel well SBWM-4 because chloride concentrations from a depth of 900 feet below surface were greater than 250 mg/L.

2. **Continue to Analyze and Report on Water Quality Annually**

Seawater intrusion is a threat, and data must be analyzed regularly to identify incipient intrusion. Maps, graphs, and analyses similar to what are found in this report should be developed every year.

3. **Reduce Frequency of Induction Logging in Sentinel Wells**
   Induction logging in the four sentinel wells has shown very little variation in salinity. Currently logging takes place quarterly. It is recommended that this be reduced to semi-annually or annually.

4. **Start Looking for Abandoned Wells that Might be Conduits for Cross-Contamination Between Aquifers**
   In an effort to protect the deeper aquifer, old abandoned or improperly destroyed wells that are screened across both the deep and shallow aquifers should be identified. Once identified, confirmation should be made that these wells have been sealed and destroyed per County standards and requirements, and if not, whether they pose a threat for cross-contamination across aquifers. Wells that are improperly destroyed and are screened across multiple aquifers should be destroyed according to County standards and requirements. Wells that do not pose a cross-contamination threat should be examined for potential to be included in the Watermaster's monitoring network.

ATTACHMENT 12

SEASIDE GROUNDWATER BASIN MANAGEMENT AND MONITORING PROGRAM ANTICIPATED 2010 SCOPE OF WORK

Seaside Groundwater Basin Management and Monitoring Program
Anticipated 2010 Scope of Work

The tasks outlined below are those that are anticipated to be performed during 2010. Some Tasks listed below are specific to 2010, while others Tasks recur throughout the program, such as data collection and database entry, and Program Administration Tasks.

Within the context of this document the term "Consultant" refers either to a firm providing professional engineering or other types of technical services, or to the Monterey Peninsula Water Management District (MPWMD). The term "Contractor" refers to a firm providing construction or field services such as well drilling, induction logging, or meter calibration.

M.1 Program Administration

M. 1. a. Project Budget and Controls ($0)	Consultants will provide monthly or bimonthly invoices to the Watermaster for work performed under their contracts with the Watermaster. Consultants will perform maintenance of their internal budgets and schedules, and management of their subconsultants. The Watermaster will perform management of its Consultants.
M. 1. b. Assist with Board and TAC Agendas ($0)	Watermaster staff will prepare Board and TAC meeting agenda materials. No assistance from Consultants is expected to be necessary to accomplish this Task.
M. 1. c. Preparation and Attendance of Meetings ($5,000)	The Consultants' work will require internal meetings and possibly meetings with outside governmental agencies and the public. For meetings with outside agencies, other Consultants, or any other parties which are necessary for the conduct of the work of their contracts, the Consultants will set up the meetings and prepare agendas and meeting minutes to facilitate the meetings. These may include planning and review meetings with Watermaster staff. The costs for these meetings will be included in their contracts, under the specific Tasks and/or subtasks to which the meetings relate. The only meeting costs that will be incurred under Task M.1.c will be: Those associated with attendance at TAC meetings (either in person or by teleconference connection), and From time-to-time when Watermaster staff asks Consultants to make special presentations to the Watermaster Board and/or the TAC. Appropriate Consultant representatives will attend TAC meetings when requested to do so by Watermaster Staff (either in person or by teleconference connection), but will not be asked to prepare agendas or meeting minutes. As necessary, Consultants may provide oral updates to their progress reports (prepared under Task M.1.d) at the TAC meetings.
M. 1. d. Prepare Board/ TAC Status Updates and Reports ($0)	Consultants will provide written monthly progress reports to the Watermaster for inclusion in the agenda packets for the TAC meetings. These progress reports will typically include project progress that has been made, problem identification and resolution, and planned upcoming work.
M. 1. e. Peer Review of Documents and Reports ($3,000)	When requested by the Watermaster staff, Consultants may be asked to assist the TAC and the Watermaster staff with peer reviews of documents and reports prepared by various other Watermaster Consultants and/or entities.

M. 1. f. **QA/QC ($0)**	A Consultant (MPWMD) will provide general QA/QC support over the Seaside Basin Monitoring and Management Program.

I. 2 Comprehensive Basin Production, Water Level and Water Quality Monitoring Program

I. 2. a. Database Management

I. 2. a. 1 Conduct Ongoing Data Entry and Database Maintenance/ Enhancement ($37,600)	The database will be maintained by a Consultant performing this work for the Watermaster. Either one of the other Consultants or the Watermaster staff will enter new data into the consolidated database. Such data will include water production volumes, water quality and water level data, and such other data as may be appropriate. The database programming may be enhanced in 2010 at the direction of the Watermaster to improve the usefulness and "user friendliness" of the database. $25,000 has been included under this task for budgeting purposes in the event such work is deemed necessary.
I. 2. a. 2 Verify Accuracy of Production Well Meters ($0)	To ensure that water production data is accurate, the well meters of the major producers were verified for accuracy during 2009. No additional work of this type is anticipated during 2010.

