



# SUMMARY OF OPERATIONS PHASE 1 ASR PROJECT

## WATER YEAR 2010

Prepared for:



JULY 2011



July 28, 2010  
Project No. 06-0027

Monterey Peninsula Water Management District  
Post Office Box 85  
Monterey, California 93942-0085

Attention: Mr. Joe Oliver, Water Resources Manager

Subject: Summary of Operations Report; Phase 1 ASR Project, Water Year 2010

Dear Mr. Oliver:

We are transmitting 12 hard copies and 1 digital image (PDF) of the subject report documenting operations of the Phase 1 ASR Project (a.k.a. Water Project 1) during Water Year 2010 (WY 2010). As you are aware, WY 2010 was an "Above Normal" hydrologic year on the Monterey Peninsula. WY 2010 was also the first year that both ASR-1 and ASR-2 wells were operational and injecting simultaneously for an entire injection season. These factors combined resulted in a total volume of 1,111 acre-feet (af) of water diverted from the Carmel River system for recharge in the Seaside Groundwater Basin, exceeding the project's projected average annual yield of 920 acre-feet per year (afy) and the sum-total of all injection for the previous 5 years of project operation.

We appreciate the opportunity to provide assistance to the District on this important project, and look forward to your comments.

Sincerely,

PUEBLO WATER RESOURCES, INC.

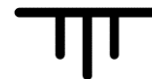
A handwritten signature in black ink, appearing to read "R. Marks", written over a horizontal line.

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Principal Engineer

Copies submitted: 12 hard, 1 digital (PDF)

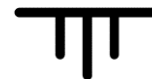


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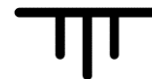
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## INTRODUCTION

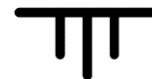
### GENERAL STATEMENT

Presented in this report are the principal findings, conclusions, and recommendations resulting from operations of the Phase 1 Aquifer Storage and Recovery (ASR) Project (a.k.a. Water Project No. 1) during Water Year 2010 (WY 2010), which extends from October 1, 2009 through September 30, 2010. The Phase 1 ASR Project is part of the Monterey Peninsula Water Management District's (District) ongoing implementation of ASR in the Seaside Groundwater Basin (SGB). The Phase 1 ASR Project site (a.k.a. the Santa Margarita site) is located on a parcel leased by the District on former Fort Ord property along General Jim Moore Boulevard in the northeast corner of the City of Seaside, California, and is shown on Figure 1 - Site Location Map. During WY 2010, approximately 1,111 acre-feet (af) were recharged in the SGB, exceeding the project's projected average annual yield of 920 acre-feet per year (afy) and the previous single largest injection year of 411 af (in WY 2006). A histogram of injection and recovery operations at the Phase 1 ASR project site is shown on Figure 2.

### BACKGROUND

The water supply for the Monterey Peninsula originates from two primary sources: the Carmel River system and the Seaside Groundwater Basin (SGB). ASR is a form of managed aquifer recharge and storage (or "groundwater banking") that involves the conjunctive use of surface and groundwater resources. As applied to the Monterey Peninsula, ASR involves the diversion of excess winter and spring time flows from the Carmel River system for conveyance to ASR wells in the SGB. The excess water is captured by California American Water (CAW) wells in the Carmel Valley during periods when flows in the Carmel River exceed fisheries bypass flow requirements, treated to potable drinking water standards, and then conveyed through CAW's distribution system to Seaside. Recharge is accomplished via injection of these excess flows into specially designed ASR wells in the SGB. The recharged water is temporarily stored underground in the SGB, utilizing the available storage space within the aquifer system. During periods of high demand, the same ASR wells and/or existing CAW production wells in the SGB are used to recover this "banked" water, which in turn allows for reduced extractions from the Carmel River system during dry periods.

The District has been developing an ASR project since 1996. The District's efforts have evolved over time from the performance of various technical feasibility investigations, leading to the construction and testing of pilot- and then full-scale ASR test wells to demonstrate the viability and operational parameters for ASR wells in the SGB. As designed, the Phase 1 ASR Project is capable of recharging up to the State Water Resources Control Board water right maximum annual diversion limit of 2,426 acre-feet per year (afy) at a combined injection rate of 6.7 cubic feet per second (equivalent to approximately 3,000 gallons per minute [gpm]), with an



average annual yield of approximately 920 afy. An Environmental Impact Report/Environmental Assessment (EIR/EA) has been certified<sup>1</sup> by the District for construction of the Phase 1 ASR Project, and the District has received permanent water rights for the project, held jointly with CAW, from the State Water Resources Control Board.

The Phase 1 ASR Project includes two ASR wells (ASR-1 and ASR-2) located at the Santa Margarita site. ASR-1 is designed for an injection capacity of 1,000 to 1,250 gpm and ASR-2 is designed for an injection capacity of 1,500 to 1,750 gpm. As-built schematics of ASR-1 and ASR-2 are presented on Figures 3 and 4, respectively.

## **PURPOSE AND SCOPE**

The overall purpose of the ongoing ASR program is to recharge the SGB with excess treated Carmel River system water when it is available during wet periods for storage and later extraction (recovery) during dry periods. ASR benefits the resources of both systems by raising water levels in the SGB during the recharge and storage periods and reducing extractions from the Carmel River System during dry periods.

The project data collection and reporting program is intended to support further demonstration of the capabilities and limitations of ASR in the SGB and to comply with the requirements of the Central Coast Regional Water Quality Control Board (RWQCB) for submitting annual technical reports for the project pursuant to Section 13267 of the California Water Code<sup>2</sup> and the existing General Waiver for Specific Types of Discharges (Resolution R3-2008-0010).

The ongoing data collection, analysis, and reporting program can be categorized into issues generally associated with:

- 1) ASR well hydraulics and performance;
- 2) Movement and dispersion of injected waters;
- 3) Aquifer response to injection, and;
- 4) Water-quality issues associated with geochemical interaction and mixing of injected and native groundwaters.

The scope of work for the WY 2010 program was developed through discussions with Mr. Joseph W. Oliver, C.Hg., Water Resources Manager with the District; and included the following:

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<sup>1</sup> Final EIR/EA for the Monterey Peninsula Water Management District Aquifer Storage and Recovery Project, State Clearinghouse #20014121065, dated August 2006.

<sup>2</sup> Letter from Roger W. Briggs, Executive Officer of the Central Coast RWQCB, to Joseph Oliver, Water Resources Manager for MPWMD, dated April 29, 2009.



- Development of the WY 2010 hydrogeologic and water-quality testing and data-collection program.
- Assistance with the implementation of the injection and water-quality testing program.
- Engineering and design coordination for final permanent facilities at the Phase 1 ASR Project site.
- Assistance with RWQCB permitting.
- Preparation of this Summary of Operations Report documenting the ASR program, procedures, and results, including recommendations for further analysis and subsequent ASR test phases.

## FINDINGS

### WY 2010 ASR OPERATIONS

Recharge operations were performed during WY 2010 during the period of December 13, 2009 to May 31, 2010. WY 2010 was classified as an “Above Normal” hydrologic year<sup>3</sup>, and a total volume of approximately 1,111 acre-feet (af) of excess Carmel River system water was diverted for recharge in the SGB. The recharge water was injected at both the ASR-1 and ASR-2 wells into the Santa Margarita Sandstone aquifer of the SGB at combined average injection rates ranging from 540 to 2,667 gpm (approximately 2.4 to 11.8 acre-feet per day [afd]).

### Recharge Procedures

Recharge into the SGB was accomplished during WY 2010 via injection into both ASR-1 and ASR-2. As-built schematics of ASR-1 and -2 are presented on Figures 3 and 4, respectively. It is noted that WY 2010 is the first year that both wells were operated in dual-injection mode for the entire water year. Having both wells in operation, combined with the above normal rainfall / runoff conditions, contributed to the relatively large injection volume during WY 2010 of 1,111 af. This volume of water exceeds the sum-total of all injection for the previous 5 years of project operation.

Injection feed water was potable water provided from the CAW distribution system, and was conveyed from Carmel Valley water sources through the Segunda-Crest pipeline network to the recently installed 24- x 30-inch diameter main ASR Pipeline in General Jim Moore Blvd and then to the Phase 1 ASR (Santa Margarita) site. It is noted that WY 2010 is the first year that the ASR Pipeline was utilized to route flows to the ASR site. In previous years, the injection source water was routed through the CAW distribution system in the City of Seaside to the CAW Paralta Well site, and finally to ASR-1 through a temporary aboveground 12-inch-diameter HDPE line that was installed as part of the WY 2002 capital improvements program. CAW's

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<sup>3</sup> Based on 98,419 af of unimpaired Carmel River flow at the San Clemente Dam site in WY 2010.





conveyance system improvements have substantially improved the injection (and extraction) capacity of the project.

Injection water was introduced into the ASR wells via the pump columns. Injection rates were controlled primarily by downhole flow control valves (FCV) installed on the pump columns, and secondarily by valves on the ASR wellhead piping. Positive gauge pressures were maintained at the wellheads during injection operations to prevent cascading of water into the wells. Injection flow rates and total injected volumes were measured with 12-inch-diameter rate and totalizing meters. Water levels in the ASR wells were measured with pressure transducers coupled to data loggers.

### **Injection Operations Summary**

Injection into ASR-1 and ASR-2 occurred during periods of available excess Carmel River system flows from the CAW distribution. Injection generally occurs at each of the ASR wells on a continuous basis when flows are available, interrupted only for periodic backflushing (discussed in a following section), which typically occurs on an approximate weekly basis. These weekly periods of continuous injection followed by backflushing are termed in this report as numbered injection “periods” at each well. During WY 2010, a total of 22 and 21 injection periods occurred at ASR-1 and ASR-2, respectively. Continuous water-level data collected at ASR-1 and ASR-2 during the WY 2010 recharge season are presented in Figures 5 and 6, respectively. Water-level data collected for each individual injection period at ASR-1 and ASR-2 are presented in Figures 7 through 28 and 29 through 49, respectively. Field data sheets collected during injection operations are presented in Appendix A - Field Data Sheets (not included in draft). Summaries of pertinent injection period operations at ASR-1 and ASR-2 are presented in Tables 1 and 2 below.

As shown in Table 1, the total duration of the 22 injection periods at ASR-1 during WY 2010 was approximately 143 days, with a total volume of 808.3 af injected at an average injection rate of approximately 1,275 gpm. For comparison, approximately 180.6 af were injected during WY 2009, which was classified as a “Normal” hydrologic year, only approximately 8.2 af were injected during WY 2007, which was classified as a “Critically Dry” hydrologic year, whereas during WY 2006, which was classified as a “Wet” hydrologic year, approximately 408 af were injected at ASR-1. It is noted that although WY 2006 was a “Wet” hydrologic year, ASR-1 was operated at an average injection rate of 1,030 gpm over a period of 89 days of injection days. In WY 2010, an “Above-Normal” hydrologic year, ASR-1 was operated at an average injection rate of 1,275 gpm over a period of 143 injection days, resulting in the comparatively greater volume of injection.

As shown in Table 2, the total duration of the 21 injection periods at ASR-2 during WY 2010 was approximately 99 days, with a total volume of 297.6 af injected. As previously mentioned, WY 2010 was the first year that ASR-2 injected Carmel River system water;



therefore, there are no previous years to compare. The total combined volume of injection at both ASR-1 and -2 during WY 2010 was 1105.9 af<sup>4</sup>.

**Table 1. WY 2010 Injection Operations Summary  
 ASR-1**

Injection Period No.	Dates		Duration (days)	Average Injection Rate (gpm)	Total Volume (af)
	Start	End			
<b>ASR-1</b>					
1	12/13/09	12/14/09	1.0	1,140	4.8
2	12/14/09	12/21/09	6.9	1,062	32.6
3	12/21/09	12/28/09	6.9	1,220	36.9
4	12/28/09	12/30/09	2.2	1,344	13.1
5	1/15/10	1/22/10	7.0	856	26.3
6	1/22/10	1/29/10	7.1	942	29.6
7	1/29/10	2/4/10	5.9	1,046	27.4
8	2/4/10	2/12/10	7.9	1,183	41.4
9	2/12/10	2/16/10	3.9	1,323	23.0
10	2/16/10	2/23/10	6.8	1,325	39.6
11	2/23/10	3/2/10	7.1	1,583	49.8
12	3/2/10	3/10/10	7.8	1,472	50.9
13	3/10/10	3/17/10	7.0	1,400	43.2
14	3/17/10	3/23/10	5.8	1,259	32.4
15	3/29/10	4/9/10	10.8	1,275	61.1
16	4/12/10	4/19/10	7.2	1,251	39.9
17	4/19/10	4/26/10	6.9	1,264	38.3
18	4/26/10	5/4/10	8.2	1,279	46.2
19	5/5/10	5/12/10	7.1	1,499	47.2
20	5/12/10	5/19/10	6.9	1,296	39.3
21	5/19/10	5/26/10	7.2	1,422	44.9
22	5/26/10	6/1/10	5.7	1,597	40.2
<b>ASR-1 Subtotals</b>			<b>143.3</b>		<b>808.3</b>

<sup>4</sup> The slight difference between this value and the 1,111 af value presented on page 3 is due to the relatively small volume of pipeline flushing (approximately 5 af, or 0.5% of the total diversion volume) required to clear particulates from the piping system prior to injection, which was routed to the onsite backflush pit and allowed to percolate into the groundwater basin.



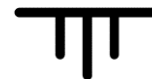
**Table 2. WY 2010 Injection Operations Summary  
 ASR-2**

Injection Period No.	Dates		Duration (days)	Average Injection Rate (gpm)	Total Volume (af)
	Start	End			
<b>ASR-2</b>					
1	12/14/09	12/14/09	0.0	1,700	0.3
2	12/15/09	12/15/09	0.1	550	0.1
3	12/17/09	12/17/09	0.1	613	0.4
4	12/18/09	12/19/09	0.9	814	3.1
5	12/19/09	12/23/09	3.8	612	10.3
6	12/23/09	12/28/09	4.7	776	16.2
7	12/28/09	12/30/09	2.3	1,041	10.4
8	1/22/10	1/25/10	3.2	627	8.8
9	1/26/10	2/2/10	7.2	892	28.3
10	2/3/10	2/10/10	7.0	861	26.6
11	2/10/10	2/16/10	6.2	536	14.6
12	2/16/10	2/23/10	6.8	617	18.5
13	2/23/10	3/2/10	7.2	807	25.5
14	3/2/10	3/12/10	9.8	793	34.4
15	3/12/10	3/17/10	4.9	829	17.8
16	3/17/10	3/23/10	5.8	649	16.6
17	3/30/10	4/2/10	2.9	445	5.8
18	4/14/10	4/19/10	5.1	336	7.6
19	4/19/10	4/25/10	5.9	938	24.5
20	4/28/10	5/3/10	5.1	287	6.5
21	5/22/10	6/1/10	10.0	483	21.3
<b>ASR-2 Subtotals</b>			<b>98.9</b>		<b>297.6</b>

### Backflushing

Most sources of injection water contain trace amounts of solids that slowly accumulate in the pore spaces in the well's gravel pack and adjacent aquifer materials, and the CAW source water is no exception. Periodic backflushing of ASR / injection wells is therefore necessary to maintain well performance by removing materials deposited/accumulated around the well bore during injection. The procedure is similar to backwashing a media filter to remove accumulated material deposited during filtration.

The general rule-of-thumb for ASR wells is to backflush at pumping rates that are at least two times the rate of injection in order to create pore throat velocities sufficient to remove



particles that cling to the surfaces of gravel pack and aquifer grains. A typical and prudent trigger for backflushing is when the amount of water level drawup during injection equals the available drawdown (as measured from the static water level to the top of the pump bowls) in the well for backflushing. This helps to avoid over-pressurization and compression of plugging materials, thereby maximizing the efficiency of backflushing and limiting the amount of residual plugging.

Based on the several years of testing conducted as part of the Santa Margarita Test Injection Well (SMTIW) project, a weekly backflushing frequency had been determined to be the best operational practice at ASR-1, which has also been applied to ASR-2. The general procedure consists of temporarily stopping injection and then pumping the wells at a rates of approximately 2,000 to 2,500 gpm (i.e., at least twice the rate of injection) for a period of approximately 15 to 20 minutes. Backflush water is discharged to the on-site backflush pit, where it percolates back into the groundwater basin.

During WY 2010, the initial backflush discharge was usually very turbid and of a deep orange-brown color, becoming cloudy after 3 to 5 minutes and then generally clears within 15 to 20 minutes. These observations have been generally consistent throughout the years of operating the SMTIW project. Additional “incidental” backflushing was also conducted during the WY 2010 storage period, typically as part of water-quality sampling of the stored water. Following routine backflushing operations and brief periods of water-level recovery, controlled 10-minute specific-capacity tests are typically performed to track well production performance and residual plugging between injection periods (discussed in a later section).

## Well Performance

Well performance is generally measured by specific capacity (pumping) and / or specific injectivity (injection), which is the ratio of flow rate (pumping or injection) to water-level change in the well (drawdown or drawup) over a specific elapsed time. The value is expressed as gpm per foot of water level change (gpm/ft). The value normalizes well performance by taking into account differing static water levels and flow rates. As such, specific capacity / injectivity data is useful for comparing well performance over time and at differing flow rates. Decreases in specific capacity / injectivity are indicative of decreases in the hydraulic efficiency of a well due to the effects of plugging. Both injection and production well performance was tracked at ASR-1 and ASR-2 during WY 2010, as discussed below.

**Injection Performance.** Injection performance has been tracked at ASR-1 since the inception of the testing program in WY 2002 by measurement and comparison of 24-hour injection specific injectivities (a.k.a. injection specific capacity). Specific injectivity is the ratio of injection rate to water-level rise (drawup) in the well casing.

ASR-1. A summary of 24-hour specific injectivity for ASR-1 for WY 2002 through 2010 is presented in Table 3 below.



**Table 3. Injection Performance Summary  
 ASR-1**

Water Year	Injection Rate (gpm)	24-hour DUP (feet)	Specific Injectivity (gpm/ft)	Water Year Change	Comments
<b>WY2002</b>					
Beginning Period	1,570	81.7	19.2	-67%	FCV not installed yet in WY2002. No recovery pumping performed.
Ending Period	1,164	199.8	6.4		
<b>WY2003</b>					
Beginning Period	1,070	70.0	15.5	+31%	Recovery pumping performed following WY2003 Injection
Ending Period	1,007	49.7	20.3		
<b>WY2004</b>					
Beginning Period	1,383	183.4	7.5	+112%	Recovery pumping performed following WY2004 Injection
Ending Period	1,072	67.4	15.9		
<b>WY2005</b>					
Beginning Period	1,045	46.6	22.4	-54%	Injectate dechlorinated in WY2005. No recovery pumping performed.
Ending Period	976	94.1	10.4		
<b>WY2006</b>					
Beginning Period	1,039	71.5	15.0	+17%	Injection procedures consistent and performance stable in WY2006. No recovery pumping performed.
Ending Period	1,008	62.2	17.5		
<b>WY2007</b>					
Beginning Period	1,098	92.4	11.9	--	Only one injection period in WY2007. No recovery pumping performed.
Ending Period	--	--	--		
<b>WY2008</b>					
Beginning Period	979	25.5	38.4	-17%	Formal rehabilitation performed prior to WY2008 injection
Ending Period	1,063	33.4	31.8		
<b>WY 2009</b>					
Beginning Period	1,119	56.1	19.9	+56%	Beginning period low specific injectivity due to high plugging rate during initial injection period. No recovery pumping performed.
Ending Period	1,069	34.3	31.1		
<b>WY 2010</b>					
Beginning Period	1,080	35.6	30.3	-19%	See discussion below
Ending Period	1,326	54.0	24.6		

The 24-hr specific injectivity values for each injection period at ASR-1 during WY 2010 are graphically presented on Figure 50. As shown in Table 3 and Figure 50, the 24-hour



specific injectivity at the beginning of WY 2010 (Injection Period No. 1) was 30.3 gpm/ft and at the end (Injection Period No. 22) it declined to 24.6 gpm/ft, an overall decline of approximately 19 percent, indicating that some residual plugging occurred over the course of the WY 2010 injection season (discussed in a following section).

In reviewing the data in Table 3, it should also be noted that there have been differences in the injection methodologies that affected the well performance. The differences in methodologies are due to various tests that have been conducted over the years to determine the best operational parameters for the ASR well. As examples: in WY 2002 the FCV had not yet been installed to control gas binding; recovery pumping was conducted only in WY 2003 and WY 2004; during WY 2005 the injectate was dechlorinated; and, ASR-1 underwent formal rehabilitation as part of the WY 2007 program (refer to the Summary of Operations Reports for those Water Years for additional details). Therefore, the well performance values and trends need to be viewed carefully within this context.

ASR-2. As discussed previously, WY 2010 was the first year that ASR-2 was in operation injecting Carmel River system water (prior to WY 2010, only short-term injection testing had been performed utilizing source water from the Marina Coast Water District, documented in the WY 2009 Summary of Operations Report). A summary of the beginning and ending injection performance at ASR-2 during WY 2010 is presented in Table 4 below.

**Table 4. Injection Performance Summary  
 ASR-2**

Water Year	Injection Rate (gpm)	24-hour DUP (feet)	Specific Injectivity (gpm/ft)	Water Year Change	Comments
<b>WY 2010</b>					
Beginning Period	1,017	156.5	<b>6.5</b>	<b>-57%</b>	See discussion below
Ending Period	237	85.0	<b>2.8</b>		

The 24-hr specific injectivity for each injection period during WY 2010 at ASR-2 are graphically presented on Figure 51. As shown in Table 4 and Figure 51, the 24-hour specific injectivity at the beginning of WY 2010 (Injection Period No. 4) was 6.5 gpm/ft and at the end (Injection Period No. 17) it declined to 2.8 gpm/ft, an overall decline of approximately 57 percent, indicating that significant residual plugging occurred over the course of the WY 2010 injection season at ASR-2 (discussed in a following section).

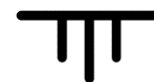
**Pumping Performance.** Pumping performance has also been tracked at ASR-1 since the inception of the SMTIW testing program by measurement and comparison of specific capacity. Specific capacity is the ratio of pumping rate to water-level drawdown in the well casing. Following routine backflushing operations and periods of water-level recovery, controlled 10-minute specific-capacity tests are typically performed to track well pumping performance, similar to the tracking of injection performance from 24-hour specific injectivity.



**ASR-1.** A summary of injection season beginning and ending 10-minute specific capacity at ASR-1 for WY 2002 through 2010 is presented below in Table 5.

**Table 5. Pumping Performance Summary  
 ASR-1**

Water Year	Pumping Rate (gpm)	10-min DDN (feet)	Specific Capacity (gpm/ft)	Water Year Change	Comments
<b>WY2002</b>					
Pre-Injection	2,825	45.1	<b>62.6</b>	<b>-53%</b>	FCV not installed yet in WY2002
Post- Injection	2,800	95.3	<b>29.4</b>		
<b>WY2003</b>					
Pre-Injection	2,775	81.9	<b>33.9</b>	<b>-16%</b>	Recovery pumping performed following WY2003 Injection
Post- Injection	2,600	91.7	<b>28.4</b>		
<b>WY2004</b>					
Pre-Injection	2,000	51.8	<b>38.6</b>	<b>-46%</b>	Recovery pumping performed following WY2004 Injection
Post- Injection	1,700	81.2	<b>20.9</b>		
<b>WY2005</b>					
Pre-Injection	1,900	49.8	<b>38.1</b>	<b>-55%</b>	Injectate dechlorinated in WY2005. No recovery pumping performed.
Post- Injection	1,500	87.1	<b>17.2</b>		
<b>WY2006</b>					
Pre-Injection	1,500	82.4	<b>18.2</b>	<b>+19%</b>	Injection procedures consistent and performance stable in WY2006. No recovery pumping performed.
Post- Injection	1,600	74.1	<b>21.6</b>		
<b>WY2007</b>					
Pre-Injection	1,500	81.7	<b>18.4</b>	<b>+3%</b>	Only one injection period in WY2007. No recovery pumping performed.
Post- Injection	1,500	79.4	<b>18.9</b>		
<b>WY2008</b>					
Pre-Injection	1,980	31.0	<b>63.8</b>	<b>-44%</b>	Formal rehabilitation performed prior to WY2008 injection. No recovery pumping performed.
Post- Injection	2,000	55.6	<b>36.0</b>		
<b>WY 2009</b>					
Pre-Injection	2,000	52.0	<b>38.5</b>	<b>-21%</b>	No recovery pumping performed.
Post- Injection	1,900	62.7	<b>30.3</b>		
<b>WY 2010</b>					
Pre-Injection	1,900	62.5	<b>30.4</b>	<b>+2%</b>	See discussion below
Post- Injection	2,000	64.2	<b>31.1</b>		



The 10-min specific capacities for each pumping test during WY 2010 at ASR-1 are graphically presented on Figure 50 along with the 24-hr specific-injectivity data. As shown on Figure 50 and in Table 5, the production specific capacity overall was relatively stable, and actually improved very slightly from approximately 30.4 to 31.1 gpm/ft over the course of WY 2010 (a negligible increase of approximately 2.3 percent). This contrasts with the injection performance results, which showed a 19 percent decline in performance over the course of WY 2010. The pumping performance results suggest that post-injection season backflush pumping was effective at removing residual plugging materials that had accumulated during the WY 2010 injection season at ASR-1.

Also shown in Table 5, the production specific capacity at ASR-1 declined from approximately 63 to 18 gpm/ft over the course of the six-year period of WY 2002 through WY 2007, an overall decline of approximately 70 percent. Following rehabilitation in 2007, the production specific capacity increased to 63.8 gpm/ft, slightly greater than the WY 2002 pre-injection specific capacity. These results are comparable to the injection performance, which similarly indicated the efficacy of rehabilitation in restoring the well's hydraulic performance. The above findings for ASR-1 also suggest that rehabilitation of ASR-2 is likely to restore its lost performance as well<sup>5</sup>.

ASR-2. A summary of injection season beginning and ending 10-minute specific capacity for ASR-2 during WY 2010 is presented below in Table 6.

**Table 6. Pumping Performance Summary  
 ASR-2**

Water Year	Pumping Rate (gpm)	10-min DDN (feet)	Specific Capacity (gpm/ft)	Water Year Change	Comments
<b>WY 2010</b>					
Pre-Injection	2,200	117.7	<b>18.7</b>	<b>-10%</b>	Pre-injection is after MCWD testing (refer to WY 2009 Summary of Operation report)
Post- Injection	2,300	136.9	<b>16.8</b>		

The 10-min specific capacities for each ASR-2 pumping test during WY 2010 are graphically presented on Figure 51 along with the 24-hr specific injectivity data. As shown on Figure 51 and in Table 6, the production specific capacity overall was relatively stable, but did decline slightly from approximately 18.7 to 16.8 gpm/ft over the course of WY 2010 (an overall decrease of approximately 10 percent). This contrasts with the injection performance results, which showed a 57 percent decline in performance over the course of WY 2010.

<sup>5</sup> ASR-2 underwent formal rehabilitation in early 2011 as suggested in the WY 2009 Summary of Operations report. As of this writing, the post-rehabilitation results appear quite favorable; however, full analysis of the ASR-2 rehabilitation has not been completed and will be documented in the upcoming WY 2011 Summary of Operations report.





It is also noted that ASR-1 (and now ASR-2) has been operated largely as an injection-only well since its construction in 2001, with recovery pumping taking place thus far in only 2003 and 2004 (refer to Figure 2 and the WY 2003 and WY 2004 Summary of Operations Reports for details). As shown in Table 5, following recovery pumping events the production performance of ASR-1 improved prior to the onset of the following year's injection season. The improved well performance is attributable to the additional removal of fine particulates from the well and near-bore aquifer matrix as a result of the extended pumping. As such, it is possible that once ASR-1 and ASR-2 are operated as true ASR wells as planned (i.e., with seasonal recovery pumping following each injection season), the amount of residual plugging between injection seasons and the attendant frequency of rehabilitation may be reduced.

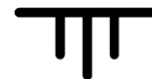
## **Plugging**

Experience at injection well sites around the world shows that all injection wells are subject to some amount of plugging, because no water source is completely free of particulates, bionutrients, or oxidants, all of which can contribute to well plugging; the CAW source water is no exception. During injection, trace amounts of suspended solids are continually being deposited in the gravel pack and aquifer pore spaces, much as a media filter captures particulates in the filter bed. The effect of plugging is to impede the flow of water from the injection well into the aquifer, causing increased injection heads in the well to maintain a given injection rate, or reduced injection rates at a given head level. Well plugging reduces injection and extraction capacity, and consequently, well life.

Relative measurements of the particulate matter in the injectate have historically been made at the Santa Margarita site through silt density index (SDI) testing during injection. The SDI was originally developed to quantitatively assess particulate concentrations in reverse-osmosis feed waters. The SDI test involves pressure filtration of source water through a 0.45 micron membrane, and observation of the decrease in flow over time; the resulting value of SDI is dimensionless, and used as a comparative value for tracking relative well plugging rates during an injection season (i.e., plugging rates tend to vary with SDI). During WY 2010, SDI measurements were made during the first week or so of the injection season, and ranged between approximately 5 the first day, decreasing to approximately 1 to 1.5 within a few days. Unfortunately, following the initial testing at the beginning of the injection season, SDI tests were not continued during the remainder of WY 2010 as has been performed in previous years, so any variations or trends in the SDI of the injectate during WY 2010 cannot be determined (routine SDI measurements will need to be continued for future injection seasons).

For comparison, historical SDI values for Carmel River system water routed through the Luzern Booster Station at ASR-1 have typically been in the range of approximately 1 to 5. Therefore, the SDI values measured during WY 2010 with the injectate routed through the new ASR Pipeline in GJM Blvd were within the typical historical range. Values within this range are generally representative of source waters with a relatively low amount of particulates.

Plugging rates during injection have historically been estimated at the site utilizing one (or all) of three methods: 1) Graphical Observed vs. Theoretical Method; 2) Difference in Water



Level Rise Method, and / or: 3) Specific Time of Injection Method<sup>6</sup>. However, these analytic methods of determining the *rate* of plugging are predicated on the injection rates at the ASR wells being held relatively constant. As discussed previously and as shown on Figures 7 through 49, injection rates at both ASR-1 and ASR-2 varied significantly as a result of pressure fluctuation in the CAW system<sup>7</sup>; therefore, plugging rates during WY 2010 injection cannot be reliably calculated.

Residual plugging, however, can be measured from the WY 2010 data. Residual plugging is the plugging that occurs during injection and remains following backflush (or recovery) pumping<sup>8</sup>. Residual plugging increases drawdown during pumping, and is manifested as declining specific capacity. Increases in residual plugging are indicative of incomplete removal of plugging particulates during backflushing and have the cumulative effect of reducing well performance through time.

As discussed previously, routine 10-minute specific capacity tests have been performed at ASR-1 and ASR-2 following backflushing events. To quantify the amount of residual plugging, as measured in feet of drawdown, requires normalization of drawdown to a reference pumping rate which allows for comparison of data that have different pumping rates. For ASR-1 and ASR-2, a reference pumping rate of 2,000 gpm has been selected. Presented in Tables 7 and 8 below are summaries of the residual plugging calculations for ASR-1 and ASR-2, respectively, during WY 2010.

As discussed in previous Water Year summary of operation reports (e.g., WY 2009, dated April 2010), the amount of water-level drawup during injection should not exceed the available drawdown in the well for backflushing. This helps to avoid over-pressurization and compression of plugging materials, thereby maximizing the efficiency of backflushing and limiting the amount of residual plugging. Water-level drawup during injection is a function of the injection rate, the duration of injection, and the rate of plugging. Identifying the amount of available draw-up for any given injection well and period is a useful guide to avoid over-pressurization and compression of plugging materials while balancing both the injection rate and duration of injection between backflushing.

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<sup>6</sup> See Pyne (1995) and / or previous Water Year Summary of Operations Reports for description of methods.

<sup>7</sup> This situation will be corrected through the installation of pressure regulating valves (PRVs) in the injection piping at both ASR-1 and ASR-2.

<sup>8</sup> Pyne (1995)

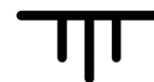


**Table 7. Residual Plugging Summary  
 ASR-1**

Test No.	Date	Pumping Rate (gpm)	10-min Drawdown (ft)	Normalized Drawdown <sup>2</sup> (ft)	Residual Plugging (ft)	Cummulative Plugging (ft)	Comments
<b>end WY09</b>	<b>10/22/09</b>	<b>1,900</b>	<b>62.5</b>	<b>65.8</b>	<b>--</b>	<b>--</b>	Pre-WY2010 Injection
1	12/14/09	1,950	61.6	63.2	-2.6	-2.6	After initial WY10 24-hr injection
2	12/21/09	1,900	64.5	67.9	4.7	2.1	
3	12/28/09	1,900	63.3	66.6	-1.3	0.8	
4	1/5/10	1,900	62.4	65.7	-0.9	-0.1	
5	1/22/10	2,000	64.7	64.7	-1.0	-1.1	
6	1/29/10	1,900	66.1	69.5	4.8	3.7	
7	2/4/10	1,900	68.6	72.3	2.7	6.5	
8	2/12/10	2,000	71.6	71.6	-0.6	5.9	
9	2/16/10	2,000	69.2	69.2	-2.4	3.4	
10	2/22/10	1,900	68.4	72.0	2.8	6.2	
11	3/2/10	2,000	73.1	73.1	1.0	7.3	
12	3/11/10	2,000	72.6	72.6	-0.5	6.8	
13	3/18/10	2,000	69.0	69.0	-3.6	3.2	
14	3/23/10	2,100	70.0	66.6	-2.4	0.8	
15	4/12/10	2,000	69.1	69.1	2.5	3.3	
16	4/19/10	1,900	65.0	68.4	-0.7	2.6	
17	4/26/10	2,000	64.9	64.9	-3.5	-0.9	
18	5/4/10	1,800	63.8	70.9	6.0	5.1	
19	5/12/10	1,900	68.4	72.0	1.1	6.2	
20	5/19/10	1,800	64.6	71.8	-0.2	6.0	
21	5/21/10	1,700	72.3	85.0	13.2	19.2	
22	5/26/10	1,900	68.8	72.5	-12.5	6.7	
23	6/2/10	2,000	64.2	64.2	-8.2	-1.5	
	<b>Averages</b>	<b>1,933</b>	<b>67.2</b>	<b>69.7</b>	<b>-0.1</b>	<b>--</b>	
				<b>Cummulative</b>		<b>-1.6</b>	

Notes:

- 1 - Specific Capacity. Ratio of pumping rate to draw down.
- 2 - Normalized based on ratio of 2,000 gpm to actual test pumping rate.



**Table 8. Residual Plugging Summary  
 ASR-2**

Test No.	Date	Pumping Rate (gpm)	10-min Drawdown (ft)	Normalized Drawdown <sup>2</sup> (ft)	Residual Plugging (ft)	Cummulative Plugging (ft)	Comments
end WY09	1/23/09	2,200	117.7	107.0	--	--	After MCWD-Source Testing.
1	12/14/09	833	120.4	289.1	182.1	182.1	After initial WY10 aborted test.
2	12/15/09	1,935	132.4	136.8	-152.3	29.8	5-min test
3	12/16/09	2,000	121.8	121.8	-15.0	14.8	
4	12/18/09	2,100	134.7	128.2	6.4	21.2	
5	12/19/09	1,800	114.4	127.1	-1.1	20.1	
6	12/23/09	1,700	112.1	131.9	4.8	24.9	
7	12/28/09	1,800	113.0	125.5	-6.4	18.5	
8	1/5/10	1,600	107.5	134.3	8.8	27.3	
9	1/26/10	2,000	115.2	115.2	-19.2	8.2	
10	2/2/10	1,900	119.8	126.1	10.9	19.1	
11	2/10/10	2,000	128.0	128.0	1.9	21.0	
12	2/16/10	2,000	135.0	135.0	7.1	28.0	
13	2/24/10	1,900	125.0	131.6	-3.5	24.6	
14	3/2/10	2,100	135.1	128.6	-3.0	21.6	
15	3/12/10	1,900	140.2	147.6	18.9	40.6	
16	3/17/10	2,200	154.2	140.2	-7.4	33.2	
17	3/23/10	2,000	132.3	132.3	-7.9	25.3	
18	4/14/10	2,100	128.7	122.6	-9.7	15.6	
19	4/19/10	2,300	136.9	119.1	-3.5	12.1	
20	6/1/10	NA	NA	NA	NA	NA	
	<b>Averages</b>	<b>1,904</b>	<b>126.7</b>	<b>137.9</b>	<b>0.6</b>		
				<b>Cummulative</b>		<b>12.1</b>	

Notes:

1 - Specific Capacity. Ratio of pumping rate to draw down n.

2 - Normalized based on ratio of 2,000 gpm to actual test pumping rate.

The relationship between water-level drawup during injection and residual plugging during WY 2010 is shown on Figures 52 and 53 for ASR-1 and ASR-2, respectively. As shown, there is a general positive relationship between maximum water-level drawup during injection and the accumulation of residual plugging (i.e., residual plugging tends to increase with increased drawup during injection).

As shown on Figure 52, the recommended maximum available drawup at ASR-1 (100 feet) was exceeded only once during WY 2010, and the cumulative residual plugging was negligible during most of the season, and actually negative at the end of the season. The lack of residual plugging at ASR-1 during WY 2010 was manifested as relatively stable specific capacities and injectivities during the injection season (see Tables 3 and 5 and Figure 50).

As shown on Figure 53, the recommended maximum available drawup at ASR-2 (130 feet) was exceeded several times during WY 2010, and there was approximately 12 feet of cumulative residual plugging by the end of WY 2010. The accumulation of residual plugging at



ASR-2 during WY 2010 was manifested as an overall decline in specific capacity and injectivity during the injection season (see Tables 4 and 6 Figure 51).

It should also be noted that ASR-2 was operating during WY 2010 in an “impaired” condition as a result of residual plugging from the Marina Coast Water District source injection testing in WY 2009 (refer to the WY 2009 Summary of Operations Report, dated April 2010). As discussed in the Summary of Operations Report for the Seaside Pilot Injection Well Project report (Fugro West, Inc., October 1999), there is a relatively straightforward relationship between the plugging potential of the injectate (i.e., SDI), hydraulic conductivity, and observed plugging rates. The effect of residual plugging is to decrease the near-bore hydraulic conductivity, which, assuming an equivalent injectate plugging potential, leads to greater plugging rates. As such, it is considered likely that following rehabilitation to remove residual plugging materials, the observed plugging and overall performance at ASR-2 in the future will more closely resemble that observed at ASR-1<sup>9</sup>.

### **Aquifer Response to Injection**

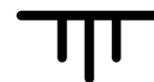
The response of the regional aquifer system to injection at the Phase 1 ASR Project site has been monitored since the SMTIW project was initiated in WY 2002. Submersible water level transducer/data logger units have been installed at eight existing offsite District monitoring well locations in the SGB. In addition, the recently constructed Seaside Middle School (SMS) monitoring wells (SMS Deep and Shallow) have been similarly instrumented. The locations of each offsite monitoring well are shown on Figure 1, and water-level hydrographs for WY 2010 are graphically presented on Figures 54 through 62.

As shown on the hydrographs, the regional water-level recovery after CAW ceased SGB pumping in early January 2010 is masked by the concurrent regional water-level response to injection (i.e., there was an overlap between the time when injection began in December and CAW ceased pumping in January). As such, the trend in regional water-level rise due to recovery from CAW pumping is not easily discernable from the water-level rise due to injection. Nonetheless, in order to estimate the water-level rise due to injection, the trend of the regional water-level rise is projected through the beginning of the injection season through the date when CAW ceased SGB pumping, and then subtracted from the total water-level rise from the beginning to the end of the WY 2010 injection season.

A summary of the regional water-level observations during the WY 2010 injection season is presented in Table 9 below.

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<sup>9</sup> ASR-2 underwent formal rehabilitation in early 2011 as suggested in the WY 2009 Summary of Operations report. As of this writing, the post-rehabilitation results appear quite favorable; however, full analysis of the ASR-2 rehabilitation has not been completed and will be documented in the upcoming WY 2011 Summary of Operations report.



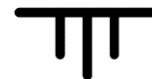
**Table 9. Summary of WY 2010 Injection Season Monitoring Well Observations**

Well ID	Distance from ASR Site (feet)	Aquifer Monitored	Pre-Injection DTW (ft btoc)	End of Injection DTW (ft btoc)	Projected Regional Recovery (ft)	Net Rise Due to Injection (ft)
MW-1	on-site	Tsm	371.0	333.7	19.6	17.7
Paralta Test	660	QTp & Tsm	372.0	ND	--	--
SMS (Deep)	1,350	Tsm	361.6	337.5	17.8	6.3
Ord Grove Test	1,600	QTp & Tsm	ND	ND	--	--
Ord Terrace (Deep)	2,260	Tsm	262.8	ND	--	--
FO-7 (Deep)	3,420	Tsm	492.4	481.2	8.6	2.6
FO-7 (Shallow)		QTp	456.4	ND	--	--
PCA East (Deep)	6,400	Tsm	ND	ND	--	--
PCA East (Shallow)		QTp	65.4	ND	--	--
FO-9 (Deep)	7,280	Tsm	137.9	ND	--	--
FO-8 (Deep)	7,580	Tsm	391.7	ND	--	--

Table 9 Notes:  
 QTp – Paso Robles aquifer  
 Tsm – Santa Margarita Sandstone aquifer  
 DTW – Depth to Water  
 ND – No Data  
 NA – Not Applicable  
 NR – No Response

As shown on the water-level hydrographs (Figures 54 through 62), water levels in the Santa Margarita Sandstone (Tsm) aquifer at the start of the WY 2010 recharge season ranged between approximately 15 to 35 feet below sea level. Positive response to injection at the Phase 1 ASR site during WY 2010 was observed at 5 of the 9 monitoring wells completed in the Santa Margarita Sandstone aquifer; however, it is noted that several dataloggers malfunctioned for a variety of reasons during the water year, making an evaluation of the water-level response to the full WY 2010 injection volume impossible at these wells. For the 3 monitoring wells with sufficient data (see Table 9 above), water-level responses ranged between 2.6 to 17.7 feet, decreasing with distance from the ASR wells.

It is also noted that at the near-coastal monitoring wells (PCA East and FO-9), water levels remained below sea level throughout the injection season. This means that the chronic water-level depression in the Tsm of the SGB was not completely “filled” by the injection of 1,111 af of recharge during an approximate 6-month injection season and that the landward groundwater gradient was not reversed. Under these water-level conditions, little to no groundwater flow from the Tsm aquifer offshore would be expected to occur and the “losses” associated with the ASR project operation are minimal to non-existent.



Due to datalogger malfunctions during WY 2010, the available data are insufficient for the monitoring wells completed in the Paso Robles Formation (QTp) aquifer to determine the response to injection in this aquifer.

## **Recovery Operations**

Recovery of the WY 2010 recharge volume was performed via existing CAW wells in the SGB (ASR-1 and ASR-2 have not yet been permitted for recovery into the CAW distribution system). As shown on Figure 2, 1,111 af were recovered during the period October 1 through December 31, 2010. The recovered water was offset by reduced pumping by CAW from the Carmel River system during this period. It is noted that in this context, ASR recovery is essentially an accounting / allocation of CAW's various water rights and pumping from the SGB, and does not represent a "molecule-for-molecule" recovery of the injected water. Rather, the volume recharged essentially increases the firm yield from the SGB by the same amount and can be "recovered" by any of CAW's wells in the SGB and / or the ASR wells themselves. It is anticipated, however, that recovery operations via ASR-1 and / or ASR-2 will occur in the future, once the wells are fully permitted for extraction into the CAW distribution system.

## **WATER QUALITY**

### **General**

As in previous years, water quality was monitored at ASR-1 during injection and aquifer storage operations. However, CAW deliveries and sufficient rainfall allowed the concurrent injection of water into ASR-2 during WY 2010 as well. No water recovery (i.e., production) was implemented directly at ASR-1 or ASR-2 during the WY 2010 period. However, an equivalent amount of the 1,111 af recharged volume was "recovered" from the basin via CAW production wells during the October 1 through December 31, 2010 period. Water quality was also observed at the identically-completed, small-diameter monitoring well MW-1 at the Santa Margarita site; these samples were collected via a dedicated down-hole sample pump with a production (purging) rate of 3 to 5 gpm, positioned in the well opposite the primary producing zone of the ASR wells' screened intervals. Far-field water quality was also monitored at CAW production wells Ord Grove and Paralta, as well as a single sample collection event at the newly constructed ASR-3 well (a.k.a. SMSTW) at Seaside Middle School; these data are discussed below. Summaries of the collected water-quality data at ASR-1, ASR-2 and MW-1 during WY 2010 are presented in Tables 10, 11, and 12, respectively, below. Analytic laboratory reports are presented in Appendix B (not included in draft).

### **Baseline Water Quality**

Because injection operations have occurred annually at ASR-1 over the past 8 years, the proximate groundwater quality has been altered from the natural subsurface conditions, making a clear distinction between "native" and "non-native" water quality both complex and subjective. The selection of a water-quality baseline to assess water-quality changes during aquifer storage, therefore, requires careful consideration, and will vary to some degree on what



**Table 10. Summary of WY 2010 Water Quality Data  
 ASR-1**

Parameter	Unit	PQL	Sampling Results								
			3/21/01	10/22/09	11/23/09	12/8/09	6/16/10	7/29/10	9/10/10	10/8/10	11/15/10
Sample Description			NGW	WY 2009 Storage			WY 2010 Storage				
Elapsed Storage Time	Days		--	211	243	258	16	59	102	130	168
Volume Pumped at Sampling	1,000 gals		--	342							
<b>Major Cations</b>											
Calcium	mg/L	1	85	71		60		41			46
Magnesium	mg/L	1	19	22		20		7			13
Potassium	mg/L	0.5	5.3	3.9		4.0		2.9			2.9
Sodium	mg/L	1	88	74		64		42			45
<b>Major Anions</b>											
Bicarbonate (as HCO <sub>3</sub> <sup>-</sup> )	mg/L	10	273	235		226		155			172
Chloride	mg/L	1	120	85	64	69	28	28	29	34	34
Sulfate	mg/L	1	95	87		93		78			74
<b>General Physical</b>											
pH	Std Units	0.1	7.1	7.6		7.6		7.3			7.5
Specific Conductance (EC)	uS	10	1015	812		742		493			547
Total Dissolved Solids	mg/L	10	618	520		505		308			328
<b>Metals</b>											
Arsenic (Total)	ug/L	1	ND	2		1	ND	ND	ND	ND	1
Barium (Total)	ug/L	10	52	123		84	58	55	57	55	63
Iron (Dissolved)	ug/L	50		ND		ND		19			ND
Iron (Total)	ug/L	50	0.12	ND		ND		25			194
Lithium	ug/L	1		10		15	3	6	6	6	7
Manganese (Dissolved)	ug/L	20		ND		ND		ND			ND
Manganese (Total)	ug/L	20	40	ND		33		ND			23
Molybdenum	ug/L	1		5		4	2	3	5	5	6
Nickel	ug/L	1									ND
Selenium	ug/L	2	ND	ND		3	ND	3	2	2	ND
Strontium (Total)	ug/L	5		317		327	222	217	216	226	240
Uranium (by ICP/MS)	ug/L	1		1		ND	ND	ND	ND	ND	ND
Vanadium (Total)	ug/L	1		ND		ND	ND	ND	ND	ND	ND
Zinc (Total)	ug/L	10	10	184		155	206	196	187	182	212
<b>Miscellaneous</b>											
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	10	224	193		185		127			141
Ammonia-N	mg/L	0.05	0.33	0.07		0.11		ND			ND
Boron	mg/L	0.01	0.14	0.08		0.07		ND			ND
Chloramines	mg/L	0.05					ND	ND	ND	ND	ND
Fluoride	mg/L	0.1	0.35			0.2					0.18
Gross Alpha	pCi/L			2.67 +/- 1.59		5.36 +/- 2.22	-0.108 +/- 1.22	2.06 +/- 0.771	-0.152 +/- 0.825	1.09 +/- 1.58	1.10 +/- 1.60
Kjeldahl Nitrogen (Total)	mg/L	0.2		ND		ND		ND			ND
Methane	ug/L	0.4		0.8		0.63	ND	ND	ND	ND	0.5
Nitrate (as NO <sub>3</sub> )	mg/L	1	ND	0.2		1.0		0.06			ND
Nitrite (as Nitrogen)	mg/L	0.1		ND		0.1		ND			ND
Nitrogen (Total)	mg/L	0.2		ND		ND		ND			ND
o-Phosphate-P	mg/L	0.1	0.46	0.2		0.1		0.23			0.19
Phosphorous (Total)	mg/L	0.03		0.22		0.22		0.34			0.29
Radium 226	pCi/L			0.928 +/- 0.474		0.460 +/- 0.337	-0.295 +/- 0.333	0.058 +/- 0.198	-0.071 +/- 0.239	0.096 +/- 0.165	0.000 +/- 248
<b>Organic Analyses</b>											
Haloacetic Acids (Total)	ug/L	1.0			ND	ND	37	20	ND	8	4
<i>Dibromoacetic Acid</i>	ug/L	1.0			ND	ND	3.3	ND	ND	ND	ND
<i>Dichloroacetic Acid</i>	ug/L	1.0			ND	ND	19.0	4.0	ND	2.3	1.8
<i>Monobromoacetic Acid</i>	ug/L	1.0			ND	ND	ND	ND	ND	ND	ND
<i>Monochloroacetic Acid</i>	ug/L	2.0			ND	ND	ND	ND	ND	ND	ND
<i>Trichloroacetic Acid</i>	ug/L	1.0			ND	ND	15	16	ND	5.6	2.2
Organic Carbon (Dissolved)	mg/L	0.2				0.95		1.2			1.1
Organic Carbon (Total)	mg/L	0.2	6.3			1.0		1.3			1.1
Trihalomethanes (Total)	ug/L	1.0			35	48	71	84	77	65	54
<i>Bromodichloromethane</i>	ug/L	0.5			11	15	23	21	20	15	12
<i>Bromoform</i>	ug/L	0.5			0.8	1.2	0.9	0.7	0.6	0.6	ND
<i>Chloroform</i>	ug/L	1.0			18	23	36	54	48	44	37
<i>Dibromochloromethane</i>	ug/L	0.5			5.6	8.8	11.0	7.5	8.3	5.8	4.5
<b>Field Parameters</b>											
Temperature	° C			17.8		17.8	18.7	17.5	17.8		
Specific Conductance (EC)	uS			865		587	570	510	530		
pH	Std Units			7.6		7.04	7.1	7.1	7.2		
ORP	mV			104.9		-40.1					
Free Chlorine Residual	mg/L			ND		ND	0.9	0.6	0.2		
Dissolved Oxygen	mg/L			0.2		1.05	4.3	4.3	4.1		
Silt Density Index	Std Units										
Gas Volume	mL										
H <sub>2</sub> S	mg/L										





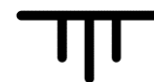
**Table 11. Summary of WY 2010 Water Quality Data  
 ASR-2 and ASR-3**

Parameter	Unit	PQL	Sampling Results		
			ASR-2		ASR-3 (SMSTW)
			3/27/07	12/7/09	12/22/10
Sample Description			NGW	WY 2009 Storage	NGW
Elapsed Storage Time	Days		--	257	--
Volume Pumped at Sampling	1,000 gals		--	--	--
<b>Major Cations</b>					
Calcium	mg/L	1	92	80	76
Magnesium	mg/L	1	19	20	18
Potassium	mg/L	0.5	5	4.5	4.5
Sodium	mg/L	1	86	81	102
<b>Major Anions</b>					
Bicarbonate (as HCO <sub>3</sub> <sup>-</sup> )	mg/L	10	274	238	304
Chloride	mg/L	1	131	121	107
Sulfate	mg/L	1	107	93	56
<b>General Physical</b>					
pH	Std Units	0.1	7.1	7.3	7.7
Specific Conductance (EC)	uS	10	1035	912	954
Total Dissolved Solids	mg/L	10	647	640	575
<b>Metals</b>					
Arsenic (Total)	ug/L	1	ND	5	4
Barium (Total)	ug/L	10	20	58	50
Iron (Dissolved)	ug/L	50	ND	138	21
Iron (Total)	ug/L	50	ND	134	21
Lithium	ug/L	1	29	27	36
Manganese (Dissolved)	ug/L	20	ND	40	27
Manganese (Total)	ug/L	20	42	36	27
Molybdenum	ug/L	1		11	
Nickel	ug/L	1	ND		ND
Selenium	ug/L	2	ND	3	ND
Strontium (Total)	ug/L	5	427	435	403
Uranium (by ICP/MS)	ug/L	1		2	
Vanadium (Total)	ug/L	1		ND	
Zinc (Total)	ug/L	10	247	27	
<b>Miscellaneous</b>					
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	10	225	195	249
Ammonia-N	mg/L	0.05	0.28	0.21	ND
Boron	mg/L	0.01	0.098	0.1	0.08
Chloramines	mg/L	0.05			
Fluoride	mg/L	0.1	0.23	0.19	0.14
Gross Alpha	pCi/L			2.72 +/- 1.84	
Kjeldahl Nitrogen (Total)	mg/L	0.2	0.5	ND	ND
Methane	ug/L	0.4		0.54	ND
Nitrate (as NO <sub>3</sub> )	mg/L	0.2	0.9	5	1
Nitrite (as Nitrogen)	mg/L	0.1	ND	ND	ND
Nitrogen (Total)	mg/L	0.2		1.2	ND
o-Phosphate-P	mg/L	0.1	ND	ND	ND
Phosphorous (Total)	mg/L	0.03	ND	0.07	0.03
Radium 226	pCi/L			0.663 +/- 0.387	
<b>Organic Analyses</b>					
Haloacetic Acids (Total)	ug/L	1.0	ND	ND	ND
<i>Dibromoacetic Acid</i>	ug/L	1.0	ND	ND	ND
<i>Dichloroacetic Acid</i>	ug/L	1.0	ND	ND	ND
<i>Monobromoacetic Acid</i>	ug/L	1.0	ND	ND	ND
<i>Monochloroacetic Acid</i>	ug/L	2.0	ND	ND	ND
<i>Trichloroacetic Acid</i>	ug/L	1.0	ND	ND	ND
Organic Carbon (Dissolved)	mg/L	0.2	0.96	0.62	0.71
Organic Carbon (Total)	mg/L	0.2	0.68	0.84	0.70
Trihalomethanes (Total)	ug/L	1.0	5.8	5	ND
<i>Bromodichloromethane</i>	ug/L	0.5	1.8	ND	ND
<i>Bromoform</i>	ug/L	0.5	ND	3.8	ND
<i>Chloroform</i>	ug/L	1.0	2.4	ND	ND
<i>Dibromochloromethane</i>	ug/L	0.5	1.6	1.2	ND
<b>Field Parameters</b>					
Temperature	°C		24.9		26.2
Specific Conductance (EC)	uS		1108		991
pH	Std Units		7.0		7.0
ORP	mV		-96		-82
Free Chlorine Residual	mg/L		ND		ND
Dissolved Oxygen	mg/L				
Silt Density Index	Std Units				
Gas Volume	mL				
H <sub>2</sub> S	mg/L		0.42		0.60



**Table 12. Summary of WY 2010 Water Quality Data  
 MW-1**

Parameter	Unit	PQL	Sampling Results													
			3/21/01	10/20/09	11/23/09	12/8/09	1/22/10	3/10/10	4/3/10	4/9/10	5/12/10	6/15/10	7/29/10	9/10/10	10/8/10	11/12/10
Sample Description			NGW	WY 2009 Storage				WY 2010 Injection				WY 2010 Storage				
Elapsed Storage Time	Days		--	209	243	258	--	--	--	--		15	59	102	130	165
Volume Pumped at Sampling	1,000 gals		--	700												
<b>Major Cations</b>																
Calcium	mg/L	1	85	90		80	54			51				50		48
Magnesium	mg/L	1	19	20		19	11			13				13		9
Potassium	mg/L	0.5	5.3	4.4		4.5	4.6			2.8				3.9		2.7
Sodium	mg/L	1	88	85		83	43			38				46		44
<b>Major Anions</b>																
Bicarbonate (as HCO3-)	mg/L	10	273	292		270	171			174				165		168
Chloride	mg/L	1	120	104	62	109	28	28	26	25	24	26		30		29
Sulfate	mg/L	1	95	89		102	85			69				80		74
<b>General Physical</b>																
pH	Std Units	0.1	7.1	7.1		7.1	7.7			8.2				7.6		7.8
Specific Conductance (EC)	uS	10	1015	995		894	561			501				499		524
Total Dissolved Solids	mg/L	10	618	637		628	355			314				318		290
<b>Metals</b>																
Arsenic (Total)	ug/L	1	ND	2		3	5			3				3		2
Barium (Total)	ug/L	10	52	52		45	35			37				44		21
Iron (Dissolved)	ug/L	50		ND		55	ND			ND				ND		ND
Iron (Total)	ug/L	50	0.12	60		ND	ND			1895				3310		ND
Lithium	ug/L	1		20		27	10			7				10		7
Manganese (Dissolved)	ug/L	20		ND		ND	ND			ND				ND		ND
Manganese (Total)	ug/L	20	40	38		ND	ND			53				111		ND
Molybdenum	ug/L	1		3		3	3			3				3		6
Nickel	ug/L	1					ND			ND						ND
Selenium	ug/L	2	ND	ND		2	4			ND				ND		ND
Strontium (Total)	ug/L	5		422		410	282			264				236		249
Uranium (by ICP/MS)	ug/L	1		0.9		ND	1			2				ND		ND
Vanadium (Total)	ug/L	1		ND		ND	4			6				7		ND
Zinc (Total)	ug/L	10	10	19		67	24			23				19		ND
<b>Miscellaneous</b>																
Alkalinity, Total (as CaCO3)	mg/L	10	224	239		221	140			143				135		138
Ammonia-N	mg/L	0.05	0.33	ND		0.06	ND			ND				ND		ND
Boron	mg/L	0.01	0.14	0.08		0.08	0.05			ND				ND		ND
Chloramines	mg/L	0.05					ND		0.07	0.04	0.06	ND		ND		ND
Fluoride	mg/L	0.1	0.35			0.19				0.26						0.19
Gross Alpha	pCi/L			2.65 +/- 1.67		4.10 +/- 1.90	ND +/- 1.0			3.56 +/- 1.26			4.43 +/- 1.37		1.09 +/- 1.58	2.69 +/- 1.81
Kjeldahl Nitrogen (Total)	mg/L	0.2		ND		ND	ND			ND				ND		ND
Methane	ug/L	0.4		0.5		1.30	ND			ND				ND		ND
Nitrate (as NO3)	mg/L	1	ND	ND		1.0	ND			1.0				0.1		ND
Nitrite (as Nitrogen)	mg/L	0.1		ND		0.2	ND			ND				ND		ND
Nitrogen (Total)	mg/L	0.2		ND		ND	ND			ND				ND		ND
o-Phosphate-P	mg/L	0.1	0.46	ND		ND	ND			0.1				ND		0.05
Phosphorous (Total)	mg/L	0.03		ND		0.13	ND			0.17				0.24		0.05
Radium 226	pCi/L			0.427 +/- 0.335		0.873 +/- 0.360	ND +/- 0.2			0.354 +/- 0.464			0.822 +/- 0.622		0.096 +/- 0.165	0.038 +/- 0.269
<b>Organic Analyses</b>																
Haloacetic Acids (Total)	ug/L	1.0		ND	ND	ND	6	12	23	20	24	33	3	9.1	ND	ND
Dibromoacetic Acid	ug/L	1.0		ND	ND	ND	ND	1.9	2.2	2.5	2.2	2.7	ND	ND	ND	ND
Dichloroacetic Acid	ug/L	1.0		ND	ND	ND	2.1	6.3	11.0	8.5	11.0	15.0	2.8	1.9	ND	ND
Monobromoacetic Acid	ug/L	1.0		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Monochloroacetic Acid	ug/L	2.0		ND	ND	ND	ND	ND	ND	ND	3	4	ND	ND	ND	ND
Trichloroacetic Acid	ug/L	1.0		ND	ND	ND	3.9	4.1	9.6	8.7	8.9	11	ND	7.2	ND	ND
Organic Carbon (Dissolved)	mg/L	0.2				0.86	1.0			1.2				1.1		1.1
Organic Carbon (Total)	mg/L	0.2	6.3			0.9	0.98			1.3				1.2		1.1
Trihalomethanes (Total)	ug/L	1.0		0.8	20.0	8	45	60	65	50	62	78	77	9.6	49	53
Bromodichloromethane	ug/L	0.5		ND	7.4	2.8	14	20	20	15	19	21	19	2.5	12	13
Bromoform	ug/L	0.5		ND	ND	ND	ND	0.9	0.8	0.8	0.9	0.8	0.6	ND	ND	ND
Chloroform	ug/L	1.0		0.8	12	5	26	30	36	26	33	48	50	6	34	35
Dibromochloromethane	ug/L	0.5		ND	0.96	ND	5.0	9.8	8.8	7.5	9.4	8.4	6.9	1.1	4.0	4.5
<b>Field Parameters</b>																
Temperature	°C			22.5		23	19	19				19.2	18.9	15.9	18.7	
Specific Conductance (EC)	uS			966		687	566	580				570	580	520	580	
pH	Std Units			7.3		7.13	7.3	7.3				6.8	6.9	7.6	6.9	
ORP	mV			-67.1		-123.2		530								
Free Chlorine Residual	mg/L			ND		ND	ND	ND				ND	ND	ND	ND	
Dissolved Oxygen	mg/L			0.11		0.33	4.5	4.5				2.3	1.8	2.3	3.1	
Silt Density Index	Std Units															
Gas Volume	mL															
H <sub>2</sub> S	mg/L															



distinctions between in-situ and injected waters are of importance. The most illustrative basis for discussing water-quality changes for the District's ASR project is to consider groundwater conditions immediately prior to the injection season as a baseline. For the WY 2010 season, groundwater quality was monitored the week prior to the commencement of injection; the results from key indicator parameters of the presence of CAW Injectate water are presented in Table 13 below.

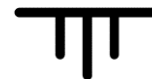
**Table 13. Initial WY 2010 Water-Quality Conditions of On-Site Wells**

Well	Cl (mg/L)	EC (umho)	Sr (ug/L)	% Injectate Based On:			Avg % Injectate in Water
				Cl	EC	Sr	
ASR-1	69	742	237	57	50	50	<b>52</b>
MW-1	109	894	410	13	14	8	<b>12</b>
ASR-2	121	912	435	0	9	0	<b>3</b>

Establishing baseline conditions this year was slightly different than previous years, and is more complex now that injection is occurring at multiple wells; essentially three different “baseline” conditions exist now, specifically at ASR-1, MW-1 and ASR-2. As Table 13 shows, none of the three locations have the same water quality prior to WY 2010 injection, and each represents a different mix of native groundwater (NGW) and water from the WY 2009 injection season. These results range from 48% NGW at ASR-1, to 97% NGW at ASR-2; with MW-1 being in between the two (both spatially and with respect to water quality) at 88% NGW. The results are noteworthy given the very close distances (i.e., under 300 feet) the wells are to each other; however, WY 2009 saw only 182 af of injection, which represents a theoretical radius-of-influence of only 159 feet<sup>10</sup> – i.e., less than the 280-foot distance separating ASR-1 from ASR-2. The issue of precisely defining a baseline water-quality condition in the future will be increasingly difficult as injection occurs at multiple wells – noting that ASR-2 was utilized for the first time this year, and ASR-3 is planned to be operational by the commencement of WY 2012.