I. 2. b. Data Collection Program

I. 2. b. 1. Site Representation and Selection. ($0)	The monitoring well network review that was started in 2008 has been completed, and sites have been identified where future monitoring well(s) could be installed, if it is deemed necessary to do so in order to fill in data gaps. No further work of this type is anticipated in 2010.
I. 2. b. 2. Collect Monthly Manual Water Levels. ($3,360)	Each of the monitoring wells will be visited on a monthly basis. Water levels will be determined by either taking manual water levels using an electric sounder, or by dataloggers.
I. 2. b. 3. Collect Quarterly Water Quality Samples. ($71,480)	Water quality data will be collected quarterly from certain of the monitoring wells. This data may come from water quality samples that are taken from these wells and submitted to a State Certified analytic laboratory for general mineral and physical suite of analyses, or the data may come from induction logging of these wells and/or other data gathering techniques. The Consultant selected to perform this work will make this judgment based on consideration of costs and other factors.
I. 2. b. 4. Update Program Schedule and Standard Operating Procedures. ($2,000)	The TAC, with assistance from Consultants, will conduct periodic reviews of the data collection program and will recommend to the Watermaster improvements as warranted.
I. 2. b. 5. Monitor Well Construction ($0)	An additional monitoring well was installed in 2009. No further work of this type is anticipated in 2010.
I. 2. b.6 Reports ($6,680)	The groundwater level and quality monitoring will be conducted on a monthly, quarterly, and annual basis, as described in the Contractor's Scope of Work. Reports summarizing data collected and analyzed will be submitted to the Watermaster on a schedule to be established during the year. Reports will include: • Water Quality and Water Level Quarterly Reports • An Annual Water Quality and Water Level Report

I. 3 Basin Management

I. 3. a. Enhanced Seaside Basin Groundwater Model (Costs listed in subtasks below)	As a result of the data obtained during Phase 1, including constructing new coastal sentinel monitoring wells and developing a consolidated database of groundwater production, water levels, and water quality, it is was concluded that at that time it was not necessary to develop a new Model. Preliminary conclusions from work performed on preparing the Basin Management Action Plan in 2008, along with comments and questions from Technical Advisory Committee and Board members, indicated that it was desirable to update the existing Model during 2009, so that it could be used as more data becomes available.
I.3.a.1 Update the Existing Model ($0)	The existing Model, described in the report titled "Groundwater Flow and Transport Model" dated October 1, 2007, was updated in 2009 in order to develop protective water levels, and to evaluate replenishment scenarios and develop answers to Basin management questions (Tasks I.3.a.2 and I.3.a.3). This work was done by a Consultant hired by the Watermaster. No further work of this type is anticipated in 2010.
I. 3. a. 2 Develop Protective Water Levels ($25,000)	A series of cross-sectional models was created in order to develop protective water levels for selected production wells, as well as for the Basin as a whole. This work was done in 2009 by a Consultant hired by the Watermaster (HydroMetrics), and is discussed in Hydrometrics' "Seaside Groundwater Basin Protective Water Elevations Technical Memorandum." In 2010 further work will be done to refine these protective water levels to find the most cost-effective approach to provide the desired degree of protection.
I. 3. a. 3 Evaluate Replenishment Scenarios and Develop Answers to Basin Management Questions ($25,000)	The updated Model was used to evaluate different scenarios to determine such things as the most effective methods of using supplemental water sources to replenish the Basin and/or to assess the impacts of pumping redistribution. This work was done in 2009 by a Consultant hired by the Watermaster (HydroMetrics), and is described in HydroMetrics' "Seaside Groundwater Basin Groundwater Model Report." In 2010 if requested by the Watermaster, HydroMetrics may use the updated Model to develop answers to other questions associated with Basin management.
I. 3. b. Complete Preparation of Basin Management Action Plan ($0)	The Watermaster's Consultant completed preparation of the Basin Management Action Plan (BMAP) in February 2009. The BMAP serves as the Watermaster's long-term seawater intrusion prevention plan. The Sections that are included in the BMAP are: • Executive Summary • Section 1 – Background and Purpose • Section 2 – State of the Seaside Groundwater Basin • Section 3 – Supplemental Water Supplies • Section 4 –Groundwater Management Actions • Section 5 – Recommended Management Strategies • Section 6 – References The only work which is anticipated to be performed on the BMAP in 2010 is discussed under Task I. 3. c.
I. 3. c. Refine and/or Update the Basin Management Action Plan ($25,000)	During 2010 it may be beneficial to update the BMAP based on new data, and/or knowledge that is gained from the work described under Tasks I. 3. a. 2 and/or I. 3. a. 3. Such work might involve issues pertaining to Basin storage capacity, water storage rights, or pumping redistribution strategies. This task is included primarily for budgeting purposes in the event such work is deemed necessary.

I. 3. d. **Evaluate Coastal Wells for Cross-Aquifer Contamination Potential ($5,000)**	If seawater intrusion were to reach any of the coastal wells in any aquifer, and if a well was constructed without proper seals to prevent cross-aquifer communication, or if deterioration of the well had compromised these seals, it would be possible for the intrusion to flow from one aquifer to another. A review of the well construction records for each of the coastal wells will be made to determine whether or not they were properly constructed so as to prevent such cross-aquifer contamination from occurring. As part of that review, records will also be reviewed to determine whether there is any indication of well seal deterioration that would lead to the potential for cross-aquifer contamination. A report summarizing the findings of this review will be prepared, with recommendations for any field inspection or other followup work that should be done in this regard.