The yield of injection operations for WY 2010 were significantly greater than for previous years, primarily as a result of WY 2010 being a hydrological “Above Normal” year; a total of approximately 1,111 af was injected between December 13 and May 31, 2010. This volume not only exceeds the average annual yield of the project (920 afy); it also exceeds the sum-total of all combined injection over the previous 5 years of facility operation. The magnitude of this year's increase in throughput is also a result of the active operation of ASR-2 simultaneously with ASR-1; the first such year this has occurred.

<sup>10</sup> This estimate is based on the injected volume being evenly and symmetrically dispersed over a 100 foot-thick aquifer zone of 17% porosity. The 100 foot thickness is based on Spinner Log surveys that show 96% of the injected water travels through 100 feet of the 200-foot screened interval of the well.



Based on the above analysis of the groundwater conditions at the commencement of the WY 2010 season, the water quality (specifically key water quality parameters chloride ion [Cl], strontium [Sr] and conductivity [EC]) at ASR-1 were used to account for calculating a correction factor for normalizing the data where dilution-correction is desired. From Table 13 above, the Cl value of 69 milligrams per liter (mg/L), or a mixture of 48% NGW and 52% injectate, was used as the baseline condition for this year's program

### **Injection Water Quality**

Source water for injection at ASR-1 was supplied from the CAW municipal water system, primarily from Carmel River system wells which are treated at the CAW Begonia Iron Removal Plant (BIRP) for iron and manganese removal. The BIRP water is also disinfected via free chlorine and a phosphate-based corrosion inhibitor is added to the filtered water before entering the CAW distribution system.

Injection water quality from the CAW system was typical of recent years, with slightly better (i.e., lower) levels of major anions and cations than the previous 3 years. The data in Table 14 show injection water quality throughout the injection season, and shows a trend observed in previous years with respect to the variation in Carmel River source waters. The first 1-2 months of diversions are typically higher in mineral content, and then drop by 10-20% as the injection season progresses. This is likely a result of the shallow river aquifer initially yielding "older" summer/fall waters that have resided in the river alluvium for a longer period of time being collected for the first 1-2 months of the ASR season.

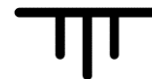
The level of Trihalomethane (THM) and Haloacetic Acid (HAA) compounds was slightly lower than previous years (average 25 and 13 ug/L respectively), which is likely a result of the relatively wet hydrologic year conditions of high rainfall and river runoff, yielding short residence times in the river alluvium. The commencement of using both ASR-1 and ASR-2 wells (which effectively doubled injection capacity) also likely benefited lowering THM and HAA levels by accelerating the passage time through the CAW distribution system. CAW has also closely managed the maintenance of free chlorine residual in the distribution system this year, resulting in lower residuals in the injected water. All of these factors contribute to the lower THM / HAA levels observed.

Levels of bionutrients (oxygen, nitrogen, phosphorous, and organic carbon) were all present at levels similar to previous years.



**Table 14. Summary of WY 2010 Water Quality Data  
 Injectate**

Parameter	Unit	PQL	Sampling Results										WY 2010 Injectate Averages
			12/16/09	1/22/10	2/3/10	2/16/10	3/2/10	3/17/10	4/14/10	5/7/10	5/12/10	6/2/10	
Sample Description			Injectate	Injectate	Injectate	Injectate	Injectate	Injectate	Injectate	Injectate	Injectate	Injectate	Injectate
<b>Major Cations</b>													
Calcium	mg/L	1	42	42		40		41	42			41	41
Magnesium	mg/L	1	15	14		13		12	13			14	14
Potassium	mg/L	0.5	3.4	3.2		2.8		2.9	3			2.9	3.0
Sodium	mg/L	1	44	41		43		43	40			41	42
<b>Major Anions</b>													
Bicarbonate (as HCO3-)	mg/L	10	157	154		157		155	157			151	155
Chloride	mg/L	1	27	27	25	26	25	28	28			26	23
Sulfate	mg/L	1	95	82		69		68	62			74	75
<b>General Physical</b>													
pH	Std Units	0.1	7.6	7.6		7.5		7.6	7.5			7.5	7.6
Specific Conductance (EC)	uS	10	522	528		494		493	470			486	499
Total Dissolved Solids	mg/L	10	355	385		348		300	288			308	331
<b>Metals</b>													
Arsenic (Total)	ug/L	1	ND	ND		ND		ND	ND			ND	0
Barium (Total)	ug/L	10	63	56		57		55	ND			61	49
Iron (Dissolved)	ug/L	50	ND	ND		ND		ND	ND			ND	0
Iron (Total)	ug/L	50	ND	ND		ND		ND	ND			55	9.2
Lithium	ug/L	1	4	6		7		5	5			5	5
Manganese (Dissolved)	ug/L	20	ND	ND		ND		ND	ND			ND	0
Manganese (Total)	ug/L	20	ND	ND		ND		ND	ND			ND	0
Molybdenum	ug/L	1	2	2		3		3	3			3	2.7
Nickel	ug/L	1	2	2				ND	ND			ND	0.8
Selenium	ug/L	2	ND	3		ND		ND	2			ND	0.8
Strontium (Total)	ug/L	5	236	216		218		200	203			213	214
Uranium (by ICP/MS)	ug/L	1	ND	ND		ND		ND	ND			ND	0
Vanadium (Total)	ug/L	1	2	2		2		ND	ND			ND	1
Zinc (Total)	ug/L	10	296	220		286		194	183			242	237
<b>Miscellaneous</b>													
Alkalinity, Total (as CaCO3)	mg/L	10	129	126		129		127	129			124	127.3333333
Ammonia-N	mg/L	0.05	ND	ND		0.05		0.06	ND			0.09	0.03
Boron	mg/L	0.01	0.04	0.04		0.38		0.07	ND			ND	0.09
Chloramines	mg/L	0.05	0.08	0.10	0.12	0.2	0.15	0.11	0.09			ND	ND
Fluoride	mg/L	0.1	0.2			0.33		0.26	0.28			0.27	0.27
Gross Alpha	pCi/L		1.89 +/- 1.05	ND +/- 1.1				0.444 +/- 0.694	0.187 +/- 1.13			-0.029 +/- 1.06	
Kjeldahl Nitrogen (Total)	mg/L	0.2	ND	ND		ND		ND	ND			ND	0
Methane	ug/L	0.4	ND	ND		ND		ND	ND			ND	0
Nitrate (as NO3)	mg/L	1	ND	ND		1		1	ND			ND	0.3
Nitrite (as Nitrogen)	mg/L	0.1	ND	ND		ND		ND	ND			ND	0
Nitrogen (Total)	mg/L	0.2	ND	ND		ND		ND	ND			ND	0.000
o-Phosphate-P	mg/L	0.1	0.3	ND		ND		0.2	0.2			0.5	0.2
Phosphorus (Total)	mg/L	0.03	0.32	ND		ND		0.29	0.25			0.55	0.24
Radium 226	pCi/L		0.148 +/- 0.29	ND +/- 0.16				0.418 +/- 0.335	0.0662 +/- 0.22			0.0535 +/- 0.348	
<b>Organic Analyses</b>													
Haloacetic Acids (Total)	ug/L	1.0	14	6	9.8	11	12	16	15	19		15	13
Dibromoacetic Acid	ug/L	1.0	2.2	ND	2.4	2.1	2.1	2.1	2.4	2.3		2.2	2.0
Dichloroacetic Acid	ug/L	1.0	6.4	2.1	3.8	4.8	5.2	6.5	5.5	7.7		6.5	5.4
Monobromoacetic Acid	ug/L	1.0	ND	ND	ND	ND	ND	ND	ND	2		ND	0.22
Monochloroacetic Acid	ug/L	2.0	ND	ND	ND	ND	ND	2.5	2.8	ND		ND	0.59
Trichloroacetic Acid	ug/L	1.0	5.7	3.9	3.6	3.7	4.3	5.3	4.0	7.2		6.6	4.9
Organic Carbon (Dissolved)	mg/L	0.2	1.3	1.0		1.1		1.1	1.1			1.3	1.2
Organic Carbon (Total)	mg/L	0.2	1.6	0.98		1.0		1.4	1.4			1.3	1.3
Trihalomethanes (Total)	ug/L	1.0	26	45	19	17	20	22	21	32		25	25
Bromodichloromethane	ug/L	0.5	8.5	14.0	7.1	6.2	6.9	7.6	6.9	10.0		8.6	8.4
Bromoform	ug/L	0.5	0.7	ND	0.67	0.59	0.64	0.62	0.71	0.66		ND	0.51
Chloroform	ug/L	1.0	11.0	26.0	5.7	5.8	8.4	9.6	8.6	15.0		12.0	11.3
Dibromochloromethane	ug/L	0.5	5.5	5.0	5.6	4.3	4.4	4.6	4.8	5.8		4.6	5.0
<b>Field Parameters</b>													
Temperature	° C		15.2	14.5	14.8	14.7	14.4		15.7	16.1		16.3	16.1
Specific Conductance (EC)	uS		568	328	559	487	520		476	492		490	501
pH	Std Units		7.1	7.4	7.5	7.4	7.3		7.2	7.3		7.3	7.3
ORP	mV		731	770		727							743
Free Chlorine Residual	mg/L		1.0	1.1	0.7	0.4	0.2		0.3	0.4		0.9	0.3
Dissolved Oxygen	mg/L		1.6	1.6	0.8	2.4	4.3		2.1	2.6		3.7	2.2
Silt Density Index	Std Units		1.6										1.6
Gas Volume	mL		0.5										0.5
H2S	mg/L		ND										0



## Water Quality During Aquifer Storage

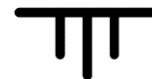
Table 10 presents a summary of water-quality data collected at ASR-1, Table 11 presents the limited water-quality data collected at ASR-2 and ASR-3, and Table 12 presents similar data collected at MW-1. Data for ASR-1 includes original 2001 native groundwater results obtained when the well was first constructed (3/21/01 sample), “baseline” water quality taken immediately prior to WY 2010 injection (12/08/09 sample), WY 2010 injection water-quality (CAW Injectate), and “stored” water quality (WY 2010 Storage) collected periodically from the aquifer after injection operations were terminated. To track the general mixing, dilution, and interaction between injected and native groundwaters, chloride ion (Cl) was used as a natural tracer. Chloride ion is very stable, highly soluble and is present in both waters; albeit at a 400 percent concentration differential. Review of Cl data collected during the 6-month storage period shows that the injected “bubble” of CAW water remained essentially intact around all three wells for the entire storage period. This condition is not unexpected due to the large volume of water injected this season. Using the same basis for estimation of radius-of-influence as discussed previously, the theoretical zone of inundation of this year’s 1,111 af of injection water encompasses a radius of approximately 1,000 feet around the wells. This volume encompasses CAW’s Paralta well (660 feet north) and approaches both the new ASR-3 well (1,350 feet north), and the Ord Grove well (1,600 feet southwest).

Review of other water-quality parameters gathered at ASR-1, including major anions and cations, redox potential (ORP), and conductivity all showed similar geochemical stability and a lack of dilution / intermixing with native groundwaters. This is unremarkable when compared to recent years due to the larger volume of water injected; although drift / gradient-induced migration was surely occurring, the injection bubble was sufficiently large to still encompass ASR-1, as well as MW-1 and ASR-2.

As found in previous ASR operations at the site, the only significant water -quality changes observed during aquifer storage were redox-related (and likely biologically mediated) reactions; these were primarily evidenced by the degradation of HAA and THM compounds. The results showed the following:

- HAAs showed the typical ingrowth resulting from the presence of free chlorine in the injected water and peaked in concentration at approximately 16 days after the cessation of injection. They then degraded completely during storage in a period of approximately 45 days at MW-1.
- THMs showed characteristic and significant ingrowth initially, peaking after 2-4 weeks of storage, followed by a gradual decline over the next 10-20 weeks of storage.

Subsequent decline in THMs followed the characteristic process: rapid degradation of Bromoform and the highly brominated species with much slower decline in Chloroform. The slower than historically-observed degradation of THM’s may be a result of the large volume of water injected and the more thorough displacement of native groundwaters; this phenomena will



need to be observed closely in subsequent operations to further assess the change in degradation rates.

### **Water Quality at MW-1**

Monitoring well MW-1 was utilized for tracking changes in injected and stored water quality in the subsurface during WY 2010. MW-1 is perforated similarly to wells ASR-1 and ASR-2, and is located approximately 90 feet east of ASR-1 (one-third the distance between ASR-1 and ASR-2). Review of the water-quality data for MW-1 presented in Table 12 shows the same trends apparent from ASR-1 storage water quality, i.e., no evidence of ion exchange or precipitation reactions, and similar THM ingrowth and decay trends. The data also provide insight into other aquifer-storage issues previously unavailable from ASR-1 alone, including the following:

Injection Bubble Transport. Water quality at MW-1 improved (based on Cl concentration data) as soon as injection started a result of displacement of native groundwaters by the higher quality CAW injectate. This trend continued until MW-1 was completely enveloped by the injection bubble, within approximately 1 week after the commencement of injection of both ASR-1 and 2. This 100% injectate condition remained stable through the cessation of injection and throughout the storage period, even through the June - September period of pumping influence from CAW's SGB wells, which tends to draw the injection "bubble" to the west.

Disinfection-By-Products (DBP's) Fate and Transport. Additional geochemical information is apparent by the comparison of THM and HAA data at ASR-1 and MW-1, which are graphically presented Figures 63 and 64, respectively. These data suggest the following:

- Both THM and HAA levels showed similar ingrowth and decay trends to those observed in ASR-1 during aquifer storage.
- Comparison of total THMs and individual THM species from both wells shows that the ingrowth phase peaked at the same time (approximate Storage Day 60) for both ASR-1 and MW-1. This finding is almost identical to data from WY 2009 which peaked at Day 55 (approximately), and further substantiates the conclusion that THM degradation rate is a function of time only; it also supports the finding that THM adsorption is not occurring during aquifer storage and transport. A functional characteristic of adsorption in flow through porous media is that compounds (especially larger molecular weight organics) demonstrate transit-time retardation commensurate with adsorption; because there is no observed retardation of THM peaking at MW-1, the occurrence of THM adsorption is unlikely.
- Similar peaking and subsequent degradation of HAA's was also observed, with concurrent peaking at ASR-1 and MW-1 occurring after 16 days of aquifer storage. The more temporal peaking and faster degradation of HAA species is largely a result of Haloacetic Acid compounds being inherently less stable



compounds than THM's, particularly in an oxygenated environment. These results are similar to previous years HAA trends.

### **Water Quality at Far-Field Monitor Wells**

Samples from the two closest CAW SGB production wells (i.e., Ord Grove and Paralta) were collected in July and November 2010 as part of the ASR sampling program. The samples were analyzed for DBP's and trace minerals which might indicate influence from the operation of the ASR wells. In addition, the construction of a third ASR well (ASR-3) was completed at the Seaside Middle School, approximately 1,350 feet north of the ASR-1 well and 700 feet north of the Paralta well. ASR-3 was test pumped in late September – early October to both develop the well and establish a baseline water quality. The laboratory results for these samples are included in Appendix B (not included in draft).

The results from these samples are notably different this year, and are a result of the far greater volumes of water injected compared to previous years. Evaluation of chloride (Cl), strontium (Sr), and electrical conductivity (EC) results all indicate that some injected water had reached the far-field wells this year.

The closest well, Paralta, showed clear signs of influence from the injected waters, with concentrations of Cl, EC, and Sr all lower than historical levels. The presence of low levels of THM compounds this year also positively confirms the presence of CAW Injectate at the site; however, the Paralta well penetrates both the QTp and Tsm formations; therefore, the precise quantification of injectate capture is not possible at this time. Based on the data collected this season, the June – September pumping of Paralta saw between 50% and 62% contribution of injected water, with THM levels of 5-8 micrograms per liter (ug/L). As a matter of potable water-quality standards, the level detected at the Paralta Well is far below the current Maximum Contaminant Level (MCL) for THM's of 80 ug/L.

The next closest well is ASR-3; which was constructed in Summer 2010 and test pumped for the first time in September 2010. ASR-3 is perforated solely in the Tsm formation and is, therefore, a good data source for water quality and mixing. In comparing the results for key water-quality indicators (Cl, EC, and Sr), the samples at ASR-3 showed a mixture of 10 - 14 % CAW Injectate (averaging 12 %), with the remaining 88 % being typical Tsm groundwater quality. No THM's were observed at ASR-3. This result is not surprising given the proximity of ASR-3 to the Santa Margarita ASR Facility, approximately 1,350 feet away and slightly downgradient.



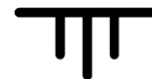


**Table 15. Evaluation of ASR-3 Water-Quality Data  
(September 24, 2010 Data)**

Constituent	Value	% Injectate (Based on CAW WY 2010 Injectate)	% Typical Tsm Water (i.e., NGW)
Cl	107	14	86
EC	873	12	88
Sr	367	10	90

The farthest well monitored for water quality as part of the ASR project, CAW's Ord Grove well, is approximately 1,600 feet away and directly downgradient from the Santa Margarita Facility. Unfortunately, the Ord Grove well is perforated predominately in the QTP formation, with only slight penetration into the upper portion of the Tsm. This suggests that the use of water-quality indicators will only be qualitative in evaluating the presence of injected waters at this well. Using the same indicator parameters (although Cl data from Ord Grove was not available in WY 2010), the results also show depressed levels of Sr and EC, which are indicative of intermixing with CAW injectate. No THM's were detected at the Ord Grove well.

Overall, water-quality data from WY 2010 showed no significant deviations from other years; however, the determination of precisely where the injected waters travel will likely be more challenging as multiple wells become operational and injection quantities increase. The most important factors – a) that no adverse geochemical reactions are occurring during aquifer storage, and b) that injection is showing direct and measurable benefit to the extant basin water quality - continue to be observed and are likely to persist as ASR operations continue and expand in the future.



## CONCLUSIONS

Based on the findings from the Phase 1 ASR Project during WY 2010, we conclude the following:

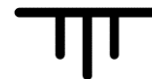
### WY 2010 Recharge Operations

WY 2010 was an “Above Normal” hydrologic year, and was also the first year that Carmel River system water was injected at ASR-2 simultaneously with ASR-1 for an entire injection season. These factors resulted in a total of approximately 1,111 af of water recharged into the Seaside Groundwater Basin at the Phase 1 ASR Project site. The volume injected during WY 2010 was the highest single-year injection volume and is greater than the operational average annual yield for the project of 920 afy. For comparison, the volume injected during WY 2007 was only 8.2 af, and during WY 2006 was 408 af, which were “Critically Dry” and “Wet” hydrologic years, respectively. The total volumes injected each year reflect the relative availability of excess Carmel River flows, as well as the number of ASR wells in operation and conveyance capacity of the CAW system. A histogram showing a summary of annual injection and recovery volumes since operations began at the Santa Margarita site is shown on Figure 2.

### Well Performance

ASR-1. During WY 2010, ASR-1 was operated at injection rates ranging between approximately 970 to 1,650 gpm (4.3 to 7.3 afd), averaging approximately 1,275 gpm (5.6 afd). The 24-hour specific injectivity at ASR-1 at the beginning of WY 2010 was 30 gpm/ft and at the end it was 25 gpm/ft, a decline of approximately 15 percent, indicating that some residual plugging occurred at the well over the course of the WY 2010 injection season. These values are comparable to the specific injectivity at the end of WY 2009 of approximately 32 gpm/ft. The pumping specific capacity, however, was relatively stable over the course of WY 2010, at approximately 30 to 31 gpm/ft prior to and following the injection season, respectively. The maintenance of specific capacity following the injection season suggests that backflushing operations were successful at removing residual plugging that had accumulated during the injection season at ASR-1.

ASR-2. During WY 2010, ASR-2 was operated at average injection rates ranging between approximately 240 to 1,100 gpm (1.1 to 4.9 afd), averaging approximately 670 gpm (3.0 afd). The 24-hour specific injectivity at ASR-2 the beginning of WY 2010 was approximately 7 gpm/ft and at the end it was approximately 3 gpm/ft, a decline of approximately 60 percent, indicating that significant residual plugging occurred at this well over the course of the WY 2010 injection season. These values are also significantly lower than the specific injectivity at the end of WY 2009 of approximately 19 gpm/ft. The pumping specific capacity also declined over the course of WY 2010, although to a lesser extent, from approximately 19 gpm/ft prior to injection to 17 gpm/ft at the end of the injection season, indicating that backflushing did not completely remove the accumulated residual plugging during WY 2010. It is noted, however, that ASR-2 was operating during WY 2010 in an “impaired” condition as a

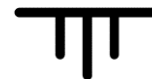


result of the significant plugging that occurred during MCWD-source water testing in WY 2009. It is anticipated that following formal rehabilitation to remove plugging materials (scheduled for December 2010) , ASR-2 will be operating at performance levels comparable to ASR-1.

### **Water Quality**

Significant conclusions regarding the water-quality investigation during WY 2010 include the following:

- Consistent with previous observations, no significant ion exchange, acid-base, or precipitation reactions were observed at the site.
- Following a short “ingrowth” period, HAAs degraded completely during aquifer storage.
- THMs showed characteristic and significant initial “ingrowth” that peaked at approximately 2 to 4 weeks of storage, followed by a gradual decline over the next 10 to 20 weeks of storage.
- THM data from the on-site monitor well also supports the finding that THM adsorption is not occurring during aquifer storage and transport; therefore, observed THM reductions during storage are likely being controlled by bioactivity.



## RECOMMENDATIONS

Based on the WY 2010 ASR program results and our experience with similar ASR projects, we offer the following recommendations for continued and future operations of the Phase 1 ASR Project:

### ASR-1 Well Operational Parameters

- Water-Level Drawup: Under the present local water-level conditions, the amount of water-level drawup should be limited to approximately 100 feet. This amount of water-level drawup during injection equals the typical available drawdown in the well for backflushing. This helps to avoid over-pressurization and compression of plugging materials, thereby maximizing the efficiency of backflushing and limiting the amount of residual plugging.
- Injection Rate: Based on the lack of overall residual plugging during WY 2010, ASR-1 can be operated at an injection rate up to approximately 1,250 gpm (5.5 AFD) to avoid excessive plugging during injection. This represents a 25 percent increase in the historical recommended injection rate of 1,000 gpm.
- Backflushing Frequency: During the recharge season, routine backflushing should continue to be performed on an approximate weekly basis, or when the amount of water-level drawup in the casing reaches approximately 100 feet (i.e., equal to the amount of available drawdown for pumping in order to avoid excessive residual plugging between injection periods and maintain well performance.

### ASR-2 Well Operational Parameters

- Water-Level Drawup: Under the present local water-level conditions, the amount of water-level drawup should be limited to approximately 130 feet, which is equal to the typical amount of available drawdown in the well for backflushing. Again, this helps to avoid over-pressurization and compression of plugging materials and limiting the amount of residual plugging.
- Injection Rate: ASR-2 experienced a decline in performance as a result of residual plugging during both WY 2009 and WY 2010. Until the well performance is improved (i.e., through downhole rehabilitation), it is recommended that ASR-2 should be operated at a maximum injection rate of approximately 750 gpm.
- Backflushing Frequency: During the recharge season, routine backflushing should be performed. Drawup is a function of specific injectivity, injection rate, plugging rates, and duration of injection. Assuming an injection rate of 750 gpm and current well performance, it is estimated that the well will experience approximately 130 feet of water level drawup after one week of continuous injection; therefore, routine backflushing of ASR-2 should continue be performed on an approximate weekly basis, or when the amount of water level drawup in the casing reaches



approximately 130 feet, whichever occurs first, in order to avoid excessive residual plugging between injection periods and maintain well performance.

It is important to note that water-level drawup during injection is a function of several factors, including specific injectivity, injection rate, plugging rates, and duration of continuous injection. Therefore, establishing a maximum drawup level is a useful guide for triggering backflushing of the ASR wells under variable conditions. For example, injecting at lower injection rates and / or with an injection source water with lower plugging potential, the amount of water level drawup per unit time will be lower and the duration of continuous injection between backflushing may be extended before the drawup limitation is reached. Conversely, injecting at a higher rate and / or with injection source water having a higher plugging potential, the rate of drawup will increase and the duration between backflushing may need to be shortened.

In addition to the above ASR well operational recommendations, we offer the following recommendations for future operations of the Phase 1 ASR Project:

1. Perform formal downhole rehabilitation of ASR-2 to restore performance losses as a result of residual plugging during both WY 2009 and WY 2010<sup>11</sup>.
2. Install pressure regulating valves at the ASR-1 and ASR-2 wellhead piping to maintain constant pressure and injection rates at the wells.
3. Install a dedicated submersible sampling pump at SMS Deep MW for water-quality sampling.
4. Perform an inventory of water-level dataloggers at each of the wells in the monitoring network and replace those that have failed or are obsolete models prior to the next water year.
5. Perform (and document) more frequent routine visits (e.g., monthly) to the monitoring well dataloggers to ensure they are operating properly on a continuous basis.
6. Include specific water quality investigations of the well backflush water to characterize and understand the likely reactions taking place at the well bore. This could potentially help in the future reduction of well plugging.

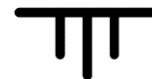
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<sup>11</sup> It is noted that ASR-2 underwent formal rehabilitation in early 2011 as suggested in the WY 2009 Summary of Operations report. As of this writing, the post-rehabilitation results appear quite favorable; however, full analysis of the ASR-2 rehabilitation has not been completed and will be documented in the upcoming WY 2011 Summary of Operations report. This recommendation reinforces the need to having had performed the rehabilitation based on the WY 2010 findings as well.



## **CLOSURE**

This report has been prepared exclusively for the Monterey Peninsula Water Management District for the specific application to the ASR Project on the Monterey Peninsula. The findings and conclusions presented herein were prepared in accordance with generally accepted hydrogeologic and engineering practices. No other warranty, express or implied, is made.



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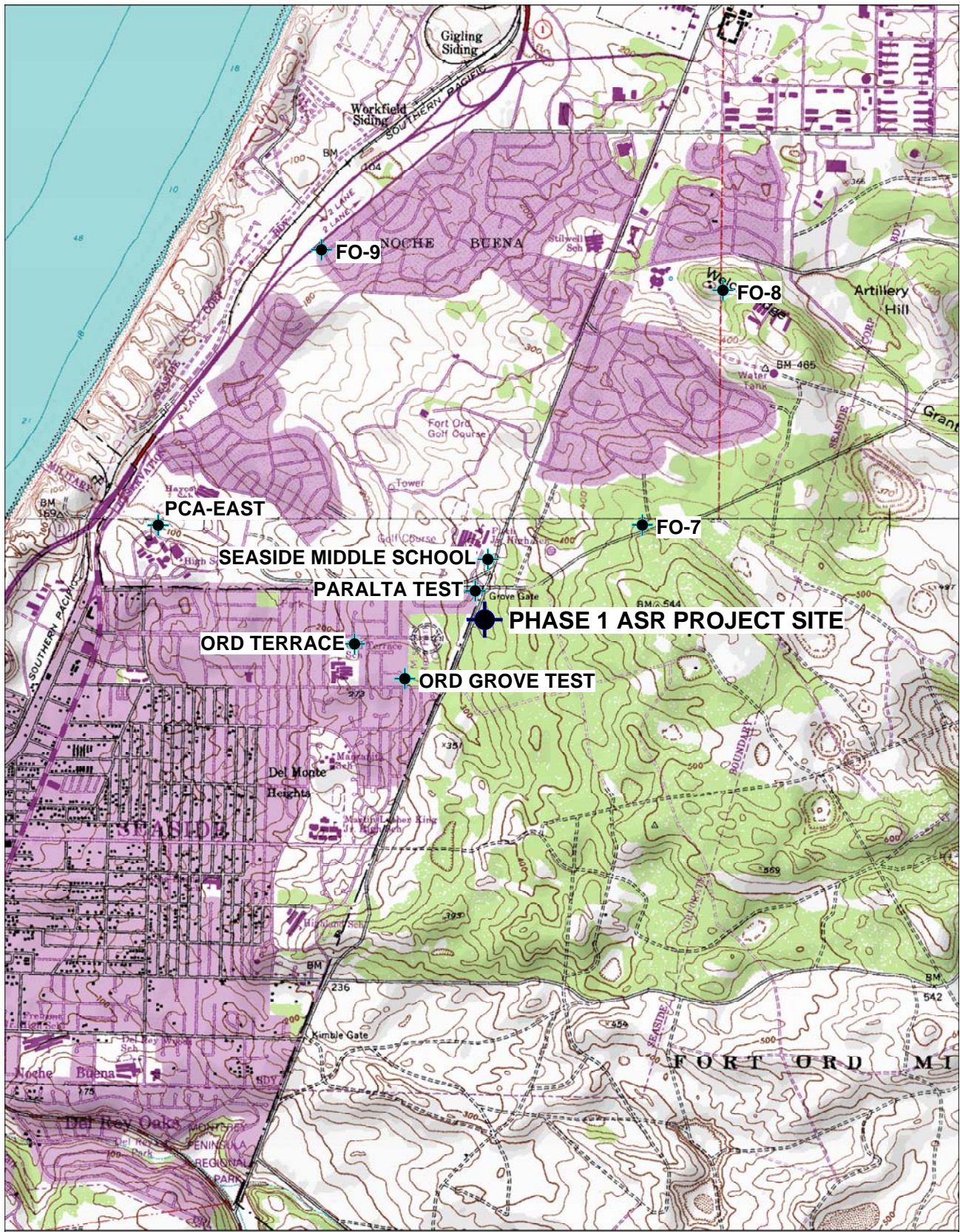


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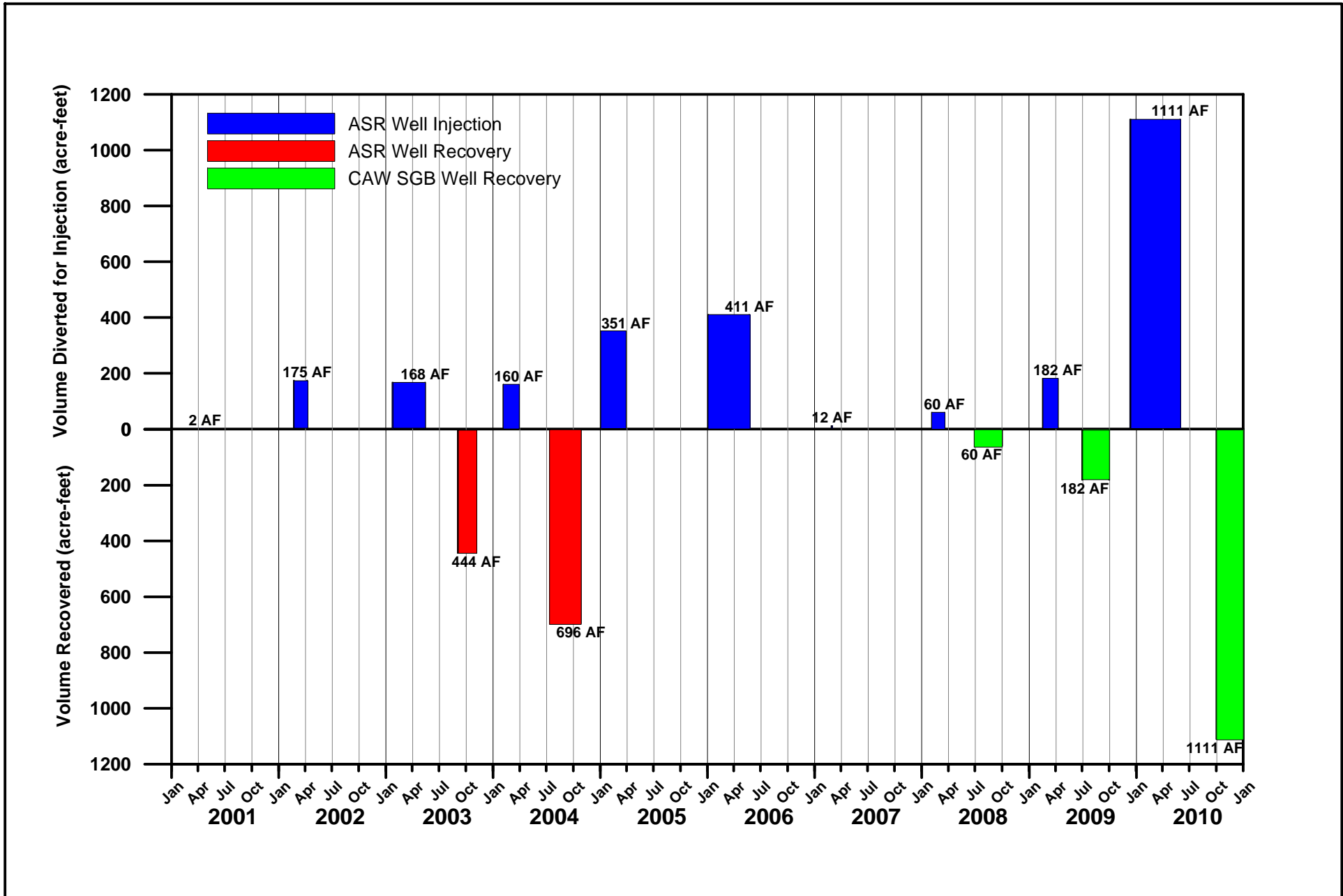
## FIGURES



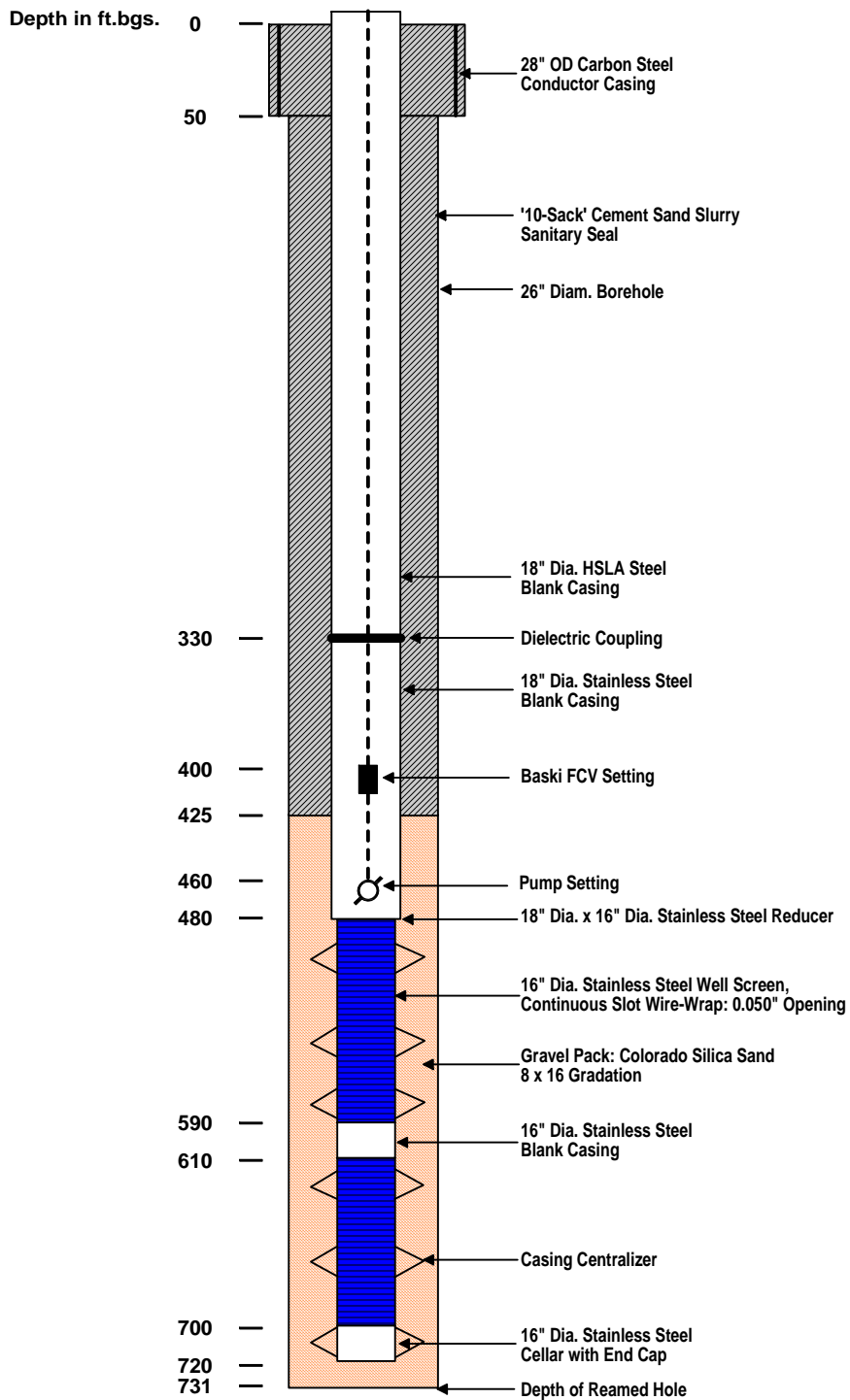
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SITE LOCATION MAP  
FIGURE 1



**HISTOGRAPH OF SGB ASR OPERATIONS  
 WY 2001 - 2010  
 FIGURE 2**



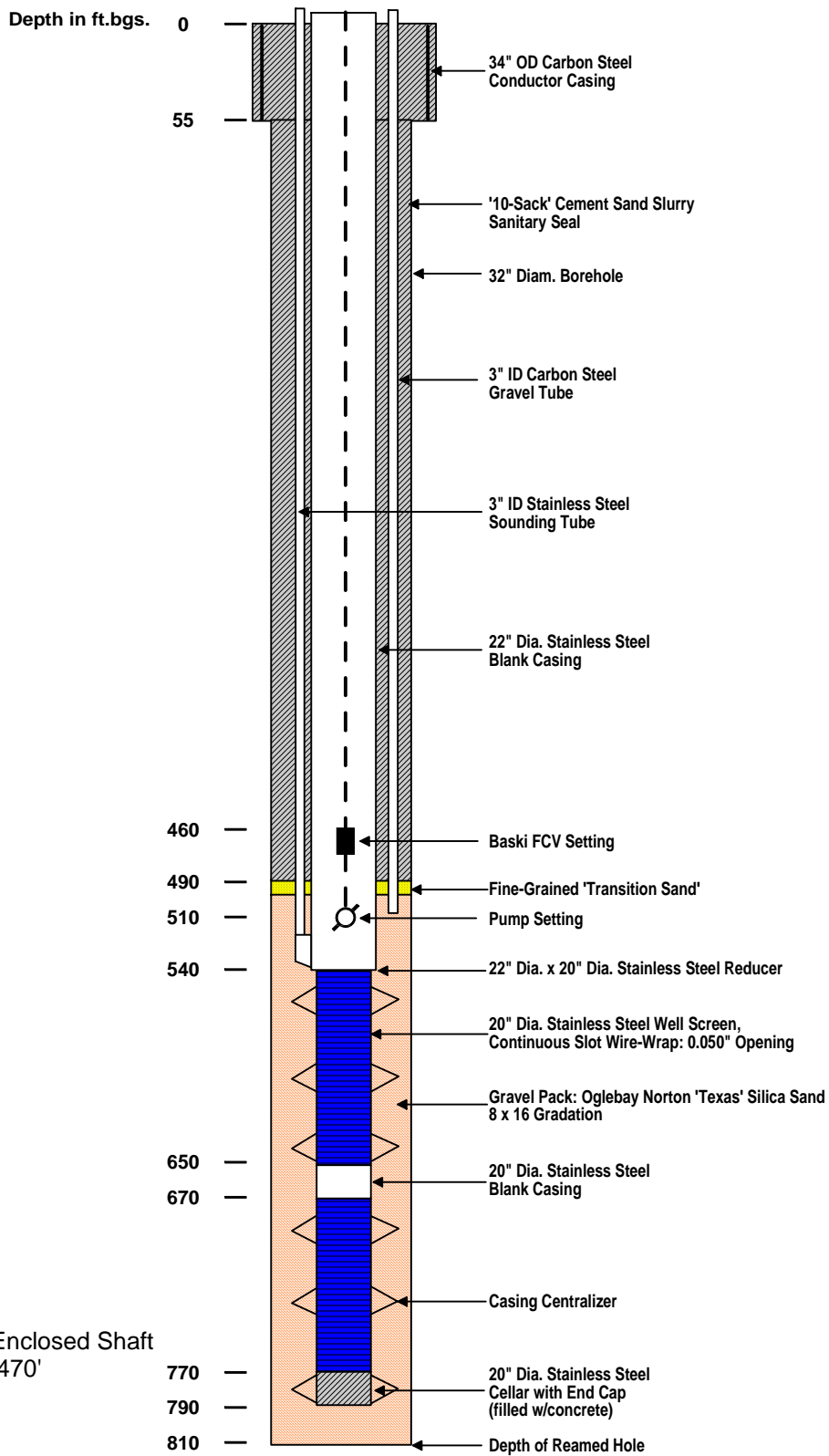
Pump Assembly Notes:

Hp: 400  
 Bowls: 14ENL, 8 stage  
 Col. Pipe Dia: 10"  
 Col. Pipe Length: 10'  
 Assy. Type: Water Lube/Open Shaft  
 Baski FCV Setting: 400' - 410'  
 Top of Bowls: 460'  
 Bowl Length: 11.5'  
 Suction Length: 10'  
 Intake: 481.5'

NOT TO SCALE

ASR-1 AS BUILT SCHEMATIC  
 FIGURE 3





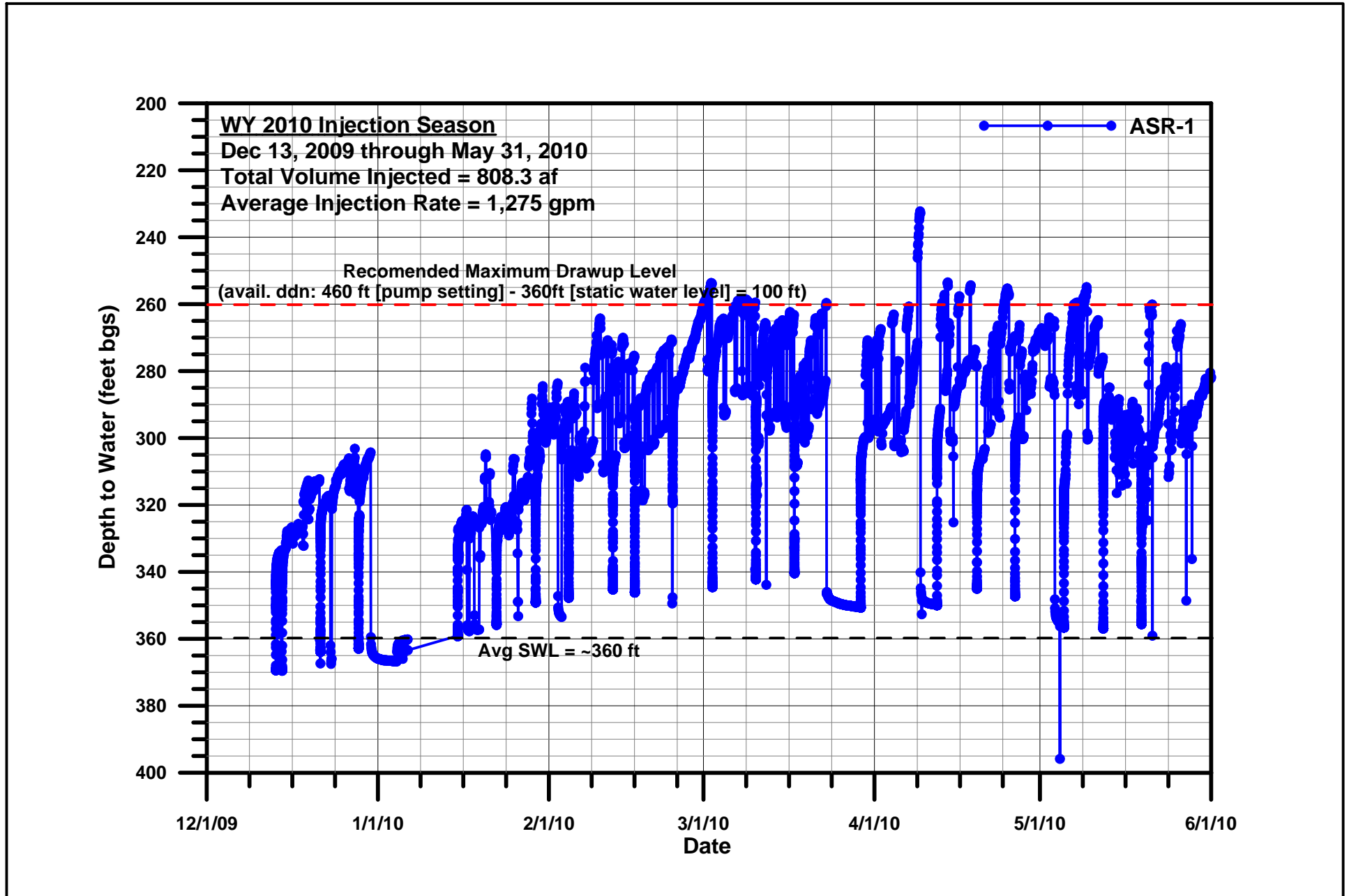
Pump Assembly Notes:

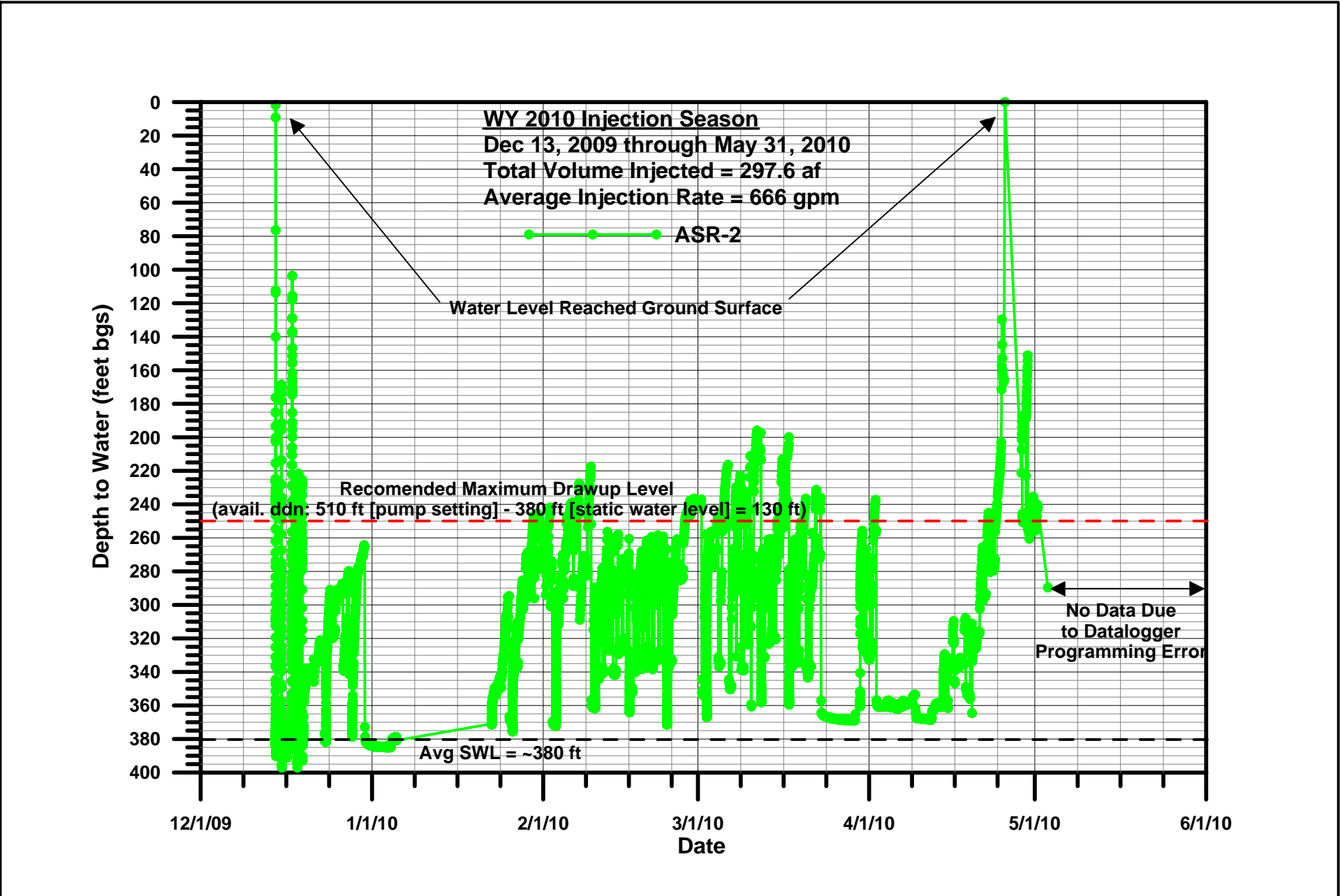
Hp: 600  
 Bowls: 16ENL, 7 stage  
 Col. Pipe Dia: 12"  
 Col. Pipe Length: 20'  
 Assy. Type: Water Flush/Enclosed Shaft  
 Baski FCV Setting: 460' - 470'  
 Top of Bowls: 510'  
 Bowl Length: 10.5'  
 Suction Length: 10'  
 Intake: 540.5'

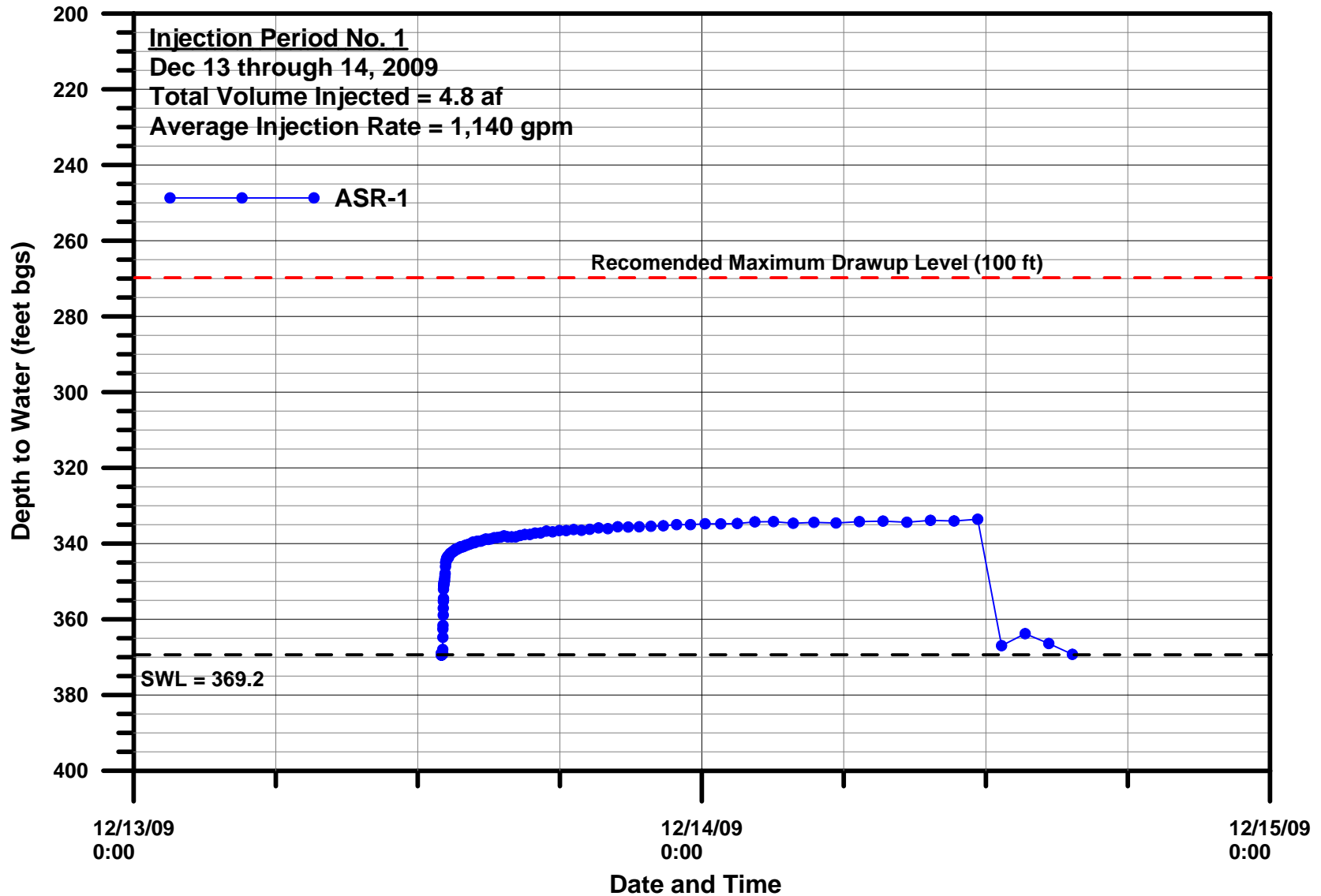
NOT TO SCALE

ASR-2 AS BUILT SCHEMATIC  
 FIGURE 4



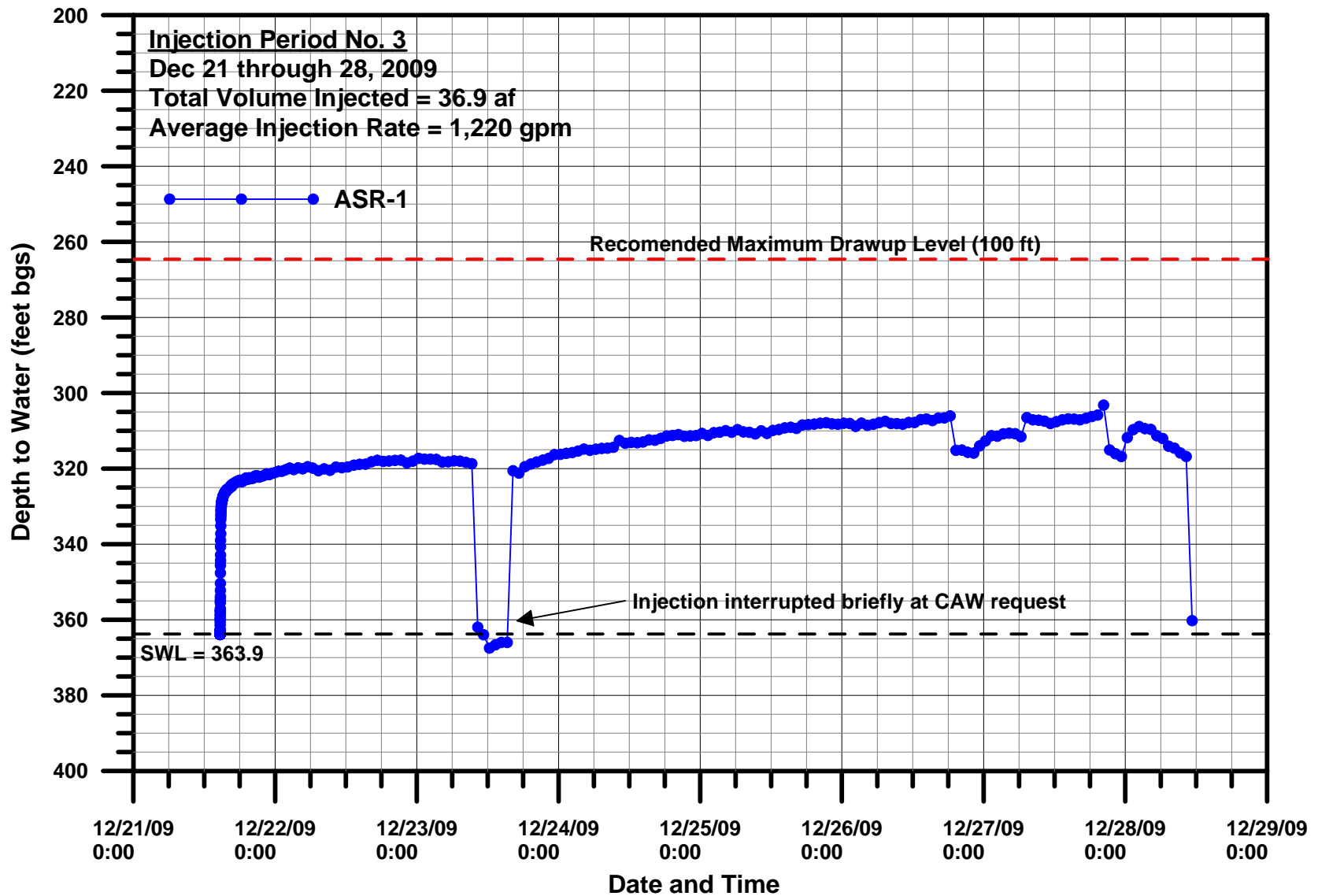


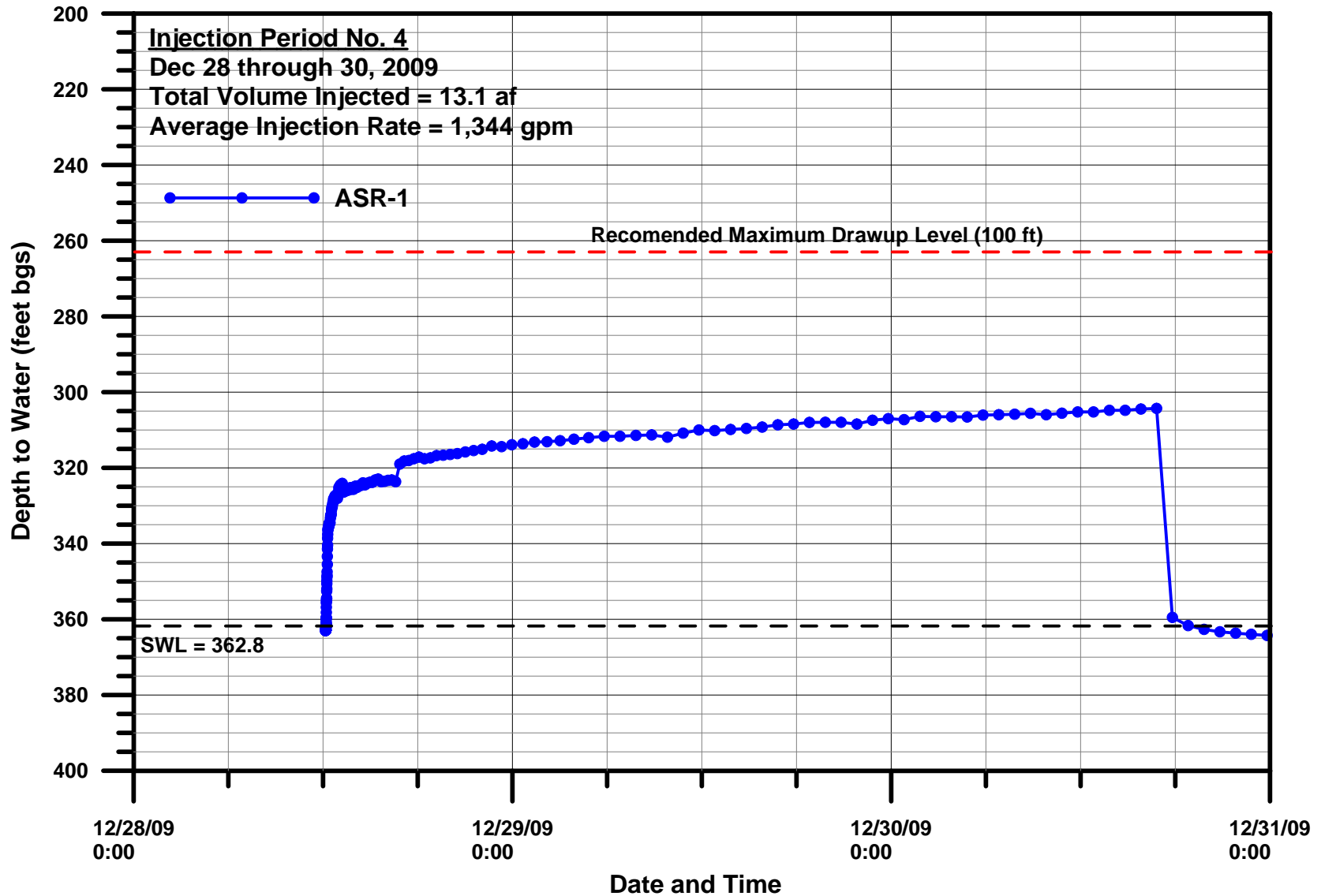


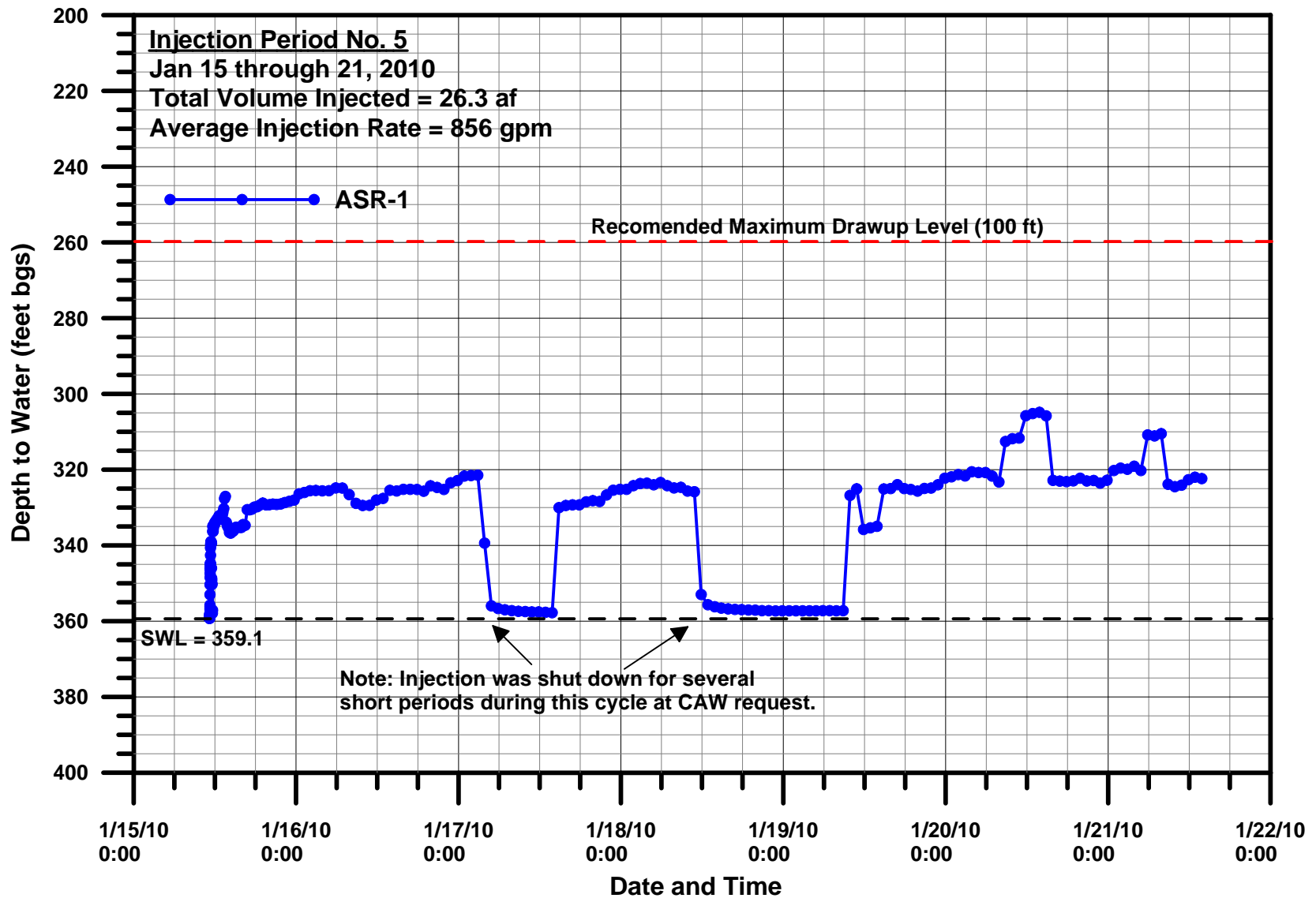


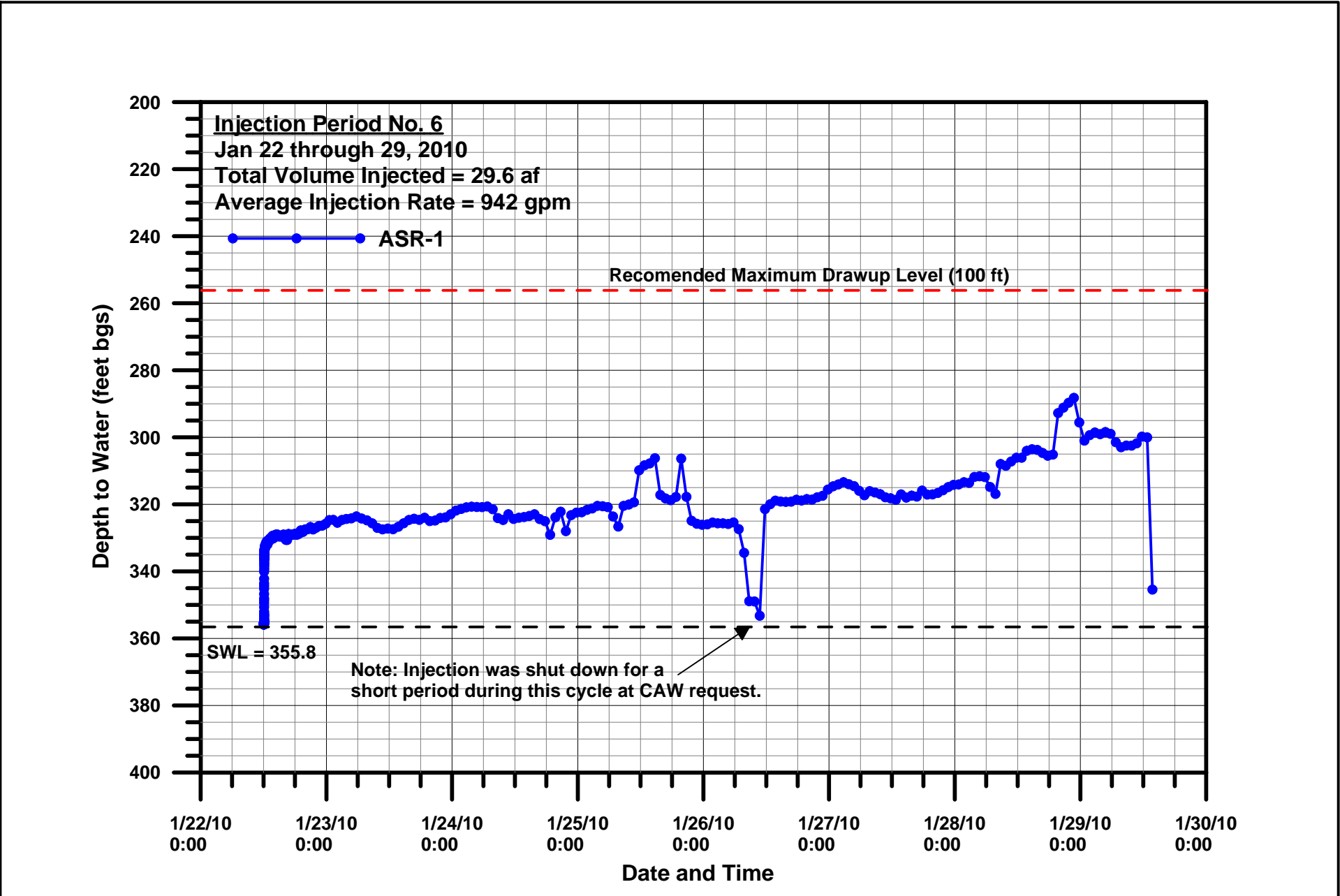


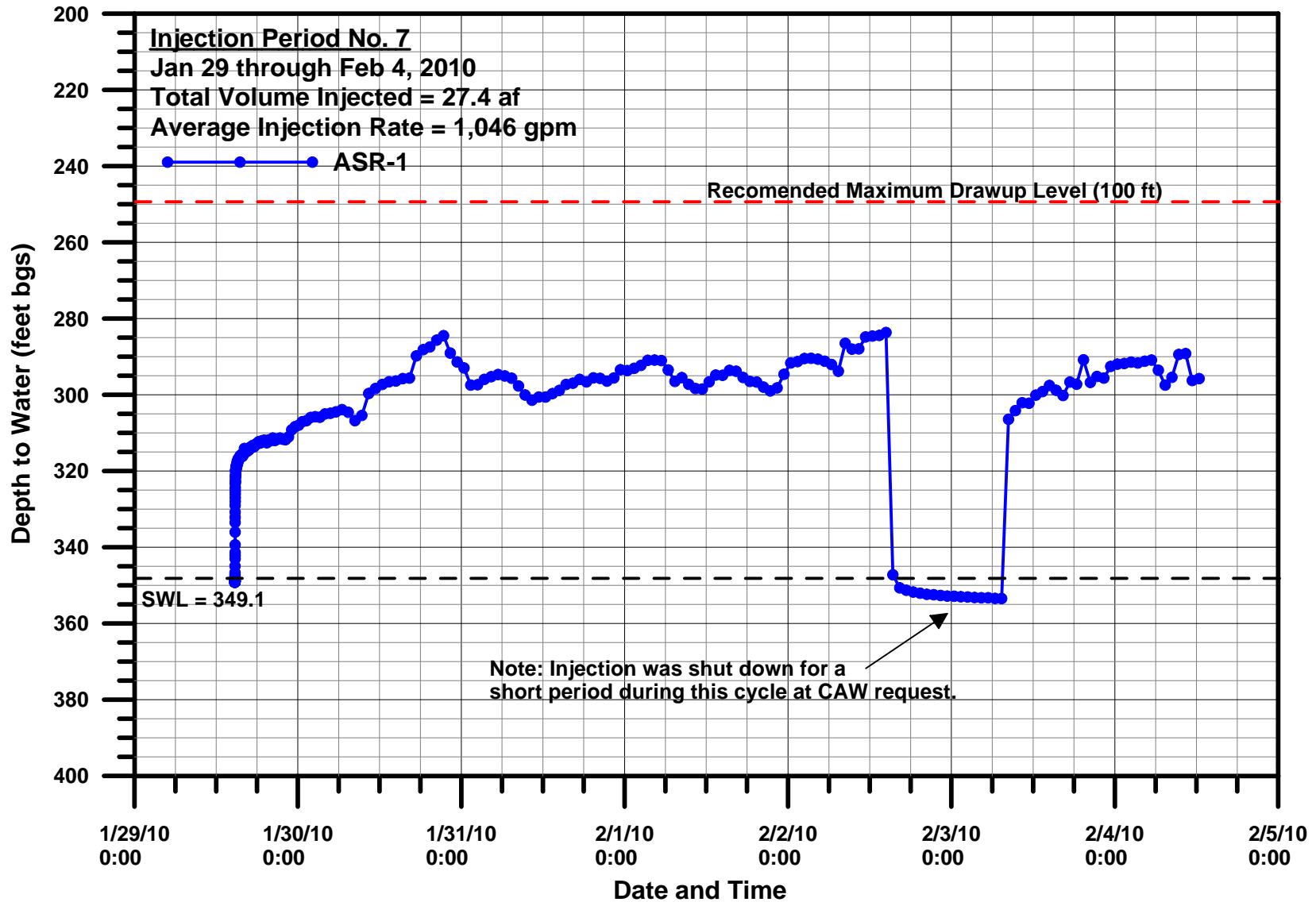


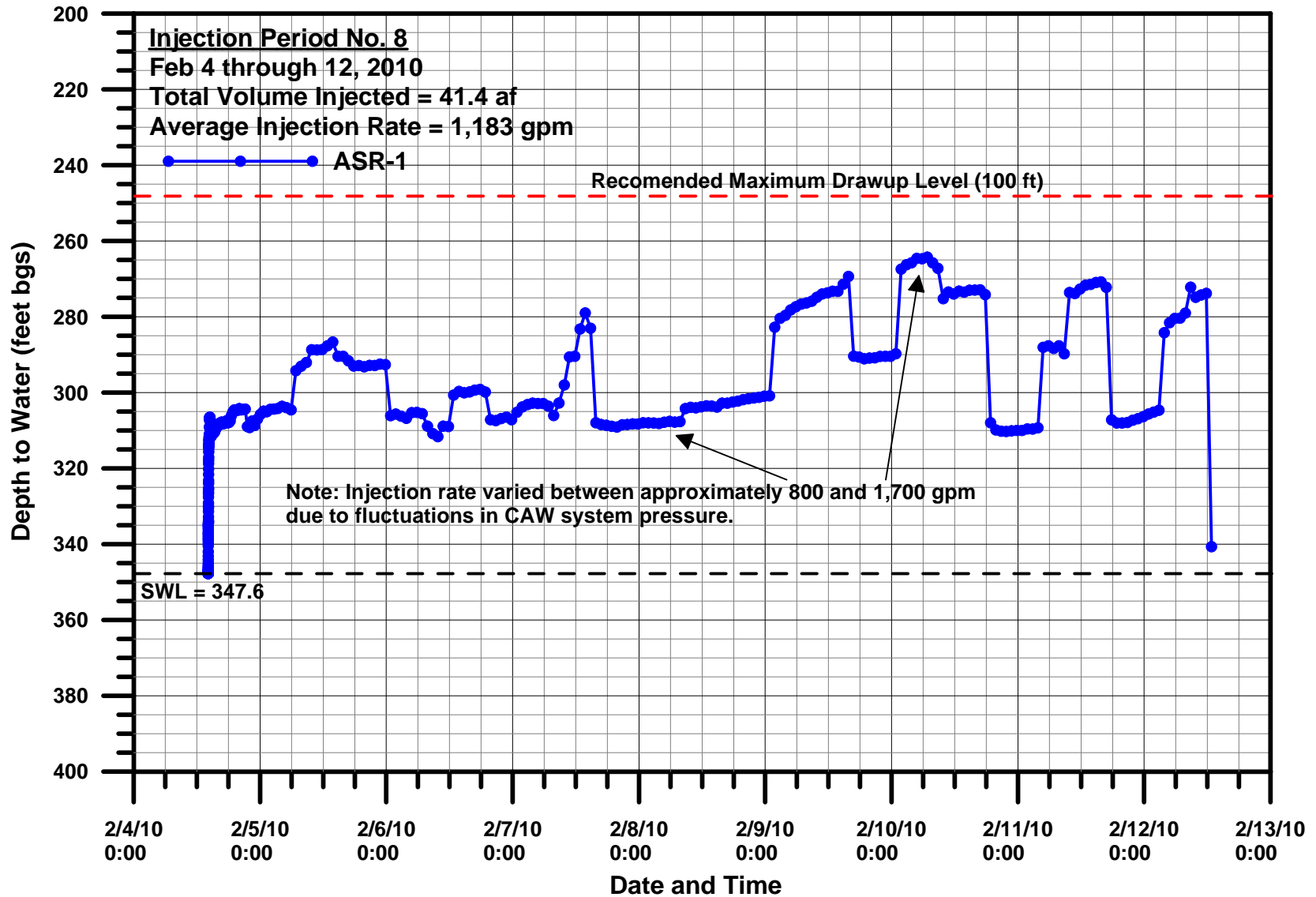


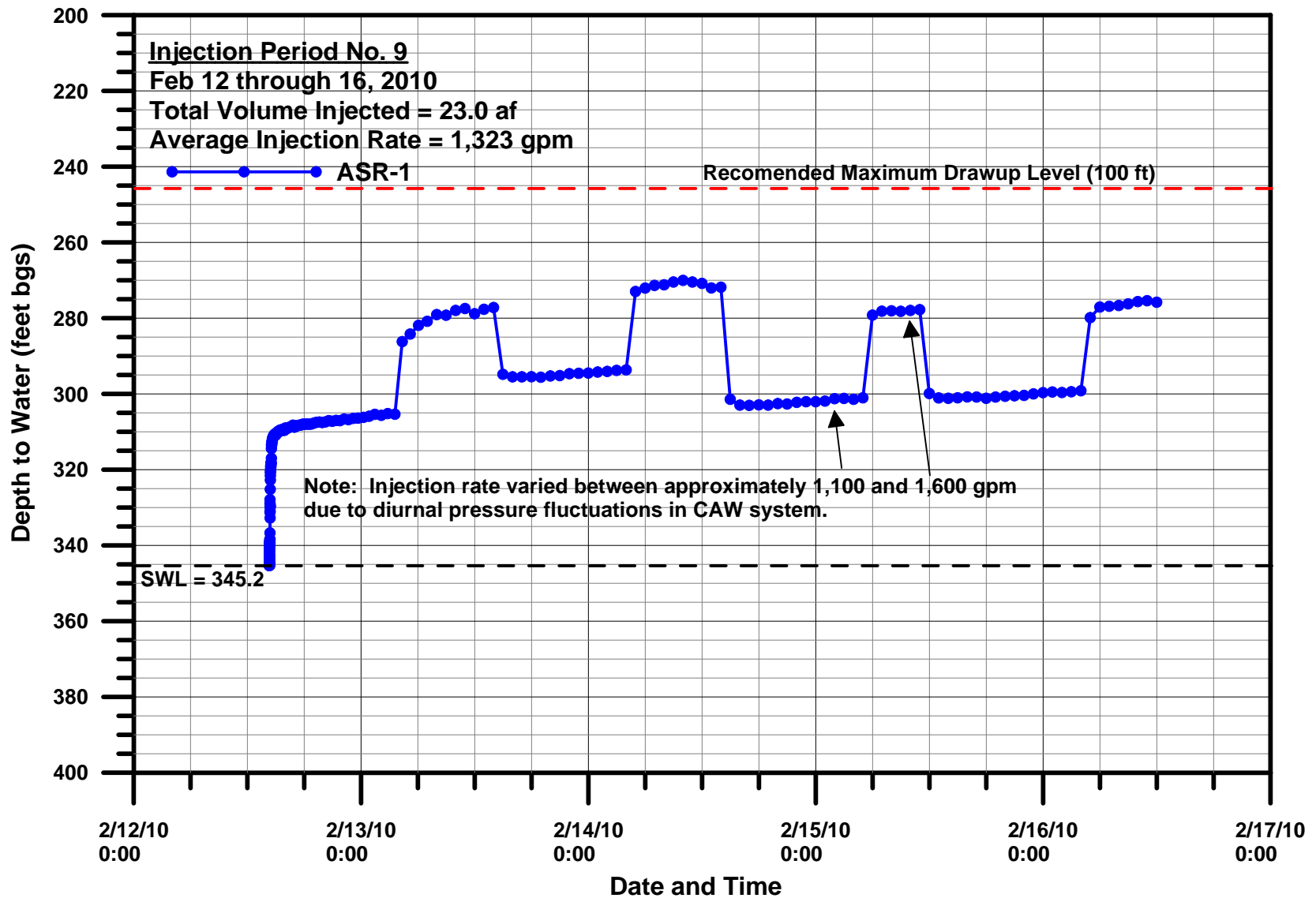




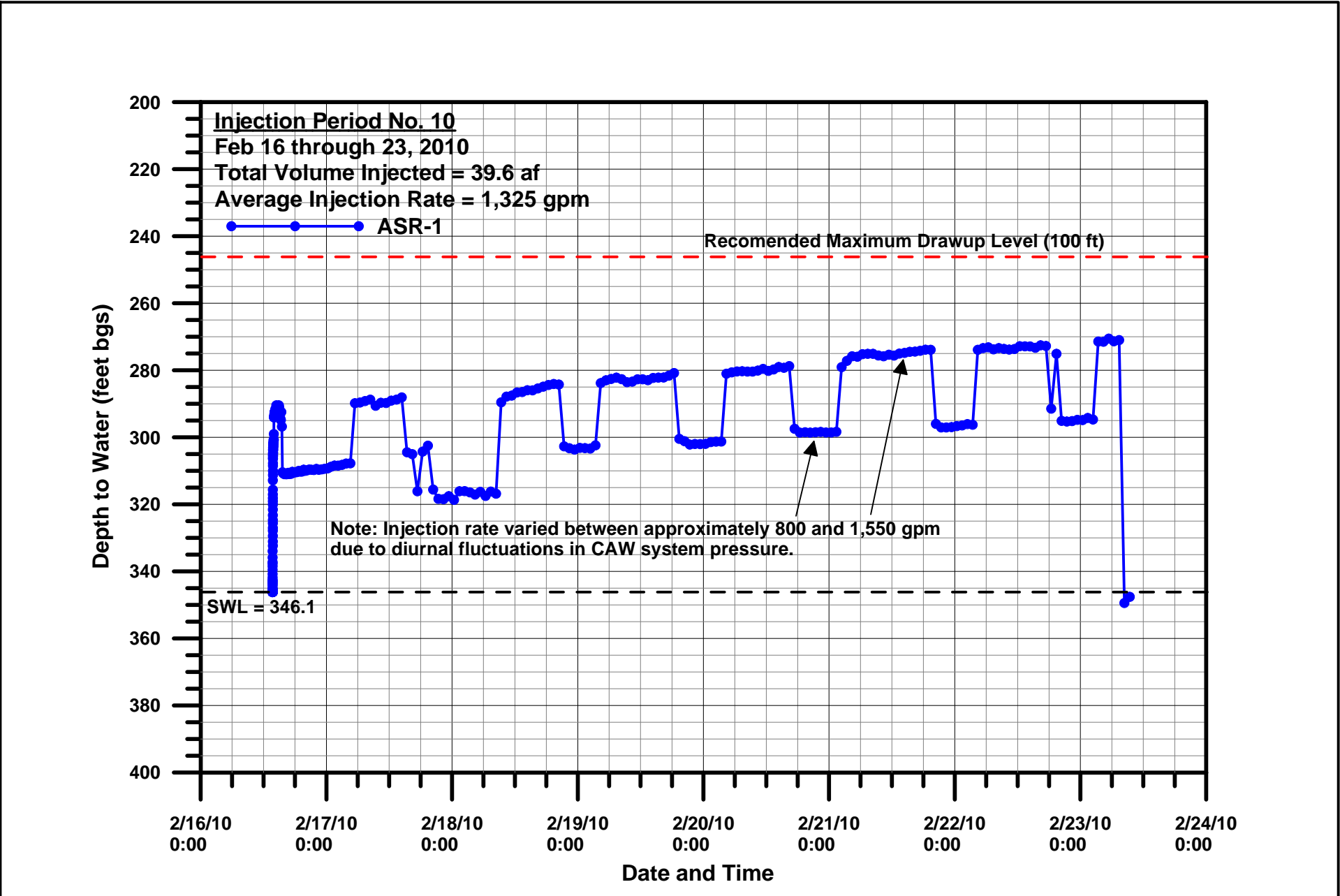


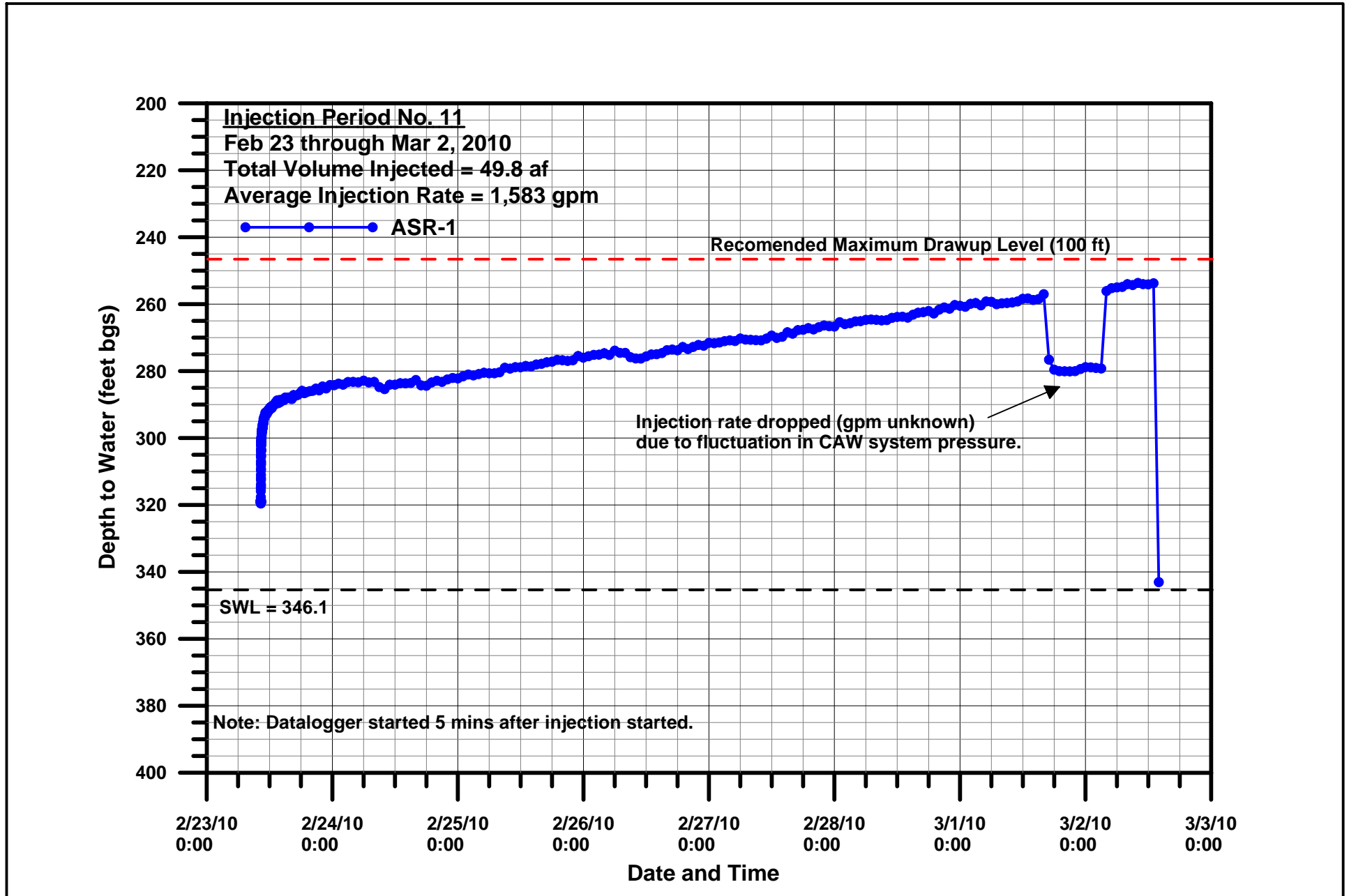


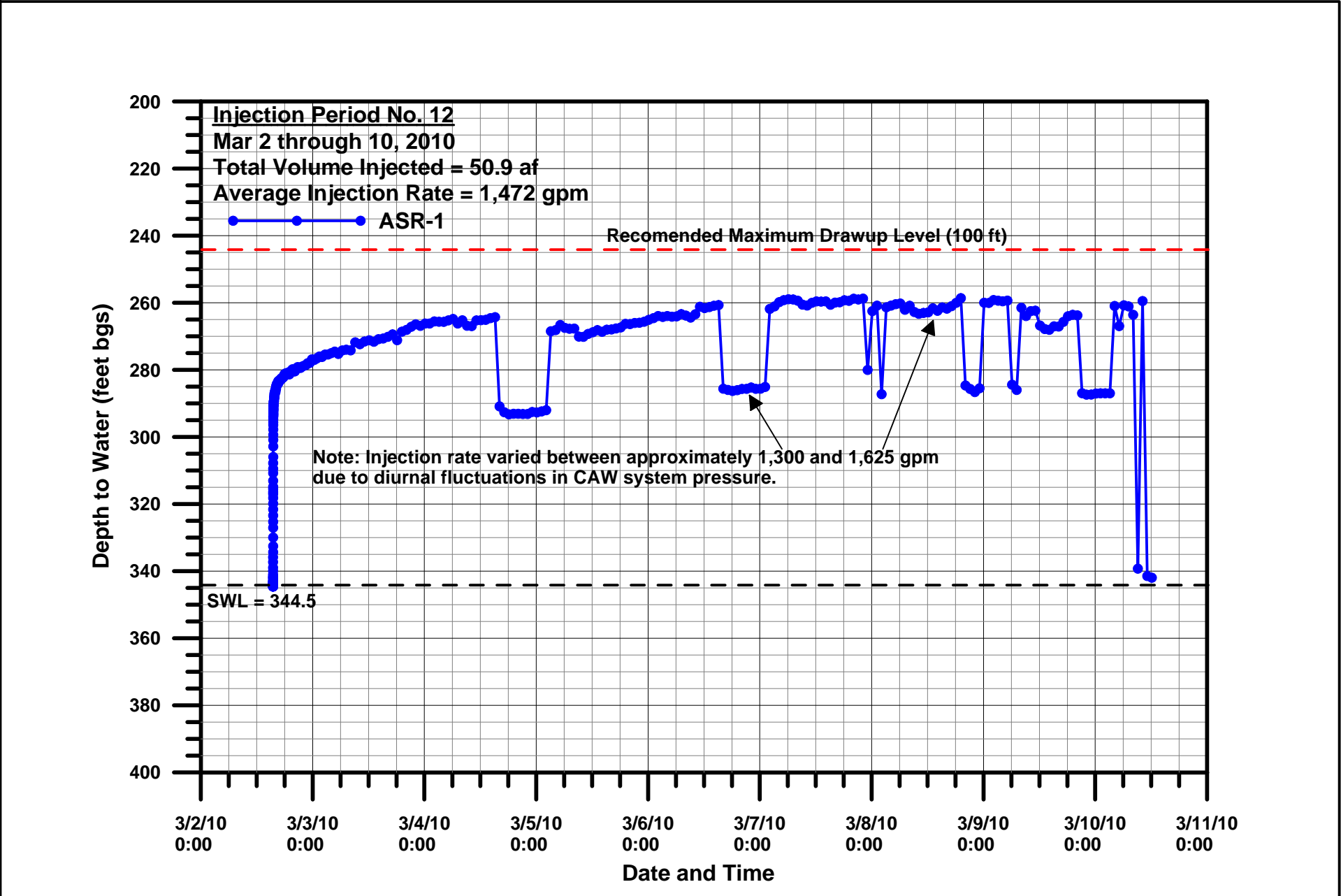


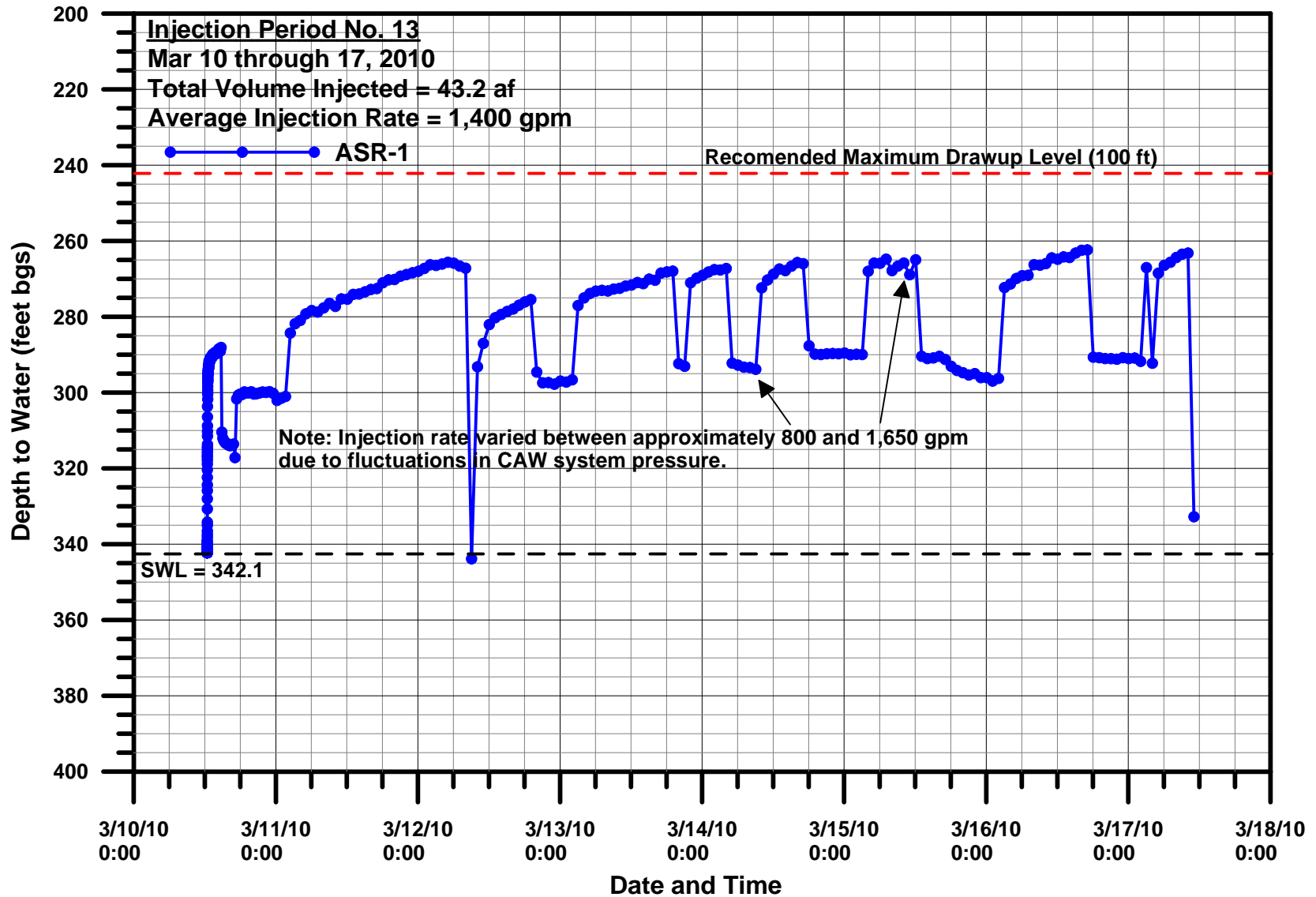


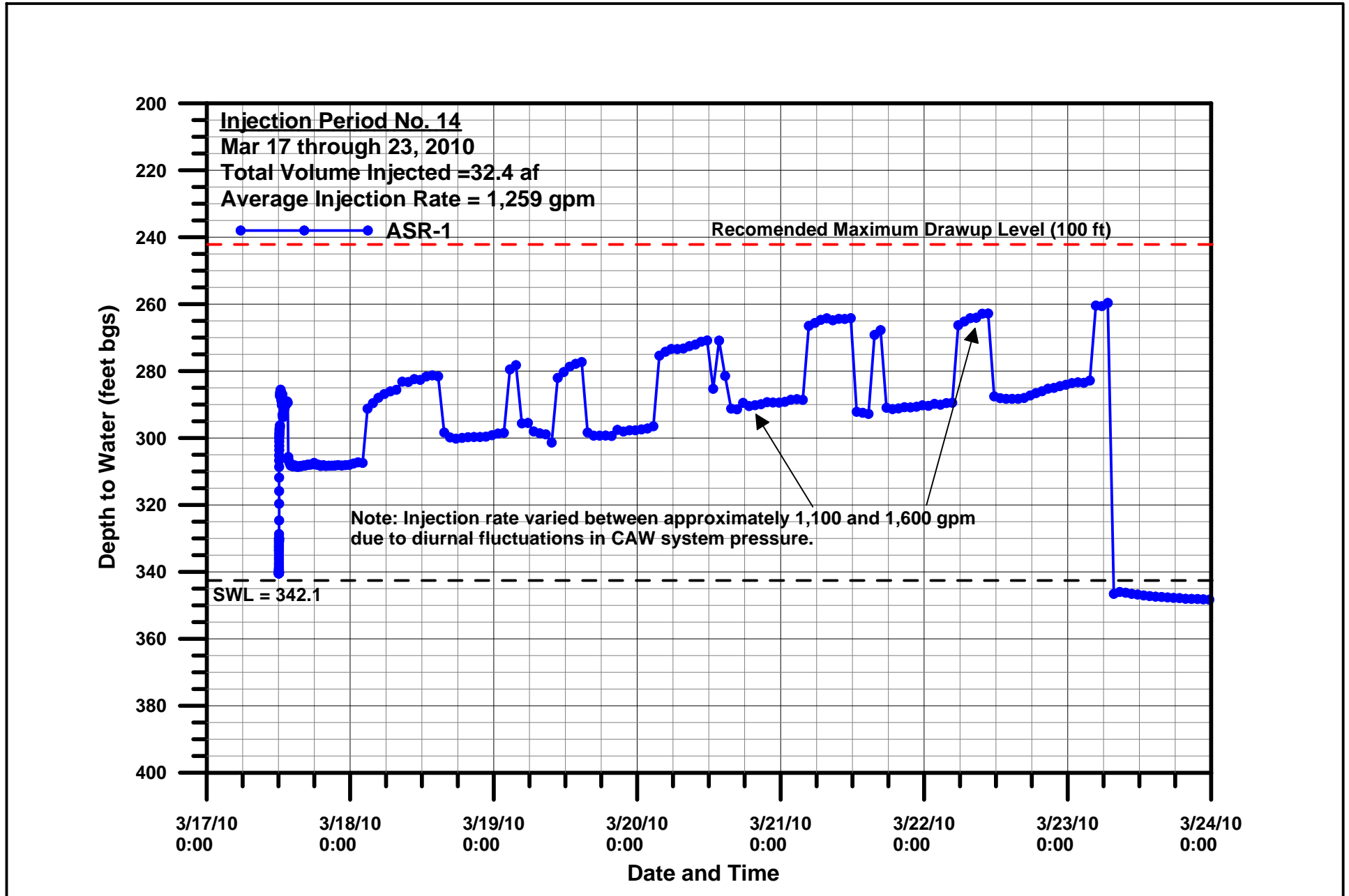


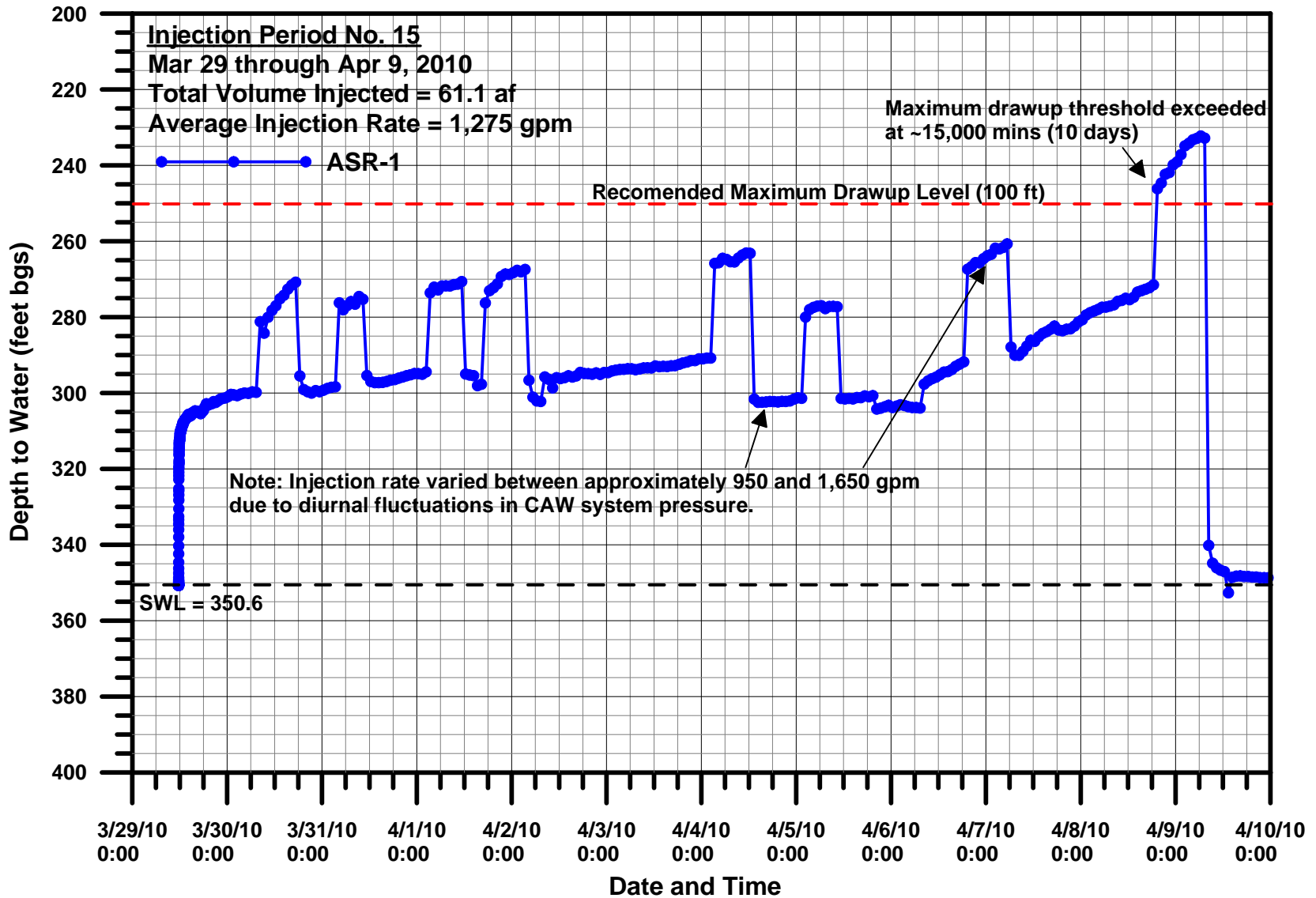


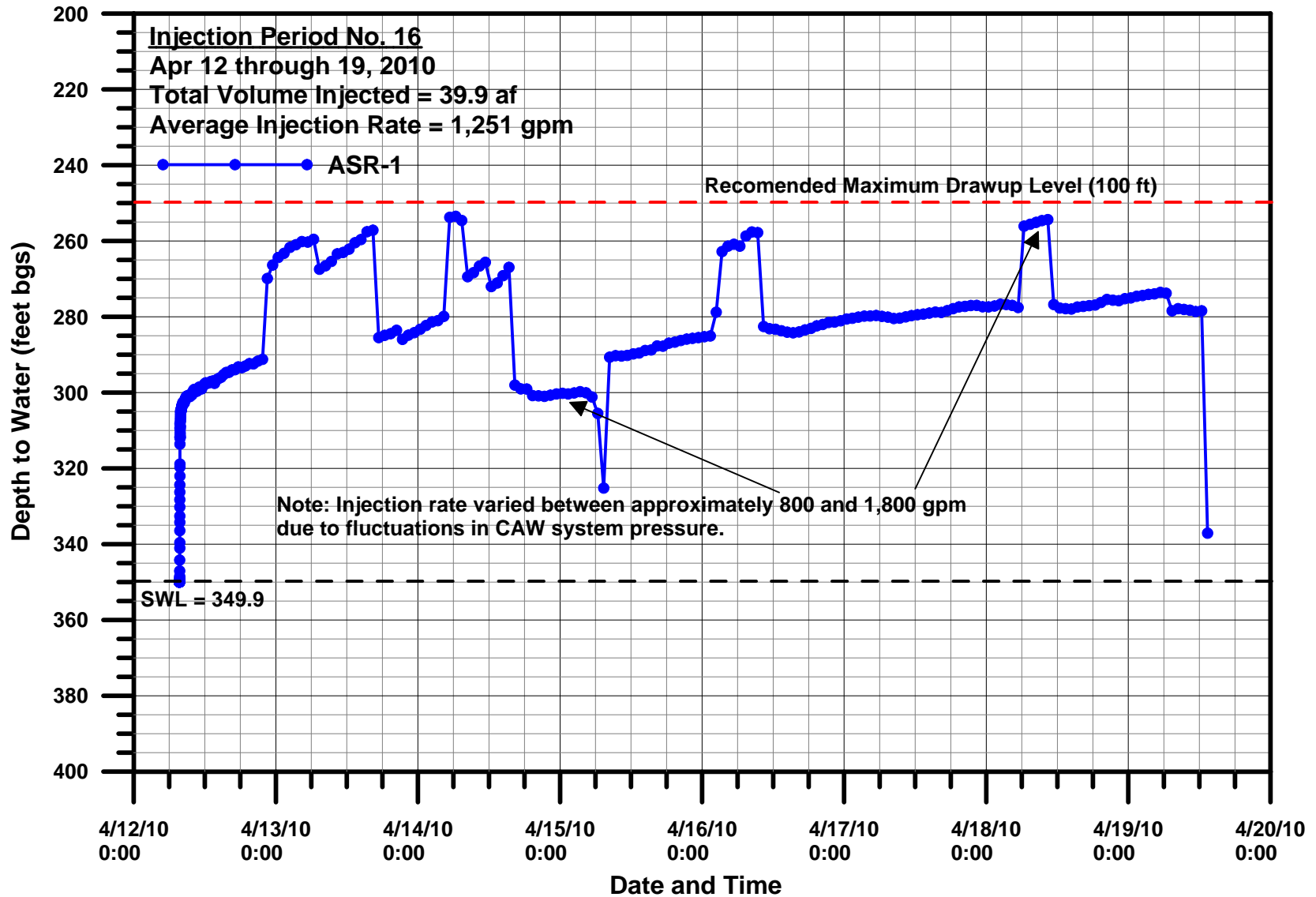


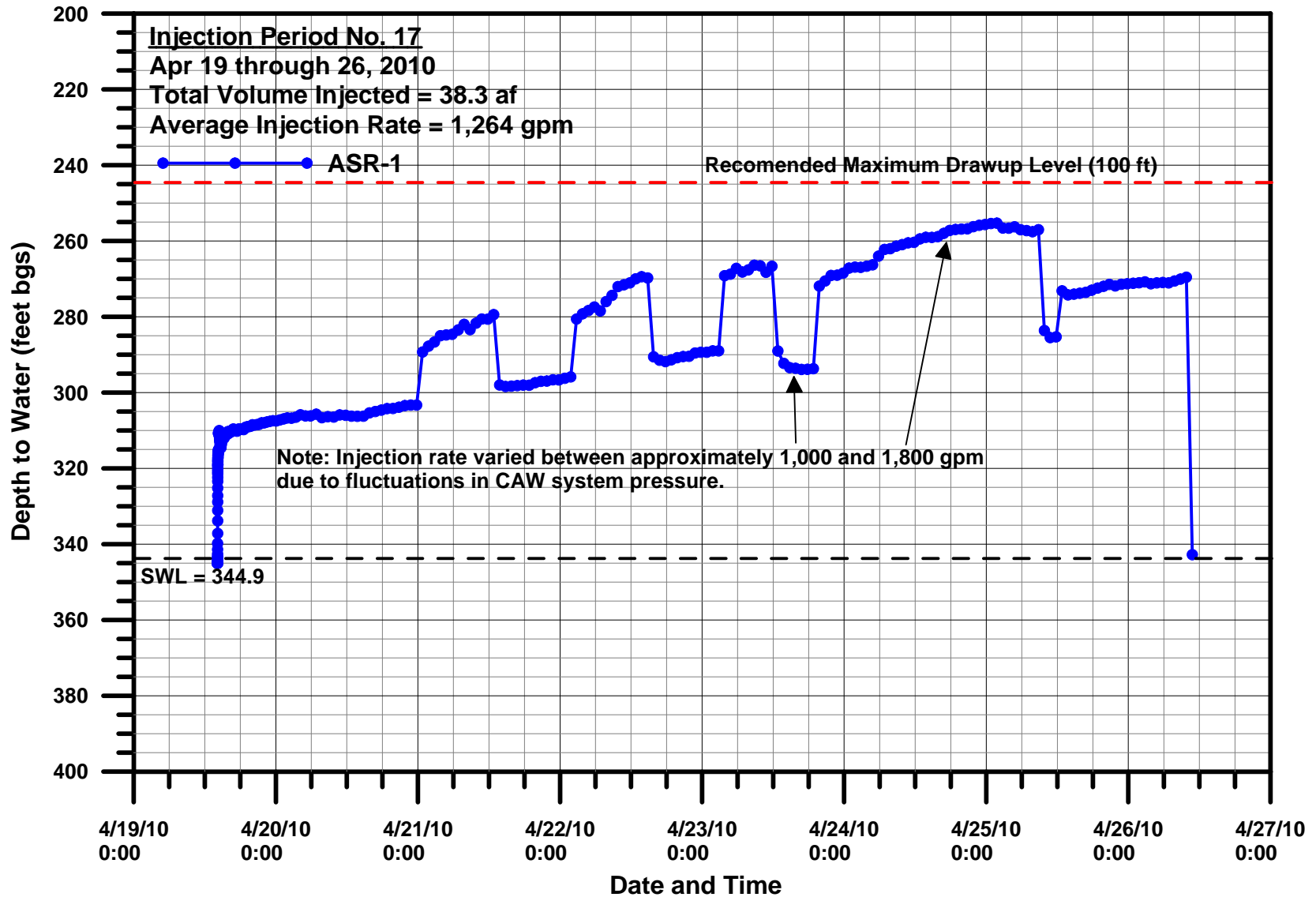




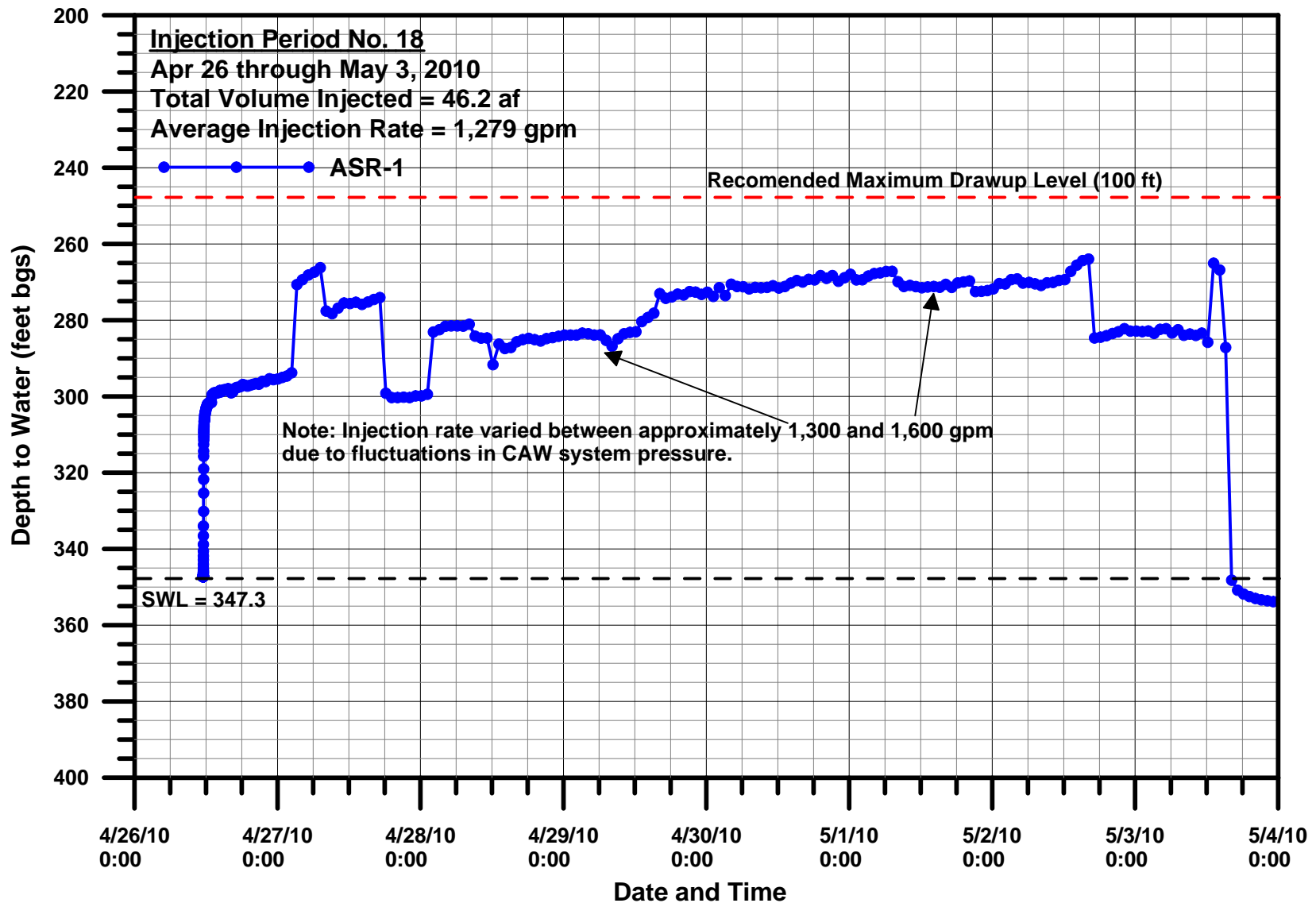