I. 4 Seawater Intrusion Response Plan (formerly referred to as the Seawater Intrusion Contingency Plan)

I. 4. a. Oversight of Seawater Intrusion Detection and Tracking ($5,600)	A Consultant will provide general oversight over the Seawater Intrusion detection program.
I. 4. b. Analyze and Map Water Quality from Coastal Monitoring Wells (costs included above under Task I. 4. a)	Annual chloride concentration maps will be produced incorporating the data from the coastal wells. Data from the Phase 1 coastal sentinel wells will be used to develop time series graphs.
I. 4. c. Annual Report- Seawater Intrusion Analysis ($25,000)	At the end of each water year, a Consultant will reanalyze all water quality data. Semi-annual chloride concentration maps will be produced for each aquifer in the basin. Time series graphs, trilinear graphs, and stiff diagram comparisons will be updated with new data. The annual EM logs will be analyzed to identify changes in seawater wedge locations. All analyses will be incorporated into an annual report that follows the format of the initial, historical data report. Potential seawater intrusion will be highlighted in the report, and if necessary, recommendations will be included. The annual report will be submitted for review by the TAC and the Board. Modifications to the report will be incorporated based on input from these bodies, as well as Watermaster staff.
I. 4. d Complete Preparation of Seawater Intrusion Response Plan ($0)	The Watermaster's Consultant (HydroMetrics) completed preparation of the long-tem Seawater Intrusion Response Plans (SIRP) in February 2009. The Sections that are included in the SIRP are: • Section 1 – Background and Purpose • Section 2 – Consistency with Other Documents • Section 3 – Seawater Intrusion Indicators and Triggers • Section 4 –Seawater Intrusion Contingency Actions • Section 5 - References No further work on the SIRP is anticipated in 2010.
I. 4. e. Refine and/or Update the Seawater Intrusion Response Plan ($0)	At the beginning of 2009 it was thought that it might be beneficial or necessary to perform work to refine the SIRP and/or to update it based on new data or knowledge that was gained subsequent to the preparation of the SIRP. However, this did not prove to be necessary, and no further work of this type is anticipated in 2010.
I. 4. f. If Seawater Intrusion is Determined to be Occurring, Implement Contingency Response Plan ($0)	The SIRP will be implemented if seawater intrusion, as defined in the Plan, is determined by the Watermaster to be occurring.

ATTACHMENT 13

METER ACCURACY VERIFICATION REPORT

Page 35 of the Amended Court Decision contains a requirement in Section L.3.j.vii, which reads:

"The Watermaster will make inspections of Water Production facilities and measuring devices at such times and as often as may be reasonable under the circumstances, and to calibrate or test such devices."

The Watermaster's Technical Advisory Committee (TAC) at its June through September 2009 meetings evaluated the water meter data submitted by each of the producing well owners and arrived at findings regarding the accuracy of these meters. Table 1 summarizes the information for each of the active production wells.

The TAC found that there are several factors which lead to the conclusion that having the water meters calibrated in the field is not practical:

- For most types of mechanical meters there is no field calibration procedure. Such meters typically must be taken out and sent to the factory for calibration in a hydraulics test facility that has volumetric calibration equipment.
- Electronic flow meters can be "calibrated" in the field, but what this really consists of is calibrating the electronics to manufacturer specifications. This ensures that the electronics are reading properly, but does not ensure that the primary element (the flow sensor) or the meter installation configuration is producing accurate metering conditions.
- Meters are often installed, due to site constraints, in such a piping configuration that they may only be able to provide reasonably accurate readings. Even if these meters were taken to the factory for calibration and then reinstalled, they would still only be able to produce reasonably accurate readings, but not readings that would match calibrated readings.

Rather than performing calibration of the installed flow meter, a more commonly used technique is perform a pump test while using a separate clamp-on type of flow meter to measure the flowrate while concurrently reading the flowrate as measured by the installed flow meter. If the clamp-on meter reads values close to those of the installed meter, then the installed meter is considered to be reading accurately. If the readings between the two meters are significantly different, then one of two conditions is assumed to exist: either (1) the pump is worn and is not performing in accordance with its pump curve, or (2) the meter is out of calibration. Depending on the age of the pump and the meter, operational experience with the pump or the meter, i.e. experience with worn parts or loose tolerances or erratic performance, the well owner determines which of these two conditions is most likely to exist and either has the pump inspected, repaired, or replaced, or sends the flow meter into the factory for recalibration, and then repeats the pump test.

The TAC concluded that there would be little benefit to requiring that pumping tests be performed on wells that have historically produced very small quantities of water, since even large errors in meter readings from these pumps would have little or no impact on Basin management decisions.

The TAC's findings are contained in Table 2. As Table 2 indicates, all of the larger active production wells have had the accuracy of their flow meters independently verified through the use of clamp-on flow meters within the past three years. Therefore, no additional meter testing is recommended at this time.

In addition to the meter calibration requirement contained in the Amended Decision, there are a set of criteria contained in the Watermaster's Rules and Regulations pertaining to the installation of meters. These are believed to have been taken from the MPWMD's standards. It is very likely that few, if any, of the currently installed meters would fully conform to all of these requirements, since most of them were installed before these requirements were in effect. Retrofitting them to conform would likely be quite costly. Therefore, the TAC concluded that these requirements would be applied to new meters being installed, but that it was not the Watermaster's intent in adopting these requirements that they

would be applied to meter installations in existence prior to the date upon which these requirements went into effect.