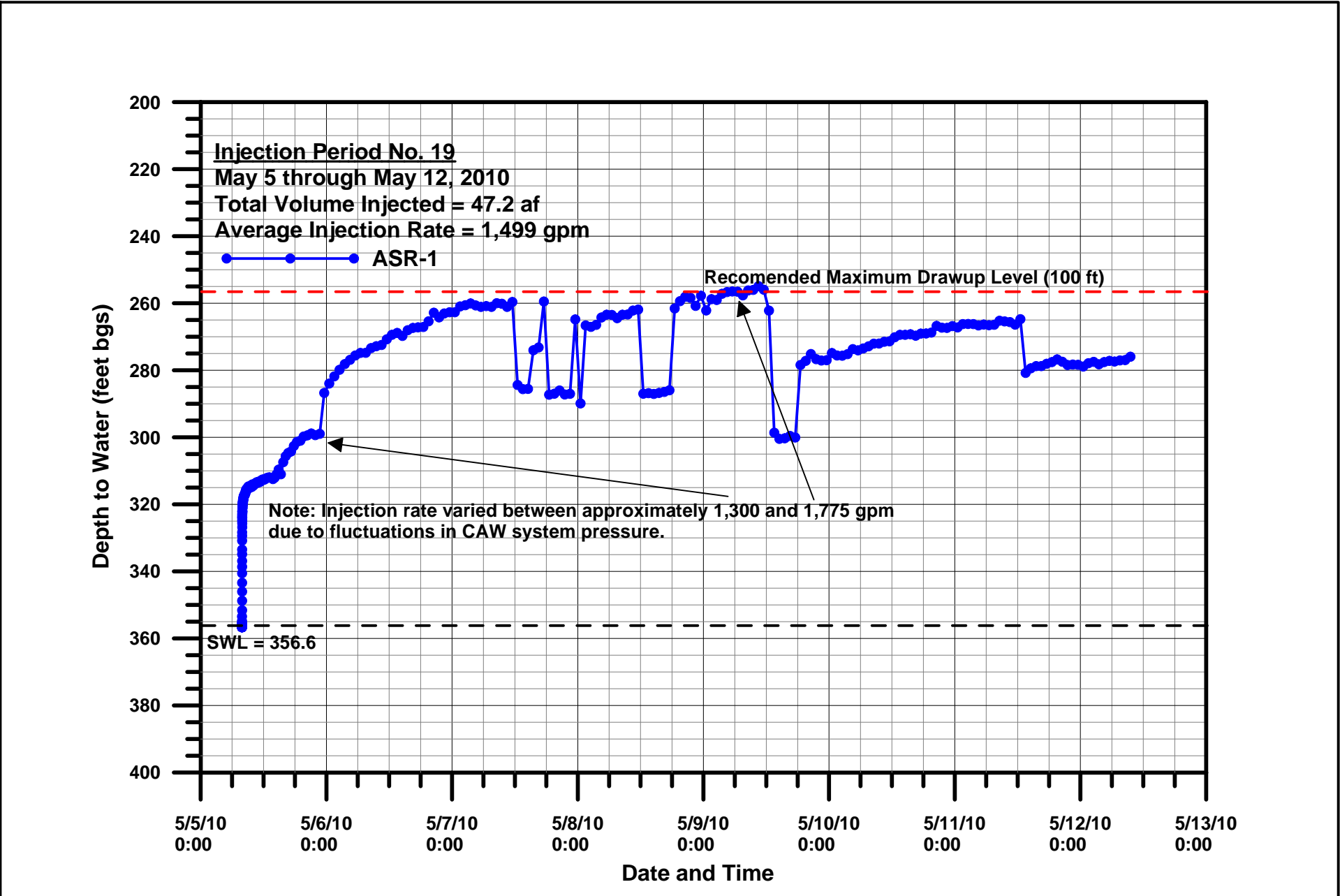


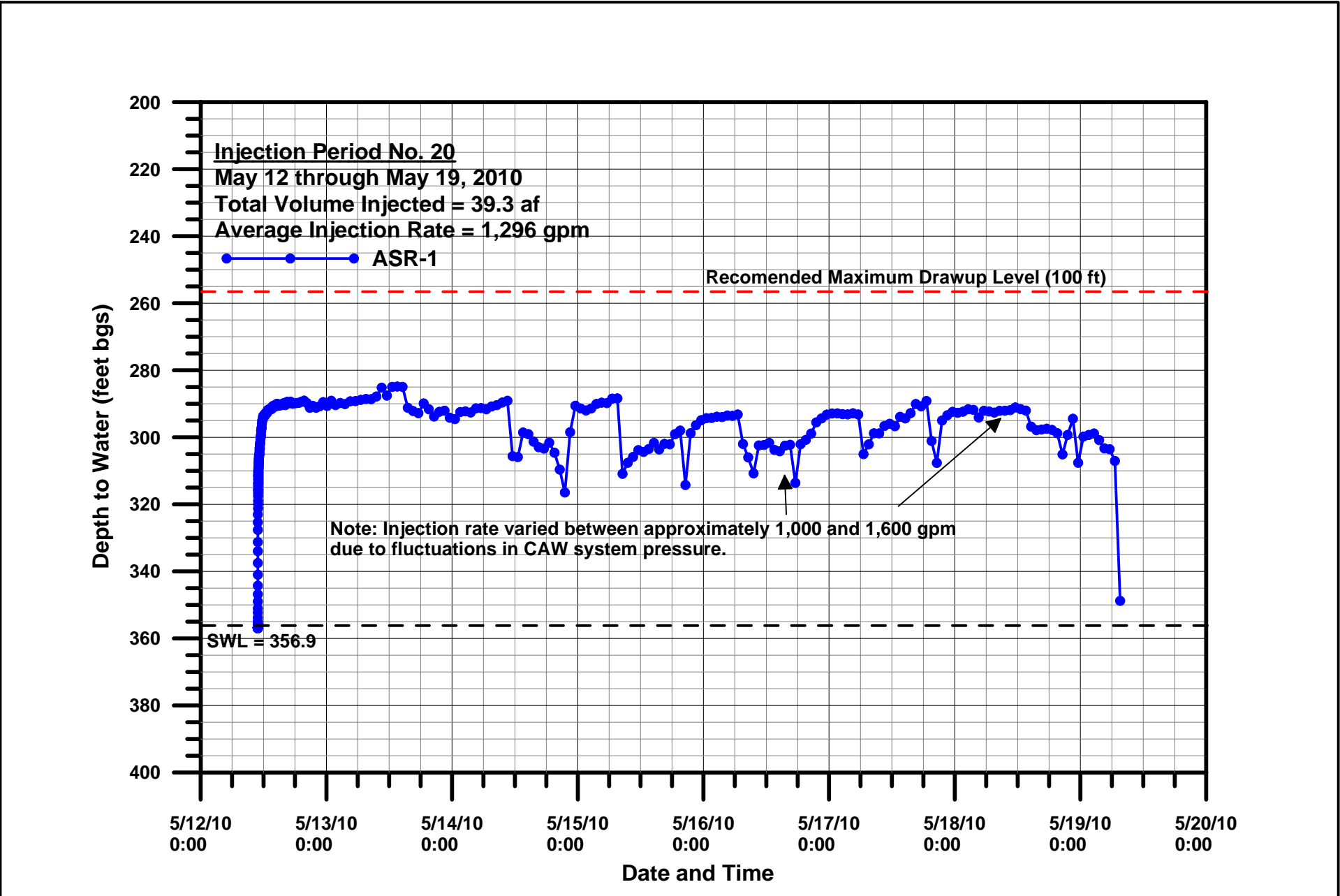


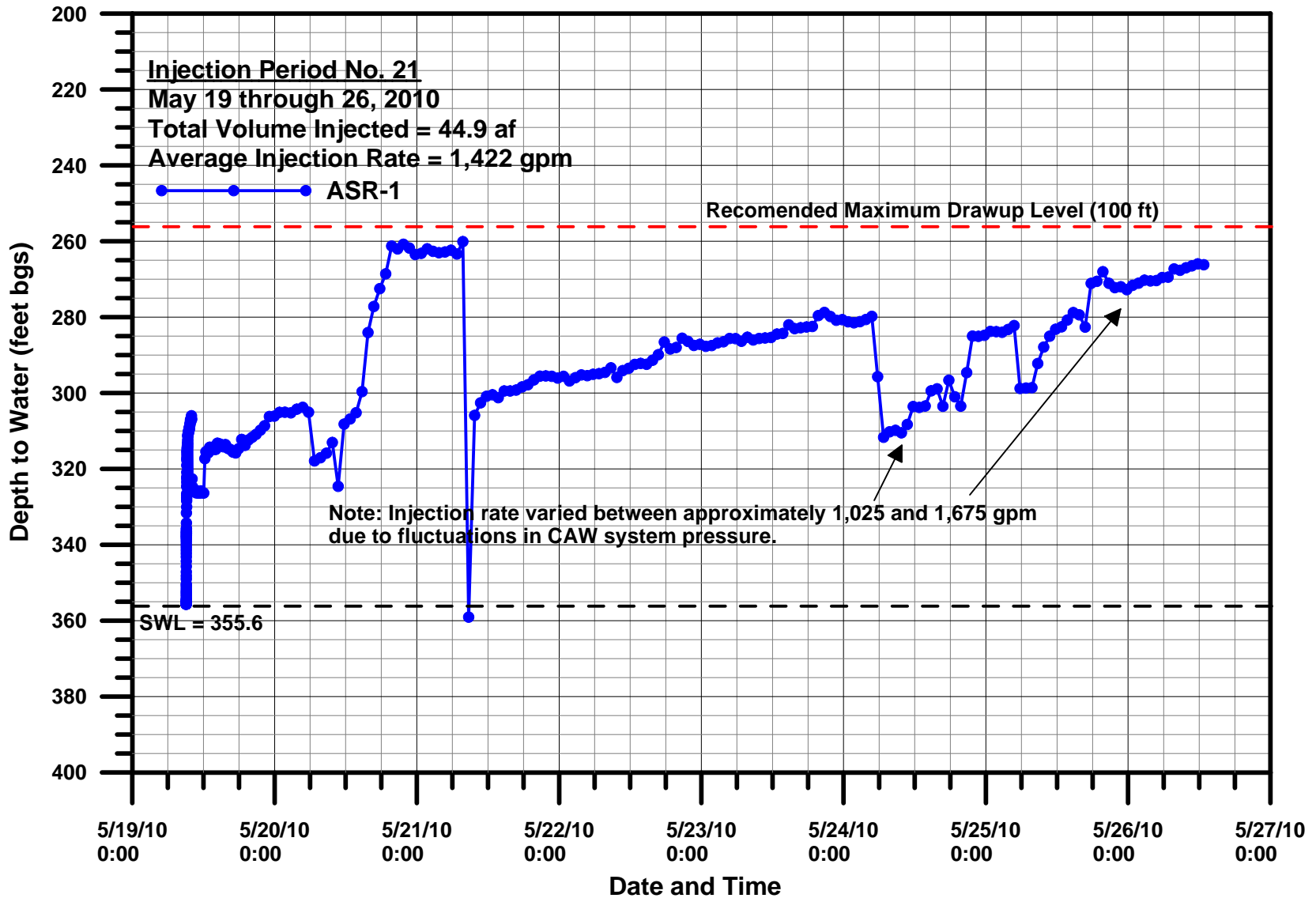


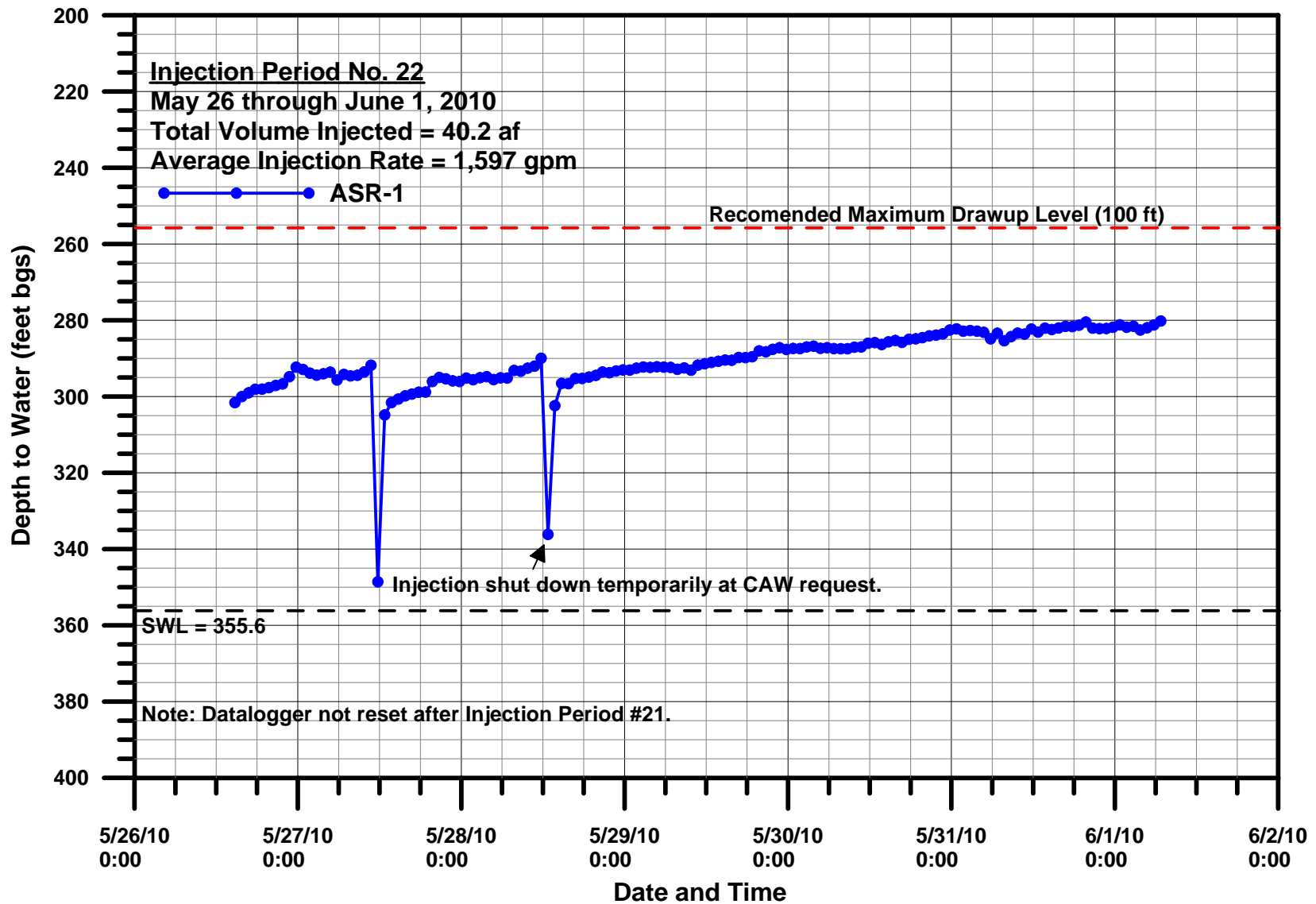


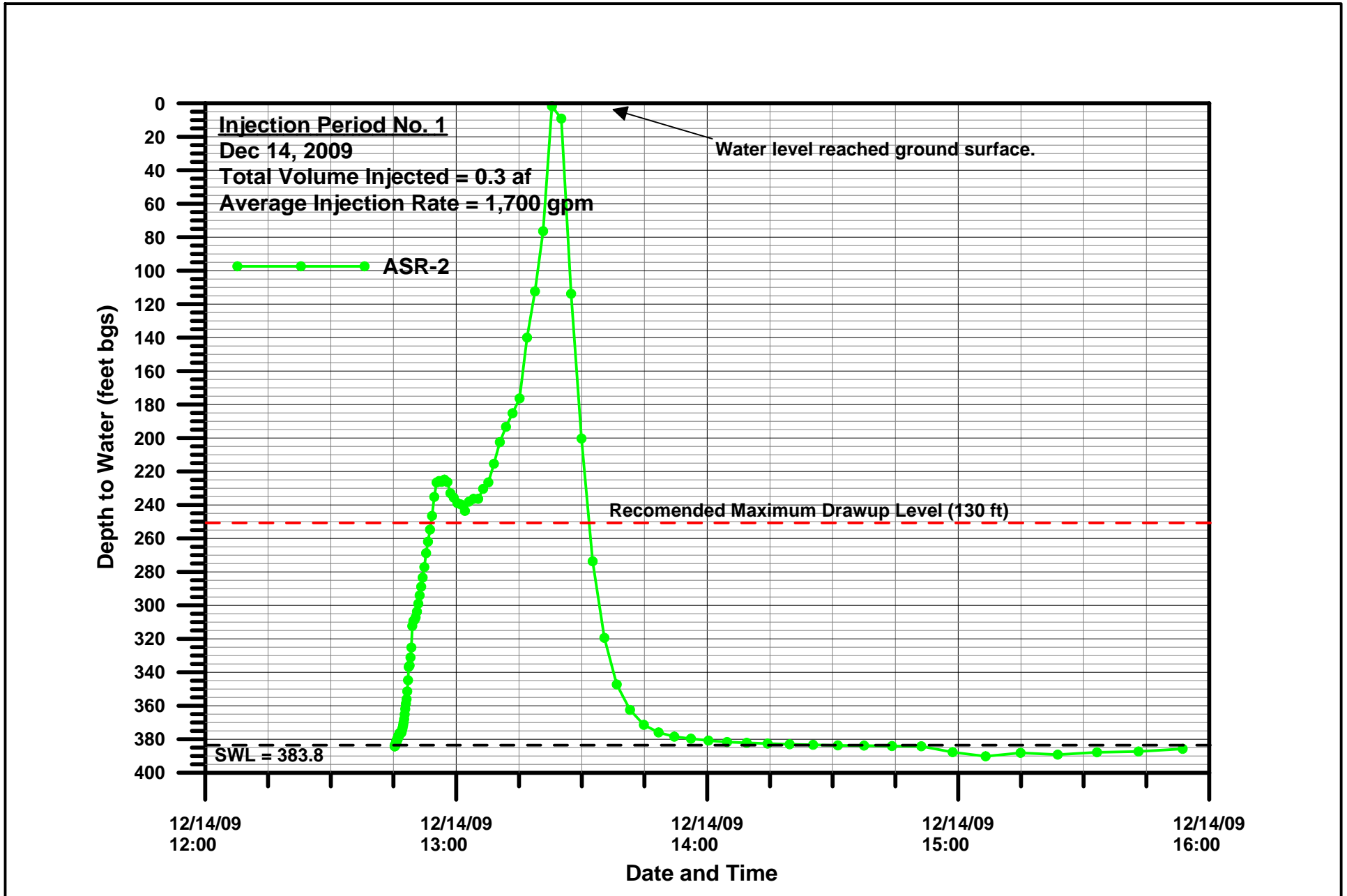


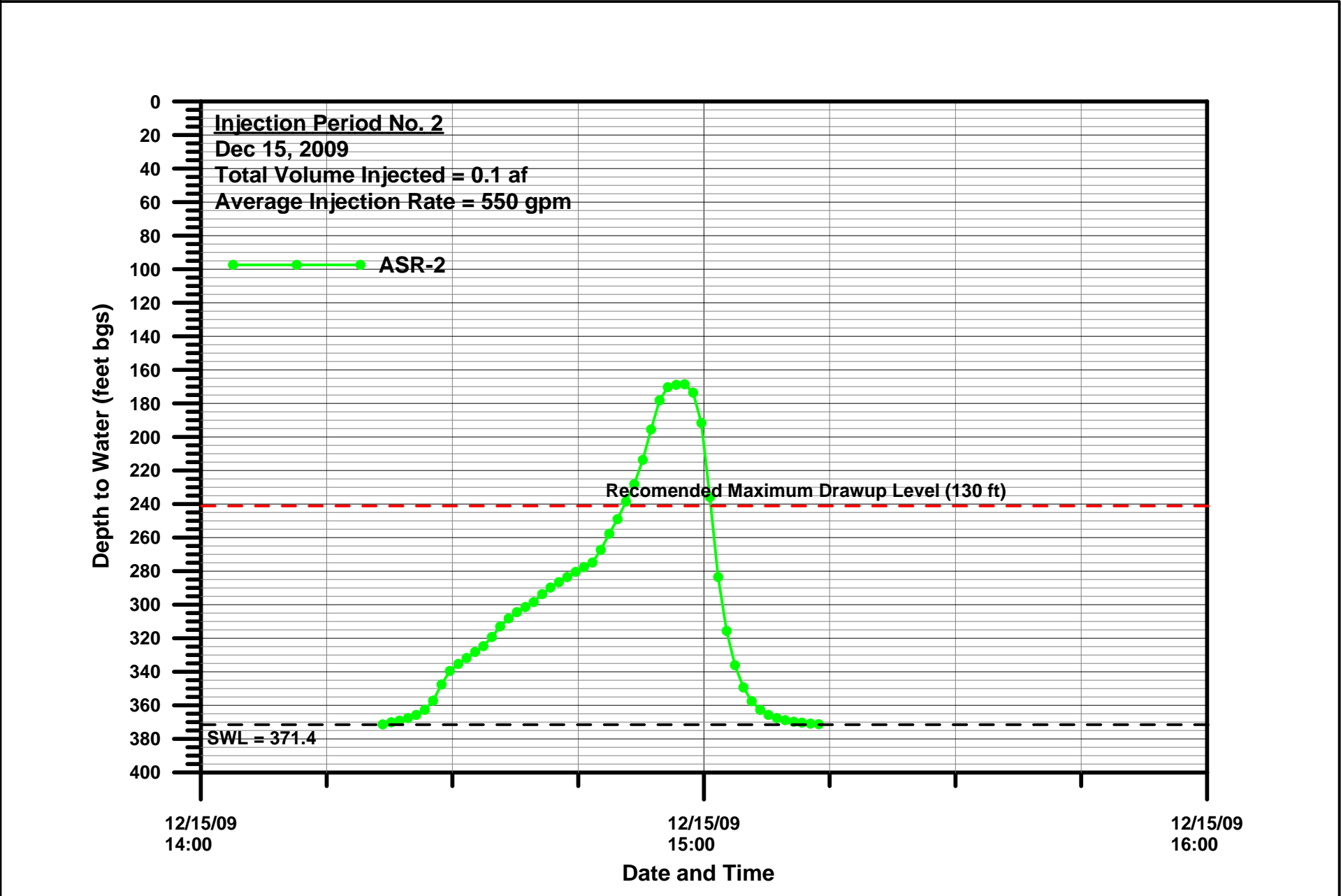


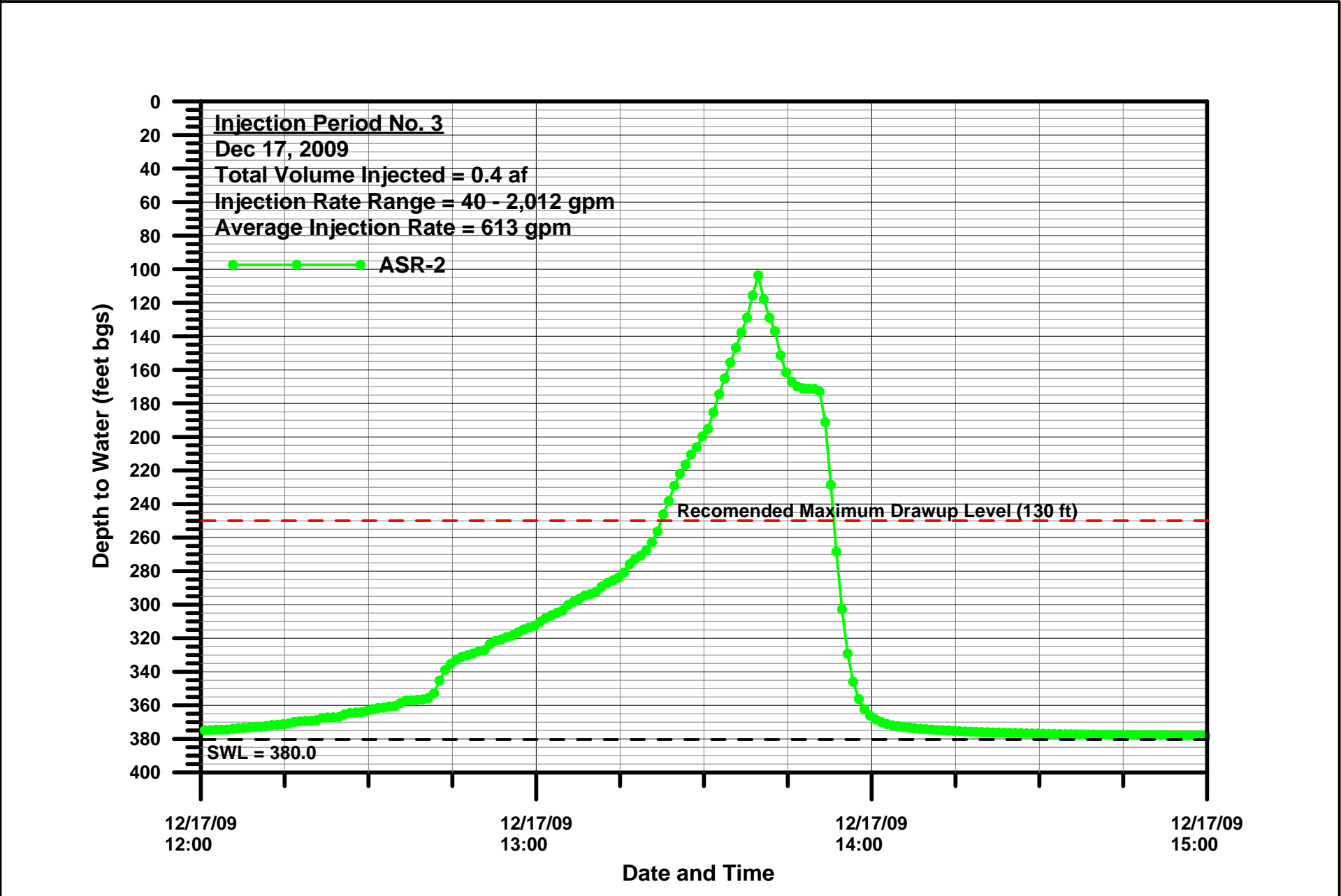




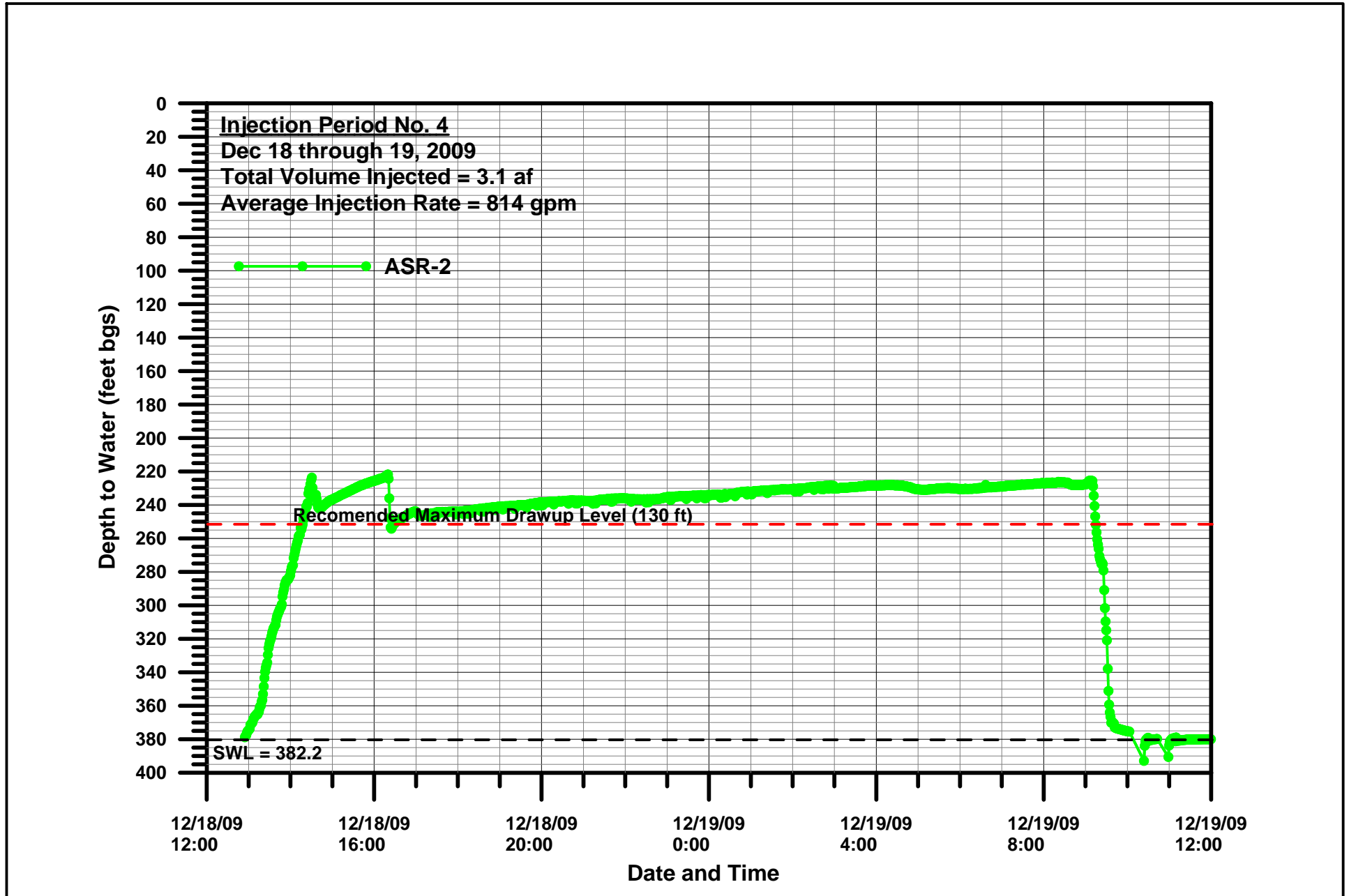


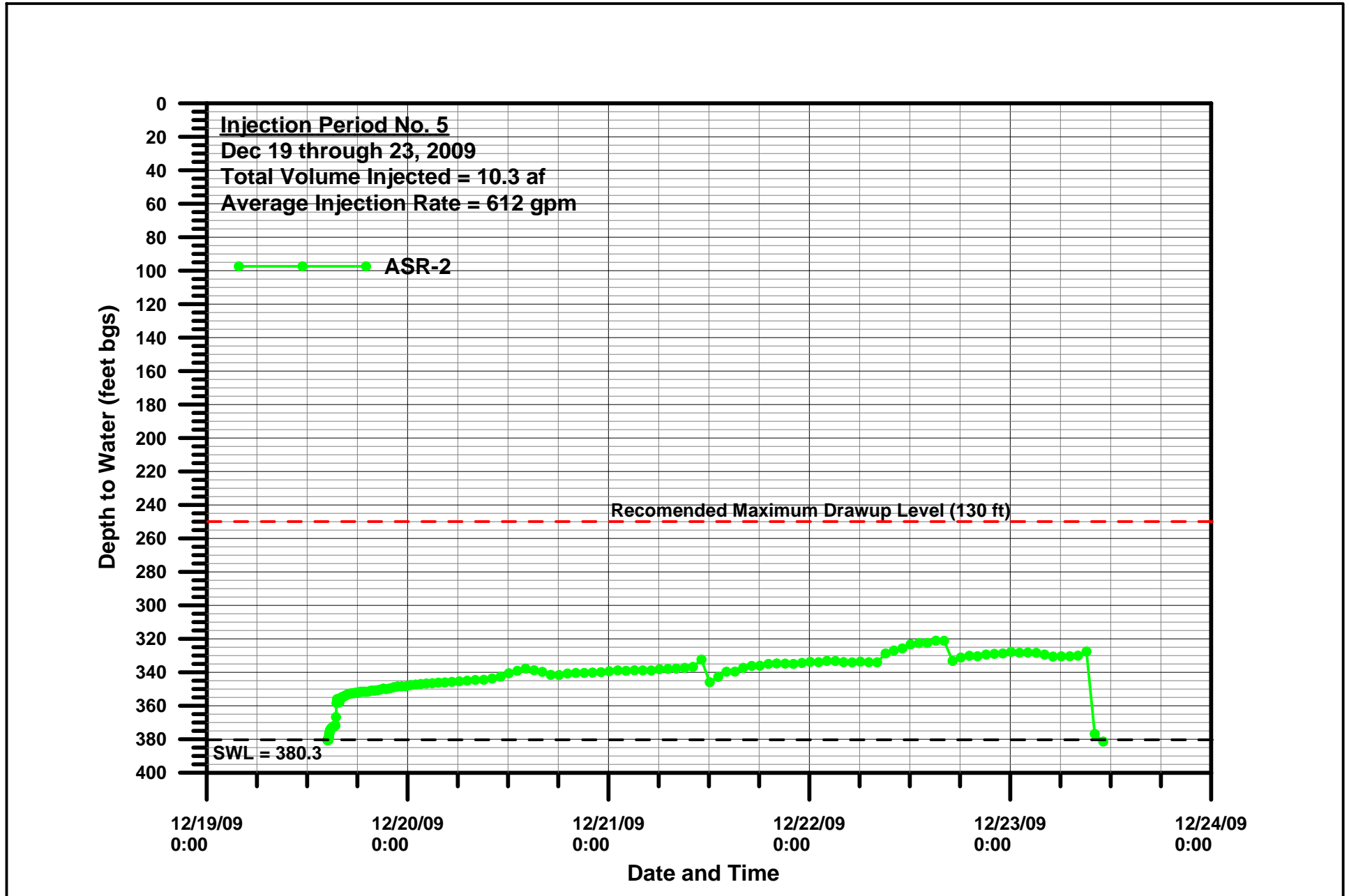


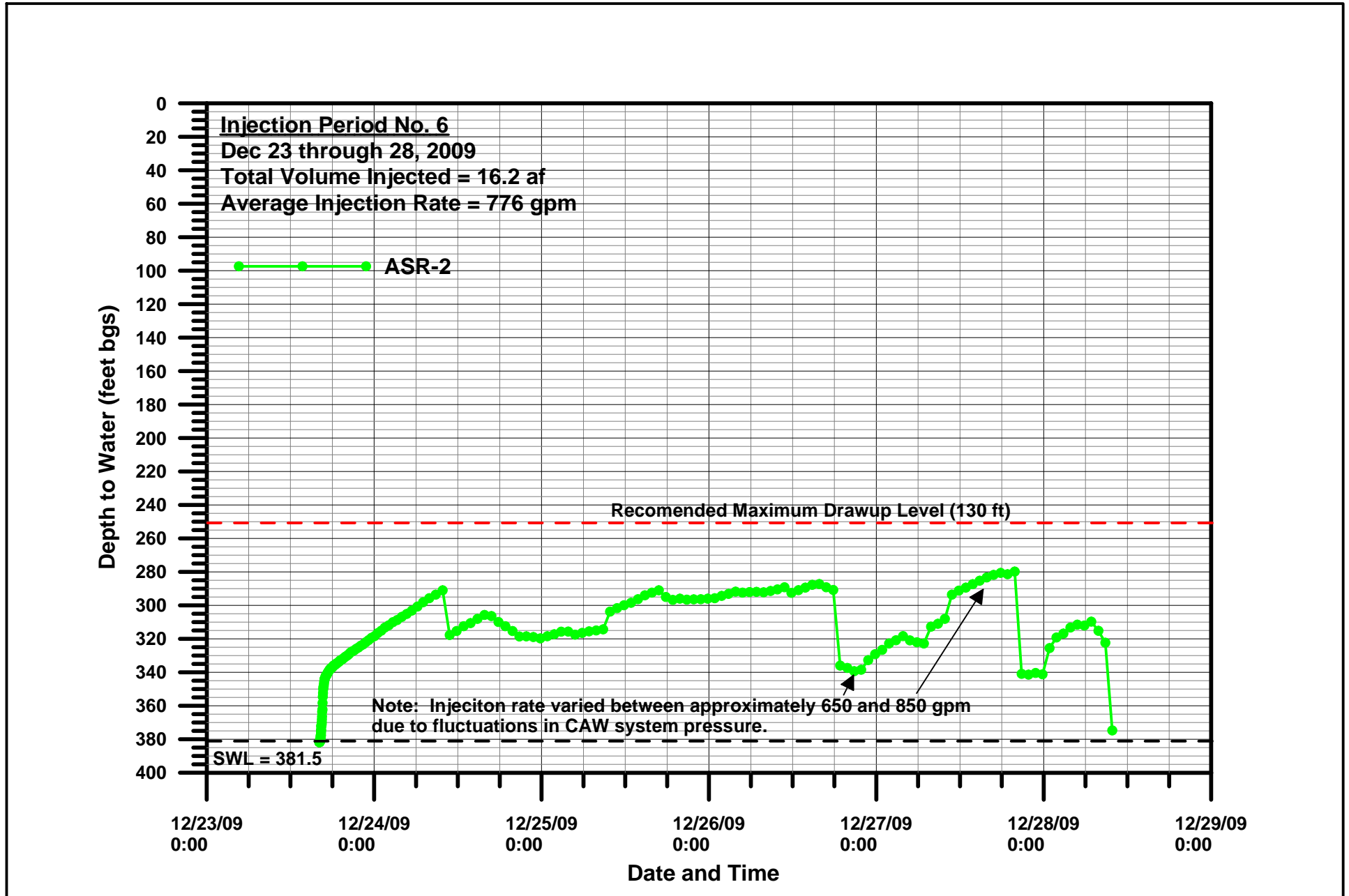




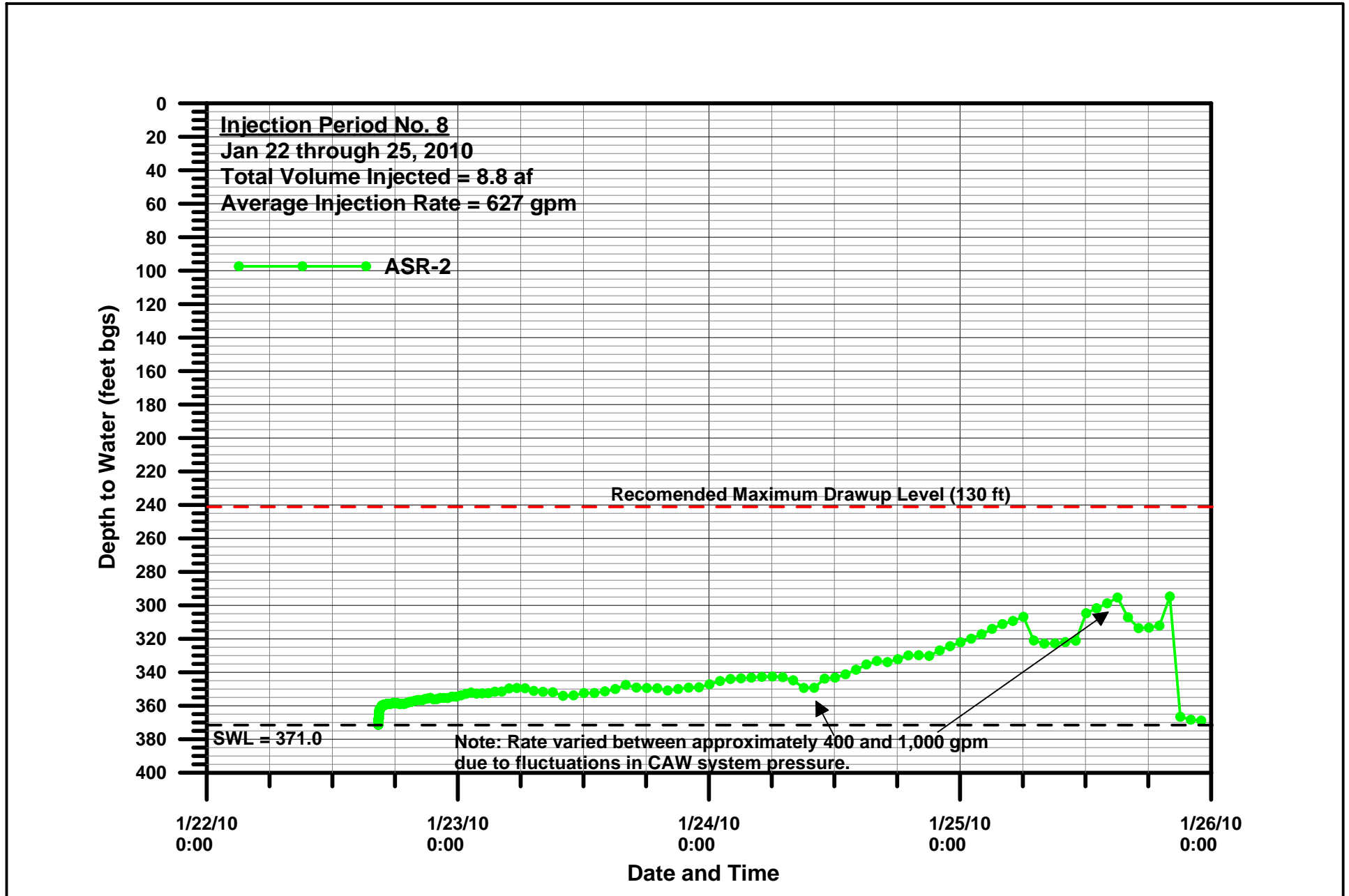


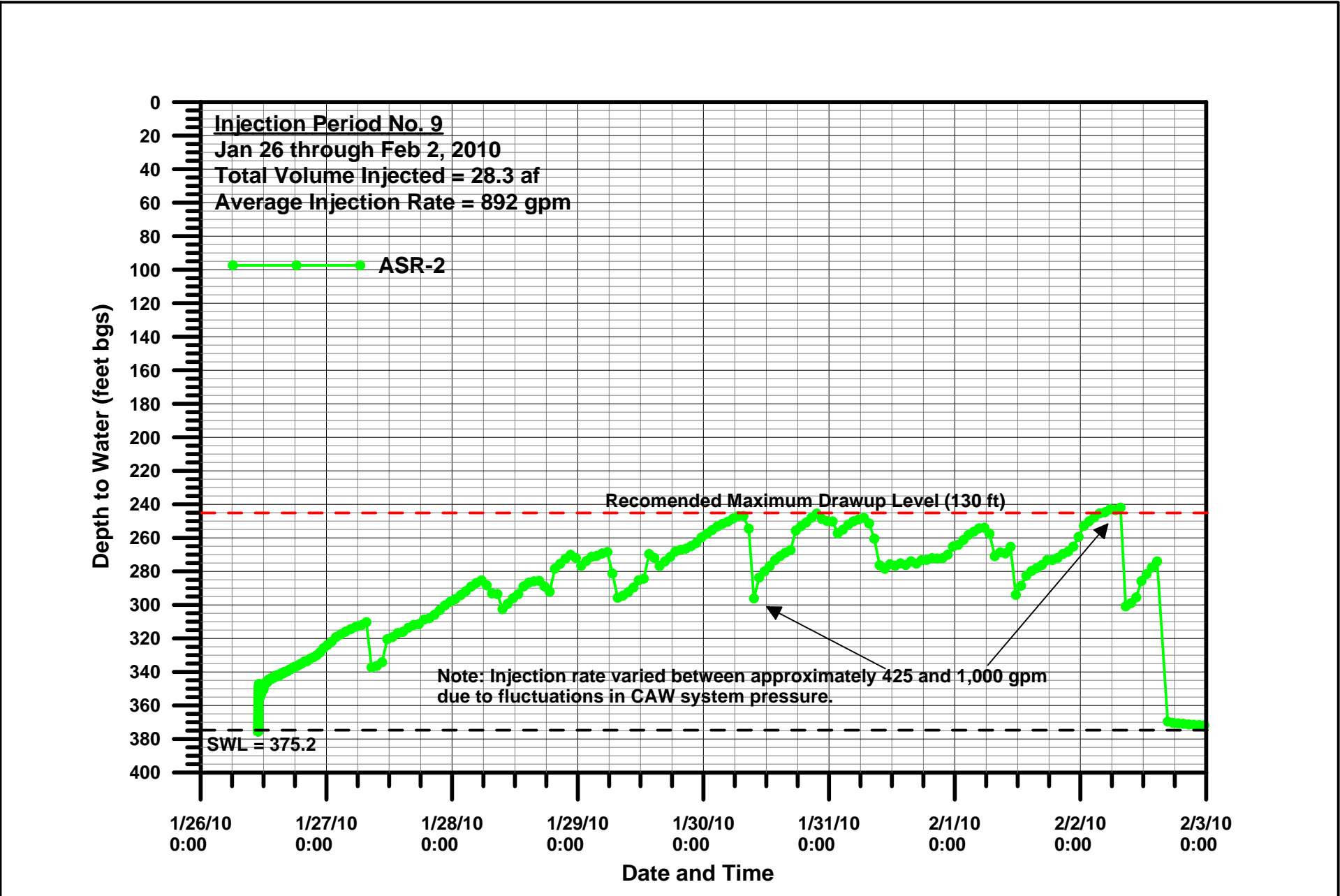


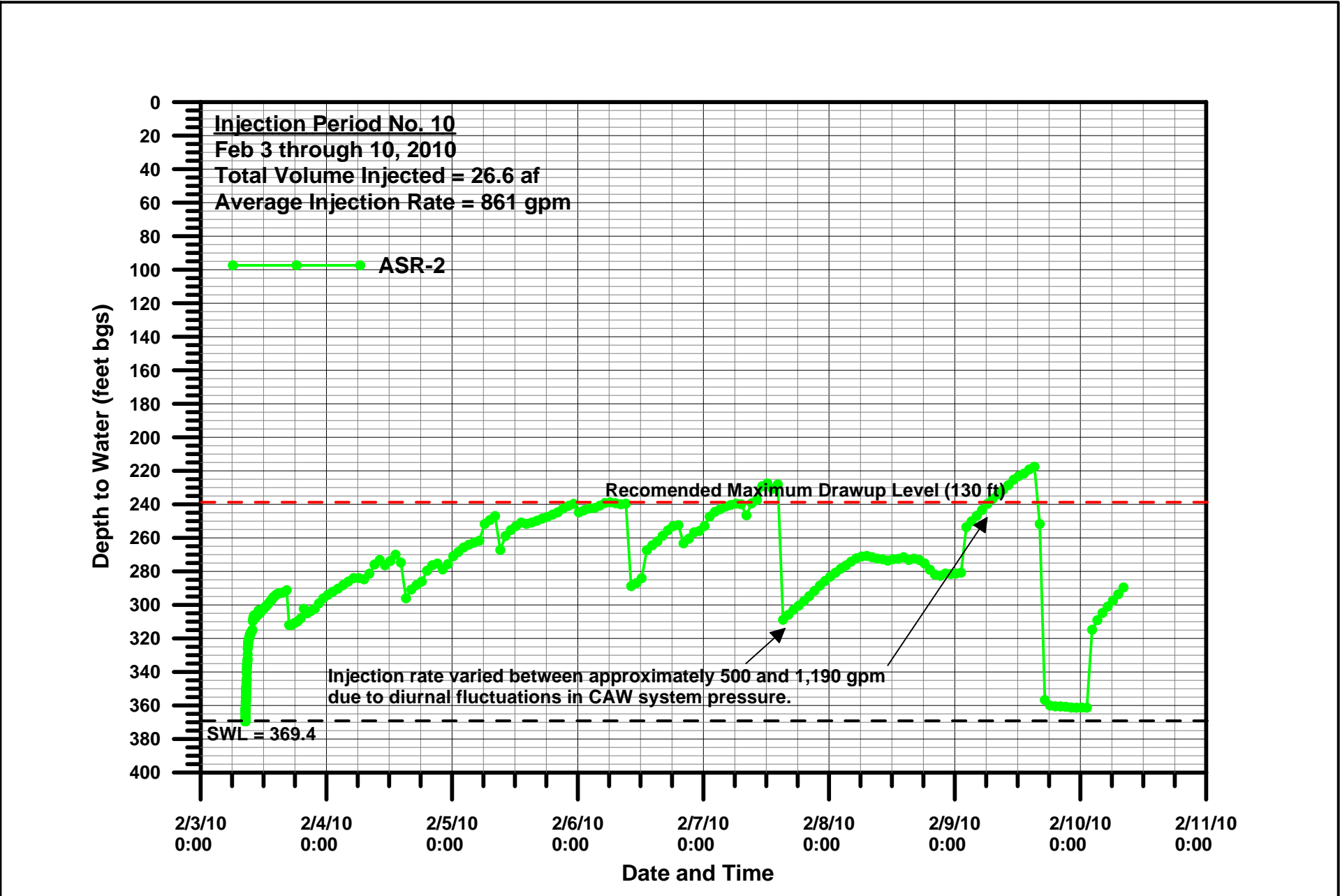


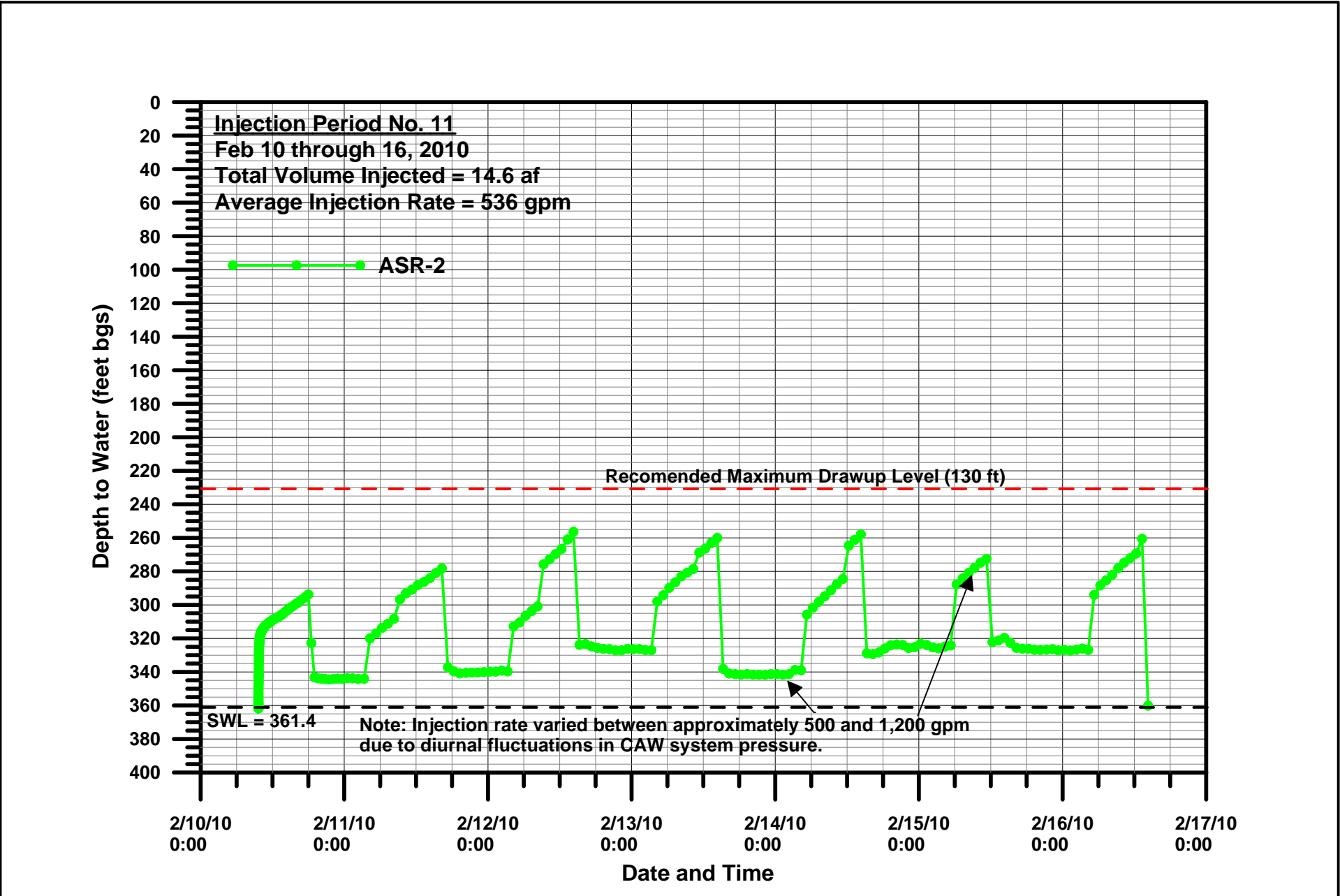




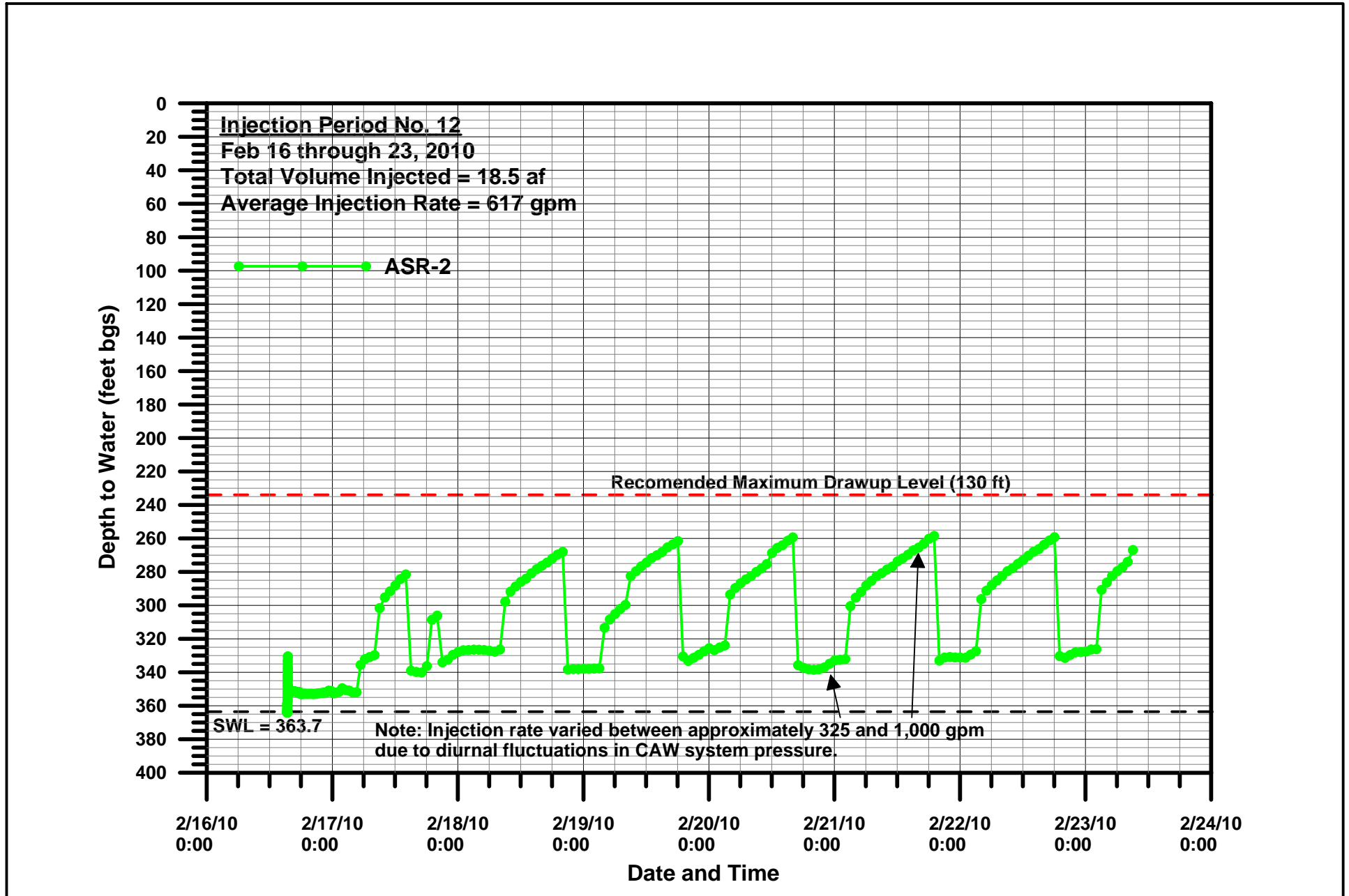


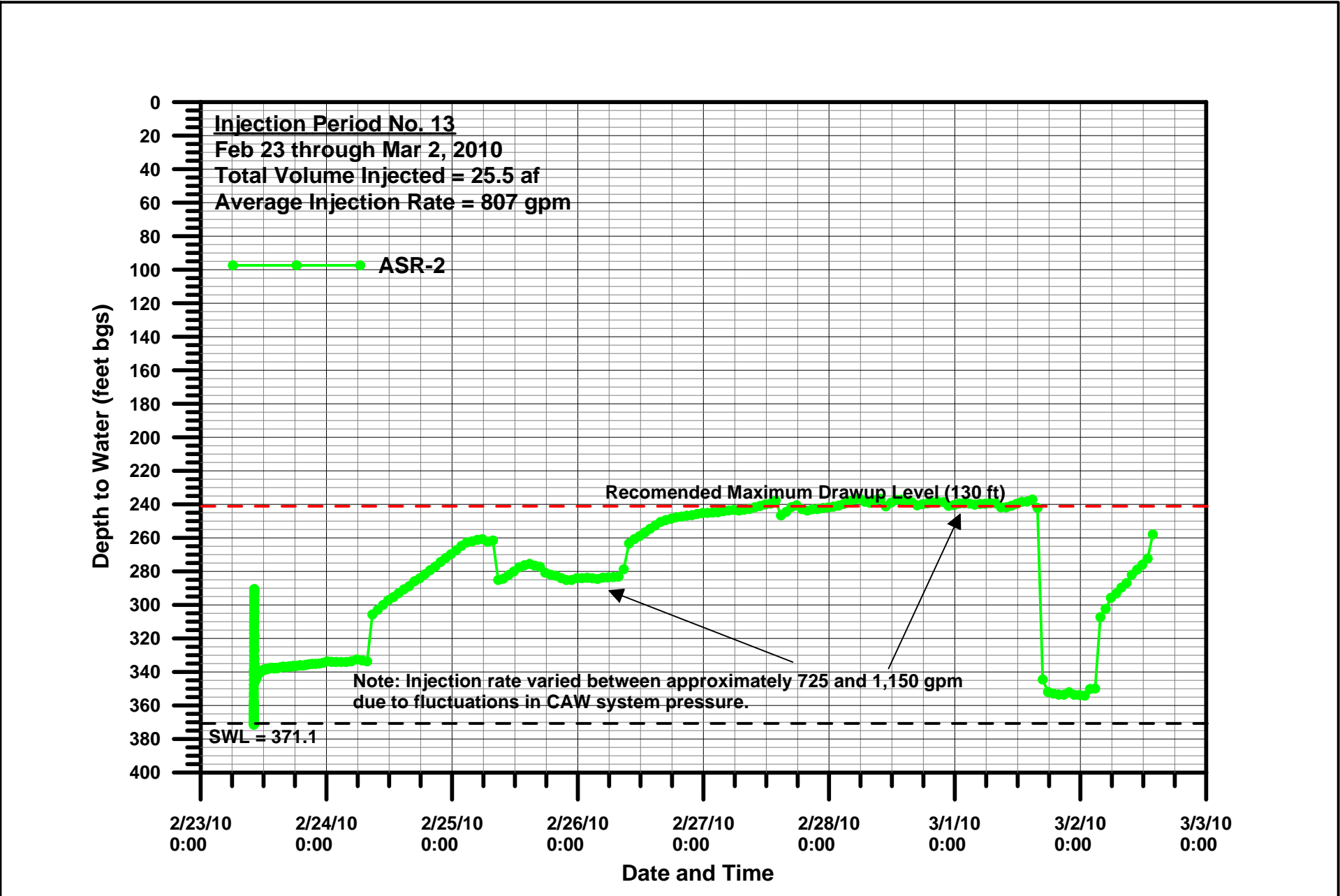


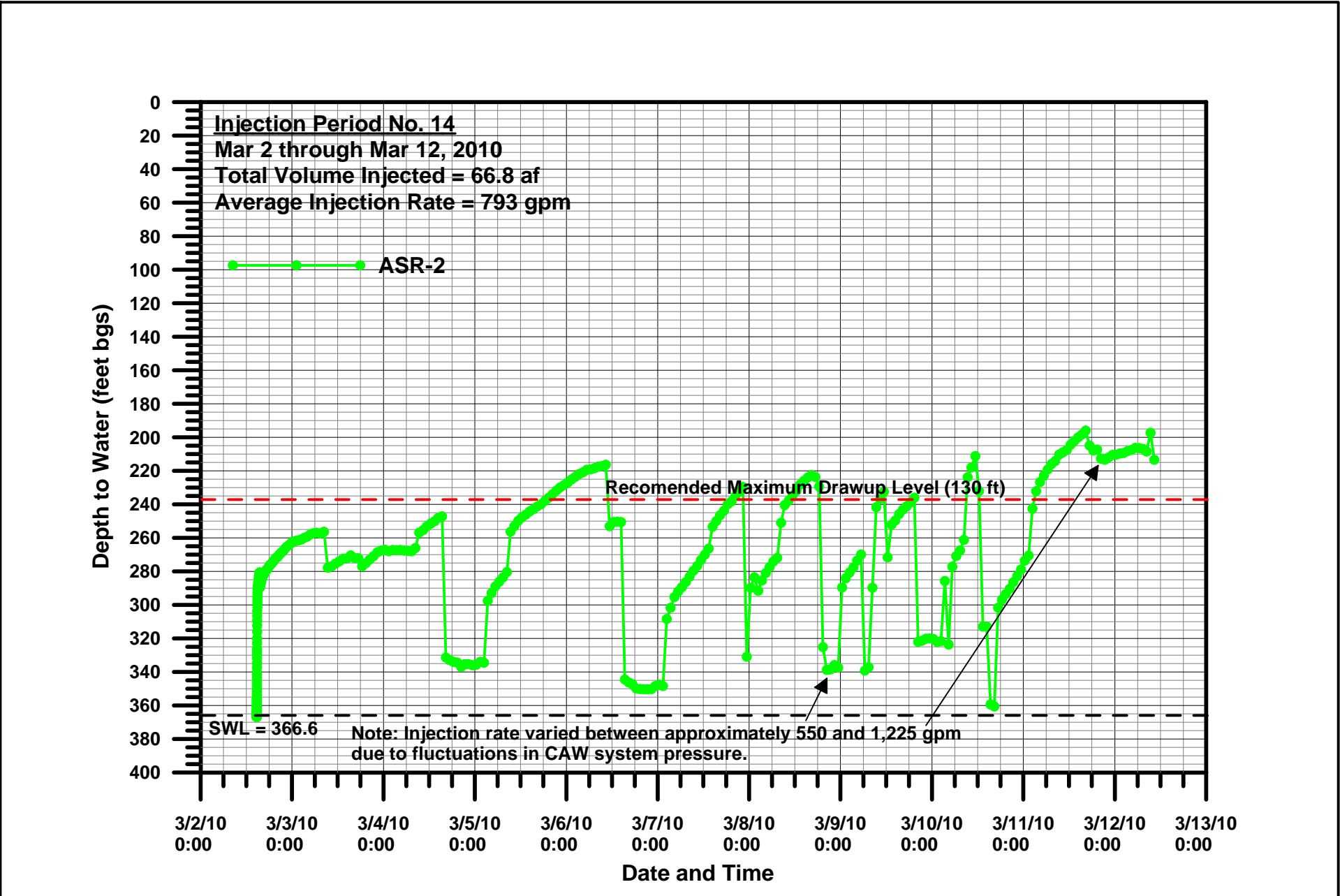


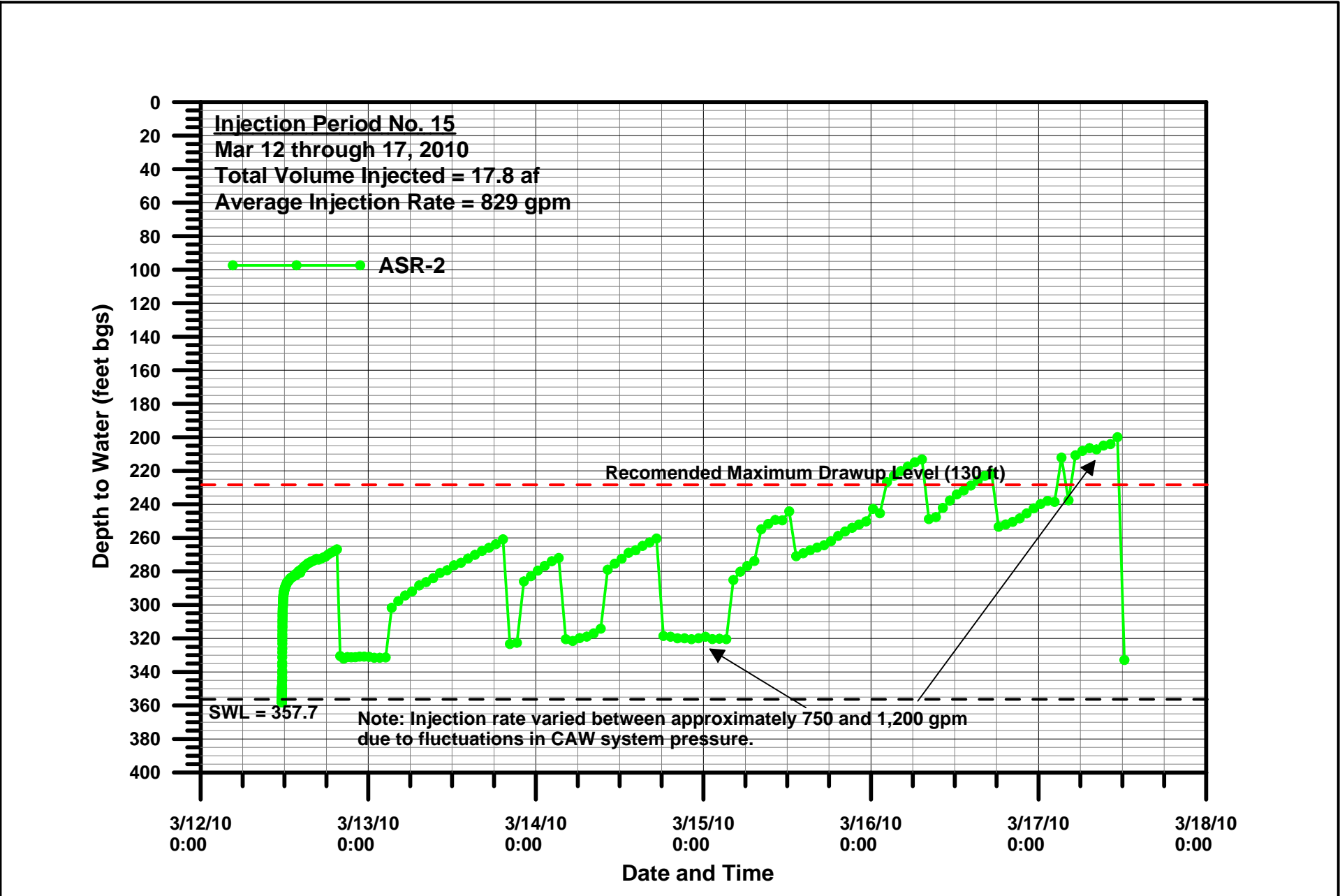


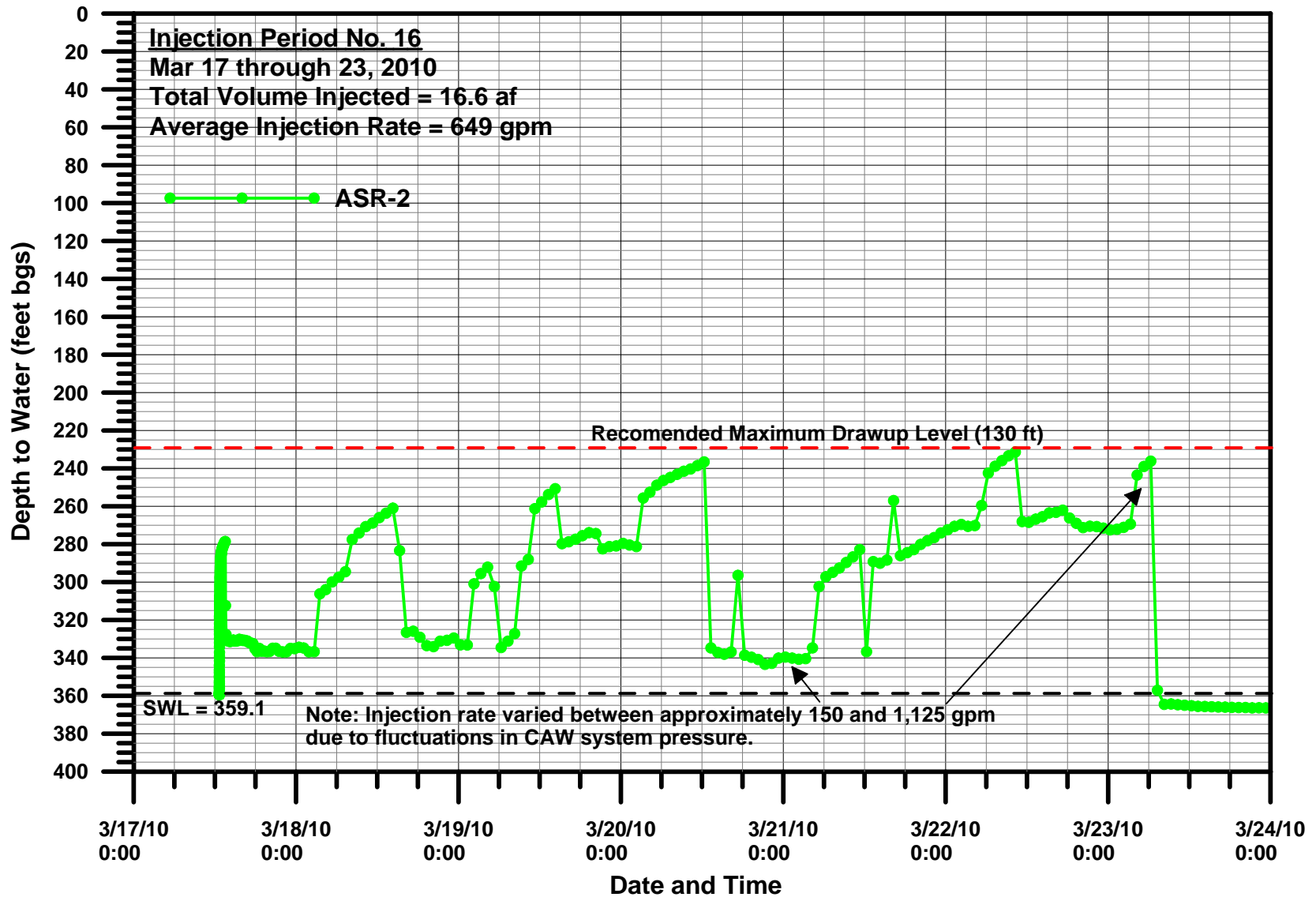