TABLE 1 – BACKGROUND INFORMATION ON EACH ACTIVE PRODUCTION WELL

WELL OWNER/ OPERATOR	WAS/WERE METER(S) RECENTLY CALIBRATED?	RECENT PUMPING DATA						COMMENTS
		WY 2006		WY 2007		WY 2008		
		Volume Pumped, AF	%-age of Total Annual Basin Production	Volume Pumped, AF	%-age of Total Annual Basin Production	Volume Pumped, AF	%-age of Total Annual Basin Production	
Laguna Seca Resorts	No, but pump tests were recently performed on both of the well pumps	264.7	5%	254.3	5%	300.2	6%	Meter readings indicate that both meters are operating (i.e. not stuck) and are producing results that closely correspond to the separate flowmeter used to conduct the pump tests.
California American Water-Coastal Subareas	No, but pump tests were recently performed. CAW reports that "Cal-Am does not calibrate well water meters, which are the source of supply for the Central Division. Cal-Am performs pump efficiency tests on its facilities to determine motor, pump, and water meter efficiency and/or accuracy. If a well water meter is found to be outside of the manufacturer's accuracy specification, it is removed and sent to the manufacturer for calibration, repair, and/or replacement."	3264.1	65%	3625.0	67%	3329.8	63%	Meter readings indicate that the meters are operating (i.e. not stuck) and are producing results that closely correspond to the separate flowmeter used to conduct the pump tests.
California American Water-Inland Subareas		445.9	9%	434.9	8%	533.1	10%	
City of Sand City	One meter is now on a well that the City asks to have classified as inactive. This is the "Design Center" well. It was originally intended for irrigation use by the owner, but the owner has subsequently abandoned that concept and is using CAW water for irrigation. The city said they are in the process of having their other meter at the City's Public Works Yard calibrated.	0.5	<1%	2.2	<1%	0.0	0%	Pursuing process of recategorizing the Design Center well as inactive. Meter reading from the Public Works Yard well shows very small flows but considerable variation from year to year. However, this may just be because of the nature of the use of this well, and not the meter.
City of Seaside-Golf Courses	Yes. Both meters were calibrated on 10-13-2008.	464.7	9%	473.0	9%	593.0	11%	None
City of Seaside-Municipal	Yes. Both meters were calibrated on 10-13-2008.	332	7%	287.8	5%	294.2	6%	None

TABLE 1 (CONTINUED)

WELL OWNER/ OPERATOR	WAS/WERE METER(S) RECENTLY CALIBRATED?	RECENT PUMPING DATA						COMMENTS
		WY 2006		WY 2007		WY 2008		
		Volume Pumped, AF	%-age of Total Annual Basin Production	Volume Pumped, AF	%-age of Total Annual Basin Production	Volume Pumped, AF	%-age of Total Annual Basin Production	
Mission Memorial Park	Meter apparently has not been calibrated since installation.	21.9	<1%	26.2	<1%	20.8	<1%	None
Security National Guaranty Inc	Yes. The owner reports that the meter was calibrated in 2006, but did not have a copy of the calibration report to submit.	8.1	<1%	9.2	<1%	4.3	<1%	None
Pasadera Country Club, LLC	No, but pump tests were recently performed on both of the well pumps	150.9	3%	214.8	4%	141.4	3%	Meter readings indicate that both meters are operating (i.e. not stuck) and are producing results that closely correspond to the separate flowmeter used to conduct the pump tests.
York School	No. Meter was installed over 5 years ago and not calibrated since it was installed.	29.5	1%	24.0	<1%	22.0	<1%	None
Monterey County Parks Department	No. One Meter is new, but not calibrated subsequent to installation; the other meter has not been calibrated.	37.8	1%	33.2	1%	33.2	1%	None
Total Basin Pumping Production, AFY			5020.1		5384.6		5272	

TABLE 2 – FINDINGS REGARDING EACH ACTIVE PRODUCTION WELL

WELL OWNER/ OPERATOR	RECOMENDED FOR PUMP TESTING TO CONFIRM METER ACCURACY?
Laguna Seca Resorts	No. Although production is significant enough to warrant periodically checking metered flows against predicted flows from pump testing to confirm that meter is working properly and producing reasonably accurate readings, pump tests were performed on all of these wells within the past 3 years. All of these tests showed good agreement between the installed meter readings and the independent (clamp-on) meter readings obtained during the conduct of the pump tests. Therefore, these meters do not appear to warrant being tested again at this time.
California American Water-Coastal Subareas	No. Although production is significant enough to warrant periodically checking metered flows against predicted flows from pump testing to confirm that meter is working properly and producing reasonably accurate readings, pump tests were performed on all of these wells within the past 3 to 5 years. All of these tests showed good agreement between the installed meter readings and the independent (clamp-on) meter readings obtained during the conduct of the pump tests. The differences between the installed meter and the clamp-on meter values ranged from 0% to 22%, with all but one of the differences being less than 15%. The test report for the one well having the 22% difference stated that "the test results may be impaired due to poor hydraulic test section." Since all but one of the wells had good agreement (a difference of less than 15%) between the installed meter readings and the independent (clamp-on) meter readings obtained during the conduct of the pump tests, and since the one outlier was for a meter with a hydraulic configuation that would not lend itself to field accuracy verification, these meters do not appear to warrant being tested again at this time.
California American Water-Inland Subareas	
City of Sand City	No. The very small production from the Public Works Well does not warrant the time, effort, and expense of checking metered flows against predicted flows from pump testing to confirm that meter is working properly and producing reasonably accurate readings.
City of Seaside-Golf Courses	No. All of these meters were calibrated within the past 3 years. All of these tests showed good agreement between the installed meter readings and the independent (clamp-on) meter readings obtained during the calibration process. Therefore, these meters do not appear to warrant being tested again at this time.
City of Seaside-Municipal	No. All of these meters were calibrated within the past 3 years. All of these tests showed good agreement between the installed meter readings and the independent (clamp-on) meter readings obtained during the calibration process. Therefore, these meters do not appear to warrant being tested again at this time.
Mission Memorial Park	No. The very small production from this well does not warrant the time, effort, and expense of checking metered flows against predicted flows from pump testing to confirm that meter is working properly and producing reasonably accurate readings.
Security National Guaranty Inc	No. The very small production from this well does not warrant the time, effort, and expense of checking metered flows against predicted flows from pump testing to confirm that meter is working properly and producing reasonably accurate readings.
Pasadera Country Club, LLC	No. Although production is significant enough to warrant periodically checking metered flows against predicted flows from pump testing to confirm that meter is working properly and producing reasonably accurate readings, pump tests were performed on all of these wells within the past 3 years. The most recent tests showed good agreement between the installed meter readings and the independent (clamp-on) meter readings obtained during the conduct of the pump tests. Therefore, these meters do not appear to warrant being tested again at this time.
York School	No. The very small production from this well does not warrant the time, effort, and expense of checking metered flows against predicted flows from pump testing to confirm that meter is working properly and producing reasonably accurate readings.
Monterey County Parks Department	No. One of the two meters is new and can be assumed to have been factory calibrated before it was installed. The other meter has been installed for an unreported period of time. The very small production from these two wells does not warrant the time, effort, and expense of checking metered flows against predicted flows from pump testing to confirm that meter is working properly and producing reasonably accurate readings.