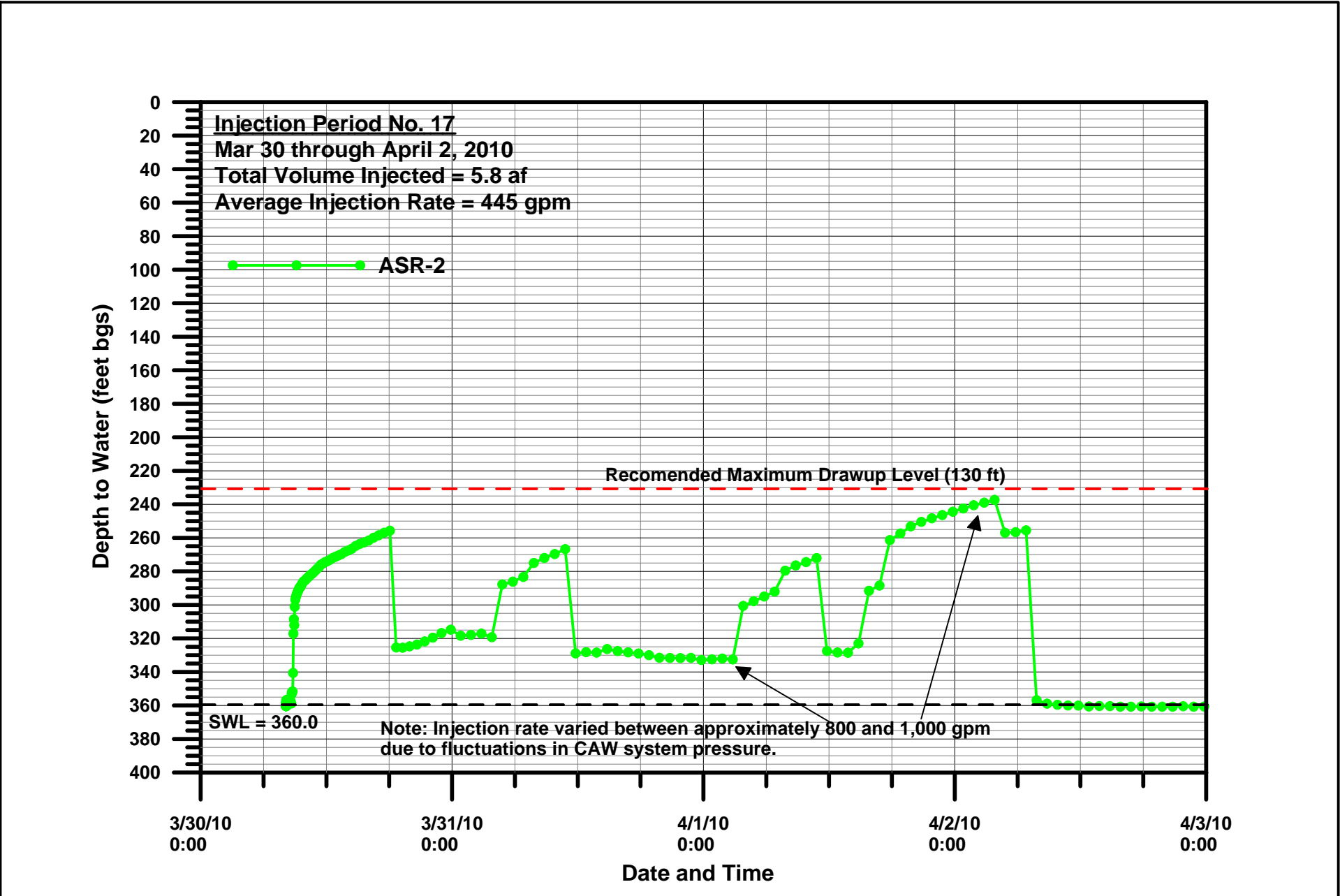


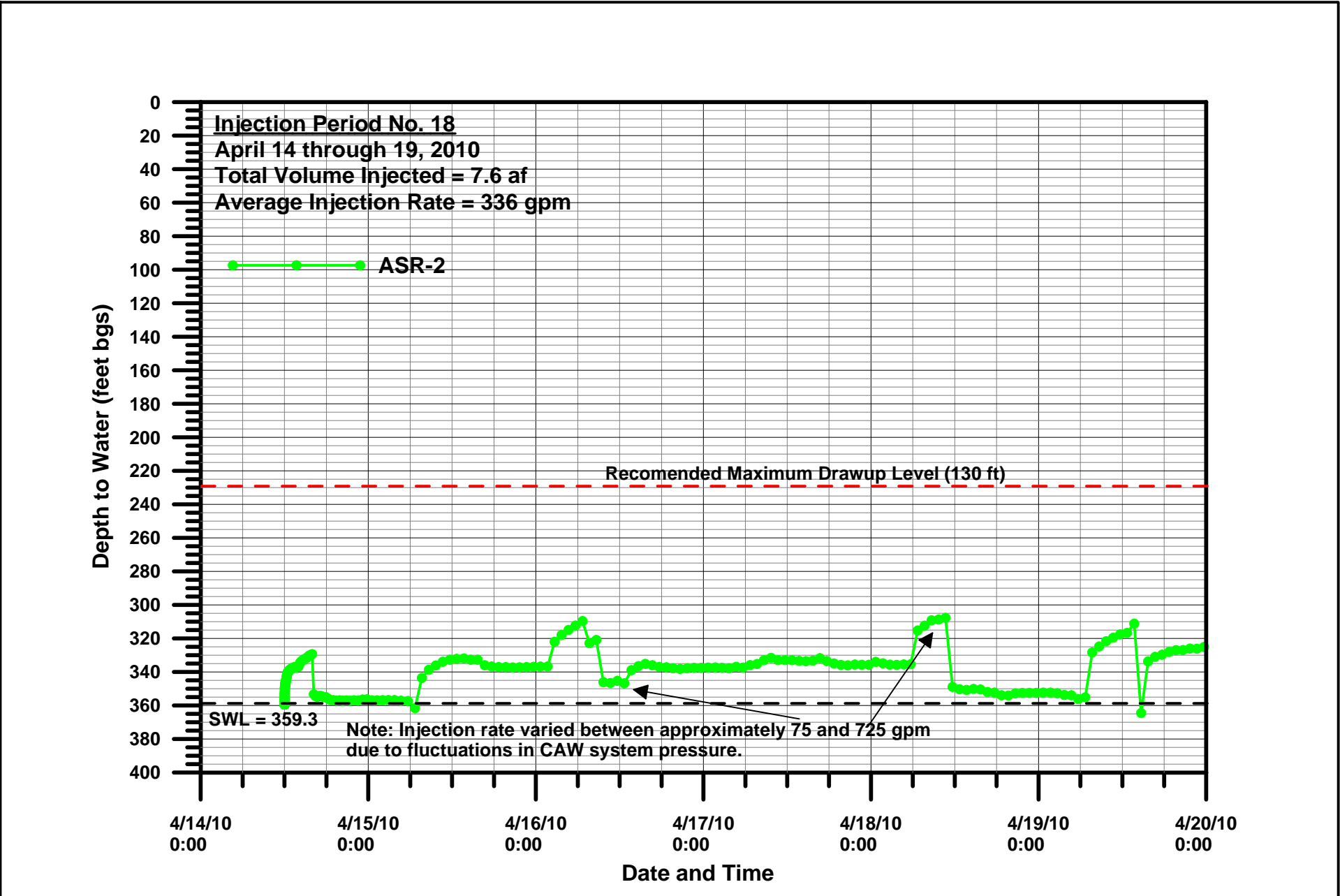


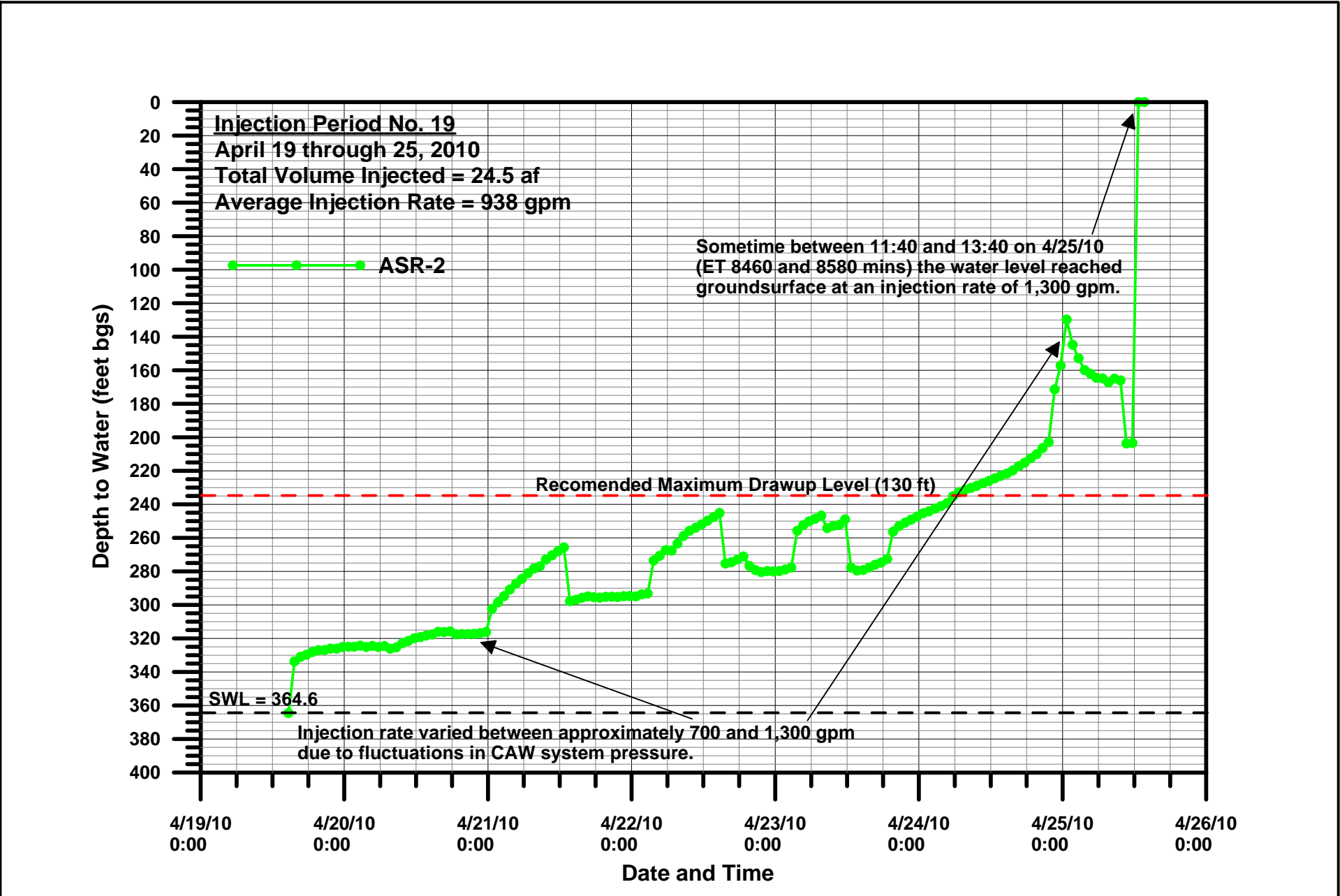




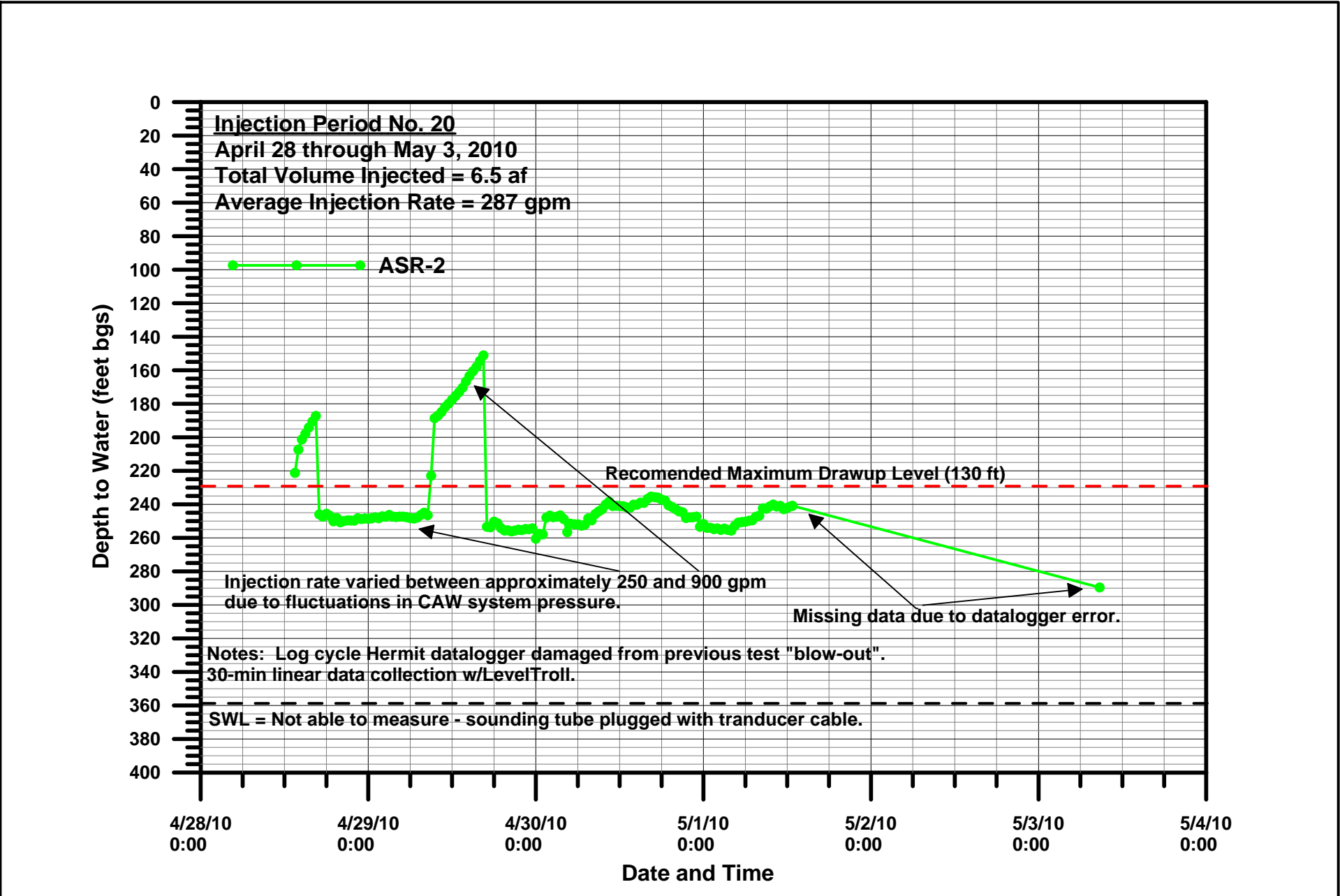


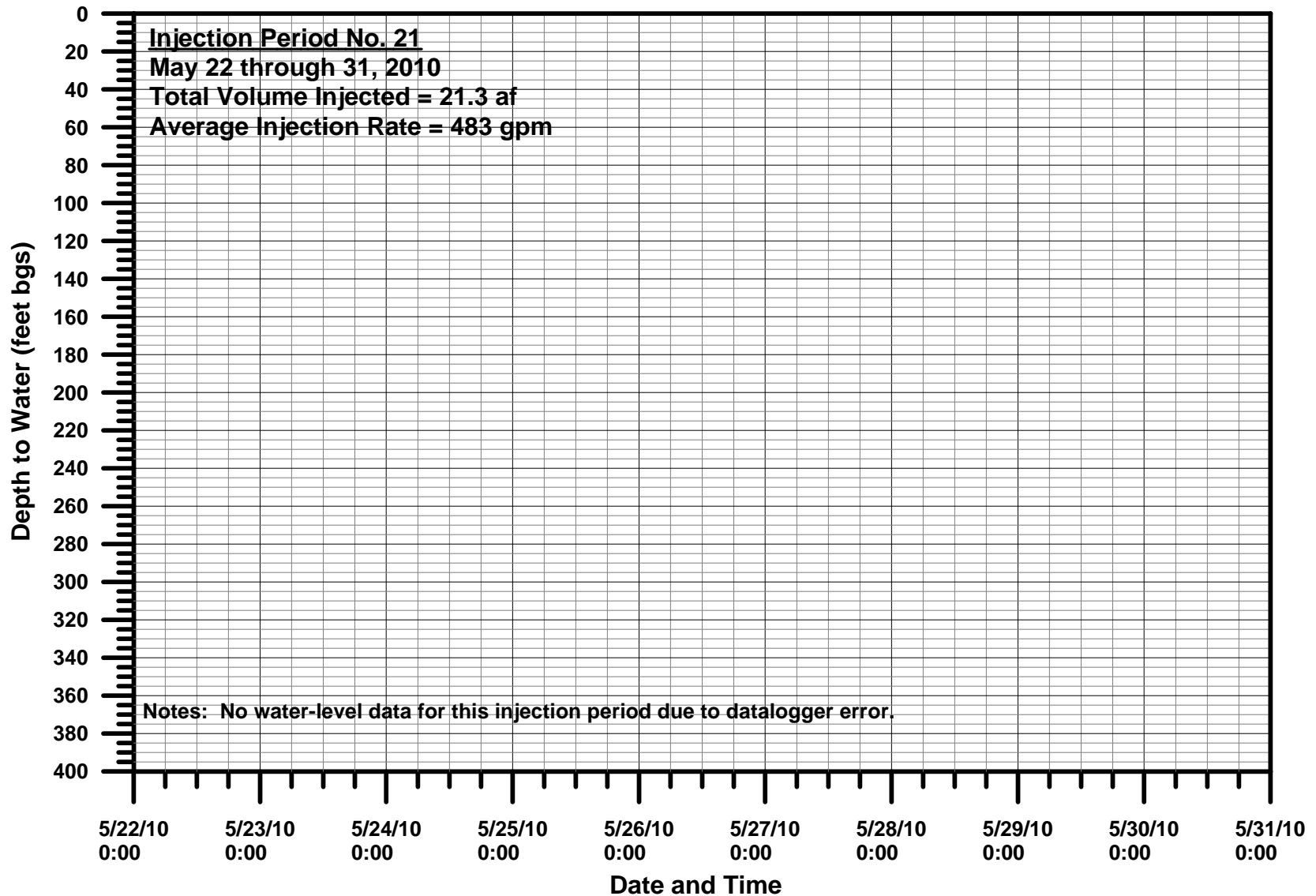


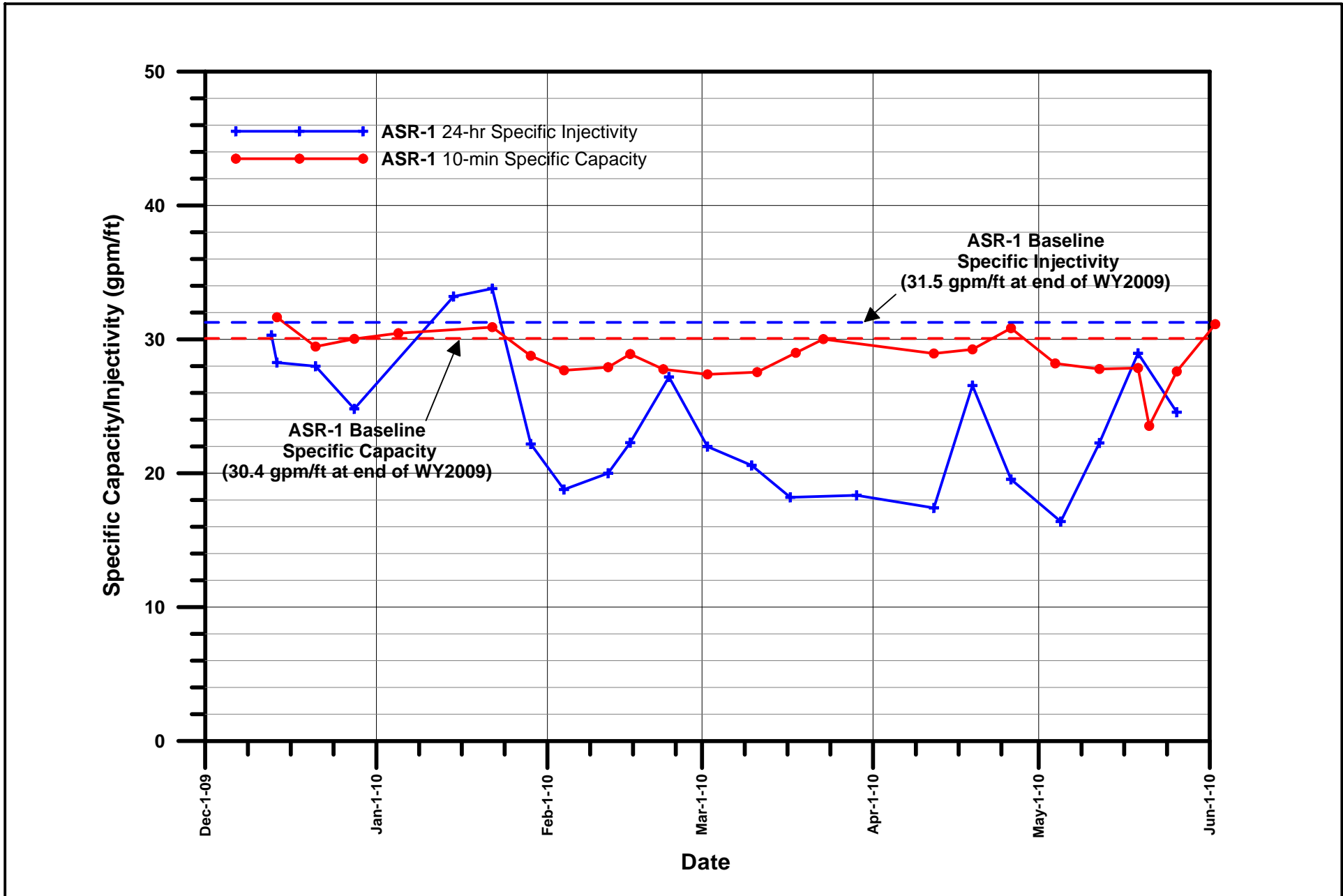


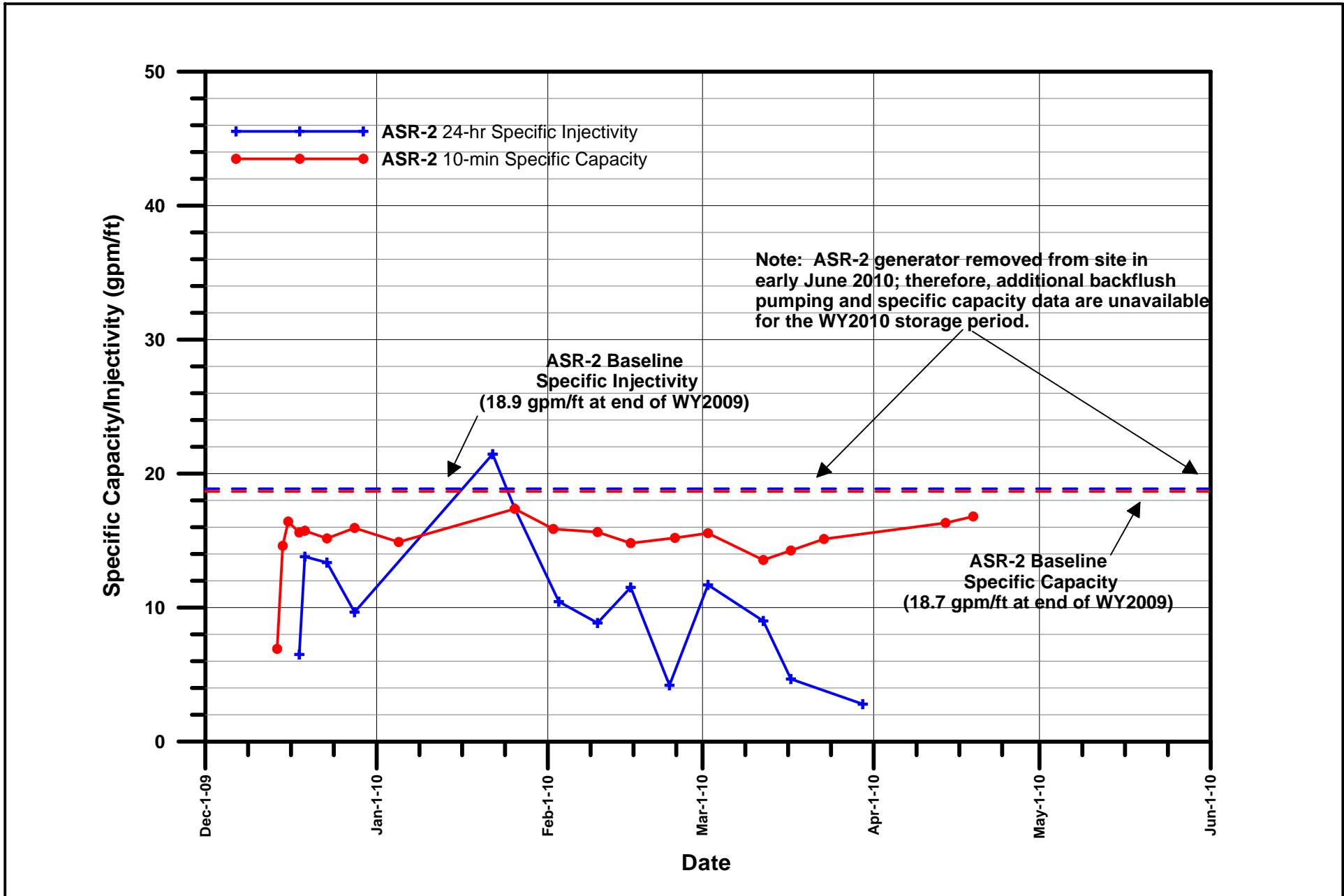


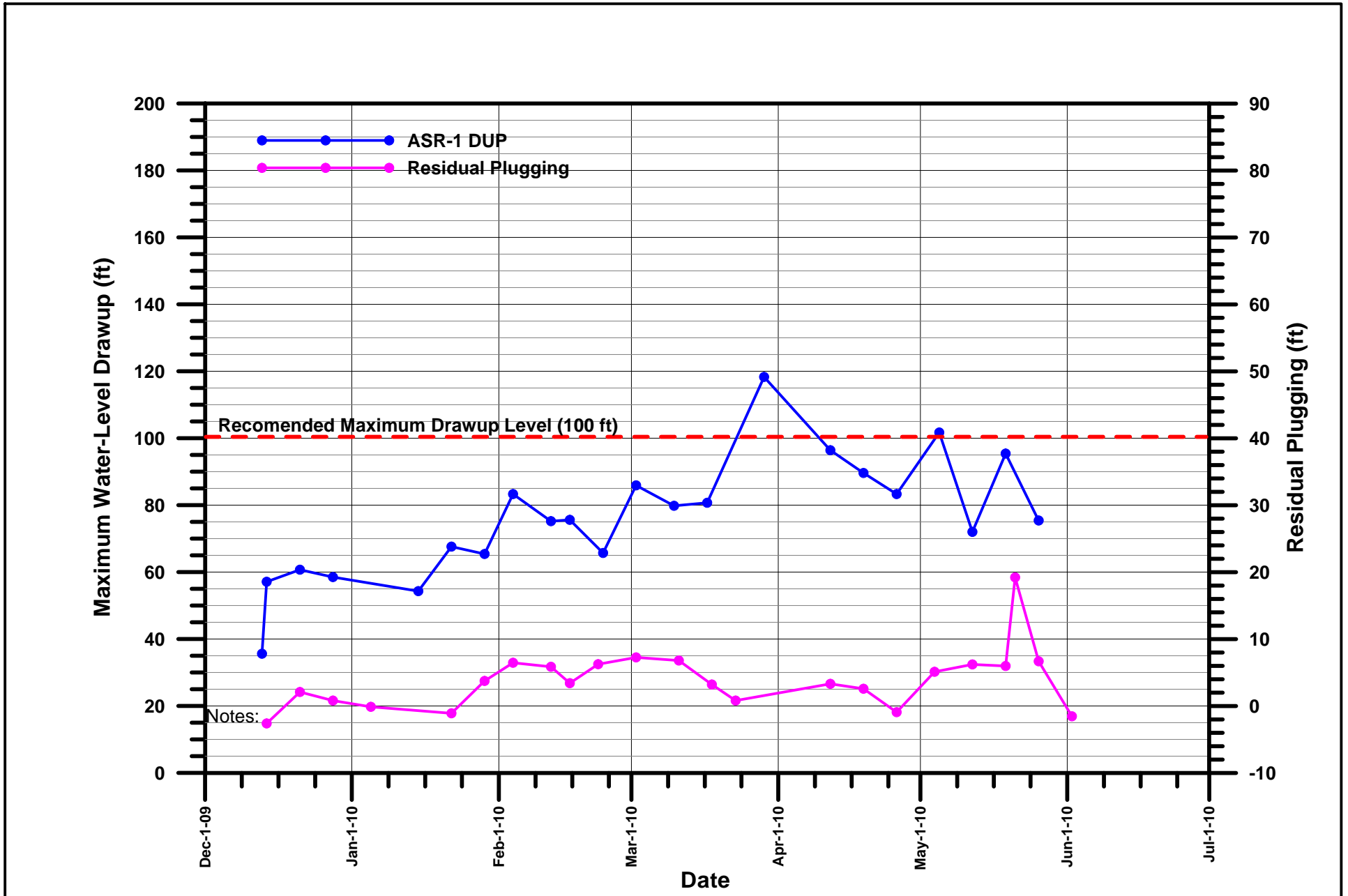


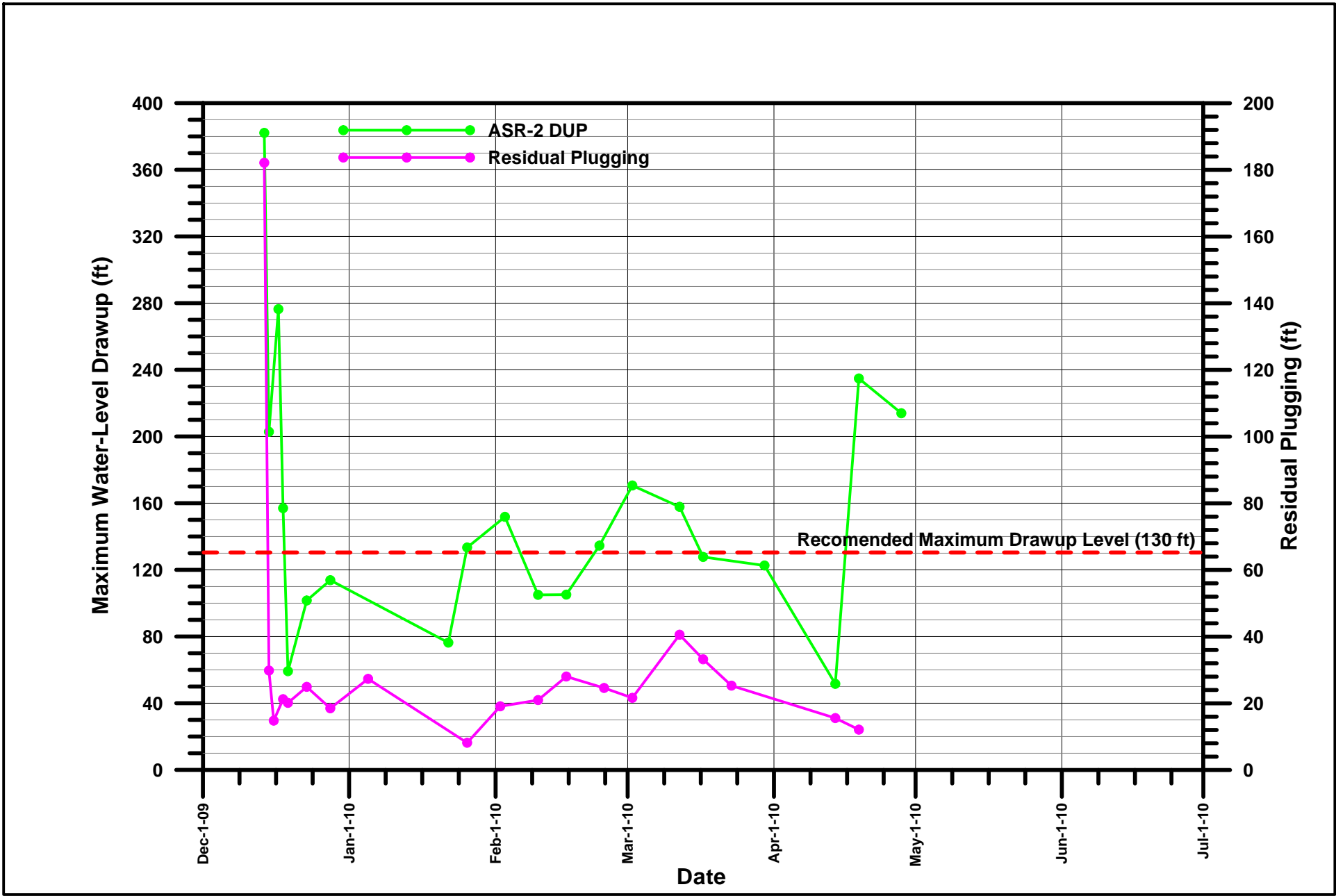


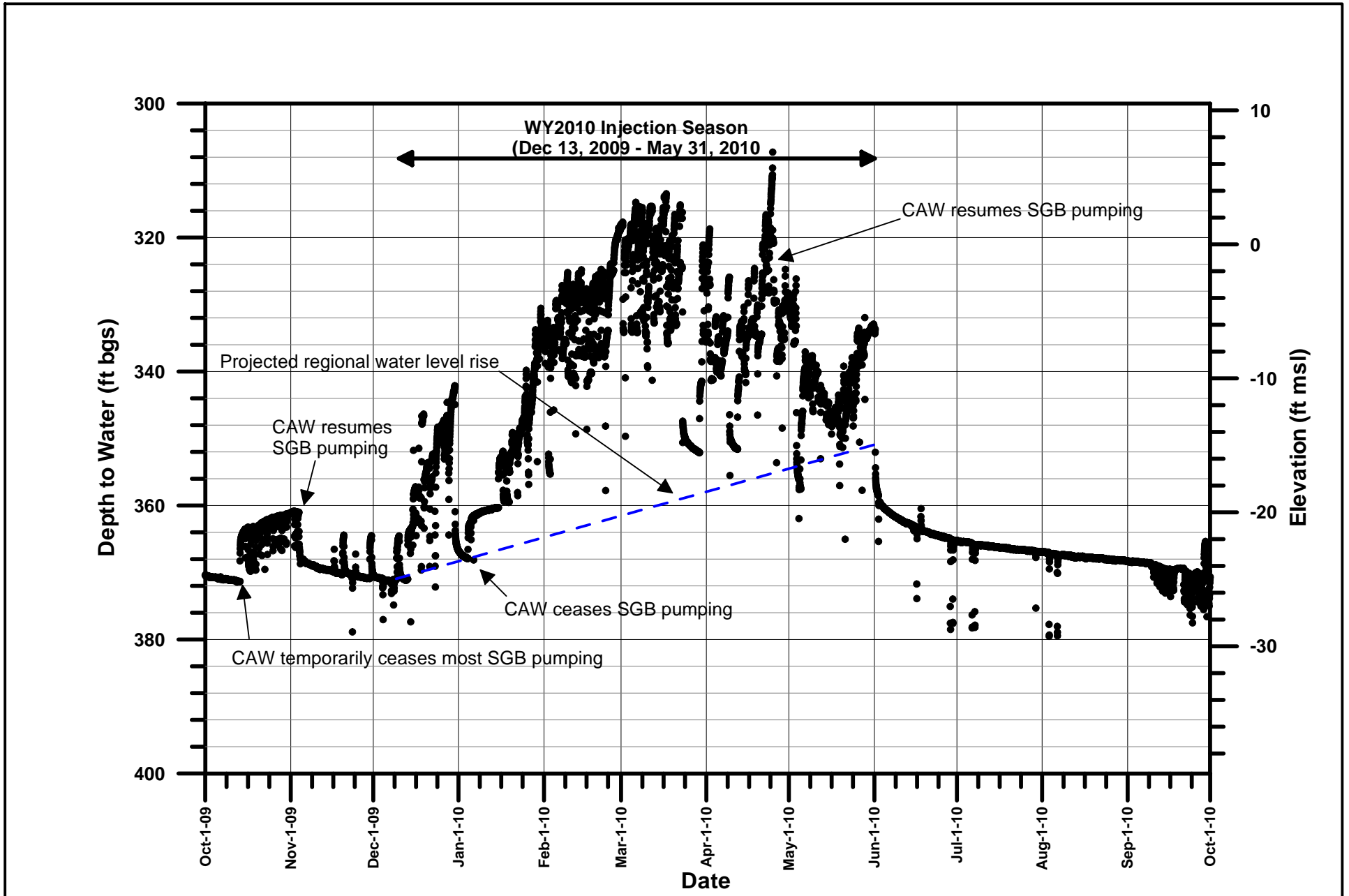


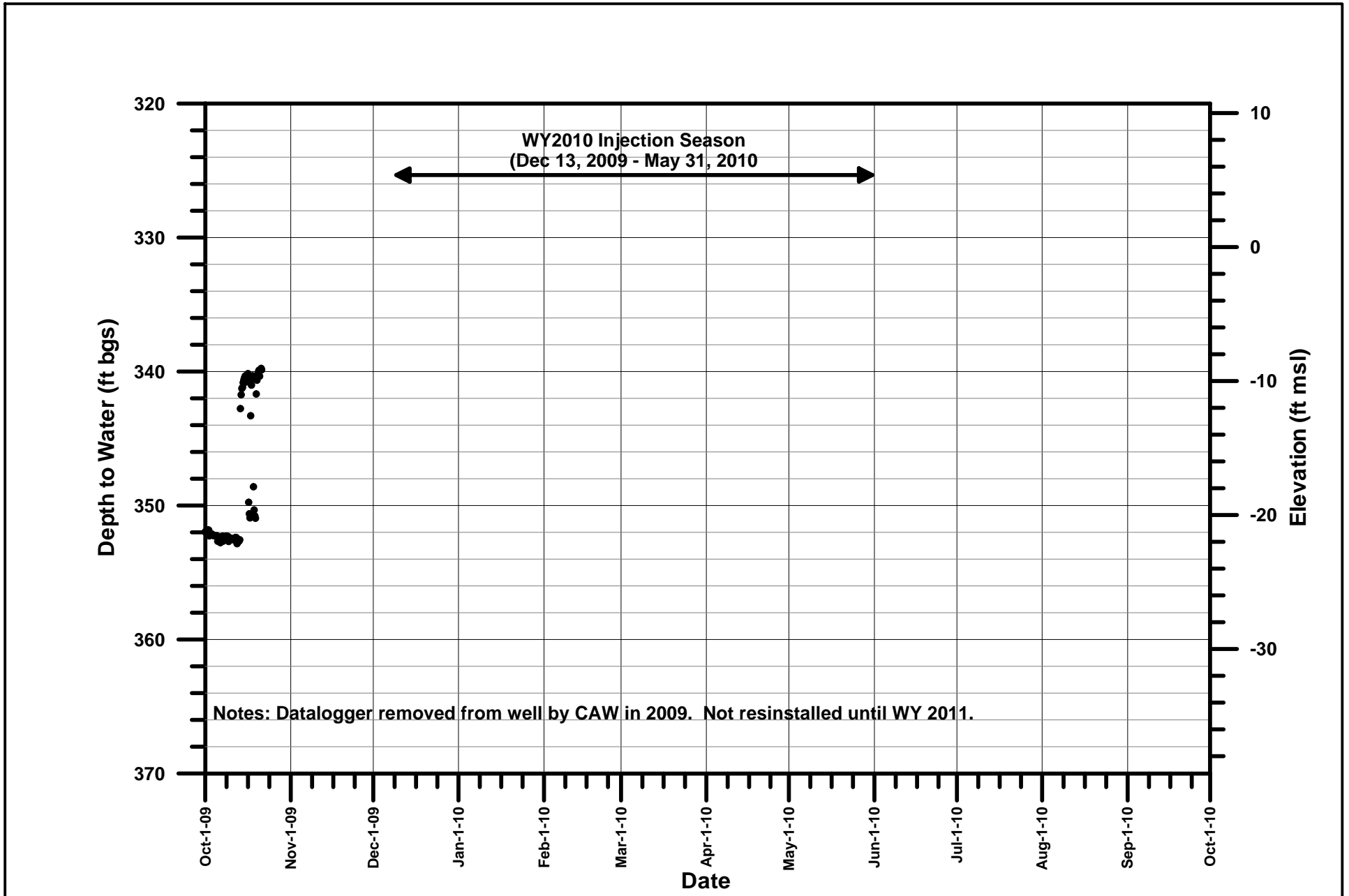




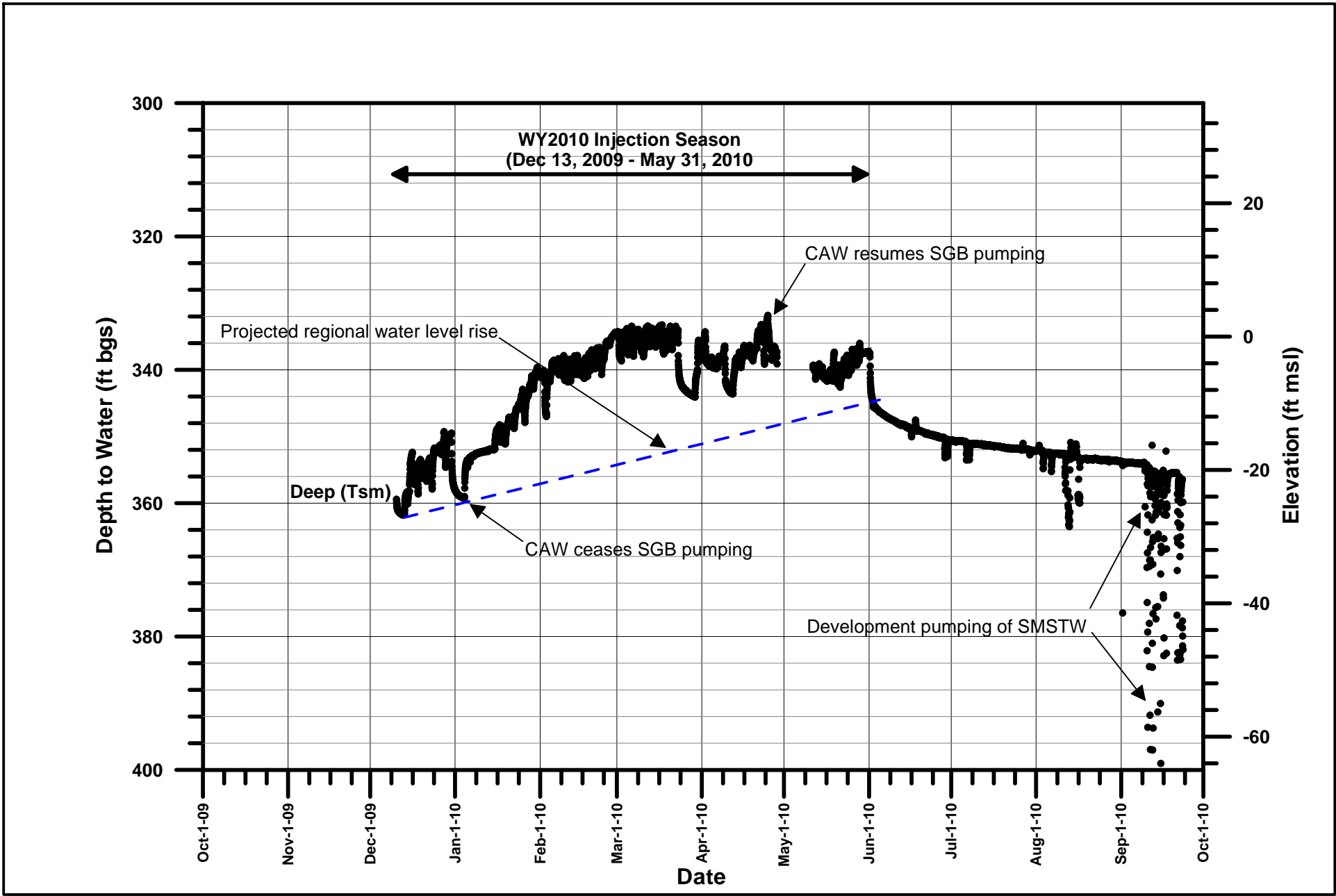


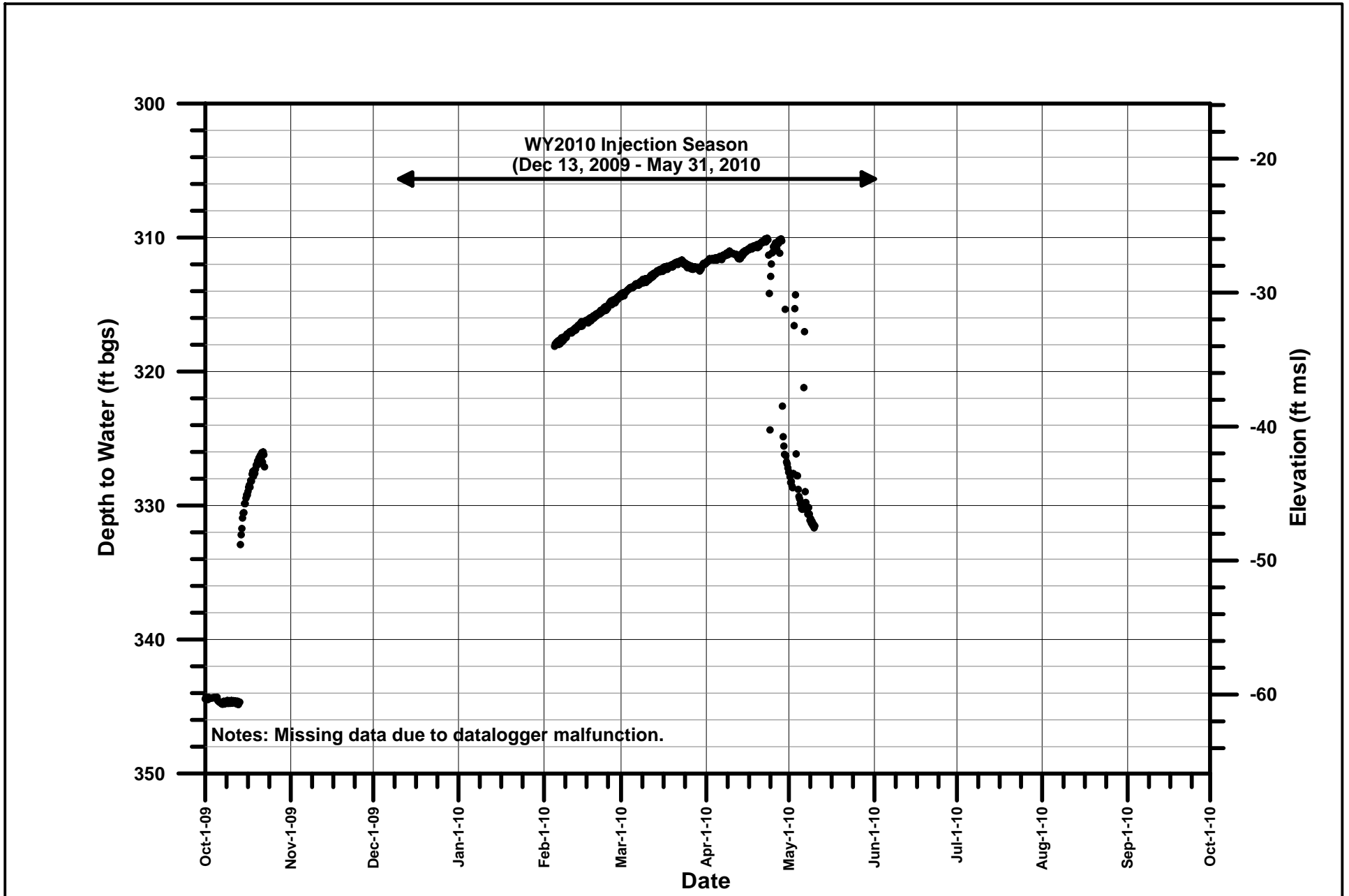






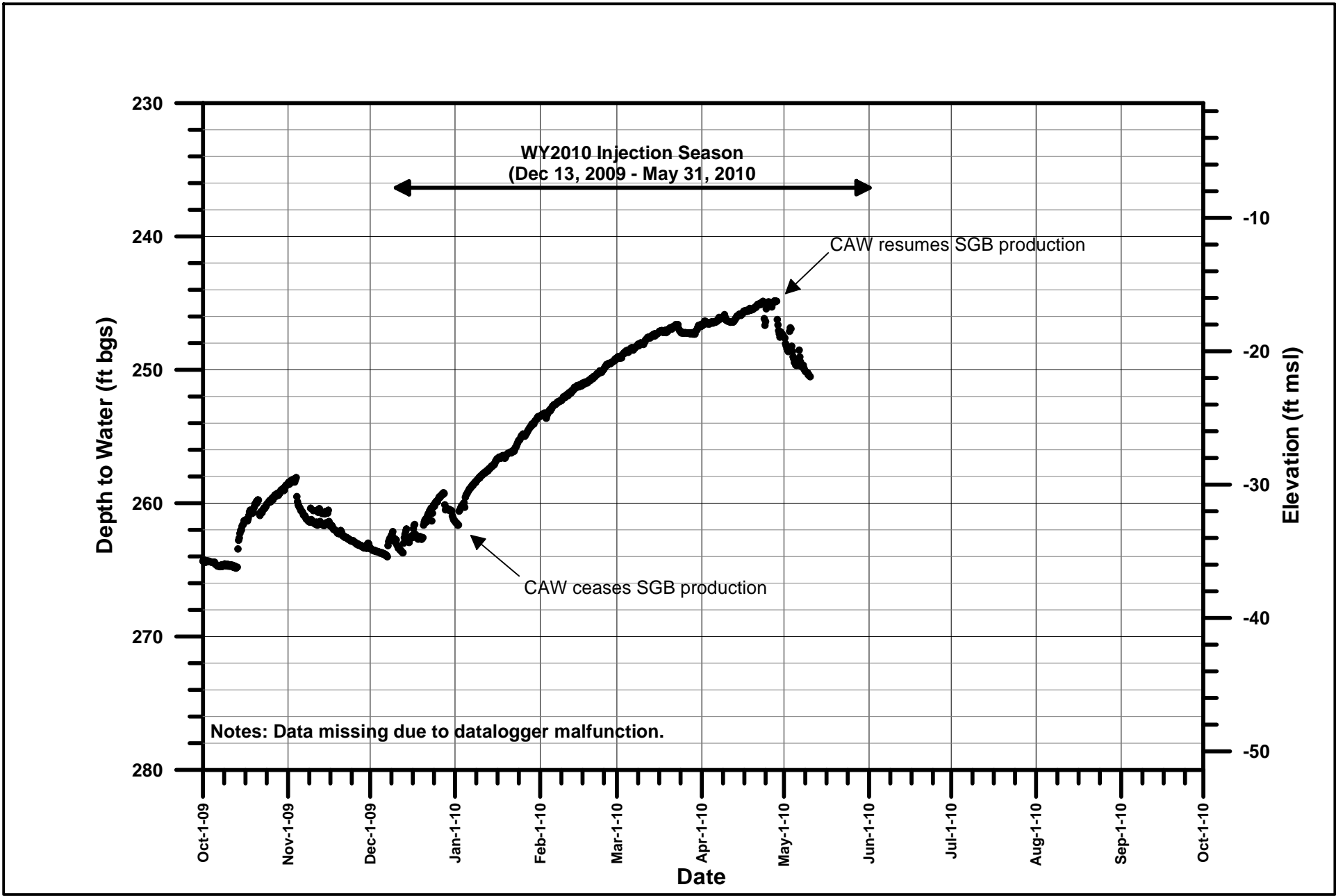


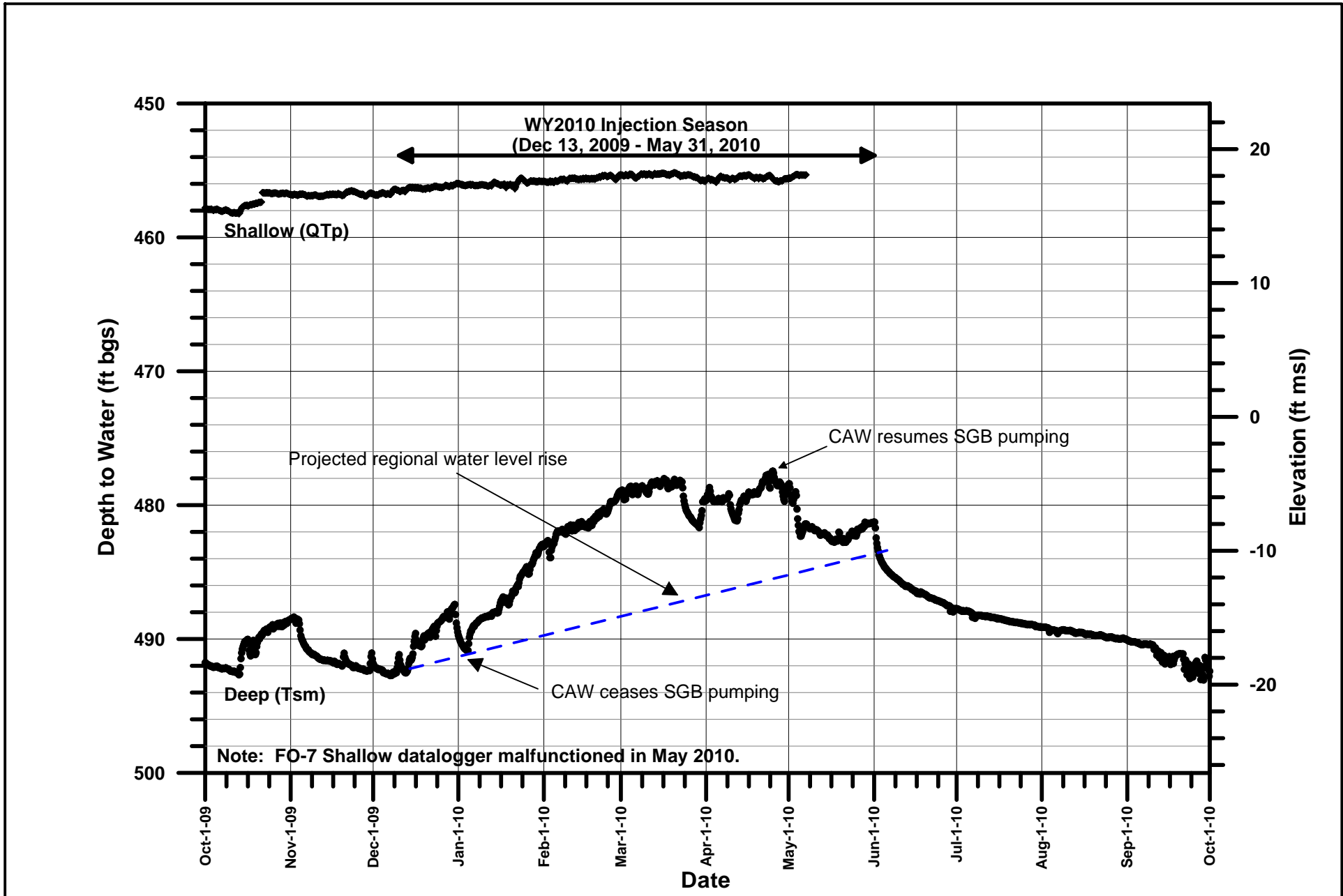


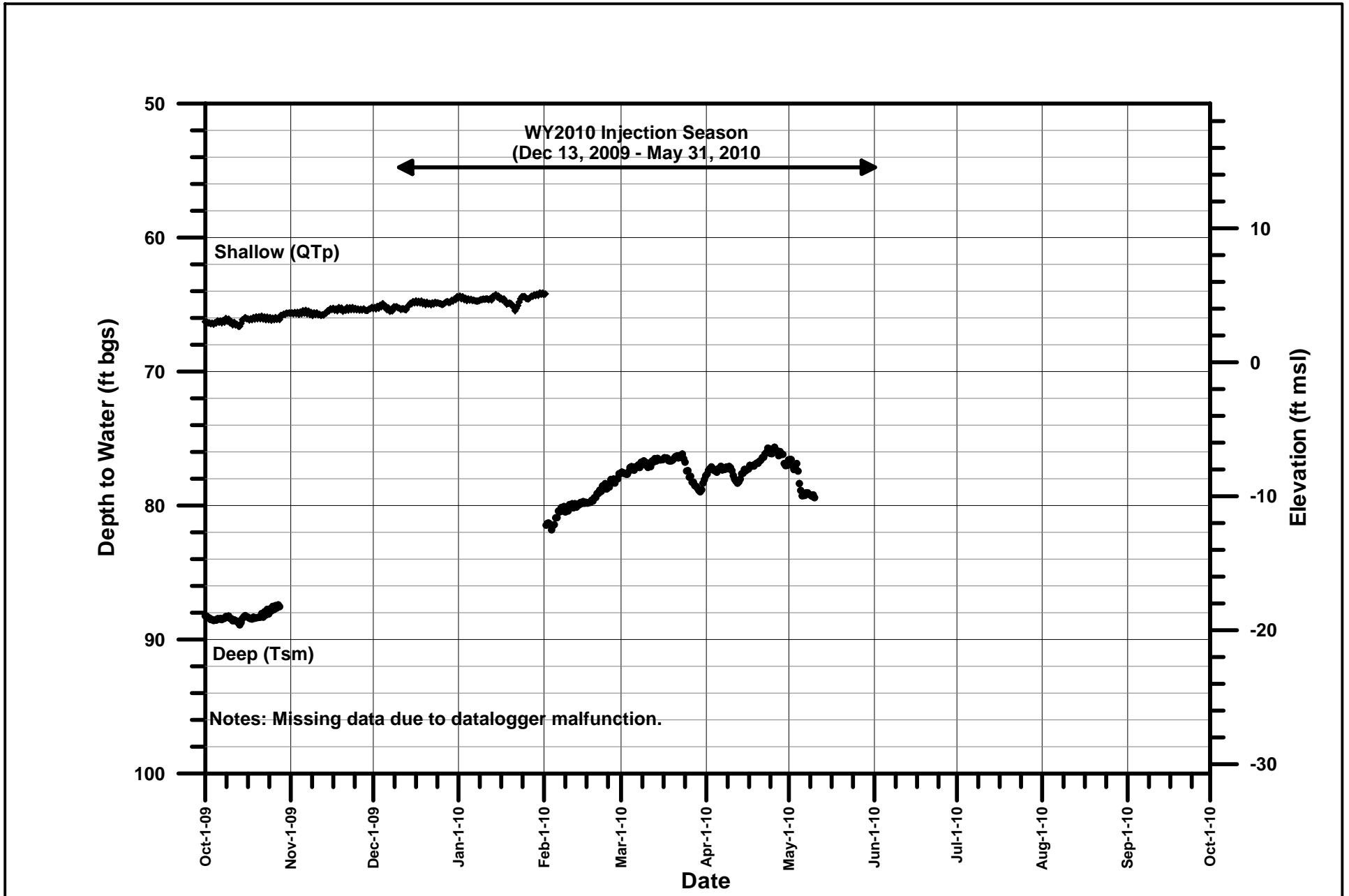


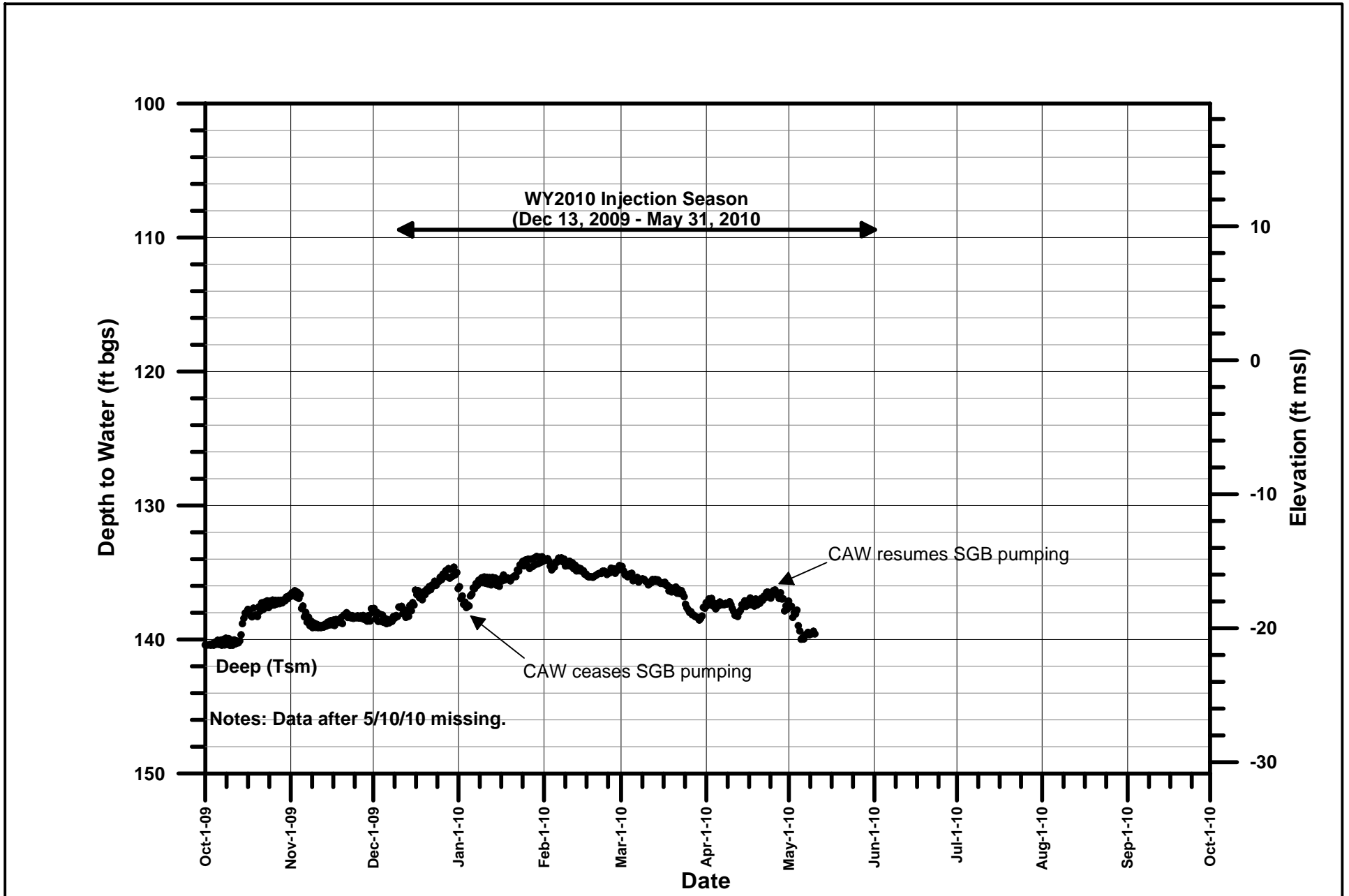
Notes: Missing data due to datalogger malfunction.