ATTACHMENT 14

EXECUTIVE SUMMARY FROM THE GROUNDWATER MODELING REPORT

EXECUTIVE SUMMARY

The Seaside Groundwater Basin Watermaster's Basin Management and Action Plan (BMAP) recommended that a calibrated groundwater flow model of the Seaside Groundwater Basin be constructed to assist with groundwater management decisions (HydroMetrics LLC, 2009a). The model will help the Watermaster predict potential impacts to the groundwater basin from various management actions, such as new supplemental water supply projects. Furthermore, as seawater intrusion is a primary concern for this coastal groundwater basin, the benefits of potential water projects on coastal groundwater elevations can be simulated, thereby providing a valuable tool for managing and optimizing future seawater intrusion mitigation or prevention activities in the Seaside Groundwater Basin.

The Seaside Groundwater Basin Watermaster Technical Advisory Committee (TAC) agreed that the model should address the following goals:

- Evaluate the effects of selected supplemental water projects on the Seaside Groundwater Basin,
- Evaluate selected management actions,
- Determine storage efficiency of recharged water,
- Determine Total Useable Stored Groundwater and Total Useable Storage Space,
- Refine the water budget and Basin safe yield, and
- Determine quantities of supplemental water necessary to achieve protective groundwater elevations.

In addition to these goals, the groundwater flow model has been constructed to be able to address where water should be recharged, how it would best be recharged and what its fate would be; how much inflow and outflow occurs from the ocean; groundwater level responses to potential water projects; location of the hydrogeologic northern Seaside Groundwater Basin boundary; and flow between subareas.

CONCEPTUAL BASIN MODEL

The regional groundwater flow model is based on a well developed conceptual model. The conceptual model includes the basic data, interpretations, and simplifications of the hydrogeologic system in the project area. The area covered by the groundwater model is larger than the Seaside Groundwater Basin defined by the Adjudicated Judgment (Figure ES-1). This regional area was modeled to allow simulation of groundwater pumping and recharge outside of the Basin that may have an influence on groundwater conditions within the Basin.

The conceptual geology recognizes four water bearing geologic units in the study area: Aromas Red Sands, continental deposits (Paso Robles aquifer), Santa Margarita Sandstone, and Purisima Formation. The Paso Robles aquifer is divided into upper, middle, and lower units for this model. The Monterey Formation is considered non-water bearing, and serves as the bottom of the modeled area. The depth and thickness of each of these geologic units was re-interpreted as part of this project. Additionally, estimated locations of geologic faults in the study area were moved slightly as part of the conceptual model development.

REGIONAL MODEL DATA SOURCES

Time-varying estimates of basin recharge for the study area were developed as part of an extensive basin–wide water balance. The recharge estimates incorporate 22 years of daily rainfall measurements from two nearby weather stations, combined with a rainfall distribution map (isohyetal map) developed by Monterey County Water Resources Agency (MCWRA). The rainfall data were combined with 22 years of monthly evapotranspiration data collected from three nearby California Irrigation Management Information System (CIMIS) stations, land use data collected from multiple sources, soil type maps from the U.S. Soil Conservation Service, and vegetation information to estimate deep recharge from rainfall. Additional sources of recharge include return flow from municipal irrigation, system losses from delivered water, return flow from septic systems, and recharge from stormwater detention ponds.

Groundwater pumping data were collected for 72 production wells in the study area. Pumping data were provided by the Monterey Peninsula Water Management District (MPWMD) for wells under the Watermaster's jurisdiction. California-American Water (CAW), City of Seaside, Marina Coast Water District (MCWD), and California Water Service (CWS) also provided monthly data. Where annual data were provided in the absence of monthly data, the historical monthly distribution provided by MPWMD was used to distribute the annual production data into months. For years where no data were available but it was confirmed that the well was operating, the long-term annual average production was used and distributed by Monterey Peninsula Water Management District's (MPWMD) historic monthly distribution.

REGIONAL MODEL DEVELOPMENT

The numerical groundwater model was built using the U.S. Geological Survey's MODFLOW 2005 model code (Harbaugh, 2005). The model simulates five geologic layers: Aromas Red Sands, upper Paso Robles aquifer, middle Paso Robles aquifer, lower Paso Robles aquifer, and Santa Margarita

Sandstone/Purisima Formation. The model simulates groundwater conditions between January 1987 and December 2008. The model incorporates the time-dependent recharge calculated as part of the conceptual model and all of the pumping data. The model simulates the interaction of groundwater in the study area with the Pacific Ocean, as well as the interaction with the adjacent Salinas Groundwater Basin.

REGIONAL MODEL CALIBRATION

Calibrating the regional groundwater flow model involved an iterative approach to best match model output to measured groundwater elevation data from the calibration period. Simulated hydraulic heads were compared against available measured groundwater elevations at 60 wells throughout the study area. The model was considered calibrated when simulated results matched the measured data within an acceptable measure of accuracy, and when successive calibration attempts did not further improve the calibration statistics. Model calibration was carried out using both hand-calibration and parameter estimation (PEST) software (Watermark Numerical Computing, 2004). As a result of the successful model calibration, the groundwater model accurately simulates historical groundwater level fluctuations and trends in all 60 wells.

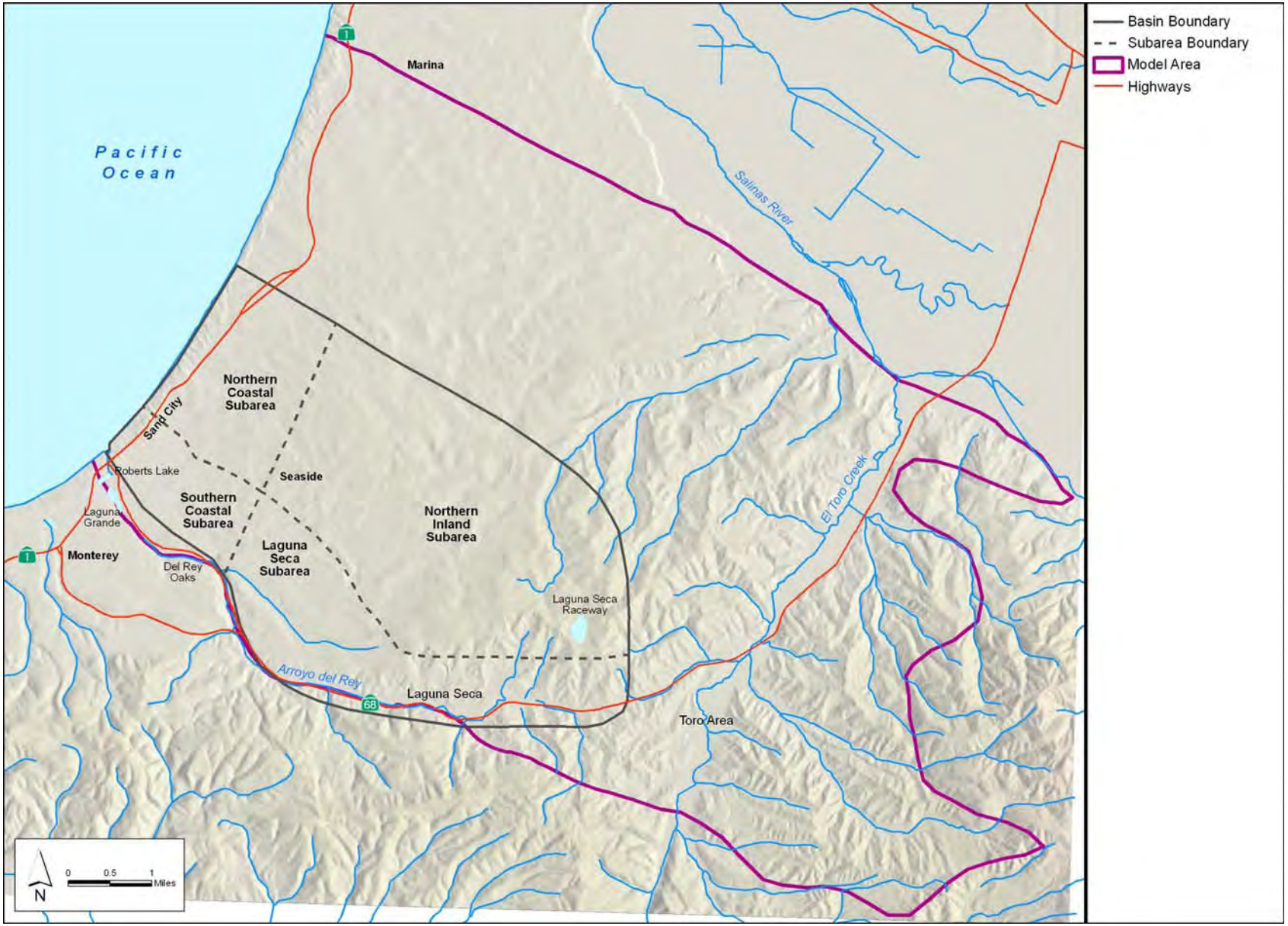


Figure ES-1: Model Area

DEVELOPMENT OF PROTECTIVE GROUNDWATER ELEVATIONS

In order to measure how successful any groundwater management scenario is, groundwater elevation targets were established. The targets are groundwater elevations that are high enough to protect the Seaside Groundwater Basin from seawater intrusion. These protective groundwater elevations were established using a different series of models than the regional groundwater flow model. The models were required to be different because variable density models are needed for establishing protective groundwater elevations, while the regional groundwater flow model does not require variable density ability. Furthermore, the size of the regional model would cause prohibitively long model run times if variable density was included. The U.S. Geological Survey's SEAWAT 2000 model code (Guo and Langevin, 2002) was used for protective groundwater elevation modeling. Figure ES-2 shows the relationship between the regional flow model and the protective groundwater elevation models.