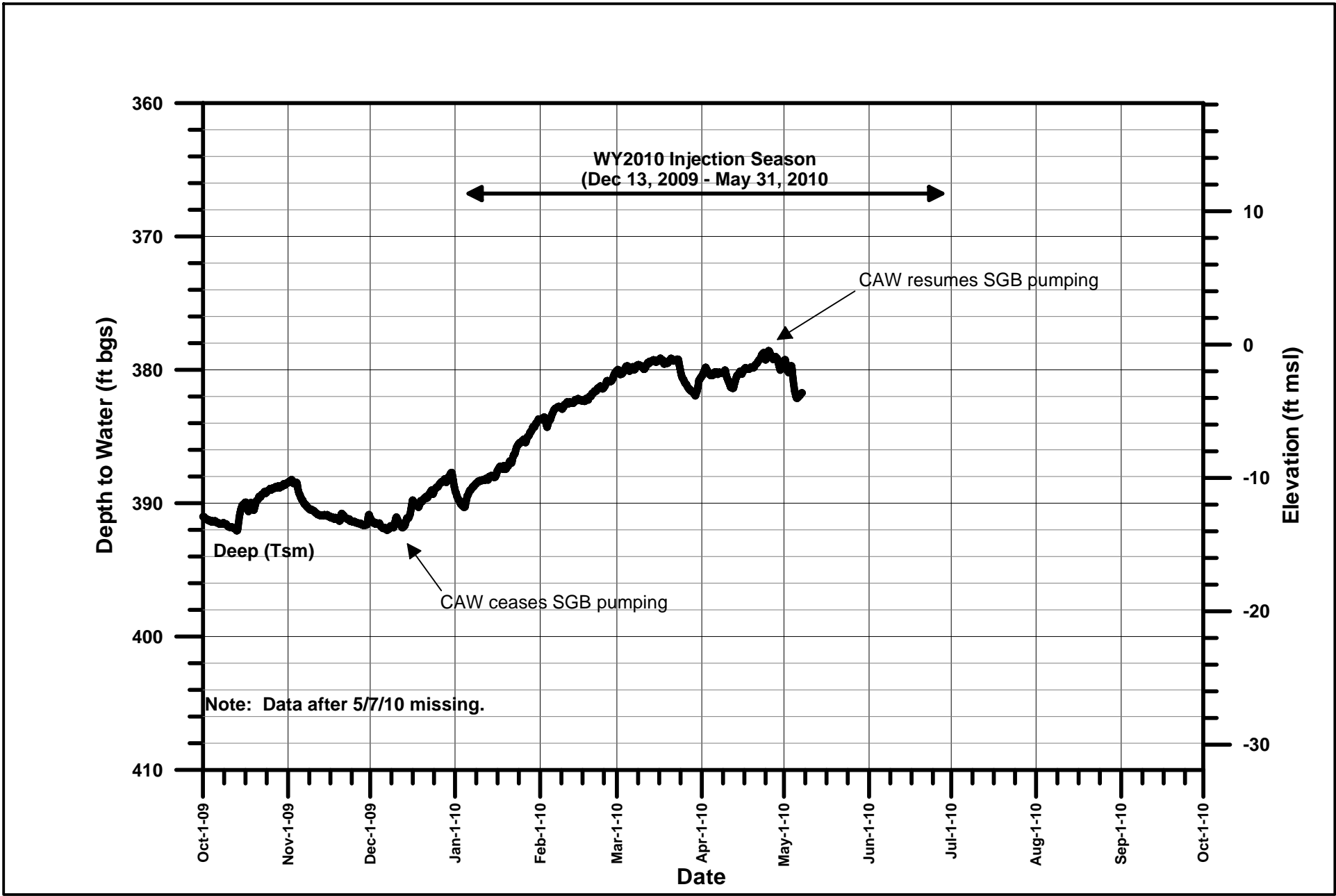


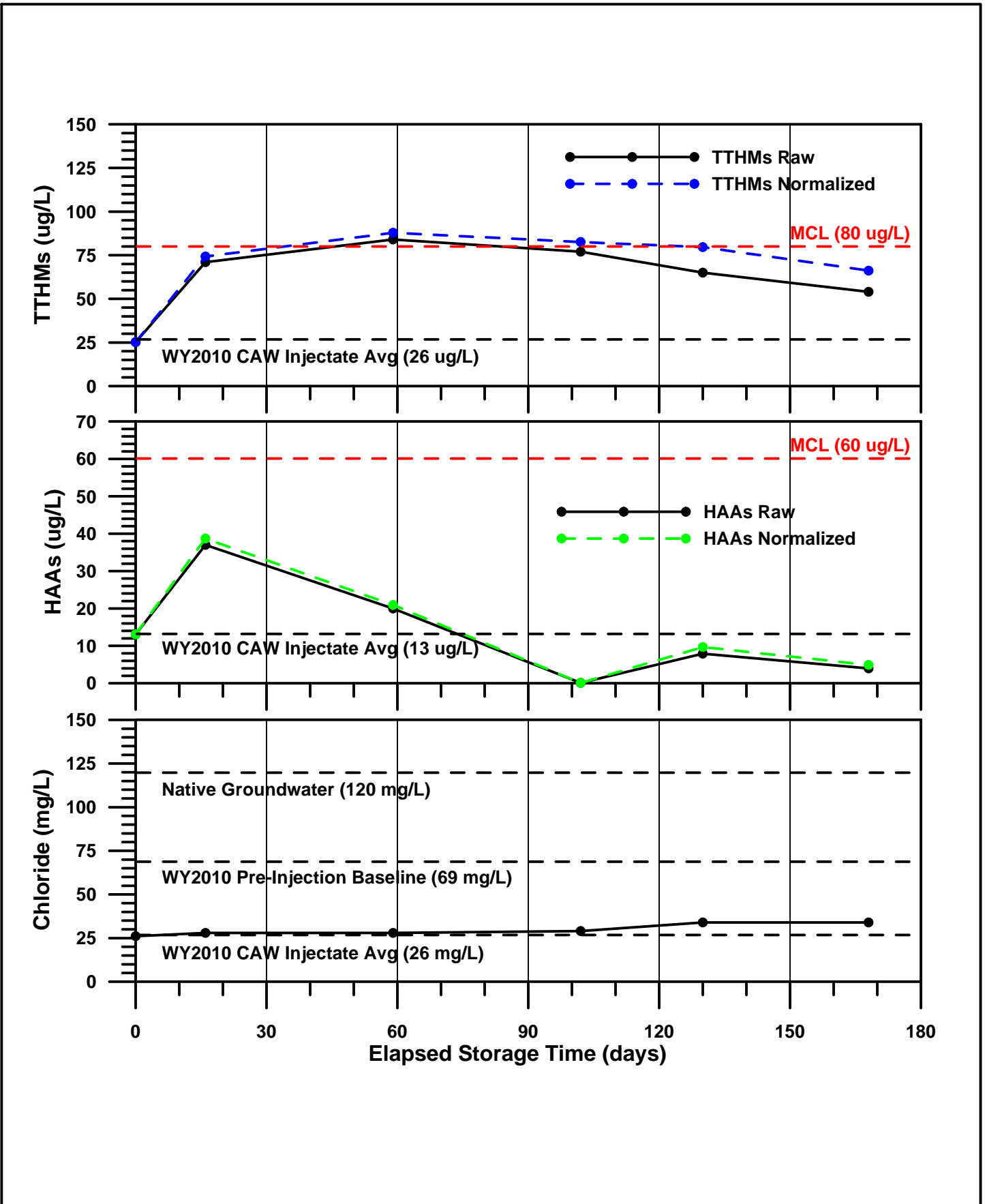




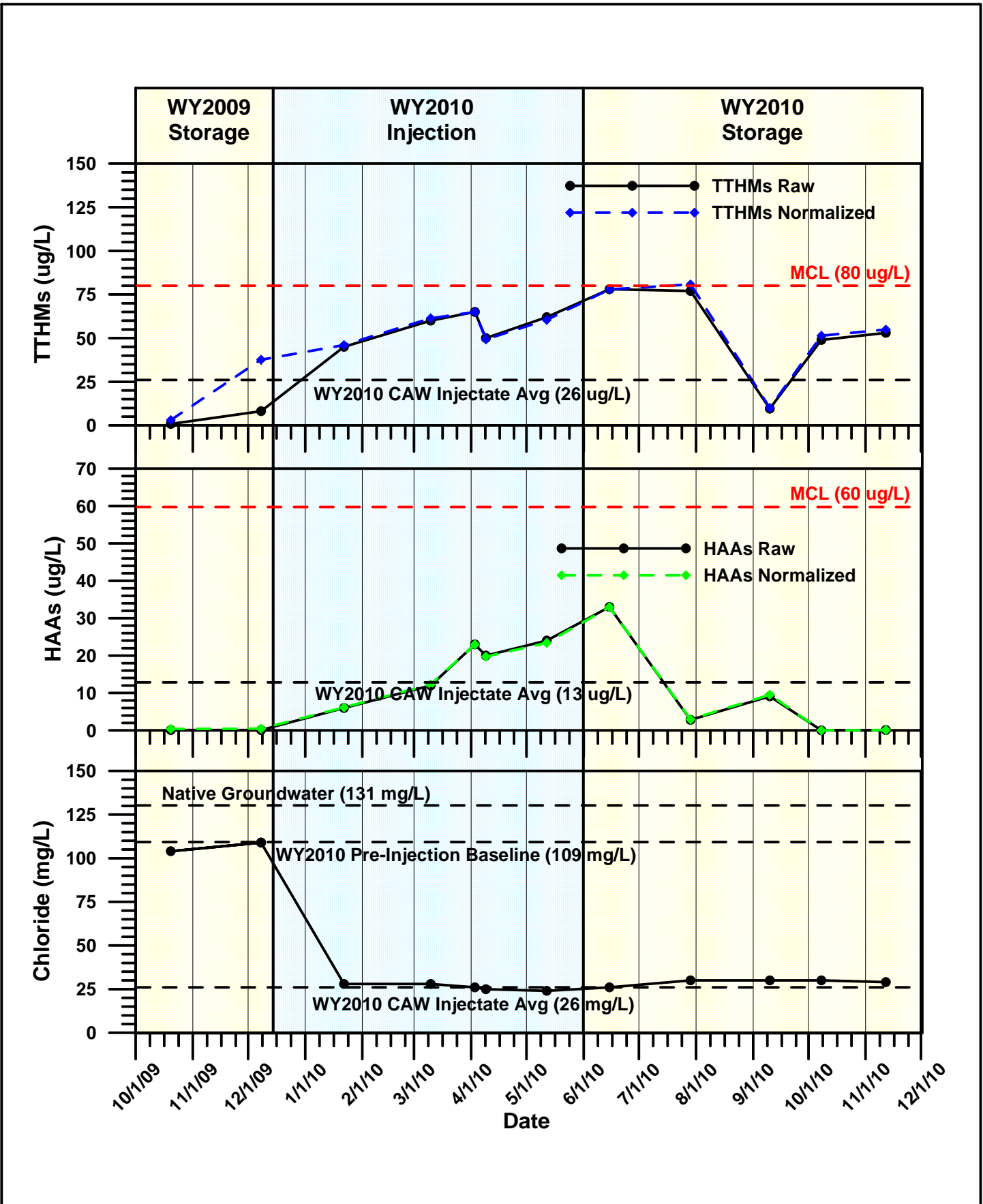












DISINFECTION BYPRODUCTS PARAMETERS  
 MW-1 WY2010  
 FIGURE 64



## **APPENDIX A - FIELD DATA**



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: WY 2010 Test #1 (Hermit Test #1)

Sheet No. 1 of 2

Date/Time	ET (min)	Rate (gpm)	Totalize (gallons)	Pressure (psi)		DTW (ft blst)	Drawup (ft)	Comments/Other
				Line	Head			
12/13/09 13 <sup>00</sup>	0		111400 (000)			369.2		Line Flushing: Inj Meter Tot = 111100 (000) BF Meter Tot = 039747 (000) FCV Tank = 990 psi 9 <sup>48</sup> Begin flushing to pit @ ~2000 gpm 11 <sup>30</sup> Reduce flow to ~1000 gpm (pit filling)
	1							
	2							
	3							
	4							
	5					362.55		
13 <sup>06</sup>	6	~900		94	39	180	351.28	
	7						349.82	
	8							
13 <sup>10</sup>	9							
	10			92	35	173	349.89	BF meter end = 040065 (000) gals 13 <sup>05</sup> 900 gpm to well, 0 gpm to pit BF meter = 040066 (000) gals
	12						345.02	
5 min	15	~1050		92	33	171		
	20						343.09	
	25							
	30						342.27	
	35							
	40						341.45	
	45							
	50						340.91	
10 min	55							
14 <sup>00</sup>	60						340.77	100-min Inj. Q/s = 1058/29.8 = 35.5 gpm/ft 1058 gpm Avg.
	70						340.26	
	80						340.01	
	90						339.86	
14 <sup>40</sup>	100	~1050		92	33	172	339.37	
20 min	120		111527 (000)				338.90	
15 <sup>00</sup>	140						338.48	
	160						338.33	
16 <sup>00</sup>	180						338.23	
30 min	210						337.87	
17 <sup>00</sup>	240						337.58	16 <sup>10</sup> ASR-2 DTW = 382.28 (Hermit/KD) ASR-1 DTW = 337.37 (Elec. Soundin)
	270						336.72	
18 <sup>00</sup>	300						336.90	
	330						336.54	
19 <sup>00</sup>	360						336.33	
	390						336.26	
20 <sup>00</sup>	420						335.86	
	450						336.08	
21 <sup>00</sup>	480						335.54	

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: WY 2010 Test #1 (Hermit Test #1)

Sheet No. 2 of 2

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft pts)	Drawdown (ft)	Comments/Other
				Line	Head	FCV			
	510						335.65		
	540						335.54		
	570						335.43		
	600						335.33		
	630						335.00		
12/14/09	660						335.00		
	690								
	720						334.75		
	750						334.79		
	780								
	810						334.72		
	840						334.29		
	870								
40 min	900						334.18		
	940						334.65		
1 hr	1000						334.40	34.8	
	1060						334.58		
	1120						334.18		
	1180	~1050		92	32	172	334.07		
	1240		112728 <del>000</del> *						* 9:30 Totalizer: (112728 <del>000</del> - 111400 <del>000</del> ) ÷ 1230 ≈ 1080 gpm Avg.
	1300								
	1360								
	1420								
	1480								11:45 open valve to waste for an additional ~500 gpm
2 hr	1600								11:50 Begin shut down ASR-1
	1720								
	1840								
	1960		112962 <del>000</del>	1450					ASR-1 BF 040157 <del>000</del> @ 1450 60 Hz @ ~2400 gpm
	2080								
	2200							10 MIN	
	2320							@ 54.4	
	2440								040202 <del>000</del> 040192 <del>000</del> 10,000 ~1950 gpm
	2560								
	2680								
	2800								
	2920								
	3040								
	3160								
	3280								
	3400								

57,000  
36,000  
21,000

90.49 x 0.10  
- 28.68 x 0.10  
62.61 = 15.97

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: A3R-1

Test: WY 2010 Test # 2

Sheet No. 1 of 4

Date/Time	El (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DWT (ft)	DrawUp (ft)	Comments/Other
				Line	Head	FCV			
12/14/09 15 <sup>55</sup>	0		112971000	96	0	266	369.38		Fng Tot 112962000 15 <sup>35</sup> Begin flow to pit BF 070205000 ~ 1000 gpm
	1								
	2						368.20		
	3								
	4						343.52		
15 <sup>50</sup>	5						342.52		
	6	~1050		94	37	175			Ads v1 slightly
	7						345.95		
	8						348.71		
	9						343.45		
15 <sup>55</sup>	10	~1050		93	31	175	342.62		
	12						340.62		
5 min	15	16 <sup>00</sup>					342.02		
	20	16 <sup>05</sup>					341.55		
	25	16 <sup>10</sup>					341.16		
	30	16 <sup>15</sup>					340.62		
	35	16 <sup>20</sup>					340.62		
	40	16 <sup>25</sup>					339.98		
	45	16 <sup>30</sup>					340.05		
	50	16 <sup>35</sup>					341.66		
	55	16 <sup>40</sup>					342.77		
10 min	60	16 <sup>50</sup>					341.59		
	70	17 <sup>00</sup>					340.26		
	80	17 <sup>10</sup>					339.94		
	90	17 <sup>20</sup>					342.20		
	100	17 <sup>30</sup>					340.19		
20 min	120	17 <sup>50</sup>					338.55		
	140	18 <sup>10</sup>					330.15		
	160	18 <sup>30</sup>					337.55		
	180	18 <sup>50</sup>					336.97		
30 min	210	19 <sup>20</sup>					336.76		
	240	19 <sup>50</sup>					336.26		
	270	21 <sup>20</sup>					335.83		
	300	21 <sup>50</sup>					335.54		
	330	22 <sup>20</sup>					334.90		
	360	22 <sup>50</sup>					334.90		
	390	23 <sup>20</sup>					334.43		
	420	23 <sup>50</sup>					334.36		
12/15	450	00 <sup>20</sup>					334.07		
	480	00 <sup>50</sup>					334.22		

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: A5R-1

Test: WY 2010 T65 #2

Sheet No. 2 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft)	Drawup (ft)	Comments/Other	
				Line	Head	FCV				
12/15/09	0120	510					333.79			
	0150	540					333.86			
	0220	570					333.68			
	0250	600					333.86			
	0320	630					333.50			
	0350	660								
	0420	690					333.18			
	0450	720					333.14			
	0520	750					333.14			
	0550	780					332.82		369.4      369	
	0620	810					332.82		-333      -327	
	0650	840					333.14		36      42	
	0720	870					333.14			
40 min	0800	900	-1050	114016000	92	33	177	333.07	36	114016000 - 112971000 = 1,045,000 gals
	0840	940								+400
1 hr	0940	1000					331.39			= 1161
	1040	1060					331.00			
	1140	1120					332.14			
	1240	1180					329.28			
	1340	1240					329.78			
	1440	1300					328.24			
	1540	1360					327.81			
	1640	1420					328.31			
	1740	1480					330.64			
2 hr	1940	1600					328.88			
	2140	1720					328.20			
	2340	1840					327.63			
12/16	0140	1960					328.03			
	0340	2080					327.70			
	0540	2200	-925	115444000	92	29	177	327.42		-tank ~ 950 psi
	0740	2320	-1000		92	25	177	327.27		opened FCV to 170 @ 0925 ~ 1,000 gpm
	0940	2440					327.31	42		opened V-2 so pr @ head < 30, built back up
	1140	2560					326.95			to 175 @ FCV. Adj it back to 170 because
	1340	2680					328.31			Q dropped to 950. WBS in it = 1000 gpm
	1540	2800	-1000	115874000	01505			331.57		
	1740	2920					329.10			
	1940	3040					327.03			
	2140	3160					329.28			
	2340	3280					328.81			
12/17	0140	3400					329.31			

64  
16  
53

369  
-219  
55

369  
-329  
40

69  
21  
48

MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Test: ASR-1 WY 2010 TEST #2

Sheet No. 3 of 4  
+ 1 ATTACHMENT

Date/Time	ET (min)	Rate (gpm)	Pressure (psi)			Depth to Water (ft bsl)			Drawup (ft)	Totalizer (gallons)	Comments/Other
			Line	Head	FCV	ASR-1	ASR-2	MW-1			
12/14/09 0300		3520									
0500		3640									
0700		3760									
0900		3880	~1000	97	23	171				116,928,000	0803 Tank @ 925 040218000 - 15F
1100		4000									011044000 ASR-2 note
1300		4120									
1500		4240									Will bring machine repair for water meter but it was a different size, said he would try to find a "manual" for it, or another unit, and a PLANNING device.
1700		4360									
1900		4480									
2100		4600									
2300		4720									
12/18 0100		4840									0808 = 1,046 g/m Ave last 24 hrs
0300		4960									Tank @ 950
0500		5080									S-TV + DM elec. ok site @ ASR-2
0700		5200	~1000	97	24	170				110,449,000	
0900		5320						43.1			
1100		5440									Δ & values to put pressure on FCV, reduce pressure on V-1 + V-2 - SEE ATTACHMENT for details
1300		5560									Make adjustments to ASR-2 at 1645 - no Δ @ ASR-1
1500		5680	~1090	80	79	224					At 14:15 TL does SDI, JS ADS, ASR-2 to reduce Q, (too much draw-up) - @ 1430 ASR-1 = 1,090 g/m JS let's go 1505
1700		5800									
1900		5920									
2100		6040									
2300		6160									
12/19 0100		6280									
0300		6400									
0500		6520									
0700		6640									
0900		6760	~1100	80	78	221			~55	120,132,000	0900 Tank @ 925
1100		6880									
1300		7000									
1500		7120	~1100			229					@ 1540 FLOW MTD DROPPED TO ~1100
1700		7240									
1900		7360									
2100		7480									
2300		7600									
12/20 0100		7720									
0300		7840									
0500		7960									
0700		8080									
0900		8200	~1090	83	83	227			~53	121,720,000	0910 Tank @ 910
			~1110			226					08950 nos. FCV one test time - but no ADJ @ ASR-2





AL ADJUSTMENTS MADE 12/18/09 1215-355 @ ASR-1

Attachment to NOTES for ASR-1 12/18/09

Line = 90 psi

12-18-09 @ 1215 / ASR-1

ADJ V1+V2 to reduce pressure on them

FCV	Line	Q
180	48	1500
185	57	1400
190	57	1380
195	59	1300
200	62	12500
205	68	1200
210	69	1150
215	70	1080

opened V-1 more

217	78	1150
218	81	1250
220	86	1300
220	88	1325
→ 220 ← = volume	90	1375
236	90	1050

left @

235

1050 @ 1231

1355 - ADJ FCV to compensate for TNS @ ASR-2

ASR-1 @	231	750
	235	900
	232	975
	220	~1040

1525 @ ASR-2 1000 @ ASR-1 @ 1400  
line = 73



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1  
Test: #3 WY 2010

Sheet No. 2 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/21/09 2309	510						721.40		
2339	540						321.62		
12/22 0009	570						321.22		
0039	600						321.05		
0109	630						320.72		
0139	660						320.72		
0209	690						320.33		
0239	720						320.37		
0309	750						319.10		
0339	780						320.93		
0409	810								
0439	840						319.79		
0509	870								
40 min 0539	900						320.08		
0619	940						319.51		
1 hr 0719	1000						319.86		
0819	1060	1210	124911 <u>1000</u>	84	84	221	320.58	43.3	@ 0800 TANK ≈ 880 psi
0919	1120						320.09		
1019	1180						320.72		
1119	1240						319.61		
1219	1300						319.76		
1319	1360						319.54		
1419	1420						319.11		
1519	1480						318.90		
2 hr 1719	1600						318.22		
1919	1720						318.11		
2119	1840						319.18		
12/23 2314	1960						318.54		364
0114	2080						317.32		-318
0319	2200						317.54		46
0519	2320						318.29		
0719	2440	1200	126731 <u>1000</u>	86	87	221	317.97	~46	@ 0809 Tank ≈ 880 psi Harvest bAs 62%
0919	2560	1300*		90	91	222			DTW 318.04 @ 0818 Harvest time
1119	2680		126859 <u>1000</u>	98	98	280			* After shutting in ASR-2, a hour = 1300
1319	2800								Start shutting ASR-1 @ 0948 FCV GPM
1519	2920		126859 <u>1000</u>	98	98	291	316.02		@ 0959 Injection completely
1719	3040	1200 *	126945 <u>1000</u>	81	81	220			stopped due to CATW system
1919	3160								issue (per Mr. Postler)
2119	3280								@ 1546, read XD = 365.98;
2319	3400								start opening FCV again

\* @ 1645 after adj. to ASR-2 TH+50

FCV	GPM
280	0
270	0
250	300
226	1250

MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

DTW @ t=0 363.87

Well: ASR-1

Test: #3 wq 2010

Sheet No. 3 of \_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/24/09 0119		3520							
0319		3640							
0519		3760							
0719		3880							
0919		4000	1250	128230	80	82	219	314.600	After ASR-2 fcv reduced: @ 1020 HERMIT 60%
1119		4120						312.539	made no fcv adj here
1319		4240							
1519		4360							
1719		4480							
1919		4600							
2119		4720							
2319		4840							
12/25 0119		4960							
0319		5080							
0519		5200							
0719		5320							
0919		5440	1300	130020				310.41	@ 0905 Tank = 840 psi; HERMIT = 61%
1119		5560	1250	130054	81	81	219	309.98	@ 0930 (after ASR-2 adj) made no fcv adj here.
1319		5680						309.91	
1519		5800						309.25	
1719		5920						309.37	
1919		6040						309.69	
2119		6160						308.91	
2319		6280						308.15	
12/26 0119		6400						308.01	
0319		6520						308.84	
0519		6640						308.55	
0719		6760						307.83	
0919		6880						308.09	
1119		7000	-1275	132019	79	79	217	308.30	After ASR-2 fcv increased (Flow reduced): @ 1114 Tank = 840 psi HERMIT = 61%
1319		7120						307.80	No fcv adj. here.
1519		7240						306.87	
1719		7360						306.65	
1919		7480						306.08	
2119		7600						315.14	
2319		7720						315.93	
12/27 0119		7840						312.70	
0319		7960						311.45	
0519		8080						310.63	
0719		8200						311.56	

JWO

JWO

TJL

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: # 3 WY 2010

Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bdst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/27/09 09 <sup>19</sup>	8320	~1280	133799600	82	83	220	307.12	56.75	00959 tank = 850 psi
11 <sup>19</sup>	8440	~1250	133852600	80	82	219	307.49		01039 after ADS FCV at ASR-2
13 <sup>19</sup>	8560						307.58		NO ADS. Here
15 <sup>19</sup>	8680						306.03		
17 <sup>19</sup>	8800						307.17		
19 <sup>19</sup>	8920						306.02		
21 <sup>19</sup>	9040						303.21		
23 <sup>19</sup>	9160						316.07		
12/28/09 01 <sup>19</sup>	9280						311.81		
03 <sup>19</sup>	9400						308.87		
05 <sup>19</sup>	9520						309.66		
07 <sup>19</sup>	9640	~1075	135489000	77	84	218	314.06	49.01	00859 tank = 840 psi
09 <sup>19</sup>	9760	~1175	135525000	81	80				00979 After shutting down ASR-2
11 <sup>19</sup>	9880								01055 Q dropped to ~1125 after BF and restart of ASR-2
	10000								Began shutting FCV
	10120								01104 - NO more flow (elapsed test time = 9865 min)
	10240								JWP
	10360		135631000			290			
	10480								
	10600								
	10720								
	10840								
	10960								
	11080								
	11200								
	11320								
	11440								
	11560								
	11680								
	11800								
	11920								
	12040								
	12160								
	12280								
	12400								
	12520								
	12640								
	12760								
	12880								
	13000								

TL

SO

TL

JWP

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: BF after Test #3 (Test 3 running)

Sheet No. 1 of 1

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/28/09			1356.31 [000]	88	88	290			040320 [000] BF with HERMIT=2649 TL
									BF @ 60.1 Hz - 2500 g/m 15 min @ 11:20
									@ 1135, motor off XD = 16.36'
									040356 [000] gal.
									@ 1145, motor on for 10-min SpC test @ 54.4 Hz
									XD <sub>i</sub> = 97.62      040375 [000] BF <sub>10</sub>
									XD <sub>10</sub> = 34.34      040356 [000] BF <sub>i</sub>
									83.28      19000
									Spm/H = 30.0 TL
									STOP TEST 3 @ 11:57

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: #4

Sheet No. 1 of 2

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/28/09 1210	0		135631 <u>000</u>	88	90	297	362.94		
1211	1	50				260			
1212	2	150				250			
1213	3	350				240			
1214	4	600				235			
1215	5	800				230			
1216	6								
1217	7	900				225			
1218	8	1050				220			
1219	9								
1220	10								
1222	12								
5 min 1225	15	1100				217			
1230	20	1125				216			
1235	25	1150				219			
1240	30	1210				217			
1245	35								
1250	40	1210				212			
1255	45	1210				210			
1300	50								
1305	55								
10 min 1310	60	1250	135701 <u>000</u>	70	67	217			
1320	70	1200				212			
1330	80								
1340	90								
1350	100								
20 min 1410	120								
1430	140	1200	135874 <u>000</u>	71	70	212		@ 1530, make no adj	
1450	160								
1510	180								
30 min 1540	210								
1610	240								
1640	270								
1710	300								
1740	330								
1810	360								
1840	390								
1910	420								
1940	450								
2010	480								

JWD  
12/28/09

JWD



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Sheet No. 2 of 2

Test: 44

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/28	2040	510							
	2110	540					316.25		
	2140	570							
	2210	(600)							
	2240	630							
	2310	(660)							
	2340	690							
12/29	0010	(720)							
	0040	750							
	0110	(780)							
	0140	810							
	0210	(840)							
	0240	870							
40 min	0310	900							
	0350	940							
1 hr	0450	1000							
	0550	1060							
	0650	1120							
	0750	1180							
	0850	1240							
	0950	1300	1275	137308	000	74	80	212	@ 1005 HERMIT = 67%
	1050	1360	1350	137407	000				@ 1045, made no adj here
	1150	1420							JW
	1250	1480							
2 hr	1350	1600							
	1750	1720							
	1750	1840							
	1950	1960							
	2150	2080							
	2350	2200							
12/30	0150	2320							Projected meter reading to 0800 hr (not recorded)
	0350	2440							
	0550	2560							
	0750	2680							
	0950	2800							
	1150	2920							
	1350	3040							Tank = 800 HERMIT = 68%
	1550	3160	1350	137		75	75	211	@ 1650
	1750	3280	Ø	139911	000	98	20	295	@ 1715 stop injection due to declining CR flow. (elapsed test time = 3245 min)
		3400							JW

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1  
Test: BF

Sheet No.      of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft blst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1-5-2010 10:08 pm		BF	139911000	92	Ø	303			Ø 1038 open v-1 - tank = 800 Ø 40375000 BF
1048	after filling		139912000				360.02 probe		just a crack to fill column
							360.51 - HERMIT		BF 060 Hz 10 mins, then 54.4 Hz for 10 mins
									BF 040418000
									XD: 98.45 XD: 36.08 6237
									BF 040399000 19000 / 62.37 = 30.46 gpm/H
									sample F-1
									Ø 40443000 off @ 1149

T2

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: #5 WY2010

Sheet No. 1 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1.15-09 11:14	0		139973000	62	62		359.19		prior to inj. flush to prt 139912007 inj
	1						358.40		040443000 - BF
	2						356.33		FCV Tank = 800 psi FCV = 303 psi
	3						348.49		SD7 = 1.0%
	4						346.17		
	5	800					345.52		① 1129 adj to compensate for low
	6						344.99		pressure in case it comes back up to 80
	7						344.74		450 gpm 230 psi FCV
	8						342.59		
	9						339.76		
	10						339.73		
	12	800		60	60	208	338.98		
5 min	15	0		72	72		339.30		
	20						350.14		
	25						357.90		① 1136 closed FCV to check system pressure
	30	900		58		205	334.97		reset to <1000 gpm in case system
	35	925			58	204	334.72		pressure comes back up.
	40						334.75		
	45						334.36		
	50						334.00		
	55						333.79		
10 min	60						333.50		
	70						333.18		
	80						332.68		
	90						333.00		
	100						332.14		
20 min	120	950	146073000	59	59	211	331.93		① 1309 (115 min et) Tank = 750
	140	1025		68	68	208	327.63		← changed while bubble test conducted
	160	950		74	74	219	334.90		Ready just to ~950 gpm
	180						335.36		
30 min	210	800	140249000	76	76	221	335.76		readjusted to 219 & 950 gpm
	240						335.40		
	270						335.25		
	300						335.29		
	330						334.72		
	360						330.57		
	390						330.42		
	420						329.92		
	450						329.82		
	480						329.35		

1+1  
+2

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: #5 w/y 2016

Sheet No. 2 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bgs)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1-15-10 1944	510						328.05		
2014	540						329.31		
2044	570						329.28		
2114	600						329.14		
2144	630						329.21		
2214	660								
2244	690						329.10		
2314	720						328.71		
2344	750						328.35		
1-16-10 0014	780								
0044	810						328.03		
0114	840						326.41		
0144	870						326.41		
40 min 0214	900						326.02		
0254	940						325.56		
1 hr 0354	1000						325.51		
0454	1060						325.59		
0554	1120						325.56		
0654	1180						324.84		
0754	1240						324.88		
0854	1300						326.59		
0954	1360	~875	141351000	68	68	219	328.92		TL
10.54	1420	~950				216	329.19	30.00	TL
11.54	1480						329.46		
2 hr 1354	1600						327.00		
1554	1720			88	90		325.63		
1754	1840						325.20		
1954	1960						325.73		
2154	2080						324.73		
2354	2200						323.48		
1-17-10 0154	2320						321.73		
0354	2440						321.47	37.72	
0554	2560						355.97		
0754	2680						357.07		
0954	2800						357.40		
1154	2920						357.54		
1354	3040		142161000	88	90	303	337.69		TL
1554	3160	~950		76	77	222	357.76		
1754	3280						329.36		
1954	3400						328.53		

In talking with Will + Cray, it is my understanding that the lower pressure in the system is due to the opening of a valve at the DPO Regulating Station, when Will shut down injection, he said the flow was near 1300 gpm

Will also indicated the problem as the failure of a "major" producing well in C.V. On 1/15/10 @ ~10:00 he said he was trying to get another well on-line (waiting to pass health tests).

@ 1030 Tank ~ 750 psi  
@ 1051 readjust FCV to get up to 950 gpm

@ 1424 CELL MESSAGE ~ 1700 from C. EVANS of CAW indicated they need to shut down due to inability to meet demand elsewhere. I MISSED THAT CALL, BUT DID GET ONE ON JAN 17th at ~5:30 with same message. Went to site to close FCV, but it was already done by Will. Foster around 3AM.

- off - NOT INJECTING  
- off " " "  
- " " "

@ 1444 R. RE-OPEN FCV from 303 to 222

@ 1451 (last daily 1/19/15 real time) Tank ~ 680 psi

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1  
Test: #5 WY 2010

Sheet No. 3 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bbs)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2154	3520						328.38		Spoke to CE - 8AM on 1/19, said it would be OK to inj. @ 1000 gpm. Asked him if we could do more later - said he would call, I call him back @ 1400 + he says 1500 would be OK
1-18-10 2354	3640						325.45		
0154	3760						325.20		
0354	3880						326.69		
0554	4000						324.02		
0754	4120	~1000	143546000	73	74	221	324.13	@ 08:25 Tank = 690	
0954	4240						324.66	(4091 mm) 143546000	
1154	4360	∅	1437471600				325.81	-(3070 mm) -142161000	
1354	4480		OFF	86	87	303	355.68	= 1021 mm = 1385000 = 1,356 gpm (?)	
1554	4600						355.68	meter is @ 1000	
1754	4720						356.93	No Adj.	
1954	4840						357.08		
2154	4960						357.22	@ 1129 - call from C.E. - unable to maintain flows due to power outage - please shut down ASR -	
1-19-10 2354	5080						357.33	OFF @ 1150	
0154	5200						357.29		
0354	5320						357.29		
0554	5440						357.29		
0754	5560						357.26		
0954	5680	∅	143747000	91	92	303	357.29	Tare down "Easy up" tarp + frame - too much wind and rain for one more day standing.	
1154	5800	1000		78	80	222	325.09	@ 0905 - open FCV (tank = 650 psi)	
1354	5920	~725	144011000	68	68	222	325.09		
1554	6040	~975		67	68	214	334.97	2 - Craig said later today possible start of ASR. * main storage tank @ Segunda has 32' and 20' is critical level for water supply	
1754	6160	~1000		70	91	220	334.97	→ 30' valve is now open to pump and was closed during tests of ASR	
1954	6280						325.23		
2154	6400						324.95		
1-20 2354	6520						323.98		
0154	6640						321.40		
0354	6760						321.61		
0554	6880						320.26		
0754	7000	~975	145102000	71	72	225	321.73	Did not increase to 1500 gpm in use P increased, but did bring it back to 1000.	
0954	7120	~1300	145370000	90	92	225	321.73	@ 0805 (7014 MIN) Tank = 625 psi	
1154	7240	~1500	145382000	89	90	217	311.70	@ 1127 ← 7014 NO ADJ.	
1354	7360							- 144011000 -5960	
1554	7480							= 1081000 gal / 1054 = 1,026 gpm avg	
1754	7600							- Robert reports cement by this AM and it was running ~1300 gpm.	
1954	7720							Tank = 650 psi - adj FCV after talking to CE.	
2154	7840								
1-21-10 2354	7960								
0154	8080								
0354	8200								

TL  
TL  
TL  
TL  
TL

**MPWMD**  
**PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: WY2020 TEST #5

8454  
- 7074  
1701,000 gal / 1460 mins = 1,168.125 g/m  
Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft blst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1-21-10 551	8320								
0751	8440	~1300	146802000	90	~90	221	208.05		Tank @ 625 psi Adj FCV down to ~217 thinking that the pressure was high enough to accommodate extra increase in flow. BUT, Flow dropped (?) to ~1050 gpm and line pressure dropped to ~68 psi so F set it back for now. @0820 injection down to ~980 g/m, line = 76 psi Avg Rate last 24 hrs = 1,181 g/m
0951	8560						323.87		
1151	8680						324.12		
1351	8800						322.01		
1551	8920						311.16		
1751	9040						310.48		
1951	9160						309.55		
2151	9280						322.76		
2351	9400						320.58		
1-22-10 0151	9520						318.43		
0351	9640						317.79		
0551	9760						308.27		
0751	9880	~900	148446000	67	68	217	308.66	@0820 (9909 min) avg 1,139 g/m 24hrs @1005 @1010 shut down for BF	
0951	10000	~350	148543000	68			324.05		
1151	10120	∅	148548000	82		300			
1351	10240								
	10360								
	10480								
	10600								
	10720								
	10840								
	10960								
	11080								
	11200								
	11320								
	11440								
	11560								
	11680								
	11800								
	11920								
	12040								
	12160								
	12280								
	12400								
	12520								
	12640								
	12760								
	12880								
	13000								

**MPWMD**  
**PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1  
Test: BF after T#5

Sheet No. 1 of 1

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft. bdst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1-22-2010		0	148548000						Erase BF value 040507000 on BF @ 1010 began cleaning FCV set values for BF @ 60 Hz, 15 min 00353407 CF @ MW-1 - turn on @ 1020 unable to read display - we knew last BF left at 54.4 Hz, slightly varied VFD, read gpm < 2400 initial, dropped off a bit when dirty slug came through, still dirty a bit after 5 mins (~2300 gpm) cleaned up after ~7 mins 040538000 after 15 mins at unk. Hz unsuccessfully tried to blow dry display on FCV - <div style="float: right; text-align: right;">             538000              - 507000              31,000 / 15              2066 g/m           </div> V D: 105.31      set back close to original V D: 40.61      setting ~ 54.4 Hz (2000 g/m) 64.70 040552000 BF <sub>10</sub> 040538000 BF <sub>1</sub> 20000 / 64.7 = 30.91 g/mf sampled F-1 040561000 end 040561000 - 040507000 54000

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: AER-1

Test: #6 WY2020

Sheet No. 1 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft b1st)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1-22-2010 1205	0		148548000	86		300	355.83		148548000 prior to early to B F
1206	1	~900		73		219	354.65		
1207	2						344.34		
1208	3						336.69		
1209	4						335.69		
1210	5						334.60		
1211	6	900					333.75		
1212	7		148552000	74		220	333.39		
1213	8						333.61		
1214	9						333.50		
1215	10						333.22		
1217	12						332.82		
5 min 1220	15						332.68		
1225	20						332.14		
30	25						331.53		
35	30						331.71		
40	35						331.82		
45	40						331.21		
50	45						331.46		
55	50						331.10		
1300	55						330.75		
10 min 1300	60	900	148610000	72		221	331.00	01313	+ fault ~ 600 psi
1310	70						330.39		
1325	80						330.10		
1335	90						329.92		
1345	100						329.78		
20 min 1425	120						329.14		
1445	140						328.96		
1505	160	900	148761000	70		221	329.60	01550	
1525	180	800	148802000	69		220	329.56	01635	
30 min 1545	210	900		64		217	329.21	after start of AER-2 cor #8 AOS @ 1635 to 217	
1605	240						328.99		
1635	270						330.60		
1705	300						328.85		
1735	330						329.06		
1805	360						329.10		
1835	390						329.14		
1905	420						328.88		
1935	450						327.77		
2005	480						328.24		



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: WY 2010 Test #6

Sheet No. 2 of 9

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1-22-10 2035	510						327.49		
2105	540						327.45		
2135	570						326.77		
2205	600						327.52		
2235	630						326.99		
2305	660								
2335	690						326.45		
1/23 0005	720						326.34		
0035	750						325.77		
0105	780								
0135	810						324.73		
0205	840						324.62		
0235	870								
40 min 0305	900						325.52		
0345	940						324.66		
1 hr 0445	1000						324.37		
0545	1060						324.20		
0645	1120						323.59	32.24	
0745	1180						324.23		
0845	1240						324.77		
0945	1300	850	149799.000	60		ZIG	325.68		Tank = 600 psi
1045	1360						327.06	28.77	No adjustments
1145	1420						327.49		
1245	1480						327.24		
2 hr 1445	1600						326.70		
1645	1720						324.70		
1845	1840						324.62		
2045	1960						324.98		
2245	2080						324.09		
1/24 0045	2200						322.98		
0245	2320						321.37		
0445	2440						320.72	35.11	
0645	2560						320.83		
0845	2680						321.47		
1045	2800	850	151191.000	61	63	212	324.66	31.17	Tank = 600
1245	2920	950	151236.000	59	60	207	324.27		1000 (2755 min)
1445	3040						323.80		1050 (2805 m) adj. FCV
1645	3160						322.94		
1845	3280						325.05		
2045	3400						323.27		

$$\frac{149799.000}{1038.000} = 1300$$

$$\frac{148761.000}{1075} = 966 \text{ gpm}$$
 avg same yesterday

$$\frac{151191.000}{1392.000} = 2755$$

$$\frac{149799.000}{1455} = 957 \text{ gpm}$$
 avg same yesterday

TL

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: WY 2010 Test #6

Sheet No. 3 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft blst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1/24/10 2245	3520						327.99		
1/25/10 0045	3640						322.48		152,355, <sup>500</sup> 4065
0245	3760						321.69		- 151,236, <sup>500</sup> 2805
0445	3880						320.47	35.36	1/19, <sup>500</sup> / 1260 m = 888 g/m day since yesterday
0645	4000						320.83	35.0	Tank = 600 psi
0845	4120	~800	152355 <sup>500</sup>	59	60	212	326.63	@0845	@ 0800 FCV needs a vibrating 210-212 as if
1045	4240	~900	152376 <sup>500</sup>	58	59	207	320.08	@1045	same Δ pressure is occurring
1245	4360						309.84		Adj. FCV @ 0825
1445	4480						307.80		
1645	4600						317.21		
1845	4720						318.75	DTW time	Mr. Masretto call ask for 50% reduction 8 PM
2045	4840	1300	153139 <sup>500</sup>	78	79	214	306.36	2045	@ 2020
2245	4960	1400		83	84		324.91	2245	After ADS, FCV @ ASR-2 @ 1830
1/26 0045	5080	1000	153165 <sup>500</sup>	88	89	238	326.13	0045	@ 2040
0245	5200	1000	153181 <sup>500</sup>	92	93	238	325.45	245	@ 2045 after out down of
0445	5320	800	153190 <sup>500</sup>	95	95	240	325.70	@0445	@ 2105 lower rate after talking to M. Masretto
0645	5440						325.41	@0645	
0845	5560	500	153722 <sup>500</sup>	78	80	244	334.47	@0845	@ 0800
1045	5680	700	153753 <sup>500</sup>	79	79	245	348.96	1045	@ 1100
1245	5800	900	153756 <sup>500</sup>	60	63	219	321.49	1245	@ 1115
1445	5920						318.93		
1645	6040						319.29		
1845	6160						318.65		
2045	6280						318.43		
2245	6400						317.93		
1/27 0045	6520						315.60		
0245	6640						319.10		
0445	6760						313.99		
0645	6880	~750	154902 <sup>500</sup>	56	57	209	315.96	39.87	@ 0745 (6940 mm)
0845	7000	~850	154945 <sup>500</sup>	60		215	316.87		@ 0835
1045	7120	~850	155063 <sup>500</sup>	62			316.96	@1045	after nearly a day of FCV @ ASR-2 - NO ADS here
1245	7240						318.18		
1445	7360						317.04		
1645	7480	850	155327 <sup>500</sup>	59	60		317.39		@ 1555
1845	7600						315.93		
2045	7720						317.04		
2245	7840						315.78		
1/28 0045	7960						314.21		
0245	8080						313.42		
0445	8200						311.84		



**MRWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: A32-1

Test: W42070 TEST #7

Sheet No. 1 of     

1-24	1444	0	1581441000			349.10
	1445	1				349.96
	1446	2				349.09
	1447	3				339.37
	1448	4				327.99
	1449	5				323.34
	1450	6	1010		200	321.94
	1451	7				320.76
	1452	8				
	1453	9				
	1454	10				
	1456	12				
5 min	1500	15				
	1505	20				
	1510	25				
	1515	30				
	1520	35				
	1525	40				
	1530	45				
	1535	50				
	1540	55				
10 min	1545	60				
	1555	70				
	1605	80				
	1615	90				
	1620	100				
20 min	1640	120				314.31
	1700	140				314.46
	1720	160				313.78
	1740	180				312.31
30 min	1810	210				312.88
	1820	240				312.64
	1910	270				311.93
	1940	300				312.60
	2010	330				311.88
	2040	360				310.34
	2110	390				311.99
	2140	420				311.59
	2210	450				310.86
	2240	480				310.81



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1  
Test: WY 2010 TEST # 7

Sheet No. 3 of \_\_\_\_\_

7/1/10	0120	3520							292.08		
	0320	3640							292.22		
	0520	3760							290.93	58.17	
	0720	3880	1,100	1630100001	53	54	197		293.50		20810 (3930) tank ~ 550 psi
	0920	4000							295.07		110 AOS
	1120	4120							298.38		
	1320	4240	1,100	1633280001	52	54	193		296.02		01245 Δ tank, 32300 psi
	1520	4360							294.90		
	1720	4480							293.83		
	1920	4600							296.51		
	2120	4720							298.02		
	2320	4840							299.20		
2/2	0120	4960							291.02		
	0320	5080							290.53	58.57	
	0520	5200							290.64		
	0720	5320	1225	1646990001	62	64	200		292.07		00830 after being down ASR-2 (5390m)
	0920	5440							286.02		
	1120	5560							289.45		
	1320	5680							284.62		
	1520	5800	1200	1652190001	58	59			283.69	65.11	01500
	1720	5920							251.32		shut down at C. Flom's request due low recovery at test station - need to shut down for repairs - @ 1530 psi tank OK to restart - but not filling at ASR-2
	1920	6040									
	2120	6160									
	2320	6280							352.68		
2/3	0120	6400							352.89		
	0320	6520							353.02		
	0520	6640							353.29		
	0720	6760	0	1652190001	83	84	302		353.43		Revised Injection @ 0755
	0920	6880	~1100		64	66	207		306.44		00505 FCV @ 223 = 700 g/m @ 0801
	1120	7000	~1025		50	52	196		302.10		+15 = 075 g/m @ 0803
	1320	7120							300.13		00910 adj. after setting ASR-2
	1520	7240							297.25		
	1720	7360							300.20		
	1920	7480							297.23		
	2120	7600	1000						296.76		
	2320	7720	1000	1657700001	99	53	197		295.65		soft welling
2/4	0120	7840							291.64		
	0320	7960							291.21		
	0520	8080							290.21	57.89	
	0720	8200	1000	1668150001	52	53	199		293.50		00010 Rudy says 2' line broken from 0805 to 0807 - he is repairing, although maybe it was Top Grade's fault.



2510

0845

PCV 4  
209 69

1315000  
168478 000

STW  
293

### MPWMD PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASK-1

Test: WV 2010 Hevma Test # 8

Sheet No. 1 of \_\_\_\_\_

2-9-2010 1407	0		167127000			347.63	
(7hr) 1410	1					344.95	
1411	2					335.00	
1412	3						
1413	4						
1414	5						
1415	6						
1416	7						
1417	8					319.20	
1418	9	-1200	167135000	46	187	312.63	o 1418
1419	10					318.92	
1421	12						
6 min 1422	15						
1423	20	1200		41	104		adjusted ASR2 → 800gpm
1431	25						
1439	30						
1440	35						
1449	40						
1459	45						
1459	50						
1504	55						
10 min 1519	60						
1524	70						
1534	80						
1544	90						
1554	100						
20 min 1614	120						
1624	140						
1654	160						
1714	180						
30 min 1724	210						
1814	240						
1854	270						
1914	300						
1944	330						
2014	360						
2044	390						
2114	420						
2144	450						
2214	480						



Should be 2/5 (Fri)  
2/10

MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: 200

TEST: 200-00-000000-TEST #1

Sheet No. 2 of

	510							
	540							
	570							
	600	while it not connect						
	630							
	660							
	690							
	720							
	750							
	780							
	810							
	840							
	870							
	900							
	930							
	1000							
	1050							
	1120	1375						
	1180	1500	162478	1500	70	69	204	283
	1240							
	1300							
	1360							
	1420							
	1480	1300			66	204	283	
	1500							
	1720							
	1840							
	1960							
	2080							
	2200							
	2320							
	2440							
	2560							
	2680	1300	170282	1500	49	52	203	
	2800	1300			59	60	210	
	2920							
	3040							
	3160							
	3280							
	3400							

1351 + 1100 = 1445. 8pm  
next to 1500 GPM and ASK 7 TO 1000

0940  
ENTER ADS 850

7/6/15  
700



MW 008593  
 DENSE ON 0830

MPWMD  
 PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: A5R-1

Test: W1200 HERMIT TEST #8

Sheet No. 4 of \_\_\_\_\_

2/10/00	0809	8320	1700	176859000	78	79	207	264.29	82.3%	00819	347.63
	1009	8440	1500				210			AD50 083F	-264.29
	1209	8560									59.34
	1409	8680									
	1609	8800									
	1809	8920									
	2009	9040									
	2209	9160									
2/11/00	0009	9280									347.63
	0209	9400									-249.35
	0409	9520									59.28
	0609	9640					208.09				
	0809	9760	1200	178585000	83	84	225	288.35	59.2%	00819	-tank=1100
	1009	9880	1400		79	80	210			* add @ 0955 after adj @ A5R-2	
	1209	10000	1400	178976000	76	78	212			* (255) return to site after call from Camp Evans requested that we could increase flow anytime.	
	1409	10120									
	1609	10240									
	1809	10360									
	2009	10480									
	2209	10600									
2/12/00	0009	10720									
	0209	10840									
	0409	10960									
	0609	11080									
	0809	11200	1300	170285000	81		220	280.35		turned up to 1500 GPM	
	1009	11320	1500		81		210			-> stopped for backflush	
	1209	11440	1400		78		215			before BF BP = 040698000	
	*	11560									
		11680		18061000							
		11800									
		11920									
		12040								CLEARED UP AFTER TWIN	
		12160								7300 GPM ON FURTH	
		12280									
		12400									
		12520								XD: 115.48; 115.59/40750 (50) BF 10	
		12640								XD 10 43.95 / 040730 (000) BF 1	
		12760								61.53 20.00	
		12880								= 32.5 gpm/ft	
		13000									

BF WQ 410 TDS 7.24PH 040954000 after starting BF  
 16.9°C OHS 10/1 DO  
 Reservoir: Inflight CAGWY ORP





**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ABR-1

Test: WY 2010 TEST #9 (Hemph test #9)

Sheet No. 3 of     

0059 2150	3620						301.02			
0259	3640						301.21			345.20
0459	3760						301.42			- 279.21
06	3880						279.21	65.09		65.99
08 59	4000	1450	1860541000	78	80	212			00549 (from connections)	NO ADS
10 59	4120						297.95			
12 59	4240						299.92			
14	4360						301.17			
16	4480						300.81			
18	4600						301.17			
20	4720						300.03			
22	4840						300.42			
24 00 59	4960						299.67			345.20
02 59	5080						299.67			- 279.21
04 59	5200						299.16			68.11
06 59	5320	1450	1876041000	79	80	214	279.09	68.11	00759	NO ADS
08 59	5440									
10 59	5560									
12 59	5680	1500								
14	5800		1881020001	93	94	210	265.44		01240	BE AVOIDING values
16	5920					305				0407541001
18	6040									2350 GPM 1.91 BE
20	6160									
22	6280									MADG CASE FOR RMW
24	6400									CONSTANT FLOW RATE
26	6520									520 US/GM
28	6640									SAMPLED @ 15 MIN
30	6760									PUMPING
32	6880									0.84 mg/L TDS
34	7000									747 mV DEP
36	7120									
38	7240									SDR1 flow rate through flow
40	7360									cell.
42	7480									
44	7600									
46	7720									PUMP TEST: 1st 0908071000
48	7840									2nd 0407571001
50	7960									20 00 1692
52	8080									VD DEPTH 1st 115.87 = 28.9
54	8200									2nd 16.17 51.44
1344	8260		1881020001	94	95	305	346.13			69.20

1500 NEW TEST STARTED @ 80 210

1540

1600

60 208

0407571000

TL

TL

JL

TL









**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 1

Test: ASR 1 Test 10 WY 2010

Sheet No. 4 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft. bsl)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/22/10 8:24	8320	1500	199002(600)	80	80	209	273.76		
2/22/10 10:24	8440								
2/22/10 12:24	8560								
2/22/10 14:24	8680								
2/22/10 16:24	8800						273.33		
2/22/10 18:24	8920						272.16		
2/22/10 20:24	9040						275.12		
2/22/10 22:24	9160						275.33		
2/23/10 0:24	9280						274.77		
2/23/10 2:24	9400						277.72		
2/23/10 4:24	9520						271.43		
2/23/10 6:24	9640						270.87		
2/23/10 8:24	9760	1570	201010(600)	78	79	202	271.00	75.2	00806
2/23/10 10:24	9880								00811
2/23/10 12:24	10000	1500	201014(600)		92	202			01107(1000) BF broken, using BF valve BF is not @ ~2300 gpm, just
2/23/10 14:24	10120								
2/23/10 16:24	10240								
2/23/10 18:24	10360								
2/23/10 20:24	10480								
2/23/10 22:24	10600								
2/24/10 0:24	10720								040064(300) 16.00 min 040571(1000) 47.58 min 12.82 / 78.82 27.35 gpm/ft. to: use valve ~ 200 gpm. Slowly close to stop flow 040892(1000)
2/24/10 2:24	10840								control to 1900, with 1000 gpm CAW
2/24/10 4:24	10960								040941(1000) valve closed, rate 0 gpm 040945 ?
2/24/10 6:24	11080								
2/24/10 8:24	11200		21.2 gpm ET 1 @						
2/24/10 10:24	11320								
2/24/10 12:24	11440								
2/24/10 14:24	11560								
2/24/10 16:24	11680								
2/24/10 18:24	11800								
2/24/10 20:24	11920								
2/24/10 22:24	12040	1500	201014(600)	92	92	302	276.13		
2/25/10 0:24	12160								040940(1000) stop #11 using 2 valves between
2/25/10 2:24	12280	1500	01023						
2/25/10 4:24	12400								
2/25/10 6:24	12520								
2/25/10 8:24	12640								
2/25/10 10:24	12760								
2/25/10 12:24	12880								
2/25/10 14:24	13000								

ALL ON TEST #11 STARTS

2/24 @ 757 1600 203154(1000) 82 82 711 28340 - dropped to 1500 gpm after ASR-2 adjustment







ASR-1  
 250  
 150  
 100  
 50  
 0

**MPWMD  
 PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: ASR-1 TEST 11, WY 2010

Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/1/10 5:00	8320								
3/1/10 7:00	8440								
3/1/10 9:00	8560	1600	214468 [000]	72	72	207	260.27	59.13	⊙ 0815 Tank = 1950 psi TLL no 105.
3/1/10 11:00	8680								
3/1/10 13:00	8800								
3/1/10 15:00	8920								
3/1/10 17:00	9040								
3/1/10 19:00	9160								
3/1/10 21:00	9280								
3/1/10 23:00	9400								
3/2/10 1:00	9520	1700	217227 [000]	78	80	203	250.11		1327 ⊙ 1305 1: 040442 [000] BACK FLUSH 2: M-T-R
3/2/10 3:00	9640	∅	217235 [000]	94	95	300			
3/2/10 5:00	9760								
3/2/10 7:00	9880								Pumped @ 60 Hz for 15 min read 040970 [000]
3/2/10 9:00	10000								
3/2/10 11:00	10120								
3/2/10 13:00	10240								10 min @ 54 Hz = 40999 [000] x 1.15 = 47.14
3/2/10 15:00	10360								BF = 040970 [000] yd 1.0 y2.29 2 @ 000 73.05
3/2/10 17:00	10480								
3/2/10 19:00	10600								
3/2/10 21:00	10720								
3/2/10 23:00	10840								
3/3/10 1:00	10960								
3/3/10 3:00	11080								
3/3/10 5:00	11200	∅	217236 [000]	92	92	305	344.49	⊙ 1529	start test # 12
3/3/10 7:00	11320	1550	217241 [000]	73	72	303			⊙ 1535
3/3/10 9:00	11440								
3/3/10 11:00	11560								
3/3/10 13:00	11680								
3/3/10 15:00	11800	1525	218859 [000]	72	71	202			⊙ 0835
3/3/10 17:00	11920								
3/3/10 19:00	12040								
3/3/10 21:00	12160								
3/3/10 23:00	12280								
3/4/10 1:00	12400								
3/4/10 3:00	12520								
3/4/10 5:00	12640								
3/4/10 7:00	12760								
3/4/10 9:00	12880								
3/4/10 11:00	13000								

TR 3/2

313

$$\frac{20,000}{73.05} = 274$$







**MPWMD**  
**PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: ASR-1 TEST #12, WY 2010

Sheet No. 3 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/5/10 2:09	3520								
3/5/10 4:09	3640								
3/5/10 6:09	3760								
3/5/10 8:09	3880	1550	223340	78	79	209	267.74	76.75	No ADJUSTMENT @ 0830
3/5/10 10:09	4000								
3/5/10 12:09	4120								
3/5/10 14:09	4240								
3/5/10 16:09	4360								
3/5/10 18:09	4480								
3/5/10 20:09	4600								
3/5/10 22:09	4720						266.05		
3/6/10 0:09	4840						265.69		
3/6/10 2:09	4960						264.58		
3/6/10 4:09	5080								Black gage after V-2, gage right at well head is inaccurate
3/6/10 6:09	5200								
3/6/10 8:09	5320						263.40		
3/6/10 10:09	5440	1450	225614	71	72	208	264.44	80.05	@ 1016 Tank ~ 1900 psi;
3/6/10 12:09	5560	1500	225655	74	76	207			@ 1044 after adj at ASR-2, valve here
3/6/10 14:09	5680								
3/6/10 16:09	5800								
3/6/10 18:09	5920								
3/6/10 20:09	6040								
3/6/10 22:09	6160								
3/7/10 0:09	6280								
3/7/10 2:09	6400								
3/7/10 4:09	6520								
3/7/10 6:09	6640								
3/7/10 8:09	6760								
3/7/10 10:09	6880								
3/7/10 12:09	7000								
3/7/10 14:09	7120	1575	228047	76	76	209			@ 1400 No adj here; only at ASR-2. JWB
3/7/10 16:09	7240								
3/7/10 18:09	7360								
3/7/10 20:09	7480								
3/7/10 22:09	7600								
3/8/10 0:09	7720								
3/8/10 2:09	7840								
3/8/10 4:09	7960								Rudy says PGE Broke the 2" line but he will have it repaired and tested
3/8/10 6:09	8080								
3/8/10 8:09	8200	1525	229704	79	80	210	262.11	82.38	@ 0805 No ABS here, only at ASR-2 TLL

### MPWMD PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR-1

Test: ASR-1 TEST #12, WY 2010

Sheet No. 4 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/8/10 10:09	8320								
3/8/10 12:09	8440								
3/8/10 14:09	8560								
3/8/10 16:09	8680								
3/8/10 18:09	8800	1450	230507600	73	74	208			@ 1707
3/8/10 20:09	8920								
3/8/10 22:09	9040								
3/9/10 0:09	9160								
3/9/10 2:09	9280								
3/9/10 4:09	9400								
3/9/10 6:09	9520								
3/9/10 8:09	9640	1525	2318091000	81	80	211	261.5		@ 0830 NO ADJUSTMENT - JL
3/9/10 10:09	9760								
3/9/10 12:09	9880								
3/9/10 14:09	10000								
3/9/10 16:09	10120	1300	232591000	78	79	210			@ 1700 TIME Set TO 211 @ 1500 GPM
3/9/10 18:09	10240								
3/9/10 20:09	10360								
3/9/10 22:09	10480								
3/10/10 0:09	10600								
3/10/10 2:09	10720								
3/10/10 4:09	10840								
3/10/10 6:09	10960								moments later Rudy report
3/10/10 8:09	11080	1400	233657000	76	79	217	261.14	83.35	a leak, says he will check with Bob about who should repair
3/10/10 10:09	11200								
3/10/10 12:09	11320		233687000						off @ 0840 - Luke line leak @ 07:38
3/10/10 14:09	11440								BF = 041003000 prior to opening
3/10/10 16:09	11560								checked rotation - went counter clockwise -
3/10/10 18:09	11680								stopped w/in ~ 5 seconds - reset for
3/10/10 20:09	11800								injection - re-start @ 0910
3/10/10 22:09	11920	1500	233699000	73	76	206			@ 1920
3/11/10 0:09	12040								
3/11/10 2:09	12160								
3/11/10 4:09	12280								
3/11/10 6:09	12400								041002000 stop ~ 1055
3/11/10 8:09	12520								Blow for DV + BPack
3/11/10 10:09	12640		@ 1225						Daryl confirmed phase going into VFD
3/11/10 12:09	12760		↓						041035000 after ~ 15 min @ ~ 2300 gpm
3/11/10 14:09	12880		233815000	92	93	305			zone obs. CCW rotation as marked on pump at 10
3/11/10 16:09	13000	1500		82	85	214			11:10 10 min test ~ 54 Hz

HemA Test #3 started @ 1224 DTW = 342.13

3/10 @ 1707

~ 800 g/m

234160000 59/60

0095040 - MW-1 after supply 3/10  
220 - adj FCV to 195 psi = 1200 gpm TL

XD: 119.37 BF: 041055000 051056000 end  
-YD10 46.78 - BFC 041035000  
72.59 26000 72.6 = 27.6 gpm/ft

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR #1

Test: Hermit Test #3

Sheet No. 1 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/10/10 12:24	1 min	0	1500	233815000	93	92	214	342.13	
3/10/10 12:25		1							
3/10/10 12:26		2							
3/10/10 12:27		3							
3/10/10 12:28		4							
3/10/10 12:29		5							
3/10/10 12:30		6							
3/10/10 12:31		7							
3/10/10 12:32		8							
3/10/10 12:33		9							
3/10/10 12:34		10							
3/10/10 12:36		12							
3/10/10 12:39	5 min	15							
3/10/10 12:44		20							
3/10/10 12:49		25							
3/10/10 12:54		30							
3/10/10 12:59		35							
3/10/10 13:04		40							
3/10/10 13:09		45							
3/10/10 13:14		50							
3/10/10 13:19		55							
3/10/10 13:24		60							
3/10/10 13:34	10 min	70							
3/10/10 13:44		80							
3/10/10 13:54		90							
3/10/10 14:04		100							
3/10/10 14:24	20 min	120							
3/10/10 14:44		140							
3/10/10 15:04		160							
3/10/10 15:24		180							
3/10/10 15:44	30 min	210							
3/10/10 16:14		240							
3/10/10 16:44		270							
3/10/10 17:14		300	800	2341601500	59	60			
3/10/10 17:44		330							
3/10/10 18:14		360							
3/10/10 18:44		390							
3/10/10 19:14		420							
3/10/10 19:44		450							
3/10/10 20:14		480							

① 1707  
 ↻ 1767 ADJUSTED FCV TO 220 @ 1700GPM

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR #1

Starting Water Level

Test: Hermit Test #3 ← 13

342.13

Sheet No. 2 of

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/10/10 20:44	510								
3/10/10 21:14	540								
3/10/10 21:44	570								
3/10/10 22:14	600								
3/10/10 22:44	630								
3/10/10 23:14	660								
3/10/10 23:44	690								
3/11/10 0:14	720								
3/11/10 0:44	750								
3/11/10 1:14	780								
3/11/10 1:44	810								
3/11/10 2:14	840								
3/11/10 2:44	870								
3/11/10 3:24	900								
3/11/10 4:04	940								
3/11/10 5:04	1000								
3/11/10 6:04	1060								
3/11/10 7:04	1120								
3/11/10 8:04	1180	1500	235372	70	69	203	277.67		left settings - JL
3/11/10 9:04	1240								
3/11/10 10:04	1300								
3/11/10 11:04	1360								
3/11/10 12:04	1420								
3/11/10 13:04	1480								
3/11/10 15:04	1600								
3/11/10 17:04	1720	1500	236157	71	71	203	273.44		@1650 no adj. TL
3/11/10 19:04	1840								
3/11/10 21:04	1960								
3/11/10 23:04	2080								
3/12/10 1:04	2200								
3/12/10 3:04	2320								
3/12/10 5:04	2440								
3/12/10 7:04	2560	1550	237689	71	72	201	266.63	75.5	@0824 Temp shut down / BF for TL CAW retest of SOC - drqv at off @ 0835 041057000 BF
3/12/10 9:04	2680								
3/12/10 11:04	2800	∅	237702	92	94	300			
3/12/10 13:04	2920								
3/12/10 15:04	3040	1620	238397	72	74	202			BF @ ~60Hz 15min - rest 041091000 end retest to 201 psi, 70/70 ~1500 psi DID NOT START NEW TEST
3/12/10 17:04	3160								
3/12/10 19:04	3280								
3/12/10 21:04	3400								

10 min @ ~54 Hz  
 XD1 120.35 041106000  
 XD10 45.65 041091000  
 75.73 15000  
 flushed a little more when sv3 j. chand up.  
 BF end = 041121000  
 something wrong with water meter F3  
 > 201000 gpm

left settings - JL

@1650 no adj. TL

@0824 Temp shut down / BF for TL  
 CAW retest of SOC - drqv at  
 off @ 0835 041057000 BF

BF @ ~60Hz 15min - rest 041091000 end  
 retest to 201 psi, 70/70 ~1500 psi  
 DID NOT START NEW TEST

@1653 NO ADJ. TL



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR #1

Starting Water Level

Test: Hermit Test #3 <sup>13</sup>

342.13

Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/16/10 7:04	8320								
3/16/10 9:04	8440	1300	245772 <input type="checkbox"/>	66	66	206	269.10	@ 0830 left settings in case pressure increase	
3/16/10 11:04	8560								
3/16/10 13:04	8680								
3/16/10 15:04	8800								
3/16/10 17:04	8920	1500	246488 <input type="checkbox"/>	74	72	206		@ 1630 left settings	
3/16/10 19:04	9040							turned on MW	
3/16/10 21:04	9160							→ PIPE BROKEN TURNED OFF	
3/16/10 23:04	9280								
3/17/10 1:04	9400								
3/17/10 3:04	9520								
3/17/10 5:04	9640								
3/17/10 7:04	9760	1400	247611 <input type="checkbox"/>	71	69	206		@ 0830 left settings	
3/17/10 9:04	9880							@ 1200	
3/17/10 11:04	10000	Ø	247893 <input type="checkbox"/>			300			
3/17/10 13:04	10120								
3/17/10 15:04	10240							SWITCHED VALUES FOR BF	
3/17/10 17:04	10360								
3/17/10 19:04	10480							BF METER 04121 <input type="checkbox"/>	
3/17/10 21:04	10600								
3/17/10 23:04	10720								
3/18/10 1:04	10840							Pump test 041143 <input type="checkbox"/>	
3/18/10 3:04	10960							41163 <input type="checkbox"/>	
3/18/10 5:04	11080								
3/18/10 7:04	11200								
3/18/10 9:04	11320								
3/18/10 11:04	11440							3AD 121.86	
3/18/10 13:04	11560							2AD 52.86	
3/18/10 15:04	11680								
3/18/10 17:04	11800								
3/18/10 19:04	11920								
3/18/10 21:04	12040								
3/18/10 23:04	12160								
3/19/10 1:04	12280								
3/19/10 3:04	12400								
3/19/10 5:04	12520								
3/19/10 7:04	12640								
3/19/10 9:04	12760								
3/19/10 11:04	12880								
3/19/10 13:04	13000								

1303

→ 3/17/10 1203 Ø 247893  90 90 300 340.536  
TEST 14

**MPWMD**  
**PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR #1

Test: Hermit Test 14 2 JWO

Sheet No. 1 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/17/10 12:03	1 min	0	247893000	90	90	300	269.1		
3/17/10 12:04		1							
3/17/10 12:05		2							
3/17/10 12:06		3							
3/17/10 12:07		4							
3/17/10 12:08		5							
3/17/10 12:09		6							
3/17/10 12:10		7							
3/17/10 12:11		8							
3/17/10 12:12		9							
3/17/10 12:13		10							
3/17/10 12:15		12							
3/17/10 12:18	5 min	15							
3/17/10 12:23		20							
3/17/10 12:28		25							
3/17/10 12:33		30							
3/17/10 12:38		35							
3/17/10 12:43		40							
3/17/10 12:48		45							
3/17/10 12:53		50							
3/17/10 12:58		55							
3/17/10 13:03		60							
3/17/10 13:13	10 min	70							
3/17/10 13:23		80							
3/17/10 13:33		90							
3/17/10 13:43		100							
3/17/10 14:03	20 min	120							
3/17/10 14:23		140							
3/17/10 14:43		160							
3/17/10 15:03		180							
3/17/10 15:23	30 min	210							
3/17/10 15:53		240							
3/17/10 16:23		270							
3/17/10 16:53		300							
3/17/10 17:23		330							
3/17/10 17:53		360							
3/17/10 18:23		390							
3/17/10 18:53		420							
3/17/10 19:23		450							
3/17/10 19:53		480							















**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 1

Starting Water Level

Test:

Test 15

350.64

Sheet No. 4 of

static WL = 350.64

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/4/10 7:23	8320								
4/4/10 9:23	8440								
4/4/10 11:23	8560	1650	269119 [000]	85	88/72	216	263.65	86.99	@ 11:23 FCV regulator was set at 208 psi & reset to 212 psi, so that flow rate will not appreciably increase if system pressure rises any more.
4/4/10 13:23	8680								
4/4/10 15:23	8800								
4/4/10 17:23	8920								
4/4/10 19:23	9040								
4/4/10 21:23	9160								
4/4/10 23:23	9280								
4/5/10 1:23	9400								
4/5/10 3:23	9520								
4/5/10 5:23	9640								
4/5/10 7:23	9760								
4/5/10 9:23	9880	1350	270705 [000]	90	91/90				@ 9:00 No adj. Awaiting word from CAW to restart inj @ ASR-2. JWB
4/5/10 11:23	10000								
4/5/10 13:23	10120								
4/5/10 15:23	10240								
4/5/10 17:23	10360	1000	271128 [000]	61					@ 1645
4/5/10 19:23	10480								
4/5/10 21:23	10600								
4/5/10 23:23	10720								
4/6/10 1:23	10840								
4/6/10 3:23	10960								
4/6/10 5:23	11080								
4/6/10 7:23	11200	950	272008 [000]	66	64	2A	303.96		@ 0830 set to <del>210</del> 210
4/6/10 9:23	11320								
4/6/10 11:23	11440								
4/6/10 13:23	11560								
4/6/10 15:23	11680								
4/6/10 17:23	11800								
4/6/10 19:23	11920								
4/6/10 21:23	12040								
4/6/10 23:23	12160								
4/7/10 1:23	12280								
4/7/10 3:23	12400								
4/7/10 5:23	12520								
4/7/10 7:23	12640	1100	273880 [000]	61	64	208	287.92	62.72	@ 0810
4/7/10 9:23	12760								
4/7/10 11:23	12880								
4/7/10 13:23	13000								

NOTE: Pressure gage closest to wellhead was sticking. Before tapping = 70 psi After tapping = 90 psi Should be replaced.