The protective groundwater elevation models simulate groundwater conditions in four vertical planes through the earth, extending out under the ocean. The inland side of each protective groundwater elevation model is anchored to one of the four coastal monitoring wells: CDM-MW-4, MSC well, PCA-West well, or Sentinel Well 3 (SBWM-3). The locations of these four vertical planes (cross-sections) are shown in Figure ES-3. The models were used to estimate the groundwater elevation that must be maintained in each monitoring well to prevent seawater from intruding into the Santa Margarita aquifer. Additional analyses were performed to estimate the groundwater elevation that must be maintained to prevent seawater from intruding into the Paso Robles aquifer, and to prevent seawater from intruding into the top 90% of the Santa Margarita Sandstone aquifer. To account for uncertainty of offshore geology and aquifer parameters, the modeling included an uncertainty analysis that allowed us to attach a level of confidence to the protective groundwater elevation targets. The target elevations for each monitoring well are shown in Table ES-1.

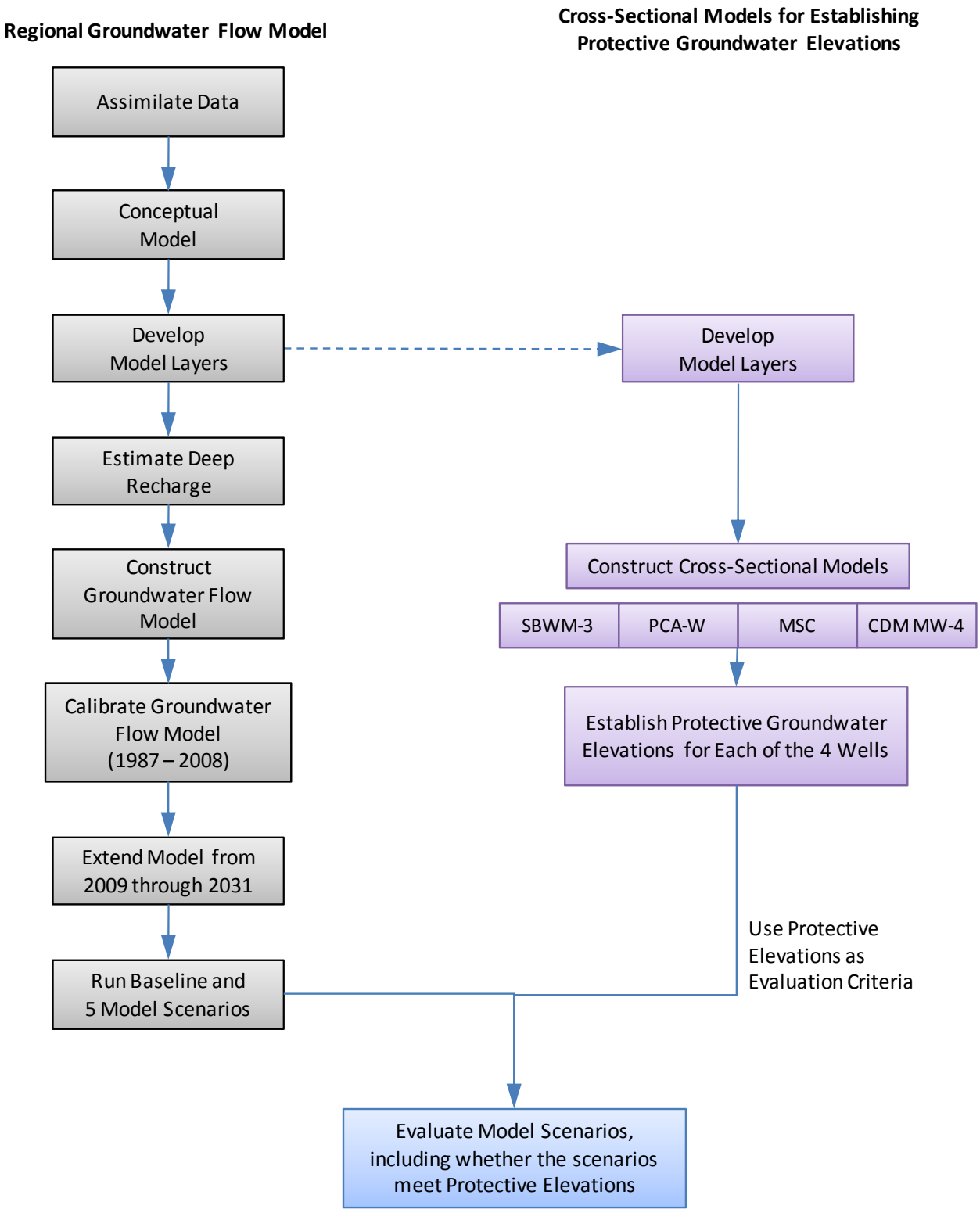


Figure ES-2: Relationship between Regional Groundwater Flow Model and Protective Groundwater Elevation Models

Figure ES-3: Cross-Section Model Locations

Table ES-1: Summary of Protective Groundwater Elevations

Well	Protected Aquifer	Range of Protective Elevations from Uncertainty Analysis (feet MSL)	Final Estimate of Protective Elevation Measured in the Well (feet MSL)
SBWM-3	Purisima	2-6	4
PCA-W	Paso Robles	2-4	2
	Santa Margarita	11-19	17
MSC	Paso Robles	3-14	11
	Santa Margarita	15-18	17
CDM MW-4	Paso Robles	2-3	2

MSL = mean sea level

SIMULATION OF MODEL SCENARIOS

The calibrated regional groundwater flow model was used to analyze the groundwater management scenarios developed by the Watermaster TAC. The ability of the scenarios to reach and maintain target protective groundwater elevations was used as one criterion to evaluate the success the each scenario. One baseline and five scenarios developed by the TAC were simulated. A 22 year predictive period was used from January 2009 through December 2031, which was a repeat of the 22 year hydrologic period used in the calibrated model. Each scenario included a specific set of pumping, in-lieu recharge, and artificial recharge conditions. Table ES-2 summarizes the main assumptions used for each scenario.

CONCLUSIONS

The five groundwater management scenarios show that the mandated triennial pumping reduction will result in a slow increase in most groundwater elevations. Additionally, the mandated pumping reduction decreases, but does not eliminate inflow from the ocean. Model scenarios with significant injection are most successful at raising groundwater elevations to protective elevations. Because the Santa Margarita aquifer is highly confined beneath thick clay beds near the ocean, it does not receive significant deep percolation recharge near the ocean. Therefore, it will take a long time for wells in the Santa Margarita aquifer to reach protective elevations without artificial recharge.

Results from the five scenarios show that the amount of water in storage is highly dependent on rainfall. The two scenarios with inland artificial recharge provide the Seaside Groundwater Basin with the most groundwater in storage. It is worth noting, however, that the quantity of groundwater in storage does not necessarily equate to recoverable groundwater. Groundwater stored in the shallow Paso Robles aquifer in some scenarios may not be easily recovered with existing wells, which mostly extract from the underlying Santa Margarita aquifer. New wells will be required in the Paso Robles aquifer to recover more of the stored water.

Table ES-2 summarizes the results for each model scenario.

Table ES-2: Summary of Model Scenario Assumptions and Results

Scenario	Assumptions	Results	Observations and Analyses
Baseline	Future land use changes phased in 25% of build-out by 2014, remainder by 2019* Water for new developments is obtained from outside of Basin* MPWMD ASR program included* Standard Allocation pumping reduced triennially (every three years) in proportion to pumping rates Alternative Allocation pumping set at Decision-allocated rates	Coastal groundwater levels in both the shallow and deep aquifers show a modest rise in response to the reduced pumping. Most groundwater elevations level off below the protective groundwater elevation around 2028.	This scenario has insufficient water to restore the Basin and raise groundwater levels above protective elevations. Additional actions are needed.
1	CAW forgoes all pumping between October 2015 and March 2027 All other Standard Producers pump at 2005 rates between October 2015 and March 2027 Pumping continues at Decision-allocated rate with triennial 10% reduction after March 2027	Deep groundwater levels rise more quickly than in the Baseline simulation, but the rise is limited. Shallow groundwater elevations decline compared to the Baseline simulation during the time other Standard Allocators are producing the same amount they produced in 2005. Approximately 3,600 acre-feet of additional water are stored compared to the baseline scenario.	The limited pumping in the deep aquifer does not result in groundwater elevations above protective elevations because deep percolation is limited by overlying clay layers. 60% of the additional stored groundwater is in the deep aquifer.
2	As in Scenario 1, CAW forgoes all pumping between October 2015 and March 2027 2,000 acre-feet per year of injection well recharge is added along General Jim Moore Boulevard	This scenario shows the highest coastal water elevations in the deep aquifer out of all the scenarios. Approximately 11,100 acre-feet of additional water are stored compared to the baseline scenario.	Injection along General Jim Moore Blvd can raise groundwater levels significantly at the coast when combined with limited pumping. 70% of additional stored groundwater is in the deep aquifer.

Table ES-2: Summary of Model Scenario Assumptions and Results, continued

Scenario	Assumptions	Results	Observations and Analyses
3	The MRWPCA GWRP recharges 2,800 acre-feet of water per year, split between the shallow and deep aquifers Pumping is the same as in the baseline scenario.	This scenario shows significant groundwater elevation rises in the deep aquifer, although not as great as Scenario 2. Groundwater elevation rises in the shallow aquifer are similar to those observed in Scenario 2. This scenario stores the most water in the Basin: approximately 17,800 acre-feet more than are stored in the baseline scenario.	Deep aquifer groundwater level rises are not as great as in Scenario 2 because the amount of deep injection is less and the deep aquifer pumping is greater in this scenario. Shallow coastal groundwater elevations are approximately equal to those in Scenario 2, suggesting a maximum level these shallow groundwater levels can rise to. Unlike Scenario 1 and Scenario 2, 62% of the additional stored groundwater is in the shallow aquifer.
4	Inject 2,600 acre-feet per year into a line of wells along the coast All Standard and Alternative Producers pump at the 2005 rates (5,600 AFY)	Groundwater elevation rises in the deep aquifer are similar to those seen in Scenario 3. Groundwater elevation rises in the shallow aquifer are small. No water is stored in the Basin.	The coastal injection raises water at the coast, but stores no water because of the aggressive pumping.
5	Move CAW's largest pumping wells inland to reduce stress on coastal groundwater levels Pumping includes the triennial 10% reductions	This scenario shows very little impact on either groundwater elevations or groundwater in storage.	Moving pumping wells inland has little advantage, and is not a useful management strategy.