4/8/10 0800 1350 275715 [000] 60 63 199 277.34 73.30 @ 08:00

4/7/10 0900 2200 278366 [000] 112 115 shut down inner flows

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-1

Test: \_\_\_\_\_ Hermit test #6

Sheet No. 1 of \_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/12/10 8:43	1 min	0					349.92		
4/12/10 8:44		1							
4/12/10 8:45		2							
4/12/10 8:46		3							
4/12/10 8:47		4							
4/12/10 8:48		5							
4/12/10 8:49		6							
4/12/10 8:50		7							
4/12/10 8:51		8							
4/12/10 8:52		9							
4/12/10 8:53		10							
4/12/10 8:55		12							
4/12/10 8:58	5 min	15							
4/12/10 9:03		20							
4/12/10 9:08		25							
4/12/10 9:13		30							
4/12/10 9:18		35							
4/12/10 9:23		40							
4/12/10 9:28		45							
4/12/10 9:33		50							
4/12/10 9:38		55							
4/12/10 9:43		60							
4/12/10 9:53	10 min	70							
4/12/10 10:03		80							
4/12/10 10:13		90							
4/12/10 10:23		100							
4/12/10 10:43	20 min	120							
4/12/10 11:03		140							
4/12/10 11:23		160							
4/12/10 11:43		180							
4/12/10 12:03	30 min	210							
4/12/10 12:33		240							
4/12/10 13:03		270							
4/12/10 13:33		300							
4/12/10 14:03		330							
4/12/10 14:33		360	1200	278928	62	60			
4/12/10 15:03		390							
4/12/10 15:33		420							
4/12/10 16:03		450							
4/12/10 16:33		480							

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR\_1

Starting Water Level

Test: Hermit test #6

349.92

Sheet No. 2 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/12/10 17:03		510							
4/12/10 17:33		540							
4/12/10 18:03		570							
4/12/10 18:33		600							
4/12/10 19:03		630							
4/12/10 19:33		660							
4/12/10 20:03		690							
4/12/10 20:33		720							
4/12/10 21:03		750							
4/12/10 21:33		780							
4/12/10 22:03		810							
4/12/10 22:33		840							
4/12/10 23:03		870							
4/12/10 23:43	40 min	900							
4/13/10 0:23		940							
4/13/10 1:23	1 hr	1000							
4/13/10 2:23		1060							
4/13/10 3:23		1120							
4/13/10 4:23		1180							
4/13/10 5:23		1240							
4/13/10 6:23		1300							
4/13/10 7:23		1360							
4/13/10 8:23		1420	1800	280403	82	80	209		SET FCV TO 213 @ 1600gpm
4/13/10 9:23		1480							
4/13/10 11:23	2hr	1600							
4/13/10 13:23		1720							
4/13/10 15:23		1840	1750	281280	84	82	211		@ 1645 SET FCV TO 214
4/13/10 17:23		1960							
4/13/10 19:23		2080							
4/13/10 21:23		2200							
4/13/10 23:23		2320							
4/14/10 1:23		2440							
4/14/10 3:23		2560							
4/14/10 5:23		2680							
4/14/10 7:23		2800	1800	282634	82	80	206		@ 0630 SET FCV TO 211 @ 1600gpm
4/14/10 9:23		2920							
4/14/10 11:23		3040							
4/14/10 13:23		3160							
4/14/10 15:23		3280							
4/14/10 17:23		3400							







**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 1

Test: \_\_\_\_\_ Hermit test #7

Sheet No. 1 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/19/10 15:08	1 min	0					349.95		
4/19/10 15:09		1							
4/19/10 15:10		2							
4/19/10 15:11		3							
4/19/10 15:12		4							
4/19/10 15:13		5							
4/19/10 15:14		6							
4/19/10 15:15		7							
4/19/10 15:16		8							
4/19/10 15:17		9							
4/19/10 15:18		10							
4/19/10 15:20		12							
4/19/10 15:23	5 min	15							
4/19/10 15:28		20							
4/19/10 15:33		25							
4/19/10 15:38		30							
4/19/10 15:43		35							
4/19/10 15:48		40							
4/19/10 15:53		45							
4/19/10 15:58		50							
4/19/10 16:03		55							
4/19/10 16:08		60							
4/19/10 16:18	10 min	70							
4/19/10 16:28		80							
4/19/10 16:38		90							
4/19/10 16:48		100							
4/19/10 17:08	20 min	120							
4/19/10 17:28		140							
4/19/10 17:48		160							
4/19/10 18:08		180							
4/19/10 18:28	30 min	210							
4/19/10 18:58		240							
4/19/10 19:28		270							
4/19/10 19:58		300							
4/19/10 20:28		330							
4/19/10 20:58		360							
4/19/10 21:28		390							
4/19/10 21:58		420							
4/19/10 22:28		450							
4/19/10 22:58		480							







**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 1

Test: Hermit test 8 TEST 18

Sheet No. 1 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/26/10 12:31	1 min	0					<del>359.5</del>		
4/26/10 12:32		1					359.5		
4/26/10 12:33		2							
4/26/10 12:34		3							
4/26/10 12:35		4							
4/26/10 12:36		5							
4/26/10 12:37		6							
4/26/10 12:38		7							
4/26/10 12:39		8							
4/26/10 12:40		9							
4/26/10 12:41		10							
4/26/10 12:43		12							
4/26/10 12:46	5 min	15							
4/26/10 12:51		20							
4/26/10 12:56		25							
4/26/10 13:01		30							
4/26/10 13:06		35							
4/26/10 13:11		40							
4/26/10 13:16		45							
4/26/10 13:21		50							
4/26/10 13:26		55							
4/26/10 13:31		60							
4/26/10 13:41	10 min	70							
4/26/10 13:51		80							
4/26/10 14:01		90							
4/26/10 14:11		100							
4/26/10 14:31	20 min	120							
4/26/10 14:51		140							
4/26/10 15:11		160							
4/26/10 15:31		180							
4/26/10 15:51	30 min	210							
4/26/10 16:21		240							
4/26/10 16:51		270							
4/26/10 17:21		300							
4/26/10 17:51		330							
4/26/10 18:21		360							
4/26/10 18:51		390							
4/26/10 19:21		420							
4/26/10 19:51		450							
4/26/10 20:21		480							







W1 102.39'  
W2 38.57'

BF M1 041399  
BF M2 041424  
BF M3 041442  
4/10 @ 1400

MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR 1

Starting Water Level

Test: Hermit test 8 TEST 18

269.56  
347.27 (?) Sheet No. 4 of

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
5/2/10 7:11	8320								
5/2/10 9:11	8440	1600	316394	84	86	215	270.23	77.04	@1011
5/2/10 11:11	8560						2		
5/2/10 13:11	8680								
5/2/10 15:11	8800								
5/2/10 17:11	8920								
5/2/10 19:11	9040								
5/2/10 21:11	9160								
5/2/10 23:11	9280								
5/3/10 1:11	9400								
5/3/10 3:11	9520								
5/3/10 5:11	9640								
5/3/10 7:11	9760	1300	318283	64	62	206	282.50		@0830 left welltop.
5/3/10 9:11	9880								
5/3/10 11:11	10000								
5/3/10 13:11	10120								
5/3/10 15:11	10240								
5/3/10 17:11	10360								
5/3/10 19:11	10480								
5/3/10 21:11	10600								
5/3/10 23:11	10720								
5/4/10 1:11	10840								
5/4/10 3:11	10960								
5/4/10 5:11	11080		318930			300			@1645
5/4/10 7:11	11200								
5/4/10 9:11	11320								
5/4/10 11:11	11440								
5/4/10 13:11	11560								
5/4/10 15:11	11680	1350	318930	64	62	201	356.61		5/5/10 DIT WT 7:52 → 8:52
5/4/10 17:11	11800								
5/4/10 19:11	11920	1300	319499	64	62	202			5/5/10 1700 - JL
5/4/10 21:11	12040								
5/4/10 23:11	12160								
5/5/10 1:11	12280								
5/5/10 3:11	12400								
5/5/10 5:11	12520								
5/5/10 7:11	12640								
5/5/10 9:11	12760								
5/5/10 11:11	12880								356.61
5/5/10 13:11	13000								-2483

TEST START 5/5/10

1650 320978 83 85 215 27483 81.78 5/7/10 @ 0805

356.61  
-2483  
81.78









**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 1

Test: \_\_\_\_\_ Test 20

Sheet No. 1 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
5/12/10 11:54	1 min	0	334325000	86	84	300	356.86		
5/12/10 11:55		1							
5/12/10 11:56		2							
5/12/10 11:57		3							
5/12/10 11:58		4							
5/12/10 11:59		5							
5/12/10 12:00		6							
5/12/10 12:01		7							
5/12/10 12:02		8							
5/12/10 12:03		9							
5/12/10 12:04		10							
5/12/10 12:06		12							
5/12/10 12:09	5 min	15							
5/12/10 12:14		20							
5/12/10 12:19		25							
5/12/10 12:24		30							
5/12/10 12:29		35							
5/12/10 12:34		40							
5/12/10 12:39		45							
5/12/10 12:44		50							
5/12/10 12:49		55							
5/12/10 12:54		60							
5/12/10 13:04	10 min	70							
5/12/10 13:14		80							
5/12/10 13:24		90							
5/12/10 13:34		100							
5/12/10 13:54	20 min	120							
5/12/10 14:14		140							
5/12/10 14:34		160							
5/12/10 14:54		180							
5/12/10 15:14	30 min	210							
5/12/10 15:44		240							
5/12/10 16:14		270							
5/12/10 16:44		300							
5/12/10 17:14		330							
5/12/10 17:44		360							
5/12/10 18:14		390							
5/12/10 18:44		420							
5/12/10 19:14		450							
5/12/10 19:44		480							















**MPWMD**  
**PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 1

Starting Water Level

Test:

Test 21

355.58

Sheet No. 4 of

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
5/26/10 3:45	8320								
5/26/10 5:45	8440								
5/26/10 7:45	8560	1550	361121000	78	80	205	269.49	86.09	@ 0805
5/26/10 9:45	8680								
5/26/10 11:45	8800								
5/26/10 13:45	8920	1675	361758000	80	80	207	266.19		shut down + BF
5/26/10 15:45	9040	1400	361765000	82	84	216			← RESTART after BF
5/26/10 17:45	9160								BF 10 mins
5/26/10 19:45	9280								041779000 Δ = 25,000/10
5/26/10 21:45	9400								2500 gpm
5/26/10 23:45	9520								rest, set lower for 10 min. test
5/27/10 1:45	9640								110.42 041798000
5/27/10 3:45	9760								- 41.58 041779000
5/27/10 5:45	9880								68.84 19,000
5/27/10 7:45	10000	1450	363218000	82	83	219	294.19	61.39	@ 0800
5/27/10 9:45	10120								27.6 gpm/ft
5/27/10 11:45	10240								
5/27/10 13:45	10360								
5/27/10 15:45	10480	1450	363617000						shut down @ 1235 resumed inj
5/27/10 17:45	10600	1500		NA	NA	212			041803000 BF
5/27/10 19:45	10720								041848000 ad BF
5/27/10 21:45	10840								80+ psi up at #2 @ 1315
5/27/10 23:45	10960								3 eyes temp. worked (CAW) 05 till 1335
5/28/10 1:45	11080								
5/28/10 3:45	11200								
5/28/10 5:45	11320								
5/28/10 7:45	11440	1525	365400000	83	82	212	295.15	60.13	@ 0830 FCV regulator was closed! Reset to 210 psi and verify open neg. JW
5/28/10 9:45	11560	1600							
5/28/10 11:45	11680								
5/28/10 13:45	11800								@ 1345 Inj off for CAW WQ sample collection while BF
5/28/10 15:45	11920								@ 1430 Inj flow back on.
5/28/10 17:45	12040	1600		80		209			
5/28/10 19:45	12160								
5/28/10 21:45	12280								
5/28/10 23:45	12400								
5/29/10 1:45	12520								
5/29/10 3:45	12640								
5/29/10 5:45	12760								
5/29/10 7:45	12880								
5/29/10 9:45	13000	1625	367996000	81	80	209	291.75	63.83	@ 1200 no adj. JW

5/30  
5-31  
6-1

1625  
1675  
Ø

370166000  
372787000  
374860000

7a 80  
7f 76  
97 97

207  
205  
301

287.49  
283.65  
280.21

68.09  
75.37

@ 0950  
@ 1153  
@ 0930-off - shut down inj

" "  
" "  
@ 0945 Morning

JW

06/02 10  
BF ASR-1 @ 13:00

041887 000 BF in slat

XDi = 101.28

XDi0 37.04

64.24

041928 000

041908 000

20,000

deter interval 10 min @ 60 Hz

= 31.13 gpm/ft







**MPWMD**  
**PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: AS2-2

Test: wy 2010 #2 (Hemit Test # 3, 1-min line), FCU Test

Sheet No. 1 of 1

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/15/07 13 <sup>35</sup>	0	0	01194650	90	0	276	376.1		13 <sup>35</sup> open gate valves, fill Col Pipe.
		0		90	73	276			13 <sup>50</sup> Line full, detect/hear
				90	85	320			flow. Increase FCV to ~320
				90	85	335			still hear slight flow (check valve leaking?)
14 <sup>15</sup>		2000		89	84	300			14 <sup>10</sup> Begin opening FCV in 5 psi inward
				89	84	295	373.8	2.3	Hear low flow, but meter not turning.
				88	83	290			n/a
14 <sup>20</sup>				87	82	285	371.2	4.9	n/a
14 <sup>25</sup>				86	82	280	370.2	5.9	n/a
				86	80	275	367.6	8.5	n/a
				88	80	270			n/a
				82	78	265	365.8	10.3	n/a
14 <sup>30</sup>				77	73	260	339.5	36.6	n/a, meter needle bouncing slightly
14 <sup>35</sup>				74	70	255	313.4	62.	n/a
14 <sup>40</sup>		-200?		73	69	250	293.0	83.1	meter moving slightly now
14 <sup>45</sup>		-500		70	66	245	249.1	127.0	FCV needle fluctuating rapidly ± 5 psi
14 <sup>55</sup>		-600		70	65	240	178.3	1197.8	FCV needle, psi gauges fluctuating rapidly Est. $Q/S \approx 600 \text{ gpm} \div 197.8 = 3.0 \text{ gpm/ft}$ Begin closing FCV to ~330 psi, stop inj.
15 <sup>00</sup>		—	011193000	90	0	335			<u>B Elushi AS2-2</u> Meter 01193000 15 <sup>27</sup> shut pump - 950 - 1150 gpm 15 <sup>40</sup> Pump trips off  Totalizer 11184000 16 <sup>00</sup> Restart Pump 16 <sup>05</sup> 50 psi, 1000 gal/48 secs = 1579 gpm PWL = $504.1 \text{ G/S} \div 128 = 1579 \div 128 = 12.3 \text{ gpm/ft}$ 16 <sup>09</sup> Pump trips off 16 <sup>30</sup> Restart Pump. 16 <sup>35</sup> 40 psi, 1000 gal/35 secs = 1714 gpm PWL = $504.9 \text{ G/S} \div 128 = 1714 \div 128 = 13.3 \text{ gpm/ft}$ 16 <sup>39</sup> Pump trips off (FCV @ 245 psi) 17 <sup>00</sup> Restart Pump 17 <sup>05</sup> 30 psi, 1000 gal/31 secs = 1935 gpm PWL = $508.5 \text{ G/S} \div 128 = 1935 \div 128 = 14.6 \text{ gpm/ft}$ 17 <sup>09</sup> Pump trips off - shut down for day.  <u>RCM</u>

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: SURGING

Sheet No. 1 of 2

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft blst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/16/09 10:00			11135 <span style="border: 1px solid black; padding: 2px;">000</span>						STATIC WL => 372.9 ~ 2,000 GPM WATCH TEST PUMPING WL => 506.2
10:10			11114 <span style="border: 1px solid black; padding: 2px;">000</span>						11135 - 11114 = 21 ; 21000 / 10 MIN => 2100 GPM 2100 / 133.3 = <span style="border: 1px solid black; padding: 2px;">15.8</span> GPM/ft BREAKER TRIP @ 13.5 MIN <hr/> LET WELL REST
10:45			11068 <span style="border: 1px solid black; padding: 2px;">000</span>						* May NOT BE FULLY RECOVERED STATIC 377.3 ~ 2,000 GPM WATCH TEST PUMPING WL => 501.5
10:5			11088 <span style="border: 1px solid black; padding: 2px;">000</span>						PUMP TRIP @ 8.5 MIN 11068 - 11088 = 20 => 20,000 GAL 20,000 GAL / 8.5 MIN = 2350 GPM 2350 GPM / 124 = <span style="border: 1px solid black; padding: 2px;">16.9</span> GPM/ft <hr/> LET WELL REST
									↓ SHEET 2

MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR #2 BF

Test: BACKWASH

Sheet No. 2 of 2

Date/Time	ET (min)	Rate (gpm)	Total/Per (gallons)	Pressure (psi)			DTW (ft)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/16/09 1400			011088 <input type="checkbox"/>						DTW 379.40 - Meter A
1415			011068 <input type="checkbox"/>						PUMPING SOL.2' SANDER ~ 2,000 GPM @ 36 PSI WATCH TEST SOL.2 - 379.4 = 121.8' 20,000 GAL = 2,000 GPM 2,000 GPM / 121.8' = <input type="checkbox"/> 16.42
									CIR. BREAK @ 14 MIN
									Let MASTER Pump
1447			011061 <input type="checkbox"/>						STATIC 380.5 METER START 011061 <input type="checkbox"/>
									~ 2,000 GPM @ 38 PSI PUMPING SOL.0 SOL.0 - 380.4 = 121
1457			011044 <input type="checkbox"/>						END METER 011044 <input type="checkbox"/> 17000 GAL / 9.5 MIN = 1800 GPM TRIPPED @ 9 MIN 30 SEC. 1800 / 121 = <input type="checkbox"/> 14.9
									* MET. A Complete TEST *

MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR-2

Test: 3 HGRMUT TEST #3 1 MIN INTERVAL

Sheet No. 1 of 2

Date/Time	ET (min)	Rate (gpm)	Total/24 (gallons)	Pressure (PSI)			DTW (ft bsl)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12-17-09 1045			↑				380.4		Will install flowmeter on IN FLOW TL, JL, JO + ST on S/RK SPAC 380.4'
1100			METER BROKEN				331		BEGAN FILLING WELL BASKI @ 330 PSI; TANK 2 1020 AUG FROM ~44 TO 122 gpm
			↓	90	87	336	380.21		column fill @ ~1120 pressure equalizing
1130				90	86	336	380.20		@ 1127 ~1.2 gpm on panium. = leaky OPENED VALVE #1 (FULL)
1135		Minimal 160 Flow					330 325 320	380.104 380.075 380.070	
		↓							
1136		Parameters		90	86	315	380.079		
1137				90	86	310	380.079		
1138				90	86	305	380.079		
1139				90	86	300	380.011		
1140		40		90	86	295	379.36	0.71	flow begins @ 295 audible flow
1144		60		90	86	292	378.70	1.38	
1149		102		88	85	291	377.41	2.6	
1152		177		88	85	288	375.98	4.1	
<del>1200</del>		229		88	84	285	374.60	5.5	
1205		275		88	84	280	373.19	6.9	less hysteresis @ well head pressure
1210		297		87	83	280	371.60	8.3	
1215		356		85	82	277	369.645	10.4	
1220		422		85	81	274	367.6	12.4	
1225		507		85	80	270	364.7	15.3	
1230		577		84	80	267	360.8	19.2	
1235		690		84	78	265	357.2	22.8	
1240		1166		77	74	260	331.2	48.8	
1250		1245		74	71	257	320.8	59.2	
1255		1310		73	70	254	314.5	65.0	
1300		1390		74	69	250	305.0	75.0	
1305		1445		72	68	247		93	FCV gage begins to "futter"
1310		1495		72	67	245	287		
1315		1589		70	65	240	269		
1320		1780		68	64	235	200		
1330		1960		64	60	232			FCV gage fluttering subsides
1333		2012				231	103		End increasing test, start closing FCV

MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR-2

Test: Hermit Test #3 (1-min interval)

Sheet No. 2 of 2

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12-17-09 1339						250			
1342						264			
1350						272			
1351		578				280			
1352						290			
1354						299			
1355						302			
1357		9.5				305			
1358		8.0		90	85	310			
1359				90	80	320			
1400		3.0		90	10	320			FCV shut, but head press continues to drop - likely represents check valve leaking
									Test is stopped so MPE can install replacement head for flow meter
									New top head: Water Specialists Serial No. 20081180-12 totalizer 000038/300 gal



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: Production Testing

Sheet No.      of     

Date/Time	BT (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft. bgs)	Drawdown (ft.)	Comments/Other
				Line	Head	FGV			
12/18/09		instantaneous water specificities							0000380007 new meter start 0930 pm at site (JD)
1000	0	0	000038000		0	333	379.3		start meter - wide open valve
1001	1	3000							
1009	9	1600			68				pinch GV to 68 psi
1010	10	1900	000019000		40		495.8		10-min Q/s = 1900 (ave) / 495.8 - 379.3 = 16.3
1012	12				30		below 505		
1013		1900			40		517.50		Document MCWD 2" lube flow 0.25 ft <sup>3</sup> /m @ 51 psi
1024					40				meter check: mech = 1880; Parametrics = 1820
1029							518.4		
1031									meter off
		instantaneous Parametrics							
1052	0		999981000		0		382.91		meter on
1053	1	2140			40				
1055	3	1950			45				
1057	5	1875			35				
1100	8								meter check: mech = 1950; Parametrics = 1900
1102	10		999996000				523.50		10-min Q/s = 2100 (ave) / 523.5 - 382.9 = 14.9
1104	12		999995500						meter off
1148	0		999955500		0		381.85		meter on
1154	6	1900			34				
1158	10		999934000				576.5 ±		10-min Q/s = 2100 (ave) / 576.5 - 381.85 = 15.6
1201	13								meter off
1233	0	0	999927000		0		381.83		meter on; don't pinch valve - max flow
1234		2800+			0				
1235					0				meter check: mech = 2550; Parametrics = 2475
1238		2365	999913500		0		below 525.2		meter off







**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: #5 (MPWMD HERMIT - swapped out PWR Hermit due to very low conductivities)

Sheet No. 1 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bdst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/19/09 1427	0		001042000				380.32	♀	start filling column - 1,000 gal
1428	1								
29	2								@ 1432 column filled 001046000
30	3								
31	4								
1432	5		001046000						- start bleed pressure w/ FCV @ 1432
32	6								
34	7								
1435	8		001046000	88	84	295	379.27		
36	9								
37	10	<100				290			
1438	12	<200		88	78	285	376.65		
5 min 1442	15	~250	001047000			275	375.77	~5	- bleed to 275 on FCV
48	20	250	001048000	88	66	270	374.22	~6	@ 1447, time leak dial @ 225 gpm
52	25	300	001049000	87	62	265			
1458	30						373.343		- Tom goes to ASR-1 to check & adjust to 1100 gpm
1502	35	275	001052000				373.069		
08	40					262			
12	45						372.278		
18	50	290		87	54	259	372.253		
1522	55								
10 min 1527	60	700	001060000	84	77	267			@ 1525 notice GV not open all the way - adjust open
1537	70	575	001066000	84	80	272	355.99	24.33	@ 1540, Tom increases flow @ ASR-1
1547	80								
1557	90	600	001078000	83	79	270	356.34	23.98	Plan to keep at 600 gpm - check tomorrow.
1607	100						355.57		
20 min 1627	120						354.52		
1647	140						353.68		
1707	160						352.99		
1727	180						352.77		
30 min 1857	210						352.36		
1827	240						352.01		
1857	270						351.65		
5 hr 1927	300						351.65		
2057	330						351.09		
6 hr 2027	360						351.09		
2057	390						350.80		
7 hr 2127	420						350.52		
2257	450						350.19		
8 hr 2327	480						349.76		

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: #5 (HERMIT ASR-2 #5)

Sheet No. 2 of \_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
	2257	510					349.13		
3 hr	2327	540					348.63		
	2357	570					349.49		
9 hr	12/20 0027	600					348.57		
	0057	630					347.80		
	0127	660							
	0157	690					347.62		
2 hr	0227	720					347.26		
	0257	750							
	0327	780					346.89		
	0357	810					346.72		
	0427	840					346.70		
	0457	870							
40 min	0537	900					346.23		
	0617	940					345.96		
1 hr	0717	1000					345.60		
	0817	1060					345.12		Hermit Battery = 99%
	0917	1120	-600	001703000	82	77	269	344.70	00925 Tank = 1800
	1017	1180					344.56	35.7	001703000 - 001042000
	1117	1240					343.77		= 661,000 ± 1128
	1217	1300					342.60		= 586 gpm
	1317	1360					340.66		
	1417	1420					339.17		
	1517	1480					337.10		
2 hr	1717	1600					339.70		
	1917	1720					341.58		
	2117	1840					340.44		380.3
	2317	1960					340.14		- 338
12/21	0117	2080					339.46		52.3
	0217	2200					339.21		
	0317	2320					339.00		Tank = 1795
	0317	2440	-545*	0025	81	77	272	338.38	00817 * last adjustment yesterday was a
	0417	2560					337.95	-52	minute increase in flow @ ASR-1 which likely
	0517	2680	700	002654000	91	87	286		lead to a slight drop in flow here @ ASR-2
11/27	1317	2800	600	002660600	92	88	281		01117 Q increase due to shut down @ ASR-1 per BF
	1517	2920	1540*		82	78	280		01119 start recovery FCV pressure
	1717	3040							FCV Q
	1917	3160							-282 ~550 over shot
	2117	3280							-281 ~600
	2317	3400							

\* @ 1458 after starting ASR-1 test #3, ADJ FCV to 270, Q = 600

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: #5 (Hermit Test ASR-2 #5)

Sheet No. 3 of 3

Date/Time	ET (min)	Rate (gpm)	Totalized (gallons)	Pressure (psi)			DTW (ft. bsl)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/22/09 0117	3520						334.02		
0317	3640						333.47		380.32 static
0517	3760						334.09		- 334.16 PWL
0717	3880	~580	003404000	82	77	272	333.77		@ 0806 Tank = 1750 PSI 46.16 drawup
0917	4000	~610		82	76	267	334.16	46.2	← Hermit time 09:06, but only 08:10 real time
1117	4120						327.06		ADJ FCV ~ 08:12 to 267 psi, Q = 610 gpm
1317	4240						323.48		
1517	4360						322.59		
1717	4480	~705	003788000			262	321.40		@ 1701 ADJ FCV, flow had gotten down 700gpm
1917	4600	~600		79	78	271	331.29		Avg Q since last ADJ was 719 gpm
2117	4720						330.48		
2317	4840						329.04		TL
12/23 0117	4960						327.83		
0317	5080						328.14		
0517	5200						329.29		
0717	5320						330.12		Hermit batt = 92% Tank = 1710 psi
0917	5440	~580	004359000	80	77	272	329.65	~50	@ 0847 ~ 540 gpm Avg since last adjustment
	5560	600		80	75	267			ADJ to 267 psi on FCV = 600 gpm
	5680		004310000	77	82	300			- spoke to Dale Beatty + Alan Brown re: wire
	5800								- @ 0935 began closing FCV
	5920								FCV gpm
	6040								~ 283 ~ 320
	6160								~ 292 ~ 175 Heard Q stop ~ 0941
	6280								~ 300 ∅ (elapsed test time = 5416 min)
	6400								
	6520								
	6640								• BF between test #5 and test #6
	6760								@ 1101 can back to ASR-2 - some flow still getting by FCV
	6880								< 100 gpm, @ 0939 [000], turned up FCV to 311
	7000								• Read MCWD 2" meter = 7119.0 ft <sup>3</sup> (ON)
	7120								press up = 53 press down = 52
1200	7240		004391000				382.507		• Motor on @ 1200 hr, initial Q = 2850 gpm
1201	7360								• Pinch CV to get 60 psi head press
1205	7480								• Pinch CV to 72 psi as WL below 446.75
1208	7600								
1210	7720		004373500				496.684		• 10-min Q/A = 1750 / 114.177 = 15.3
	7840								(not 100% confident that ending WL is true)
	7960								
1250	8080		004365000				384.145		• Motor on; initial Q = 2800 gpm;
1252	8200								• Reduced to 75 psi and 1540 gpm
1300			004348000				496.270		• 10-min Q/A = 1700 / 112.125 = 15.2
1302			004345000						• Motor off -- end of BFing today. JWD

MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR-2

Test: #6 (HERMIT ASR-2 #6)

Sheet No. 1 of

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft. bts)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/23/07 1610	0		004345	86	0	318	381.449	0	
	1								
	2								
	3								
	4								
	5								
	6								
	7		004349	86	82	292			Column pipe full - opening FCV
	8								
	9								
	10								
	12	200	004350	85	80	280			
5 min 16 25	15	300		84	79	275	374.366		
	20	400	004352	82	78	270			
	25	600	004355	80	76	265			
16 40	30	750	004358			260	354.639		
16 45	35	775	004362			260	349.910	32.5	
16 50	40	800	004365	77	74	259	347.080	34.4	Will try to hold at 750 gpm. juw
	45						344.310		
	50						343.533		
	55						342.262		
10 min 17 10	60						342.191		
	70						340.353		
	80								
	90								
	100						337.869		
20 min 18 10	120								
	140						334.955		
	160								
	180						333.749		
30 min 19 40	210								
	240						330.117		
	270								
	300						327.564		
	330								
	360						325.245		
	390								
	420								
	450						320.719		
12/24 00 10	480						319.364		

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2  
 Test: #6 (HERMIT ASR-2 #6)

Sheet No. 2 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
12/24/09 0046	510						318.285		
0110	540								
0140	570						315.815		
0210	600						313.189		
0240	630						311.961		
0310	660						310.044		
0340	690								
0410	720								
0440	750						306.872		
0510	780								
0540	810						305.191		
0610	840								
0640	870						303.198		
40 min 0720	900						300.793		(5407000) - 4345(000) = 1062000
0800	940						298.229		
1 hr 0900	1000	1150	005407(000)	73	69	255	295.807		@ 0900 Avg Rate HERMIT 90%
1000	1060	800	005435(000)	77	73	265	293.600		@ 1015 adjust FCV
1100	1120						291.098	90.35	
1200	1180								
1300	1240								
1400	1300						315.526		
1500	1360								
1600	1420								
1700	1480								
2 hr 1900	1600								
2100	1720								
2300	1840						319.716		
12/25 0100	1960								
0300	2080								
0500	2200								
0700	2320								
0900	2440	700	006451(000)	79	75	265	314.556	66.89	@ 0906 Tank = 1780 psi; HERMIT 88%
1100	2560	800	006462(000)	78	74	262	304.03		@ 0920 adjust FCV
1300	2680						300.21		
1500	2800						296.71		
1700	2920						292.84		
1900	3040						285.55		
2100	3160						291.46		
2300	3280						296.89		
12/26 0100	3400						296.84		

JWO

JWO





**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: BF AFTER TEST 6

Sheet No.      of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bgs)	Drawup (ft)	Notes	Comments/Other
				Line	Head	FCV				
12/28/04 1000	0	0	009615000				375.74			
1002	2	2900								Line 116 on @ 0915 71275 CF @ 1002 52/50 psi Motor heater OFF
1017	7	1580	009602000	77	78					
1020	10		009597500				488.39			Probe set ~ 522.0 (bottom of bowl) Got below 522 ~ 3 mins into BF Probe drops to ~ 60 psi, recovered Equilibrate @ ~ 65 psi Still below transducer (~ 496) Punch back to 78 psi - got a 491 reading 10-min $Q/s = 1800 / 113.15 = 15.9$
1027			009587000							After 10 min test, open discharge GV until WL declines to 522", then shut off. @ 1027, motor off.
										Total BF gallons = 28,000 JWC
							378.20			



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: BF

Sheet No.      of     

Time	Flow (gpm)	Volume (gallons)	Pressure (psi)	Notes
1157		012982	70	314 Tank = 1680 psi XD = 150.95 - 34.00 126.95 feet above probe 71547 CF on 1/2" line, 54/52 psi start BF @ 1209 @ 82 PSI 1550 gpm 25 MIN INTO FLUSH COLOR IS GONE 45-34 = 11 feet over probe 1530 / 105.6 = 14.68 rest - pump again
1240		012965		STATIC 151.07 METER READ 12965 Psi 82 151.07 12965 4360 12949 53% ORP 107.47 6.8 PH 498 uS/cm COND 1600 GPM 1.8 mg/L DO 167.47 15.70C TEMP 0.05 CL residual
1250		12949		43.60
1256		12957		SWR well off after ORP sealed up - locked generator - turned pump motor back on

TL

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TL

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: DF

Sheet No. 1 of 1

1-6-09	1000		012939(002)		316			<p>Wire line on pumpkit = 71840 CE                  tank = 1550 psi                  53/52 psi</p> <p>XD = 153.78 (Absolute - not corrected)                  ON @ 1012                  very dirty initially                  pressure to 74 psi ~ 1.650 gpm                  water clear now</p> <p>@ 1018 XD = 45.99 psi = 78                  ~ 15.25 gpm @ 1019                  ~ 15.25 gpm @ 1026</p> <p>shut down @ 1028 next fill 1045</p> <p>XD 151.86 @ 1044 start @ 1045 (opened                  ~ 2500 gpm value 25                  pressure to ~ 80 psi) (check)</p> <p>XD = 46.95 @ 1050 ~ 1.550 gpm                  @ 1100 ~ 1.525 gpm = 108.2                  XD = 43.64 @ 1100 = 14.1 gpm/hr</p> <p>opened valve a bit to draw water down,                  shut off @ 1102</p> <p>Closed valve line and turned off motor director</p>
			012882(000)					

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2  
Test: WY 2010 Test # 8

Sheet No. 1 of 3

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft test)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1/22/10 1625	0	∅	012861000	68	∅	217	371.85*	head = 1250 psi	
1626	1						367.88	L=68/H=65 after fully column	
1629	2						367.39	∅ 1620	
1628	3						365.17	012882000 heave pulpy water in column	
1629	4						363.81		
1630	5						362.74		
1631	6	475	012893000	64	60	254	362.32	went down to ASR-1	
1632	7						362.18		
1633	8						362.11		
1634	9						362.04		
1635	10						361.76		
1637	12						361.75		
5 min 1640	15	500	012897000	62	59	254	361.26	after adj. ASR-1 to ~900 g/m	
1645	20						359.99		
1650	25						359.99		
1655	30						359.91	* First reading on test = 370.99, but	
1700	35						359.71	this was the reading on previous test just before	
1705	40						359.35	I started this test, difference = 0.86	
1710	45						359.13		
1715	50						359.06		
1720	55						359.06		
10 min 1725	60						358.98		
1735	70						358.91		
1745	80						358.77		
1755	90						358.27		
1805	100						358.48		
20 min 1825	120						358.61		
1845	140						358.74		
1905	160						358.87		
1925	180						358.14		
30 min 1955	210						357.21		
2015	240						356.48		
2055	270						356.53		
2105	300						355.45		
2155	330						355.85		
2225	360						355.70		
2255	390						354.96		
2325	420						355.02		
2355	450						354.16		
1/23 0025	480						354.22		

TL

**MPWMD**  
**PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2  
Test: WY 2010 TEST 8

Sheet No. 2 of 3

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1/23 0055	510						353.35		
0125	540						352.42		
0155	570						351.63		
0225	600						352.20		
0255	630						352.11		
0325	660						351.88		013423000 1060
0355	690								012897000 - 15
0425	720						350.94		526,000 / 1045m = 503 g/m avg
0455	750						350.84		
0525	780						348.98		∴ NO OBJECT MOUNT
0555	810								because line pressure is a little lower than yesterday
0625	840						348.61	23.24	
0655	870								
40 min 0725	900						348.73		371.85
0805	940						350.26		- 350.91
1 hr 0905	1000						350.79		20.94
1005	1060	400	013423000	56	54	252	350.91	20.94	Tank = FZ80 psi
1105	1120						353.08		
1205	1180						352.75		
1305	1240						351.26		
1405	1300						351.26		
1505	1360						350.33		
1605	1420						348.84		
1705	1480						346.34		
2 hr 1905	1600						348.15		
2105	1720						349.55		
2305	1840						347.80		
1/24 0105	1960						345.81		014106000
0305	2080						342.55		- 013423000
0505	2200						341.79		683000 / 1460m
0705	2320						341.14	30.71	= 468 g/m avg
0905	2440						343.30	28.55	since yesterday
1105	2560	400	014106000	56	58	249			@ 1025 adj FCV to 243 psi
1305	2680	500		57	57	242	341.75		(2520m)
1505	2800						337.13		
1705	2920						331.83		
1905	3040						330.93		
2105	3160						328.52		
2305	3280						328.69		
1/25 0105	3400						320.82		

TL



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: WY 2010 #9

Sheet No. 1 of     

Date/Time	FT (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW ((ft) Dist)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1/26/09 11:00	0		015734600				375.44		
01	1						367.03		
02	2						361.80		
03	3						354.93		
04	4						352.25		
11:05	5	600	015736600	65		250	350.48		Go to ADS, ASR 1
11:06	6						350.20		
07	7						349.07		
08	8						348.43		
09	9						347.79		
11:10	10						347.30		
11:12	12						352.82		
5 min 11:15	15						350.57		
11:20	20						354.45		
11:25	25						353.96		
11:30	30						353.18		
11:35	35						352.76		
11:40	40						352.26		
11:45	45						351.86		
11:50	50						351.06		
11:55	55						350.99		
10 min 12:00	60	425		57	57	249	350.51		12:05 ads to 500 gpm
12:10	70						347.68		
12:20	80						347.47		
12:30	90						346.90		
12:40	100						346.19		
20 min 13:00	120						345.21		
13:20	140						344.51		
13:40	160						344.52		
14:00	180						343.46		
30 min 14:30	210						342.68		
15:00	240						342.47		
15:30	270						341.39		
16:00	300						341.17		
16:30	330						340.03		
17:00	360						339.90		
17:30	390						338.57		
18:00	420						337.57		
18:30	450						337.13		
19:00	480						336.63		

TL



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: WY 2010 TEST 9

Sheet No. 2 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1-26-10 1930	510						335.78		
2000	540						335.01		
2030	570						333.06		
2100	600						333.62		
2130	630						332.19		
2200	660						331.33		
2230	690								
2300	720						330.19		
2330	750						328.41		
1/27 0000	780								
0030	810						325.84		
0100	840						323.93		
0130	870								
40 min 0200	900						321.87		
0240	940						319.25		
1 hr 0340	1000						317.55		
0440	1060						315.98		
0540	1120						314.43		
0640	1180						313.02		
0740	1240						312.22	63.22	
0810	1300	~450	016666000	52	50	236			@ 0750 (1250 min)
0840	1360	500	016672000	60	57	251			@ 0800 after adjusting FCV
0940	1420	510	016764000	59	55	249			@ 1055
1040	1480	760	016775000	58	54	240			@ 1117 - all dirty after adjv JL, TL, JO
2 hr 1340	1600								
1540	1720	~820	017001000	55	51	239			@ 1600
1740	1840								
1940	1960								017984000 2705
2140	2080								016775000 - 1457
2340	2200								12090000 / 1298 = 968 gpm
1/28/10 0140	2320						296.43		conv
0340	2440						291.67		
0540	2560						286.78		
0740	2680	~990	019984000	54	49	240	288.10	87.34	point is 1300 psi
0940	2800						293.27		@ 0805 (2705) Make no adj at ASR-2
1140	2920						299.16		but do adjust ASR-1 from 750 to 1600 gpm @ 0840 JO
1340	3040	11000	018244000	54	52	240	293.28	82.16	@ 1430
1540	3160						286.63		
1740	3280						285.48	89.96	
1940	3400						291.93		

TL  
JO  
← scanned

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: WY 2010 Test #9

Sheet No. 3 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bgs)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
1/28/10 2140	3520						275.27		
2340	3640						269.97		
1/29 0140	3760						276.52		
0340	3880						271.28		
0540	4000						269.71	106.23	
0740	4120	~775	019434(000)	47	44	235	281.21	94.23	00800 (car and valves closed - no watch) no ADS TL
0940	4240						292.76		
1140	4360						285.27		
1340	4480						284.20		
1540	4600	~975	019811(000)	50	48		271.95		01505 after BF @ ASR-1 TL
1740	4720						273.95		
1940	4840						268.18		
2140	4960						266.41		
2340	5080						263.06		
1/30 0140	5200						257.52		
0340	5320						253.12		
0540	5440						250.27		
0740	5560	~1025	020995(000)	44	43	233	246.91	128.53	00905 (57.45 m)
0940	5680	~700	021013(000)	51	48	242			00925 after adjusting FCV (close to max dia) TL
1140	5800						283.40		
1340	5920						276.78		
1540	6040								
1740	6160								
1940	6280						252.89		
2140	6400						247.84		
2340	6520						248.62		
1/31 0140	6640						250.13		
0340	6760						255.04		
0540	6880						250.09		
0740	7000						248.00		
0940	7120	~760	022445(000)	46	42	236	260.46		0035 no adj - large wk flux JWB
1140	7240						276.25		
1340	7360						276.53		
1540	7480						276.11		
1740	7600						275.34		
1940	7720						273.08		
2140	7840						272.32		
2340	7960						270.14		
2/1 0140	8080						264.23		
0340	8200						258.18		

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: WY 2010 Test #9

Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bsl)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/1/10 0540	8320			X			254.39	121.04	
0740	8440	750	023489000	50	46	239	257.50		00820 (8480m) NO ADS
0940	8560								
1140	8680	600	023616000	48	45	237			0110-117 next FCV after shutting down for aborted BF - no cube water today due to MPE breaking it on 1/29
1340	8800	650	011205			238			
1540	8920	700	023836000	51			279.97	95.47	
1740	9040						276.34		01640
1940	9160						275.30		
2140	9280						269.69		
2340	9400						265.37		
2/2 0140	9520						252.97		
0340	9640						247.88		
0540	9760						244.99		Lube Line 72062 - still not on
0740	9880	1000	024683000	55	52	238	243.71	131.73	00815 ADS FCV to 250, flow drop to 700 - lube line on ~ 0.33 CFM @ ~ 0830 - recheck at ASR-2, rate ≈ 550 gpm
0940	10000						306.01		
1140	10120						295.76		
1340	10240						281.81		
1540	10360	960	024940000	72	70	275	274.37		01505 turn off of CAW request
	10480	0	024941	94	95	310			72159 CF Lube Line on since 0835
	10600								
	10720								
	10840								
	10960								
	11080								
	11200								
	11320								
	11440								
	11560								
	11680								
	11800								
	11920								
	12040						392.57		00738 on 2/3 prior to start of new test
	12160								
	12280								
	12400								
	12520								
	12640								
	12760								
	12880								
	13000								

BF XD1  $\frac{166.15}{119.76} \times 024941000$   
 XD10  $\frac{46.39}{119.76} \times 024922000$   
 $\frac{19000}{119.76} = 159.97$   
 LUBE LINE METER 72163 FT<sup>3</sup>

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR #2

Test: WY 2010 TEST #10

Sheet No. 1 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft. bsl)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/3/2010 0833	0	0	024932000	61	0	312	369.29		024924000 before filling column @ 0815
(Wed) 0834	1						369.01		filled @ 0830
0835	2						362.79		
0836	3						362.02		
0837	4						361.62		
0838	5						358.51		
0839	6						356.88		
0840	7						354.90		
0841	8						351.87		
0842	9						350.26		
0843	10						350.13		
0845	12	500	024936000	54	51	242	348.60		
5 min 0848	15	700		51	48	238	344.14		adj. FCV to 236
0853	20						335.63		
0858	25	~800		50	44	233	332.38		adj FCV to 233
0903	30	~825	024948000	48	46	233	324.80		nmr cal.
0908	35						321.61		
0913	40						320.55		
0918	45						319.95		
0923	50						319.00		
0928	55						317.65		
10 min 0933	60						317.50		
0943	70						316.16		
0953	80						315.57		
1003	90						309.72		
1013	100						306.88		
20 min 1023	120						308.23		
1043	140						306.60		
1103	160						306.11		
1123	180						304.56		
30 min 1153	210						303.08		
1223	240						302.11		
1253	270						300.00		
1323	300						298.09		
1353	330						297.31		
1423	360						295.69		
1453	390	1000	025400500	44	46	232	296.00		adjust FCV TO 241 @ 800GPM (6:53) JL
1523	420						293.44		
1553	450						293.00		
1623	480						292.49		

MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR-2

Test: WY 2010 TEST #10

Sheet No. 2 of     

Date/Time	Elev (ft)	Rate (gpm)	Totalizer (Gallons)	Pressure (psi)			DTW (ft) (BIS)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/3/10 1653	510						291.42		
(Wed) 1723	540						312.18		
1753	570						312.04		
1823	600						310.97		
1853	630								
1923	660						310.12		
1953	690						308.29		
2023	720						302.48		
2053	750								
2123	780						305.25		
2153	810						303.91		
2223	840						302.49		
2253	870								
40 min 2323	900						299.30		
2/4 0003	940						296.40		
1 hr 0103	1000						294.20		
(Thu) 0203	1080						292.43		
0303	1120						290.52		026241000
0403	1180						288.39		024932000
0503	1240						286.34		1309000 ÷ 1427 = 917 gpm Avg
0603	1300						284.31	84.91	
0703	1360						285.31		@ 08:10
0803	1420	-990	026241000	50	47	234	285.04		NO ADSI Tank ~ 1100 psi
0903	1480	115							
2 hr 1103	1600								
1303	1720								
1503	1840								
1703	1960								
1903	2080								
2103	2200								
2303	2320								
2/5 0103	2440								
(Fri) 0303	2560								
0503	2680								
0703	2800								
0903	2920	1150	027736000		61	247	249.6		adjusted to 1,000 GPM
1103	3040								
1303	3160								
1503	3280								
1703	3400	1100	028217000		60	254	249.9		adjusted to 1000 GPM - 2L FCV 256

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: WY2010 Test #10

Sheet No. 3 of     

2/4/10  
(Sat)

2/7/10  
(Sun)

Date/Time	FT (ft)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
P03	3520								
2103	3640								
2303	3760								
0103	3880								
0303	4000								
0503	4120								
0703	4240								
0903	4360	1125	02942700	47	45	262	239.00	130.20	@1003
1103	4480	700		47	50	212			FCV line valve was shut ADJ due to DU. (CAW)
1303	4600								
1503	4720								TLL
1703	4840								
1903	4960								
2103	5080								
2303	5200								
0103	5320								
0303	5440								
0503	5560								
0703	5680								
0903	5800								
1103	5920								
1303	6040	1190	030980 000	72	68	255	227.34	141.95	@1223
1503	6160								
1703	6280	1075		63	59	248			@1250
1903	6400								
2103	6520								
2303	6640								
2/4 0103	6760								
0303	6880								
0503	7000								
0703	7120	750	031820 000	48	45	237	270.85	98.94	@0859
0903	7240								NO ADJ TLL
1103	7360								
1303	7480								
1503	7600	700	03217 000		44	237	271.28		NO ADJUSTMENT in case pressure spikes
1703	7720								
1903	7840								
2103	7960								
2303	8080								
0103	8200								

11:50  
11:5  
11:50  
11:50  
est for 8AM - 030980 000  
264 000  
= 030,776,000

Adjusted: ASR1 up in flow to  
brdy ASR2 down in flow - JNO

MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR2

Test: HERMIT TEST #10

Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft b150)	Drawup (ft)	Comments/Other
				Line	Read	FCV			
2/10 0223	8320								
0503	8440								
0703	8560								
0903	8680	1000	632944 [1000]		70	254	234.16		left settings
1103	8800								369.29
1303	8920								-234.16
1503	9040	1100	033379 [10]	70	70	254	219.46	135.13	01530
1703	9160	900				261			735.13
1903	9280								72169 CF on lubeline - forgot to
2103	9400								start luber this AM, so just turned down @
2303	9520								Luber line was not hooked - spoke to Rudy + got it
2/10 0103	9640								going @ 1605 - Adj. to 0.27 CFM - almost shut
0303	9760								completely
0503	9880								
0703	10000	510	033602 [1000]	75	71	263	297.12	72.17	@0823
0903	10120								72401 CF on luber line
	10240								-297.12
	10360								72.17
	10480								
	10600								STOPPED INJECTION
	10720								BEGAN BACKFLUSH
	10840								
	10960								
	11080								XD - 179.09 PRIOR TO PUMPING
	11200								XD - 51.13 meter ID# 033592 [1000]
	11320								87.96 meter LZ 033612 [1000]
	11440								20 [1000] 87.96
	11560								BACKFLUSH CEASED @ 7min = 22.74 gpm/ft
	11680								72409 Lubeline OFF
	11800								
	11920								
	12040								
0938	<del>12100</del>	700	033593 [1000]		72	259	361.44		INITIAL
	12280								BEGAN INJECTION 033593 [1000]
	12400								
	12520								ASR#2 TEST 11
	12640								left setting to build up pressure
	12760								
	12880								
	13000								

JL  
#12

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: WY2010 "ASR2 Test #11 (Hermit Test #1)

Sheet No. 1 of 4

Date/Time	TET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			BFW (in <sup>3</sup> /hr)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/10/10 9:38	1 min	0	033593000		84	305	361.44	0	
2/10/10 9:39		700			72	259	360.45	0.99	
2/10/10 9:40							348.99	12.45	
2/10/10 9:41							343.62	17.82	
2/10/10 9:42							342.98	18.46	
2/10/10 9:43									
2/10/10 9:44									
2/10/10 9:45									
2/10/10 9:46									
2/10/10 9:47									
2/10/10 9:48									
2/10/10 9:50									
2/10/10 9:53	5 min								
2/10/10 9:58									
2/10/10 10:03									
2/10/10 10:08									
2/10/10 10:13									
2/10/10 10:18									
2/10/10 10:23									
2/10/10 10:28									
2/10/10 10:33									
2/10/10 10:38									
2/10/10 10:48	10 min								
2/10/10 10:58									
2/10/10 11:08									
2/10/10 11:18									
2/10/10 11:38	20 min						310.16	51.28	
2/10/10 11:58							309.24	52.20	
2/10/10 12:18							308.39	53.05	
2/10/10 12:38							307.63	53.81	
2/10/10 12:58	30 min						306.36	55.08	
2/10/10 13:28									
2/10/10 13:58							305.23	56.21	
2/10/10 14:28							303.75	57.69	
2/10/10 14:58							302.97	58.47	
2/10/10 15:28							301.34	60.10	
2/10/10 15:58							300.48	60.96	
2/10/10 16:28							298.83	62.61	
2/10/10 16:58							297.49	63.95	
2/10/10 17:28							296.48	64.96	(all typed entries transcribed by TLL from his notes)





MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR-2

Test: WY2010 ASR2 Test #11 (HERMIT TEST #1)

Sheet No. 3 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/12/10 2018		3520							
2218		3640							
2/13/10 0018		3760							
0218		3880				326.32			
0418		4000							
0618		4120							
0818		4240							
1018		4360	825 036239000	72	68	257	280.77	80.67	@ 1050 I open FCV to increase flow to 900 gpm.
1218		4480	900						I note that FCV was set at 247 psi when I arrived. I reset to (253 psi) JWD
1418		4600	950 036346000	71	67	255			
1618		4720							@ 1245 re-check - no adj JWD
1818		4840							
2018		4960					341.38		
2218		5080					341.73		
2/14 0018		5200					341.46		
0218		5320					341.73		
0418		5440					338.92		
0618		5560					308.00		361.44
0818		5680					298.23		- 291.42
1018		5800					291.42	70.02	70.02
1218		5920	700 036890000	73	69	259	284.51		@ 1200
1418		6040					261.19	100.25	Reset FCV to (253 psi) ~900 slm
1618		6160					328.92		
1818		6280					328.43		
2018		6400					324.20		
2218		6520					323.98		
2/15 0018		6640					325.83		
0218		6760					324.07		361.44 361.44
0418		6880					326.08		- 261.19 284.51
0618		7000					324.66		100.25 77.13
0818		7120	710 037495000	76	73	262	284.31	77.13	@ 0858 (continue) NT ADJ.
1018		7240							
1218		7360					272.58		
1418		7480					321.30		← 316 Δ M DTW
1618		7600					322.98		
1818		7720					326.38		
2018		7840					327.04		
2218		7960					326.94		
2/16 0018		8080					327.36		
0218		8200					327.51		

TLL

TLL

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Test: WY2010 "ASR2 Test #11 (Hermit Test #1)

Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (feet)	Drawdown (ft)	Comments/Other
				Line	Head	FCV			
2/16/10 4:18	8320						526.28		361.44 361.44
2/16/10 8:18	8440					?	294.23	67.21	-294.23 -285.62
2/16/10 8:18	8560	650	038089 [000]	76	72	260			@ 0803 67.21 75.82 pu 0.0718
2/16/10 10:18	8680	750	038207 [000]	76	72	261			@ 1049 ←
2/16/10 12:18	8800								
2/16/10 14:18	8920	820	038365 [000]	75	72	262			@ 1358 72409 CF on Lake Line
2/16/10 16:18	9040		038366 [000]						off open @ 1040 add to 0.25 CFM
2/16/10 18:18	9160								24 / 24 psi
2/16/10 20:18	9280								
2/16/10 22:18	9400								
2/17/10 0:18	9520								2000 135.04 14.8
2/17/10 2:18	9640								
2/17/10 4:18	9760								171.30 038366 [000]
2/17/10 6:18	9880								- 36.26 038346 [000]
2/17/10 8:18	10000								135.04 20000 / 10min = 2000 GPM
2/17/10 10:18	10120								Picked to ~50 psi after 3 min
2/17/10 12:18	10240								
2/17/10 14:18	10360								Flowcell Flow Rate 5057
2/17/10 16:18	10480								
2/17/10 18:18	10600								
2/17/10 20:18	10720								
2/17/10 22:18	10840								
2/18/10 0:18	10960								
2/18/10 2:18	11080								
2/18/10 4:18	11200		038337 [000]						
2/18/10 6:18	11320								
2/18/10 8:18	11440								
2/18/10 10:18	11560	750	038337 [000]	74	255	363.74			TEST #12 ASR-2 Started @ 15 24
2/18/10 12:18	11680								
2/18/10 14:18	11800	250		86	255				
2/18/10 16:18	11920								
2/18/10 18:18	12040								
2/18/10 20:18	12160								
2/18/10 22:18	12280								
2/19/10 0:18	12400								
2/19/10 2:18	12520								
2/19/10 4:18	12640								
2/19/10 6:18	12760								
2/19/10 8:18	12880								
2/19/10 10:18	13000								

510 us/cm  
7.25 °C  
16.9 °C  
0.50 mg/L DO  
710 mV ORP  
0.8% RESIDUAL CHLORINE

1355 when opening the FCV we noticed system pressure drop from 70 psi to 50 psi @ ASR2 well head  
will download pressure record





**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: ASR 2 Test 12 WY 2010

Sheet No. 3 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/19/10 2:04	3520								
2/19/10 4:04	3640								
2/19/10 6:04	3760								
2/19/10 8:04	3880	700	040497 <input type="checkbox"/> 1000		72	260	302.7	61.04	reset to 255 @ 1000 gpm
2/19/10 10:04	4000								
2/19/10 12:04	4120								
2/19/10 14:04	4240								
2/19/10 16:04	4360								
2/19/10 18:04	4480								
2/19/10 20:04	4600								
2/19/10 22:04	4720								
2/20/10 0:04	4840								
2/20/10 2:04	4960								
2/20/10 4:04	5080								
2/20/10 6:04	5200								
2/20/10 8:04	5320								
2/20/10 10:04	5440								
2/20/10 12:04	5560	900	041701 <input type="checkbox"/> 1000		70	257	278.35	115	Set to 255
2/20/10 14:04	5680								
2/20/10 16:04	5800								
2/20/10 18:04	5920								
2/20/10 20:04	6040								
2/20/10 22:04	6160								
2/21/10 0:04	6280								
2/21/10 2:04	6400								
2/21/10 4:04	6520								
2/21/10 6:04	6640								
2/21/10 8:04	6760								
2/21/10 10:04	6880								
2/21/10 12:04	7000								
2/21/10 14:04	7120								
2/21/10 16:04	7240	950	042890 <input type="checkbox"/> 1000		72	69	256		@ 1724 - leave settings - will likely be shutting down injection tomorrow JWS
2/21/10 18:04	7360								
2/21/10 20:04	7480								
2/21/10 22:04	7600								
2/22/10 0:04	7720								
2/22/10 2:04	7840								
2/22/10 4:04	7960								
2/22/10 6:04	8080								
2/22/10 8:04	8200	750	043376 <input type="checkbox"/> 1000		75	72	260		@ 0839 TL

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: ASR 2 Test 12 WY 2010

Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/22/10 10:04	8320								
2/22/10 12:04	8440								
2/22/10 14:04	8560								
2/22/10 16:04	8680								
2/22/10 18:04	8800								
2/22/10 20:04	8920								
2/22/10 22:04	9040								
2/23/10 0:04	9160								
2/23/10 2:04	9280								
2/23/10 4:04	9400								
2/23/10 6:04	9520								
2/23/10 8:04	9640								
2/23/10 10:04	9760								
2/23/10 12:04	9880								
2/23/10 14:04	10000								
2/23/10 16:04	10120								
2/23/10 18:04	10240								
2/23/10 20:04	10360								
2/23/10 22:04	10480								
2/24/10 0:04	10600								
2/24/10 2:04	10720								
2/24/10 4:04	10840								
2/24/10 6:04	10960								
2/24/10 8:04	11080	900	0443551000	80	271	260.76	96.98		AIR IS OFF SHUT DOWN AND BACKFLUSH. ←
2/24/10 10:04	11200								950 LUBE 72713
2/24/10 12:04	11320								METER 2: 0443551000
2/24/10 14:04	11440								2: 0443361000
2/24/10 16:04	11560								9000 / 5 = 1800 gpm
2/24/10 18:04	11680								
2/24/10 20:04	11800								
2/24/10 22:04	11920								
2/25/10 0:04	12040								PROBE 1: 164.91
2/25/10 2:04	12160								2: 37.905
2/25/10 4:04	12280								1005
2/25/10 6:04	12400								BLWD 1005
2/25/10 8:04	12520								510 uskm
2/25/10 10:04	12640								772 MV ORP
2/25/10 12:04	12760								7.24 pH
2/25/10 14:04	12880								15.1°C
2/25/10 16:04	13000								0.471 gpm Drawup

DTW 371.13 LP 86 12006 gpm  
2/24 @ 0905 044707000 325 gpm

STARTED NEW TEST @ 1009  
H. FCV ADJ to 257 (650 gpm)  
76 295

0443361000  
371.13 - 2/23  
- 333.70 - 2/24  
37.43

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: ASR 2 Test 13 WY 2010

Sheet No. 1 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/23/10 10:09	1 min	0	044331000		86	305	371.13	0	TLL transcription of JL notes
2/23/10 10:10		1							
2/23/10 10:11		2							
2/23/10 10:12		3							
2/23/10 10:13		4							
2/23/10 10:14		5							
2/23/10 10:15		6							
2/23/10 10:16		7							
2/23/10 10:17		8							
2/23/10 10:18		9							
2/23/10 10:19		10							
2/23/10 10:21		12							
2/23/10 10:24	5 min	15							
2/23/10 10:29		20							
2/23/10 10:34		25							
2/23/10 10:39		30							
2/23/10 10:44		35							
2/23/10 10:49		40							
2/23/10 10:54		45							
2/23/10 10:59		50							
2/23/10 11:04		55							
2/23/10 11:09		60							
2/23/10 11:19	10 min	70							
2/23/10 11:29		80							
2/23/10 11:39		90							
2/23/10 11:49		100							
2/23/10 12:09	20 min	120							
2/23/10 12:29		140							
2/23/10 12:49		160							
2/23/10 13:09		180							
2/23/10 13:29	30 min	210							
2/23/10 13:59		240							
2/23/10 14:29		270							
2/23/10 14:59		300							
2/23/10 15:29		330							
2/23/10 15:59		360							
2/23/10 16:29		390							
2/23/10 16:59		420							
2/23/10 17:29		450							
2/23/10 17:59		480							



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2 \_\_\_\_\_

Test: ASR 2 Test 13 WY 2010 \_\_\_\_\_

Sheet No. 2 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
2/23/10 18:29	510								
2/23/10 18:59	540								
2/23/10 19:29	570								
2/23/10 19:59	600								
2/23/10 20:29	630								
2/23/10 20:59	660								
2/23/10 21:29	690								
2/23/10 21:59	720								
2/23/10 22:29	750								
2/23/10 22:59	780								
2/23/10 23:29	810								
2/23/10 23:59	840								
2/24/10 0:29	870								
2/24/10 1:09	900								
2/24/10 1:49	940								
2/24/10 2:49	1000								
2/24/10 3:49	1060								
2/24/10 4:49	1120								
2/24/10 5:49	1180								
2/24/10 6:49	1240								
2/24/10 7:49	1300	325	044707000		76	275	333.70	37.43	@ 08:05, re-set FCV to 257 psi, ~650 gpm TLL
2/24/10 8:49	1360	650				257			
2/24/10 9:49	1420								
2/24/10 10:49	1480						303.47		
2/24/10 12:49	1600								
2/24/10 14:49	1720								
2/24/10 16:49	1840	850	045139000	72	70	257	290.99	71.14	1649 NO ADJ.
2/24/10 18:49	1960								
2/24/10 20:49	2080								
2/24/10 22:49	2200								
2/25/10 0:49	2320								
2/25/10 2:49	2440								
2/25/10 4:49	2560								
2/25/10 6:49	2680								
2/25/10 8:49	2800	1050	046100000	69	67	255	262.46	108.67	0815 - ADJ FCV to 257 TLL
2/25/10 10:49	2920								
2/25/10 12:49	3040								
2/25/10 14:49	3160	900	046426000	74	71	259	276.51	94.62	@1439 No adj Jwo
2/25/10 16:49	3280						275.66		
2/25/10 18:49	3400						277.19		



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: ASR 2 Test 13 WY 2010

Sheet No. 4 of 4

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/1/10 4:49	8320								
3/1/10 6:49	8440								371.13
3/1/10 8:49	8560	950	051782600	68	66	255	239.88	131.25	@0820
3/1/10 10:49	8680								Adj FCV to 257
3/1/10 12:49	8800								
3/1/10 14:49	8920								@1
3/1/10 16:49	9040								
3/1/10 18:49	9160								
3/1/10 20:49	9280								BF WQ 510 us/cm
3/1/10 22:49	9400								15.0°C
3/2/10 0:49	9520								7.28 pH
3/2/10 2:49	9640								0.31 mg/L DO
3/2/10 4:49	9760								714 mV ORP
3/2/10 6:49	9880								
3/2/10 8:49	10000								
3/2/10 10:49	10120								
3/2/10 12:49	10240	875	052643600	91	87	263	273.93		@1353
3/2/10 14:49	10360	Ø	052647600	97	95	307			@1400 73023 CF Lube Line
3/2/10 16:49	10480								start generator 0.23 cfm
3/2/10 18:49	10600								
3/2/10 20:49	10720								
3/2/10 22:49	10840								XD 170.06
3/3/10 0:49	10960								M: 052647600 Adj "NC"
3/3/10 2:49	11080								M: 052626800 XD13 34.99
3/3/10 4:49	11200								21,000 ÷ 135.07
3/3/10 6:49	11320								= 15.5 gal/ft
3/3/10 8:49	11440	Ø	052616600	92	93	307	366.60	Ø	(Note) Loose connection where cable attached to well, but XD is not changing very much
3/3/10 10:49	11560								@1443 start test #14
3/3/10 12:49	11680	1100				258			@1453 set FCV - not equilibrated yet
3/3/10 14:49	11800								ASR-1 off low BE
3/3/10 16:49	11920								
3/3/10 18:49	12040	1100	053789600	68	66	251			@0838 Adj FCV to 256
3/3/10 20:49	12160								very intense rain - skipped permit
3/3/10 22:49	12280								
3/4/10 0:49	12400								
3/4/10 2:49	12520								
3/4/10 4:49	12640								
3/4/10 6:49	12760								
3/4/10 8:49	12880								
3/4/10 10:49	13000								

TM ↓  
3/2  
3/3

TL

TL



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2 \_\_\_\_\_

Test: ASR 2 Test #14 WY 2010

Sheet No. 2 of \_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/2/10 23:03	510								
3/2/10 23:33	540								
3/3/10 0:03	570								
3/3/10 0:33	600								
3/3/10 1:03	630								
3/3/10 1:33	660								
3/3/10 2:03	690								
3/3/10 2:33	720								
3/3/10 3:03	750								
3/3/10 3:33	780								
3/3/10 4:03	810								
3/3/10 4:33	840								
3/3/10 5:03	870								
3/3/10 5:43	900								
3/3/10 6:23	940								
3/3/10 7:23	1000								
3/3/10 8:23	1060	1100	53789000	68	66	251		@ 8:28 Did not check Hermit due to intense rain, but anticipated rapid drawup, and therefore, set FCV to 256. TLL	
3/3/10 9:23	1120							= 1173000 gals ÷ 1065 = 1102 gpm	
3/3/10 10:23	1180								
3/3/10 11:23	1240								
3/3/10 12:23	1300								
3/3/10 13:23	1360								
3/3/10 14:23	1420								
3/3/10 15:23	1480								
3/3/10 17:23	1600								
3/3/10 19:23	1720								
3/3/10 21:23	1840								
3/3/10 23:23	1960								
3/4/10 1:23	2080								
3/4/10 3:23	2200								
3/4/10 5:23	2320								
3/4/10 7:23	2440	900	055061	67	68	256	265.80	100.80 @ 0830 ADJ TO 254 @ 1,000 GPM	
3/4/10 9:23	2560								
3/4/10 11:23	2680								
3/4/10 13:23	2800								
3/4/10 15:23	2920								
3/4/10 17:23	3040								
3/4/10 19:23	3160								
3/4/10 21:23	3280								
3/4/10 23:23	3400								

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: ASR 2 Test #14 WY 2010

Sheet No. 3 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/5/10 1:23	3520								
3/5/10 3:23	3640								
3/5/10 5:23	3760								
3/5/10 7:23	3880	750	055931 (600)	74	72	261	280.31	86.29	@ 0830 RESET FCV TO 254 @ 1000 GPM
3/5/10 9:23	4000								
3/5/10 11:23	4120								
3/5/10 13:23	4240								
3/5/10 15:23	4360								
3/5/10 17:23	4480								
3/5/10 19:23	4600								
3/5/10 21:23	4720								
3/5/10 23:23	4840								
3/6/10 1:23	4960								
3/6/10 3:23	5080								
3/6/10 5:23	5200								
3/6/10 7:23	5320								
3/6/10 9:23	5440	1225	057717 (600)	66	64	247	217.59	149.01	Tank = 625 psi @ 1033 1268 gpm on parameters set FCV to 257
3/6/10 11:23	5560								
3/6/10 13:23	5680	975	057724 (600)	72	68	259			@ 1040 - still cavitation after adjustment 98 g/m on pump TLL
3/6/10 15:23	5800								
3/6/10 17:23	5920								
3/6/10 19:23	6040								
3/6/10 21:23	6160								
3/6/10 23:23	6280								
3/7/10 1:23	6400								
3/7/10 3:23	6520								
3/7/10 5:23	6640								
3/7/10 7:23	6760								366.60 start
3/7/10 9:23	6880								
3/7/10 11:23	7000								
3/7/10 13:23	7120	775	058472 (600)	74	72	260	270.23	96.37	@ 1405 Lower FCV to slightly increase flow,
3/7/10 15:23	7240	900		73	70	255	253.55		@ 1415 I expect flow will continue to rise slightly.
3/7/10 17:23	7360						246.01		
3/7/10 19:23	7480						240.18		
3/7/10 21:23	7600						235.31		
3/7/10 23:23	7720						224.74		
3/8/10 1:23	7840						289.85		
3/8/10 3:23	7960						291.60		
3/8/10 5:23	8080						281.03		
3/8/10 7:23	8200						273.94		

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: ASR 2 Test #14 WY 2010

Sheet No. 4 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/8/10 9:23	8320	700	059303 [000]	76	72	261	273.97	92.63	@ 0813 Adj FCV to 255
3/8/10 11:23	8440	875	059311 [000]	72	69	255			@ 0823 939 gpm on saw TL
3/8/10 13:23	8560								
3/8/10 15:23	8680								
3/8/10 17:23	8800	1090	059856 [000]	70	67	254			@ 1709 ADJ to 257 psi
3/8/10 19:23	8920					257			Left keys back at gate TL
3/8/10 21:23	9040								
3/8/10 23:23	9160								
3/9/10 1:23	9280								
3/9/10 3:23	9400								
3/9/10 5:23	9520								
3/9/10 7:23	9640	550	060315 [000]	76	75	267	289.4		@ 0830 SET FCV TO 256 @ 950GPM - JL
3/9/10 9:23	9760								
3/9/10 11:23	9880	950	060496 [000]	80	77				@ 1145 Pressure in system drops - C. Evans is doing a flow test @ DR0 reg station @ 1220 back from 590 to 775 gpm. JWD
3/9/10 13:23	10000								→ Left settings, tube line broken JL
3/9/10 15:23	10120								
3/9/10 17:23	10240	900	060742 [000]	72	74				
3/9/10 19:23	10360								
3/9/10 21:23	10480								
3/9/10 23:23	10600								
3/10/10 1:23	10720								
3/10/10 3:23	10840								
3/10/10 5:23	10960								7305 L CF
3/10/10 7:23	11080	700	061207 [000]	76	73	262			@ 0823 310 Adj to 253 - go shut down ASR-1 for BF
3/10/10 9:23	11200								No mcmd water through tube line - Later Bob P.
3/10/10 11:23	11320	1200	061421 [000]	88	86	269			@ 1145 Tells Rudy to fix it. Rudy says he will but it will take a little while due to need to haul dig. TL
3/10/10 13:23	11440								
3/10/10 15:23	11560								@ 1136 3/10 Adj FCV to 275 while #1 is off TL
3/10/10 17:23	11680	1100	061528 [000]	60	55	270			
3/10/10 19:23	11800			56	52	242			@ 1700 Reset FCV. TL
3/10/10 21:23	11920								
3/10/10 23:23	12040								
3/11/10 1:23	12160								
3/11/10 3:23	12280								
3/11/10 5:23	12400								
3/11/10 7:23	12520	1000	062207 [000]	66	64	254	213.6	153	@ 0830 Left settings, BF this afternoon - JL (OVER)
3/11/10 9:23	12640								
3/11/10 11:23	12760								
3/11/10 13:23	12880								
3/11/10 15:23	13000								

3/11/10 17:23

1150

062769 [000]

68 65 250

@ 1702 Adj FCV, could not BF till tube line repaired TL

66 52 255

66 54 255

ASR 2 Test #14 WY 2010





**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2 \_\_\_\_\_

starting water level

Test: ASR 2 Test #14 WY 2010 #15

357.69

Sheet No. 2 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft. btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/12/10 19:58	510								
3/12/10 20:28	540								
3/12/10 20:58	570								
3/12/10 21:28	600								
3/12/10 21:58	630								
3/12/10 22:28	660								
3/12/10 22:58	690								
3/12/10 23:28	720								
3/12/10 23:58	750								
3/13/10 0:28	780								
3/13/10 0:58	810								
3/13/10 1:28	840								
3/13/10 1:58	870								
3/13/10 2:38	900								
3/13/10 3:18	940								
3/13/10 4:18	1000								
3/13/10 5:18	1060								
3/13/10 6:18	1120								
3/13/10 7:18	1180								
3/13/10 8:18	1240								
3/13/10 9:18	1300	325	044707000	76		275	333.70	37.43	@ 08:05 re-set FCV to 257 psi, ~650 gpm
3/13/10 10:18	1360	650				257			
3/13/10 11:18	1420								
3/13/10 12:18	1480								
3/13/10 14:18	1600	875	064957000	71	60	256	272.37	85.32	@ 14:24 I make no adj today as line pressure is not near max and could come up. I note that HERMIT is not on external power and that jumper cable lock broken. Jwo = 1132000 gals ± 1606 mins = 705 gpm
3/13/10 16:18	1720								
3/13/10 18:18	1840								
3/13/10 20:18	1960								
3/13/10 22:18	2080								
3/14/10 0:18	2200								
3/14/10 2:18	2320								
3/14/10 4:18	2440								
3/14/10 6:18	2560						321.52	36.17	- TL JWL failed to turn "motor breaker" back on - TL found it on permit back on EP
3/14/10 8:18	2680						318.85		
3/14/10 10:18	2800						314.23		
3/14/10 12:18	2920						279.02	78.62	
3/14/10 14:18	3040	775	065780000	72	69	256			< for 11:17 on permit (12:18 DST no.) TL @ 12:13 Pan. meter did not "wake" when I hit enter Pan. meter has light indicating "recharge"
3/14/10 16:18	3160								
3/14/10 18:18	3280								
3/14/10 20:18	3400								

CORRECT →  
- TLL

I assume this is old data that did not get deleted when this sheet was printed. Jwo

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

starting water level

Test: ASR 2 Test #14 WY 2010 #15

357.69

Sheet No. 3 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/14/10 22:18	3520								
3/15/10 0:18	3640								
3/15/10 2:18	3760								
3/15/10 4:18	3880								
3/15/10 6:18	4000								
3/15/10 8:18	4120	750	066502	68	69	208	273.92	83.97	@ 0830 ; SET TO 204 @ 1000 GPM TURNED FLOW METER BACK ON
3/15/10 10:18	4240								
3/15/10 12:18	4360								
3/15/10 14:18	4480								
3/15/10 16:18	4600	850	067012	43	41	230	265.63	92.06	1819 @ 1630 863 on PAN meter No ADJ - Low pressure
3/15/10 18:18	4720								
3/15/10 20:18	4840								
3/15/10 22:18	4960								
3/16/10 0:18	5080								
3/16/10 2:18	5200								
3/16/10 4:18	5320								
3/16/10 6:18	5440								
3/16/10 8:18	5560	1200	067911	64	62	246	213.1	144.6	@ 0830 TURNED FLOW TO 254 @ 950 will backflush tomorrow
3/16/10 10:18	5680								
3/16/10 12:18	5800								
3/16/10 14:18	5920	1							
3/16/10 16:18	6040	1000	068370	70	68	256			@ 1630 left settings checked on tube lines 732
3/16/10 18:18	6160								
3/16/10 20:18	6280								
3/16/10 22:18	6400								
3/17/10 0:18	6520								
3/17/10 2:18	6640								
3/17/10 4:18	6760								
3/17/10 6:18	6880	1200	069321	67	65	251			@ 0830 set flow to 255 @ 1000 gpm
3/17/10 8:18	7000								
3/17/10 10:18	7120								
3/17/10 12:18	7240								
3/17/10 14:18	7360	1200	069636	68	70	254	199.9	157.6	shut down for backflush.
3/17/10 16:18	7480								
3/17/10 18:18	7600								
3/17/10 20:18	7720								
3/17/10 22:18	7840								
3/18/10 0:18	7960								
3/18/10 2:18	8080								
3/18/10 4:18	8200								
									BF      Meter 069641 1000 069619 1000 X01 189.27 X02 35.04 154.23      22 1000 = 14.2 154

1338 wt

EST 16 3/17/10 1238 -1000

72 71 256 359.4



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR #2

Test: \_\_\_\_\_

Hermit Test 16

Sheet No. 1 of \_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/17/10 12:38	1 min	0	69619000	72	72	300	359.11		
3/17/10 12:39		1							
3/17/10 12:40		2							
3/17/10 12:41		3							
3/17/10 12:42		4							
3/17/10 12:43		5							
3/17/10 12:44		6							
3/17/10 12:45		7							
3/17/10 12:46		8							
3/17/10 12:47		9							
3/17/10 12:48		10							
3/17/10 12:50		12							
3/17/10 12:53	5 min	15							
3/17/10 12:58		20							
3/17/10 13:03		25							
3/17/10 13:08		30							
3/17/10 13:13		35							
3/17/10 13:18		40							
3/17/10 13:23		45							
3/17/10 13:28		50							
3/17/10 13:33		55							
3/17/10 13:38		60							
3/17/10 13:48	10 min	70							
3/17/10 13:58		80							
3/17/10 14:08		90							
3/17/10 14:18		100							
3/17/10 14:38	20 min	120							
3/17/10 14:58		140							
3/17/10 15:18		160							
3/17/10 15:38		180							
3/17/10 15:58	30 min	210							
3/17/10 16:28		240							
3/17/10 16:58		270							
3/17/10 17:28		300							
3/17/10 17:58		330							
3/17/10 18:28		360							
3/17/10 18:58		390							
3/17/10 19:28		420							
3/17/10 19:58		450							
3/17/10 20:28		480							

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR #2

Starting Water Level

Test: Hermit Test 16

359.11

Sheet No. 2 of     

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/17/10 20:58	510								
3/17/10 21:28	540								
3/17/10 21:58	570								
3/17/10 22:28	600								
3/17/10 22:58	630								
3/17/10 23:28	660								
3/17/10 23:58	690								
3/18/10 0:28	720								
3/18/10 0:58	750								
3/18/10 1:28	780								
3/18/10 1:58	810								
3/18/10 2:28	840								
3/18/10 2:58	870								
3/18/10 3:38	900								
3/18/10 4:18	940								
3/18/10 5:18	1000								
3/18/10 6:18	1060								
3/18/10 7:18	1120								
3/18/10 8:18	1180	750	070129 [000]	74	72	260	295.03	64.08	@ 0830 SET FCV TO 200 = 510,000 gal ÷ 1192 mins = 428 gpm
3/18/10 9:18	1240								
3/18/10 10:18	1300								
3/18/10 11:18	1360								
3/18/10 12:18	1420								
3/18/10 13:18	1480								
3/18/10 15:18	1600								
3/18/10 17:18	1720								
3/18/10 19:18	1840								
3/18/10 21:18	1960								
3/18/10 23:18	2080								
3/19/10 1:18	2200								
3/19/10 3:18	2320								
3/19/10 5:18	2440								
3/19/10 7:18	2560	300	070958 [000]	50	49	247	331.60	27.91	@ 0830 SET FCV TO 247 J2
3/19/10 9:18	2680	360	070989 [000]	53	49	247			@ 1000 Set FCV to 232 psi. J2
3/19/10 11:18	2800	725		47	46	232			@ 1010 Record settings after adjustment. J2
3/19/10 13:18	2920	1075	071163 [000]	70	66	254			@ 1315 Check settings. J2
3/19/10 15:18	3040								
3/19/10 17:18	3160								
3/19/10 19:18	3280								
3/19/10 21:18	3400								

need to fill in. J2



**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR #2

Starting Water Level

Test: \_\_\_\_\_

Hermit Test 16

359.11

Sheet No. 4 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
3/23/10 7:18	8320	1125	075014000	86	84	207			After shutting ASR-1, shut this FCV
3/23/10 9:18	8440								
3/23/10 11:18	8560								
3/23/10 13:18	8680								
3/23/10 15:18	8800								
3/23/10 17:18	8920								
3/23/10 19:18	9040								
3/23/10 21:18	9160								
3/23/10 23:18	9280								
3/24/10 1:18	9400								
3/24/10 3:18	9520								
3/24/10 5:18	9640								
3/24/10 7:18	9760								
3/24/10 9:18	9880								
3/24/10 11:18	10000		074993000						
3/24/10 13:18	10120								
3/24/10 15:18	10240								
3/24/10 17:18	10360								
3/24/10 19:18	10480								
3/24/10 21:18	10600								
3/24/10 23:18	10720								
3/25/10 1:18	10840								
3/25/10 3:18	10960								
3/25/10 5:18	11080								
3/25/10 7:18	11200								
3/25/10 9:18	11320								
3/25/10 11:18	11440								
3/25/10 13:18	11560								
3/25/10 15:18	11680								
3/25/10 17:18	11800								
3/25/10 19:18	11920		075069000						
3/25/10 21:18	12040								
3/25/10 23:18	12160								
3/26/10 1:18	12280	1006		71	72	207			360.03 INITIAL 363.
3/26/10 3:18	12400								
3/26/10 5:18	12520								
3/26/10 7:18	12640								
3/26/10 9:18	12760								
3/26/10 11:18	12880								
3/26/10 13:18	13000								

TEST 18







**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Starting Water Level

Test:

Test 18/17

360.03

Sheet No. 3 of

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/1/10 20:47	3520								
4/1/10 22:47	3640								
4/2/10 0:47	3760								
4/2/10 2:47	3880								
4/2/10 4:47	4000								
4/2/10 6:47	4120								
4/2/10 8:47	4240	950	077948	62	60	235		@ 0830 SHUT DOWN PER WF	
4/2/10 10:47	4360	8				300			
4/2/10 12:47	4480								
4/2/10 14:47	4600								
4/2/10 16:47	4720								
4/2/10 18:47	4840								
4/2/10 20:47	4960								
4/2/10 22:47	5080								
4/3/10 0:47	5200								
4/3/10 2:47	5320								
4/3/10 4:47	5440								
4/3/10 6:47	5560								
4/3/10 8:47	5680								
4/3/10 10:47	5800								
4/3/10 12:47	5920								
4/3/10 14:47	6040								
4/3/10 16:47	6160								
4/3/10 18:47	6280								
4/3/10 20:47	6400								
4/3/10 22:47	6520								
4/4/10 0:47	6640								
4/4/10 2:47	6760								
4/4/10 4:47	6880								
4/4/10 6:47	7000								
4/4/10 8:47	7120								
4/4/10 10:47	7240	0	077948	84	81	3/2	357.47	@ 1147 Injection still off per request from C. Evans on 4/2. Note that 110v power has been restored to ASR-2 site.	
4/4/10 12:47	7360								
4/4/10 14:47	7480								
4/4/10 16:47	7600								
4/4/10 18:47	7720								
4/4/10 20:47	7840								
4/4/10 22:47	7960								
4/5/10 0:47	8080								
4/5/10 2:47	8200								

Jwo





**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Starting Water Level

Test:

test 19/18

359.32

Sheet No. 2 of

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bstst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/14/10 21:21	510								
4/14/10 21:51	540								
4/14/10 22:21	570								
4/14/10 22:51	600								
4/14/10 23:21	630								
4/14/10 23:51	660								
4/15/10 0:21	690								
4/15/10 0:51	720								
4/15/10 1:21	750								
4/15/10 1:51	780								
4/15/10 2:21	810								
4/15/10 2:51	840								
4/15/10 3:21	870								
4/15/10 4:01	900								
4/15/10 4:41	940								
4/15/10 5:41	1000								
4/15/10 6:41	1060								
4/15/10 7:41	1120	75	078211000	62	58	268	361.74	@ 0810 Adj FCV to 246 psi to increase to 500 gpm	
4/15/10 8:41	1180	500						= 285000 gal + 1149 = 248 gpm JWO	
4/15/10 9:41	1240								
4/15/10 10:41	1300								
4/15/10 11:41	1360								
4/15/10 12:41	1420								
4/15/10 13:41	1480								
4/15/10 15:41	1600								
4/15/10 17:41	1720	575	078505000	56	52	244	332.87	26.75	
4/15/10 19:41	1840								
4/15/10 21:41	1960								
4/15/10 23:41	2080								
4/16/10 1:41	2200								
4/16/10 3:41	2320								
4/16/10 5:41	2440								
4/16/10 7:41	2560	725	078970000	76	72	257	309.70	42.62	
4/16/10 9:41	2680	500		78	75	266			
4/16/10 11:41	2800	200				260			
4/16/10 13:41	2920	350		60		250			
4/16/10 15:41	3040								
4/16/10 17:41	3160								
4/16/10 19:41	3280								
4/16/10 21:41	3400								

@ 0800 1st checked the setting - 272 - makes no sense. Turned FCV - as indicated here @ 0813

@ 1415 Adj FCV from 260 to 250 psi to increase injection rate. JWO

TLL

← 10 MIN

WL 1 171.84  
WL 2 34.90

M1 083095  
M2 080372

735771 → 4 2" MC

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR-2

Starting Water Level

Test: test 19/14

359.32

Sheet No. 3 of

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/16/10 23:41	3520								
4/17/10 1:41	3640								
4/17/10 3:41	3760								
4/17/10 5:41	3880								
4/17/10 7:41	4000								
4/17/10 9:41	4120	380	079481000	57	53	247		⊙0915	
4/17/10 11:41	4240							No ADS, in case previous count up TLL	
4/17/10 13:41	4360								
4/17/10 15:41	4480								
4/17/10 17:41	4600								
4/17/10 19:41	4720								
4/17/10 21:41	4840								
4/17/10 23:41	4960								
4/18/10 1:41	5080								
4/18/10 3:41	5200								
4/18/10 5:41	5320								
4/18/10 7:41	5440						315.86	4346	
4/18/10 9:41	5560	680	099999000	75	73	258		⊙0938 - incrementally increased FCV by 2 psi hoping to see response in flow rate. 10 min after start flow had some response. FCV 242 @ 265 psi - flow still @ 675 @ 10:00 TL	
4/18/10 11:41	5680								
4/18/10 13:41	5800								
4/18/10 15:41	5920								
4/18/10 17:41	6040								
4/18/10 19:41	6160								
4/18/10 21:41	6280								
4/18/10 23:41	6400								
4/19/10 1:41	6520								
4/19/10 3:41	6640								
4/19/10 5:41	6760								
4/19/10 7:41	6880	75	080175000	59	56	263		⊙0809 - reset FCV to 242, 5.00 g/m TL	
4/19/10 9:41	7000								
4/19/10 11:41	7120								
4/19/10 13:41	7240								
4/19/10 15:41	7360	650	080393000	49	50	249	311.46	47.86	
4/19/10 17:41	7480								
4/19/10 19:41	7600								
4/19/10 21:41	7720	550	080372000	50	49	249	359.32	WT 1545 START TEST #20	
4/19/10 23:41	7840								
4/20/10 1:41	7960							4/14/10 (1261) → ? TIME DRIFT - JL	
4/20/10 3:41	8080								
4/20/10 5:41	8200								

550 080985000 51 49 251

NO ADJ



BF1 088:  1000  
 BF2 088290  000

WL N/A

280 FCV  
 800 GPM

1315

**MPWMD  
 PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: \_\_\_\_\_ Test 20/14

Sheet No. 1 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/19/10 15:45	1 min	0					359.32		
4/19/10 15:46									
4/19/10 15:47		2	800	78	76	213		left settings	
4/19/10 15:48		3							
4/19/10 15:49		4							
4/19/10 15:50		5							
4/19/10 15:51		6	300	81	82	216		30832 4/20/10 set to 1000	
4/19/10 15:52		7							
4/19/10 15:53		8	200			257			
4/19/10 15:54		9							
4/19/10 15:55		10							
4/19/10 15:57		12							
4/19/10 16:00	5 min	15							
4/19/10 16:05		20							
4/19/10 16:10		25							
4/19/10 16:15		30							
4/19/10 16:20		35							
4/19/10 16:25		40							
4/19/10 16:30		45							
4/19/10 16:35		50							
4/19/10 16:40		55							
4/19/10 16:45		60							
4/19/10 16:55	10 min	70							
4/19/10 17:05		80							
4/19/10 17:15		90							
4/19/10 17:25		100							
4/19/10 17:45	20 min	120							
4/19/10 18:05		140							
4/19/10 18:25		160							
4/19/10 18:45		180							
4/19/10 19:05	30 min	210							
4/19/10 19:35		240							
4/19/10 20:05		270							
4/19/10 20:35		300							
4/19/10 21:05		330							
4/19/10 21:35		360							
4/19/10 22:05		390							
4/19/10 22:35		420							
4/19/10 23:05		450							
4/19/10 23:35		480							

These Are Incorrect





**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Starting Water Level

Test: \_\_\_\_\_

Test 20

359.32

Sheet No. 3 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/22/10 2:25	3520								
4/22/10 4:25	3640								
4/22/10 6:25	3760								
4/22/10 8:25	3880	1650	683359 [000]	70	68	254			@ 0830
4/22/10 10:25	4000								
4/22/10 12:25	4120								
4/22/10 14:25	4240								
4/22/10 16:25	4360	850	083925 [000]	48	46	245	275.77	83.35	@ 1645
4/22/10 18:25	4480								
4/22/10 20:25	4600								
4/22/10 22:25	4720								
4/23/10 0:25	4840								
4/23/10 2:25	4960								
4/23/10 4:25	5080								
4/23/10 6:25	5200								
4/23/10 8:25	5320	1050	84752 [000]	70	66	254	249.01	110.31	@ 0815 249.01 @ 7:40 on 4/23/10
4/23/10 10:25	5440								
4/23/10 12:25	5560								
4/23/10 14:25	5680								
4/23/10 16:25	5800	850	85227 [000]	50	46	235			@ 1630 279.25 @ 1540 on 4/23/10
4/23/10 18:25	5920								
4/23/10 20:25	6040								
4/23/10 22:25	6160								
4/24/10 0:25	6280								
4/24/10 2:25	6400								
4/24/10 4:25	6520								
4/24/10 6:25	6640								
4/24/10 8:25	6760								
4/24/10 10:25	6880	1200	86370 [000]	70	68	250	230.09	179.23	@ 1011 230.09 @ 940 on 4/24/10
4/24/10 12:25	7000								
4/24/10 14:25	7120						222.85	130.54	
4/24/10 16:25	7240						219.58		
4/24/10 18:25	7360						214.48		
4/24/10 20:25	7480						209.47		
4/24/10 22:25	7600						206.82		
4/25/10 0:25	7720						157.27		
4/25/10 2:25	7840						144.55	214.77	
4/25/10 4:25	7960						159.75		
4/25/10 6:25	8080						164.37		
4/25/10 8:25	8200						167.08		

STEVE (805) 620-2238

73599 (F) *Went*  
 find in to 0.50 CF  
 @ 1500

MPWMD

PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT

Well: ASR 2

Starting Water Level

Test: \_\_\_\_\_

Test 20

359.32

Sheet No. 4 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft bst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/25/10 10:25	8320								
4/25/10 12:25	8440	~1300	688325 <u>1000</u>	52	56	1250	165.87	156.09	
4/25/10 14:25	8560			@	1340		203.27		@ 1340 water blasting out of vent and soundly take pad for chem building flooded as is our road and "Lester Tanner" Turned up to 300 to stop inf. Hermit floating in tank, no external power, 80% battery. Breaker did not appear to be closed still in the "on" position. Turned it off then on and did same at switch, but still no external power. Sounder and TROLLABLE blower partially out of hole. TL
4/25/10 16:25	8680						363.84		
4/25/10 18:25	8800								
4/25/10 20:25	8920								
4/25/10 22:25	9040								
4/26/10 0:25	9160								
4/26/10 2:25	9280								
4/26/10 4:25	9400								
4/26/10 6:25	9520								
4/26/10 8:25	9640								
4/26/10 10:25	9760								
4/26/10 12:25	9880								
4/26/10 14:25	10000								
4/26/10 16:25	10120								
4/26/10 18:25	10240								
4/26/10 20:25	10360								
4/26/10 22:25	10480								
4/27/10 0:25	10600								
4/27/10 2:25	10720								
4/27/10 4:25	10840								
4/27/10 6:25	10960								
4/27/10 8:25	11080								
4/27/10 10:25	11200								
4/27/10 12:25	11320								
4/27/10 14:25	11440								
4/27/10 16:25	11560								
4/27/10 18:25	11680								
4/27/10 20:25	11800								
4/27/10 22:25	11920								
4/28/10 0:25	12040								
4/28/10 2:25	12160								
4/28/10 4:25	12280								
4/28/10 6:25	12400								
4/28/10 8:25	12520								
4/28/10 10:25	12640								
4/28/10 12:25	12760								
4/28/10 14:25	12880								
4/28/10 16:25	13000								

~~4/25/10 @ 01:40:48 DWN 129.776~~  
 Injunct DWN  
 how to  
 - was here @ 1300 & DWN look ok

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Test: \_\_\_\_\_

Test ~~21~~ 20

Sheet No. 1 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/28/10 13:15	1 min	0							
4/28/10 13:16		1							
4/28/10 13:17		2							
4/28/10 13:18		3							
4/28/10 13:19		4							
4/28/10 13:20		5							
4/28/10 13:21		6							
4/28/10 13:22		7							
4/28/10 13:23		8							
4/28/10 13:24		9							
4/28/10 13:25		10							
4/28/10 13:27		12							
4/28/10 13:30	5 min	15							
4/28/10 13:35		20							
4/28/10 13:40		25							
4/28/10 13:45		30							
4/28/10 13:50		35							
4/28/10 13:55		40							
4/28/10 14:00		45							
4/28/10 14:05		50							
4/28/10 14:10		55							
4/28/10 14:15		60							
4/28/10 14:25	10 min	70							
4/28/10 14:35		80							
4/28/10 14:45		90							
4/28/10 14:55		100							
4/28/10 15:15	20 min	120							
4/28/10 15:35		140							
4/28/10 15:55		160							
4/28/10 16:15		180							
4/28/10 16:35	30 min	210							
4/28/10 17:05		240							
4/28/10 17:35		270							
4/28/10 18:05		300							
4/28/10 18:35		330							
4/28/10 19:05		360							
4/28/10 19:35		390							
4/28/10 20:05		420							
4/28/10 20:35		450							
4/28/10 21:05		480							

500-360

~360 STARTING

360 DTW = 150

**MPWMD  
PHASE 1 AQUIFER STORAGE AND RECOVERY PROJECT**

Well: ASR 2

Starting Water Level

Test: \_\_\_\_\_

Test 21/20

0

Sheet No. 2 of \_\_\_\_\_

Date/Time	ET (min)	Rate (gpm)	Totalizer (gallons)	Pressure (psi)			DTW (ft btst)	Drawup (ft)	Comments/Other
				Line	Head	FCV			
4/28/10 21:35	510								
4/28/10 22:05	540								
4/28/10 22:35	570								
4/28/10 23:05	600								
4/28/10 23:35	630								
4/29/10 0:05	660								
4/29/10 0:35	690								
4/29/10 1:05	720								
4/29/10 1:35	750								
4/29/10 2:05	780								
4/29/10 2:35	810								
4/29/10 3:05	840								
4/29/10 3:35	870								
4/29/10 4:15	900								
4/29/10 4:55	940								
4/29/10 5:55	1000								
4/29/10 6:55	1060								
4/29/10 7:55	1120								
4/29/10 8:55	1180								
4/29/10 9:55	1240								
4/29/10 10:55	1300								
4/29/10 11:55	1360								
4/29/10 12:55	1420								
4/29/10 13:55	1480								
4/29/10 15:55	1600	900	089174600	74	76	261		@ 1675	
4/29/10 17:55	1720								
4/29/10 19:55	1840								
4/29/10 21:55	1960								
4/29/10 23:55	2080								
4/30/10 1:55	2200								
4/30/10 3:55	2320								
4/30/10 5:55	2440	300	089379600	82	80	271		@ 0830	
4/30/10 7:55	2560								
4/30/10 9:55	2680								
4/30/10 11:55	2800								
4/30/10 13:55	2920								
4/30/10 15:55	3040								
4/30/10 17:55	3160								
4/30/10 19:55	3280								
4/30/10 21:55	3400								





rate  $\phi$  09. total 07500 P/L 92 P/H  $\phi$  FCV 300

5/21/10 @ 1600 (reset running @ 1500 gpm - 80 psi)

no BF prior to MJ. - TLL

5/22/10

367.68 DTW @ 1015 sounder. 165.886 = Hermit stat CWL

$\phi$  090416 000 85/83

set FCV to 275 running @ 350 g/m

82/79 @ 1039

5/23/2010 @ 1200

090975 000 gal 82/79 FCV = 272

400 gpm

WL probe = 340.55

no adj

HERMIT (81% bit)

339.40 @ 5/23 10:01

366.32 @ 5/22 9:22

26.92 du

JWO

5/24/2010 @ 0900

091393 000 gal 60/58 FCV = 274

$\phi$  gpm

200 gpm

58/55 FCV = 260

open FCV to A flow

check HERMIT probe 175 ft and rising

363.58 @ 5/24 8:15

366.32 @ 5/22 9:22

2.74 du

JWO

5/24/2010 @ 1630

091552 000 gal 74/70 FCV = 260

500 gpm

Verify FCV setting @ 260 - was at 254 psi, no reset to 260 psi

340.16 @ 5/24 14:01

366.32 @ 5/22 9:22

26.16 du

JWO

5/25/2010 @ 0800

091936 000 64/60 FCV = 263

250 gpm

Verify FCV setting @ 260 - no, 262! Reset to 254 psi - now 350 gpm.

366.32 @ 5/22 9:22

353.72 @ 5/25 6:01

12.60 du

JWO

5/25/2010 @ 1230

092235 000 60/64 FCV = 255

Reset FCV to 258 psi - now 475 gpm.

366.32

313.39 @ 5/25 15:01

42.93 du

JWO

5/26/2010 @ 0812

092783 000 74/70 FCV = 256

700 gpm - reset to

366.32

304.16

62.16 du ADJ TO 267 ON FCV = 500 gpm



**REPORT OF FIELD OBSERVATIONS**

Job No.: 06-0025	Date: 12/13/09	M	T	W	T	F	S	X
Client: MPWMD	Location: Phase 1 ASR site							
Project: WY 2010	Weather: cloudy/rain							
Observer: RLM	Observation Period	Start: 7 <sup>45</sup>	Stop: 17 <sup>10</sup>					

7<sup>45</sup> on site ASR-2, SWL = 386.67' Gtst.

Set up PWR 500 psi A PXD & Hermit 3000.

34.1 FT H<sub>2</sub>O @ G.S. Set XD @ ~ 500'

XD Head = 147.62 (-34.1) + 386.67 = 500.19' Gtst setting.

~8<sup>30</sup> Start Test #1, 2 min linear.

8<sup>40</sup> ASR-1: Replace MPWMD Hermit w/ PWR Hermit.

PXD-261, SN 8097, 260 PSIG, Linear 1.9277, Scale 247.378,  
offset = 0.0073.

SWL = 369.23' Gtst. XD head = 91.61 @ XD setting = 460.84' Gtst.

~10<sup>00</sup> Begin flushing to waste @ ~ 2000 gpm (see field data sheets)

~13<sup>00</sup> Begin injecting ASR-1

13<sup>20</sup> TLR I leave site for lunch.

14<sup>30</sup> Back on site. Injecting @ ~ 1050 gpm (see data sheets)

17<sup>10</sup> Leave site.

**REPORT OF FIELD OBSERVATIONS**

Job No.: 06-0025	Date: 12/14/09	<input checked="" type="checkbox"/> M	<input type="checkbox"/> T	<input type="checkbox"/> W	<input type="checkbox"/> T	<input type="checkbox"/> F	<input type="checkbox"/> S	<input type="checkbox"/> S
Client: MPWMD	Location: phase 1 ASR site							
Project: wy 2010	Weather: partly cloudy							
Observer: RLM	Observation Period	Start: 8 <sup>00</sup>	Stop: 17 <sup>30</sup>					

8<sup>00</sup> on site. ASR-1 inject @ ~ 1050 gpm (see data sheets)

9<sup>45</sup> ASR-2: reset XD & came back to better location. Have to raise XD ~ 3.0'. Stop Test #1 XD setting = (500-3) 497'6" total

10<sup>10</sup> open ASR-2 tube flow (was closed). Totalizer = 69528.0 ft<sup>3</sup>  
Flow = 0.34 cfm, Pressure up = 51 psi, down = 51 psi, Δ = 1 psi

10<sup>30</sup> MW-1: wy 2009 #2 Running. Extract data.  
Hrly intervals. DTW @ 10<sup>30</sup> = 363.62. Leave running.

12<sup>20</sup> Begin flushing to waste @ ASR-2 (~500-1000 gpm)  
while also 1000 gpm to ASR-1 waste.

12<sup>30</sup> stop ASR-2 flushing, Begin filling ASR-2 col pipe  
(see field data sheets)

17<sup>30</sup> Leave site.

**REPORT OF FIELD OBSERVATIONS**

Job No.: 06-0025	Date: 12/15/09	M	X	W	T	F	S	S
Client: MPWMD	Location: SMTW site							
Project: Ph 1 ASR, wy 2010	Weather: Cloudy							
Observer: RCM	Observation Period Start: 8 <sup>05</sup> Stop: 17 <sup>35</sup>							

8<sup>05</sup> on site Tom Lindberg on site, taking readings @ ASR-1

8<sup>15</sup> ASR-2: Start generator. Totalizer = 011309 [650] gals  
 FCU = ~272 psi, Tank = 1980 psi, SWL = 381.5  
 Lube: 6983 [10] ft<sup>3</sup>, 0.24 cfm, psi up = 51, down = 52

8<sup>50</sup> start pump.

9<sup>00</sup> PWH = 505.6' Gfst, 50 psi, 1000 gal / 43 secs = 1395 gpm  
 Q/S = 1395 ÷ 124.1 = 11.2 gpm/ft

9<sup>05</sup> Pump trips off.

9<sup>35</sup> Restart pump

9<sup>45</sup> PWH = 505.8, 45 psi, 1000 gal / 36 secs = 1667 gpm  
 Q/S = 1667 ÷ 124.3 = 13.4 gpm/ft

9<sup>47</sup> Pump trips off

10<sup>10</sup> Restart pump

10<sup>15</sup> U-V: 440V, V-W: 440V, W-U: 440V, U: 540 Amps,  
 V: 540 Amps, W: 540 A

10<sup>20</sup> PWH = 507.2, 40 psi, 1000 gal / 34 secs = 1765 gpm

10<sup>21</sup> Pump trips off Q/S = 1765 ÷ 125.7 = 14.0 (Adj: 15% = 16.1 gpm/ft)

10<sup>40</sup> Restart pump

10<sup>45</sup> PWH = , 35 psi, 1000 gal / 34 secs = 1765 gpm

10<sup>47</sup> Pump trips off (7-min only)

-11<sup>00</sup> Will Foster (AW) on site

**REPORT OF FIELD OBSERVATIONS**

Job No.: 06-0025	Date: 12/15/09	M	X	W	T	F	S	S
Client: MPWMD	Location: SMTIW site							
Project: wy 2010	Weather: Partly cloudy							
Observer: RCM	Observation Period		Start: 8:05		Stop: 17:35			

11<sup>25</sup> Restart pump. 17<sup>7</sup> 1000 gal / 32 secs = 1875 gpm, 30 psi

11<sup>30</sup> PWL = 509.6 (128.1' draw @ 1/s = 14.6 gpm/ft)

11<sup>35</sup> PWL = 509.8, 32 psi, 1000 gal / → abort, pump trips off.

12<sup>00</sup> Restart pump

12<sup>05</sup> PWL = 508.5, 28 psi, 1000 gal / 31 secs = 1935 gpm  
 @ 1/s = 1935 ÷ 127' = 15.2 gpm/ft

12<sup>10</sup> PWL = 509.8, 30 psi, Pump Trips off. Shut down.

12<sup>30</sup> Leave site. (Will Foster stays on site)

12<sup>50</sup> Back on site.

13<sup>00</sup> Joe Oliver on site. Prepare to conduct FCU test

@ ASR-2

13<sup>30</sup> start ASR-2 FCU test (see data sheets)

15<sup>00</sup> Complete FCU Test.

15<sup>30</sup> Begin backflushing ASR-2 (see data sheet)

17<sup>35</sup> Leave site.

**REPORT OF FIELD OBSERVATIONS**

Job No.: 06-0025	Date: 1/20/10	M	T	<del>W</del>	T	F	S	S
Client: MPWMD	Location: Fort Ord / Sensitive							
Project: WY 2010 ASR	Weather: Rain							
Observer: RCM	Observation Period	Start: 16 <sup>00</sup>	Stop: 17 <sup>10</sup>					

16<sup>00</sup> on site. No personnel or activity (except ASR-1 injection)  
 Take photos of staged materials, planned trench areas, etc.  
 16<sup>40</sup> ASR-1; Totalizer = 14580 (10000), ~950 gpm, 72 psi Line  
 DTW = 323.05, FLU = 219 psi  
 Download Test #4 & 5 (#5 is currently running)  
 XD setting: RP = 369.23, XD Hand = 91.61 ⇒ 460.84 ft Gtoc  
 17<sup>10</sup> Leave site.

**REPORT OF FIELD OBSERVATIONS**

Job No.: 06-0025	Date: 1/21/10	M	T	W	X	F	S	S
Client: MPWMD	Location: Fort Ord / Seaside							
Project: WY 2010 ASR	Weather: Rain							
Observer: RCM	Observation Period	Start: 9:00	Stop: 1:15					

9<sup>00</sup> ASR-1: Totalizer = 146860 [000], ~900 gpm, Line = 70 psi  
 FCU = 219 psi, DTW = 310.52 (@ 8<sup>51</sup>). → Projected/  
 Placeholder for 9<sup>51</sup> = 323.87, XD @ 9<sup>10</sup> = 136,46 (460.33)

9<sup>20</sup> ASR-2: Test # 7 running. Last DTW = 370.95 @ 8<sup>18</sup>.  
 Manual DTW = 369.55, XD = 160.99 (529,54 ??)  
 Extract data, Last data pt = 369.75 @ 9<sup>18</sup>. OK

9<sup>35</sup> Line Pressure @ ASR-2 = 68 psi

9<sup>40</sup> MW-1: Extract test data. WY 2009 #2 Running.  
 15% used memory, 13% used battery.  
 10<sup>00</sup> last data pt = 352.34. Attempt to get manual  
 DTW, but unable to get sounder past 220' in col. pipe  
 (no room in 3/4" s.tube)

11<sup>15</sup> SDI: ET Sec ⇒ 0.49

0	25
5	26
10	27
15	27

11<sup>45</sup> Leave Site.

13<sup>00</sup> Back on site.

**REPORT OF FIELD OBSERVATIONS**

Job No.: 06-0025	Date: 1/21/10	M	T	W	<input checked="" type="checkbox"/>	F	S	S
Client: MPWMD	Location: Fort Ord / Searsville							
Project: WY 2010 ASR	Weather: overcast / rain							
Observer: RCM	Observation Period	Start: 9:00	Stop: 1:15					

14<sup>10</sup> ASR-1: ~ 925 gpm, 72 psi LP, FCU = 220 psi

Totalizer = 147158 [000] . Extract Test #5

DTW = 322.67 @ 13<sup>51</sup>

Process / plot / e-mail Test #5 data

15<sup>15</sup> ASR-1: ~ 1300 gpm, Totalizer = 147241 [000], 92 psi LP

FCU = 226 psi, DTW = 311.16' (x0 = 150.15' = 461 ft)



**MPWMD Phase 1 ASR Project  
Field Sampling Data**

ASR-382.40

Observer:	R, JL		
Date:	10/20/09		
Observation Period: Start:	1305	Stop:	1345
Well ID:	MW-1		
Weather:	CLOUDY, WIND ~ 5MPH FROM NW		

Purging/Water Level Data		Notes:
Well Status	RUNNING	
Purge Rate (gpm)	~3	
Totalizer Reading Start (gals)	00730107	@ ~1005 00736007 @ 1305
Totalizer Reading End (gals)	00737107	@ ~1450
Purge Volume (gals)	700	
Static Water Level*	364.29 DTW	361.44 @ ASR-1 @ 1300
Data Logger Water Level	→	

\* Pump must be off a minimum of 10 minutes prior to measuring.

Water Quality Parameter Data						
Time:	1330					
Temperature (°C)	22.5°C					
Conductivity (umhos/cm)	966 us/cm					
pH	7.3					
ORP (mV)	-67.1 mV					
Free Chlorine Residual (mg/L)	ND					
Dissolved Oxygen (mg/L)	0.11 mg/L					
Silt Density Index	Low					
Gas Volume (mL)	--					
H2S (mg/L)	--					
Visual Observation	CLEAR					

Sampling Data			
Sample Container Type	Preservative	Laboratory	Laboratory Analyses Requested
THMs			
HAA5			
G-1			
S-1			

Notes: Flow rate of 100 ml/min for THM and HAA sample collection.  
Disinfect sample port prior to BACT sample collection

Additional Information and Observations
376.73 FITCH SOURCE MONITOR SHALLOW
356.28 @ Fitch Deep @ 1500 MONITOR





**MPWMD Phase 1 ASR Project  
Field Sampling Data**

Observer:	TL/JL		
Date:	10/20/09 10/22/09		
Observation Period: Start:	1530	Stop:	1600
Well ID:	ASR-1		
Weather:	part		

Purging/Water Level Data		Notes:
Well Status	ON	Regular R.F. cycle
Purge Rate (gpm)		
Totalizer Reading Start (gals)	035585000	BF
Totalizer Reading End (gals)	035927800	
Purge Volume (gals)	20,000 +	
Static Water Level*		
Data Logger Water Level		

\* Pump must be off a minimum of 10 minutes prior to measuring.

Water Quality Parameter Data						
	Time:	1600				
Temperature (°C)		17.8				
Conductivity (umhos/cm)		865				
pH		7.6				
ORP (mV)		104.9				
Free Chlorine Residual (mg/L)		ND				
Dissolved Oxygen (mg/L)		0.20				
Silt Density Index		—				
Gas Volume (mL)		—				
H2S (mg/L)		—				
Visual Observation		clear				

Sampling Data			
Sample Container Type	Preservative	Laboratory	Laboratory Analyses Requested
G-1, S-1, DSTES			

Notes: Flow rate of 100 ml/min for THM and HAA sample collection.  
Disinfect sample port prior to BACT sample collection

Additional Information and Observations



### MPWMD Phase 1 ASR Project Field Sampling Data

Observer:	TL/JL		
Date:	11-4-09		
Observation Period: Start:	1145	Stop:	1245
Well ID:	ASR-1		
Weather:	Foggy Windy		

Purging/Water Level Data		Notes:
Well Status	running	run 8 hrs @ 60% (2500gpm)
Purge Rate (gpm)	1800	then reduced to 1800 gpm
Totalizer Reading Start (gals)	038707000	
Totalizer Reading End (gals)	038799600	
Purge Volume (gals)		
Static Water Level*		
Data Logger Water Level		

\* Pump must be off a minimum of 10 minutes prior to measuring.

Water Quality Parameter Data						
	Time:	1200				
Temperature (°C)		18.1				
Conductivity (umhos/cm)		901				
pH		7.1				
ORP (mV)		120				
Free Chlorine Residual (mg/L)		-				
Dissolved Oxygen (mg/L)		0.32				
Silt Density Index		-				
Gas Volume (mL)		-				
H2S (mg/L)		-				
Visual Observation						

Sampling Data			
	NONE - THIS flush was a demonstration for visitors from <sup>Southern</sup>		
Sample Container Type	Preservative	Laboratory	Laboratory Analyses Requested

Notes: Flow rate of 100 ml/min for THM and HAA sample collection.  
Disinfect sample port prior to BACT sample collection

Additional Information and Observations



**MPWMD Phase 1 ASR Project  
Field Sampling Data**

Observer:	RCM		
Date:	12/15/09		
Observation Period: Start:	1510	Stop:	1540
Well ID:	ASR-1		
Weather:	cloudy/rain		

Purging/Water Level Data		Notes:
Well Status	Injecting	
Purge Rate (gpm)	NA	
Totalizer Reading Start (gals)	NA	
Totalizer Reading End (gals)	NA	
Purge Volume (gals)	NA	
Static Water Level*	NA	
Data Logger Water Level	NA	

\* Pump must be off a minimum of 10 minutes prior to measuring.

Water Quality Parameter Data						
	Time:	1530				
Temperature (°C)		14.7				
Conductivity (umhos/cm)		582				
pH		7.8				
ORP (mV)		727				
Free Chlorine Residual (mg/L)		0.7				
Dissolved Oxygen (mg/L)		3.5				
Silt Density Index		5.2				
Gas Volume (mL)		0.3				
H2S (mg/L)		-				
Visual Observation		Clear				

Sampling Data			
Sample Container Type	Preservative	Laboratory	Laboratory Analyses Requested

Notes: Flow rate of 100 ml/min for THM and HAA sample collection.  
Disinfect sample port prior to BACT sample collection.

Additional Information and Observations			
	Calibration Check Orion 280		
	STD	measured	
Fel only	pH 4.0	3.8	✓
	7.0	6.9	✓
	10.0	9.8	✓
	ORP 244 mV @ 13.9°C		✓

**SDI TESTING DATA SHEET**

Project ASR-1 WY2010

Sheet 1 of 3

Project # \_\_\_\_\_

Date 12/13/09

Location ASR-1

Sampler RCM/TLL

Testing Intervals \_\_\_\_\_ Hours

Time	Minutes	Milliliters	Fill Time Seconds	Comments
10:00	0	500	25	~2000 gpm, leaking SDI setup
	5	500	126	
	10	500	213	
	15	500	265	
			1	
10 <sup>30</sup>	0	500	21	
	5	500	71	
	10	500	108	
	15	500	141	SDI = 5.7
11 <sup>00</sup>	0	500	21	
	5	500	64	
	10	500	105	
	15	500	136	SDI = 5.6
11 <sup>40</sup>	0	500	21	~1000 gpm to waste
	5	500	42	
	10	500	65	
	15	500	99	
12 <sup>00</sup>	0	500	21	
	5	500	39	
	10	500	69	
	15	500	101	

**SDI TESTING DATA SHEET**

Project ASR-1 WY2010

Sheet 2 of 3

Project # \_\_\_\_\_

Date 12/13/09

Location ASR-1

Sampler RCM/TLL

Testing Intervals \_\_\_\_\_ Hours

Time	Minutes	Milliliters	Fill Time Seconds	Comments
<u>12<sup>30</sup></u>	0	500	21	<u>1000 gpm flush to waste</u>
	5	500	40	
	10	500	57	
	15	500	80	
<u>14<sup>40</sup></u>	0	500	21	<u>1000 gpm Injection</u>
	5	500	54	
	10	500	77	
	15	500	94	
<u>12/11</u> <u>8<sup>45</sup></u>	0	500	20	<u>1000 gpm injection</u>
	5	500	24	
	10	500	26	
	15	500	27	
<u>11<sup>30</sup></u>	0	500	20	<u>~1500 gpm to waste.</u>
	5	500	22	
	10	500	25	
	15	500	27	
<u>2/15</u> <u>0910</u>	0	500	37	<u>Test 2 WY2010 1050 g/m</u>
	5	500	39	
	10	500	40	
	15	500	44	

**SDI TESTING DATA SHEET**

Project \_\_\_\_\_

Sheet 3 of 3

Project # \_\_\_\_\_

Date 1/1

Location ASR-1

Sampler TL/JL

Testing Intervals \_\_\_\_\_ Hours

$$\left[ 1 - \left( \frac{T_0}{T_{15}} \times 100 \right) \right] / 15$$

Time	Minutes	Milliliters	Fill Time Seconds	Comments
12-16-09 1127	0	500	19	SDI = 1.6
1132	5	500	19	
1137	10	500	23	
1142	15	500	25	
12-18-09 1410	0	500	28	old SDI test
1415	5	500	30	
1420	10	500	32	SDI = 1.0
1425	15	500	33	
12-18-09 @ 1615				
1615	0	500	26	@ 11 minutes
1620	5	500		walkdown, p built to ~33psi
1625	10	500		↑ 75. Start = 30
1630	15	500	32	SDI = 1.3
12/22/09 0930	0	500	25	paper looks very clean
0935	5	500	27	
0940	10	500	28	
0945	15	500	29	SDI = 0.93
	0	500		
	5	500		
	10	500		
	15	500		



### MPWMD Phase 1 ASR Project Field Sampling Data

Observer:	TL		
Date:	12/16/09		
Observation Period: Start:	1050	Stop:	1215
Well ID:	ASR-1 INJECTATE		
Weather:			

Purging/Water Level Data		Notes:
Well Status	Injecting	~1000 gpm
Purge Rate (gpm)		
Totalizer Reading Start (gals)		
Totalizer Reading End (gals)		
Purge Volume (gals)		
Static Water Level*		
Data Logger Water Level		

\* Pump must be off a minimum of 10 minutes prior to measuring.

Water Quality Parameter Data						
	Time:	1055				
Temperature (°C)		15.2				
Conductivity (umhos/cm)		568				
pH		7.1				
ORP (mV)		731				
Free Chlorine Residual (mg/L)		1.00				
Dissolved Oxygen (mg/L)		1.55				
Silt Density Index		1.6				
Gas Volume (mL)		0.5				
H2S (mg/L)		ND				
Visual Observation		—				

Sampling Data			
Sample Container Type	Preservative	Laboratory	Laboratory Analyses Requested
DGPS			
G-1			
S-1			

Notes: Flow rate of 100 ml/min for THM and HAA sample collection.  
Disinfect sample port prior to BACT sample collection

Additional Information and Observations



**MPWMD Phase 1 ASR Project  
Field Sampling Data**

Observer: <u>TL/JL</u>
Date: <u>12/22/09</u>
Observation Period: Start: <u>0910</u> Stop: <u>0930</u>
Well ID: <u>MW-1</u>
Weather: <u>clear, cold (rain yesterday)</u>

Purging/Water Level Data		Notes:
Well Status	<u>RUNNING</u>	<u>rain overnight - ON @ 1130 12/21/09</u>
Purge Rate (gpm)	<u>4.3 @ 0822</u>	<u>008150 @ 0822</u>
Totalizer Reading Start (gals)	<u>00764110</u>	<u>@ 1217 on 12/21/09</u>
Totalizer Reading End (gals)	<u>00917908</u>	<u>@ 0930 OFF @ 0932</u>
Purge Volume (gals)	<u>53810</u>	
Static Water Level*	<u>N/A</u>	
Data Logger Water Level		

\* Pump must be off a minimum of 10 minutes prior to measuring.

Water Quality Parameter Data						
Time:	<u>0916</u>					
Temperature (°C)	<u>64.6</u>					
Conductivity (umhos/cm)	<u>621</u>	<u>← with HANNA TDS tester due to low battery on Yeeh</u>				
pH	<u>7.54</u>	<u>← with ORP/pH meter " " " "</u>				
ORP (mV)	<u>314.2</u>					
Free Chlorine Residual (mg/L)	<u>ND</u>					
Dissolved Oxygen (mg/L)	<u>1.49</u>					
Silt Density Index	<u>-</u>	<u>0.96 @ ASR-1</u>				
Gas Volume (mL)	<u>-</u>					
H2S (mg/L)	<u>2</u>					
Visual Observation	<u>clear</u>					

Sampling Data			
Sample Container Type	Preservative	Laboratory	Laboratory Analyses Requested
<u>NONE</u>			
Notes: <u>Flow rate of 100 ml/min for THM and HAA sample collection.</u> <u>Disinfect sample port prior to BACT sample collection</u>			

Additional Information and Observations
<u>F-T ONLY - Batteries low on both conductivity and pH meter, so used back-ups</u>



20

Location SM ASR

Date

Project / Client

12.13.09 1500 RM

INJECTATE

TEMP 14.7°C

COND 582  $\mu\text{mhos/cm}$

PH 7.8

ORP 787 mV

Fcl 0.7 mg/L

DO 3.5 mg/L

SDI 6.2

12.16.09 1050 TL

INJECTATE

1000 SPM

TEMP 15.2°C

COND 568  $\mu\text{mhos/cm}$

PH 7.1

ORP 731 mV

Fcl 1.0 mg/L

DO 1.55 mg/L

SDI 1.6

GAS 0.5 mL

21

Location SM ASR

Date

Project / Client

12.22.09 0910 JL

MN-1 5.380 GAL PERSE

TEMP 64°F

COND 621  $\mu\text{mhos/cm}$

PH 7.54

ORP 314 mV

Fcl N/D

DO 1.49 mg/L

1.5.2010 1210 ASR 2

TEMP 15.7°C

COND 498  $\mu\text{mhos/cm}$

PH 6.8

ORP 538 mV

Fcl 0.05 mg/L

DO 1.86 mg/L

Location SM ASR

Date

Project / Client

1.15.10 1330 JL INJECTATE

TEMP 13.8°C  
 COND 514  $\mu\text{mhos/cm}$   
 PH 7.2  
 ORP 607.6 mV  
 FeI 0.3 mg/L  
 DO 1.6 mg/L  
 SDI 1.06  
 GAS 0.1 mL

1.22.10 0900 JL INJECTATE

TEMP 14.5°C  
 COND 328  $\mu\text{mhos/cm}$   
 PH 7.4  
 ORP 370 mV  
 FeI 1.1  
 DO 1.61 mg/L

DBP, 51.47

Location SM ASR

Date

Project / Client

1.22.10 1105 ASRI 2000 gPM

TEMP 14.9°C  
 COND 559  $\mu\text{mhos/cm}$   
 PH 7.4  
 ORP 762 mV  
 FeI 0.08 mg/L  
 DO 1.46 mg/L

1.26.10 1100 JL ASR-2

TEMP 15.6°C  
 COND 425  $\mu\text{mhos/cm}$   
 PH 7.4  
 ORP N/A  
 FeI N/A  
 DO 1.12 mg/L

Location SM ASR

Date \_\_\_\_\_

Project / Client \_\_\_\_\_

2-1-10	1245	JL	INJECTATE	1100 GPM
	TEMP		16.3 °C	
	COND		547 umho/cm	
	PH		7.5	
	ORP		N/A	
	FeI		1.47	
2-3-10	0840	JL	INJECTATE	1050 GPM
	TEMP		14.8 °C	
	COND		559 umho/cm	
	PH		7.5	
	ORP		N/A	
	FeI		0.7 mg/L	
	DO		0.77 mg/L	
	DBP			

Location SM - ASR

Date \_\_\_\_\_

Project / Client \_\_\_\_\_

1-22-10	1340	JL	MW-1	
	TEMP		18.3 °C	
	COND		554 umho/cm	
	PH		7.2	
	ORP		461 mV	
	DU		0.88 mg/L	
2-3-10	0840	INJECTATE		1000 GPM
	TEMP		14.8 °C	
	COND		559 umho/cm	
	PH		7.5	
	ORP		N/A	
	FeI		0.7 mg/L	

Location SM-ASR

Date

Project / Client

3-2-10	1230	JL	INJECTATE
TEMP	14.4°C		
COND	520 $\mu\text{mhos/cm}$		
PH	7.31		
ORP	727 mV		
FeI	0.22 mg/L		
DO	4.3 mg/L		
DBP SAMPLED			
3-10-10	0830	JL	MW-1
TEMP	19 °C		
COND	580 $\mu\text{mhos/cm}$		
PH	7.3		
ORP	530 mV		
FeI	N/A		
DO	4.5 mg/L		

Location SM-ASR

Date

Project / Client

3-10-10	0930	JL	INJECTATE
TEMP	16 °C		
COND	488 $\mu\text{mhos/cm}$		
PH	7.3		
ORP	695 mV		
FeI	0.6 mg/L		
DO	6.5 mg/L		
4-14-10	1230	JL	INJECTATE
TEMP	16.5°C		
COND	485 $\mu\text{mhos/cm}$		
PH	7.2		
ORP	N/A		
FeI	0.7 mg/L		
DO	3.8 mg/L		

Location SIM - ASR

Date \_\_\_\_\_

Project / Client \_\_\_\_\_

DATE	TIME	INJECTATE	PARAMETER	VALUE
5-12-10	1100	JL	TEMP	16.3 °C
			COND	470 $\mu\text{mhos/cm}$
			PH	7.3
			ORP	N/A
			FEL	0.9 mg/L
			DO	3.7 mg/L
5-12-10	1130	JL	TEMP	19.2 °C
			COND	570 $\mu\text{mhos/cm}$
			PH	6.8
			ORP	N/A
			FEL	N/D
			DO	2.3 mg/L

Location SIM - ASR

Date \_\_\_\_\_

Project / Client \_\_\_\_\_

DATE	TIME	INJECTATE	PARAMETER	VALUE
6-2-10	1300	JL	TEMP	17.1 °C
			COND	510 $\mu\text{mhos/cm}$
			PH	7.2
			ORP	N/A
			FEL	0.4 mg/L
			DO	4.4 mg/L
6-15-11	1200	JL	TEMP	18.9 °C
			COND	580 $\mu\text{mhos/cm}$
			PH	6.9
			ORP	N/A
			FEL	N/D
			DO	1.8 mg/L

Location SM-ASR

Date \_\_\_\_\_

Project / Client \_\_\_\_\_

6.16.10 D30 TL INJECTATE

TEMP 16.7°C  
 COND 570  $\mu\text{mhos/cm}$   
 PH 7.1  
 ORP N/A  
 FeI 0.9 mg/L  
 DO 4.3 mg/L

7.29.10 1600 JL ASR-AI

TEMP 17.5°C  
 COND 510  $\mu\text{mhos/cm}$   
 PH 7.1  
 ORP N/A  
 FeI 0.6 mg/L  
 DO 4.3 mg/L

Location SMA-ASR

Date \_\_\_\_\_

Project / Client \_\_\_\_\_

9.10.10 1045 JL ASR 1

TEMP 17.8°C  
 COND 530  $\mu\text{mhos/cm}$   
 PH 7.2  
 ORP N/A  
 FeI 0.2 mg/L  
 DO 4.1 mg/L

9.10.11 1300 MWA

TEMP 18.7°C  
 COND 580  $\mu\text{mhos/cm}$   
 PH 6.9  
 ORP N/A  
 FeI N/D  
 DO 3.1 mg/L

Location SM ASR

OUT OF ORDER

Date

Project / Client FIELD PARAM TRANSPOSED FROM JL

FIELD BOOK

1-18-10 MW-1

COND 580  $\mu$ S/cm  
 PH 7.3  
 TEMP 19° C  
 ORP N/A mV  
 DO 4.5 mg/L  
 FCL ND mg/L

2-8-10 MW 1

COND 566  $\mu$ S/cm  
 PH 7.6  
 TEMP 15.5° C  
 ORP N/A mV  
 DO 3.2 mg/L  
 FCL ND mg/L

TRANSCEIBED FROM JL FIELD BOOK

Date

Location

Project / Client

5-31-10 MW-1

COND 510  $\mu$ S/cm  
 PH 7.4  
 TEMP 16.2° C  
 DO 2.4 mg/L  
 ORP N/A mV  
 FCL ND mg/L

7-29-10

COND 520  $\mu$ S/cm  
 PH 7.6  
 TEMP 15.9° C  
 DO 2.3 mg/L  
 ORP N/A mV  
 FCL ND mg/L

\*OUT OF ORDER

TRANSCRIBED FROM JL FIELD BOOK

Location SM ASP Date

Location Date

Project / Client FIELD QUALITY

Project / Client

3-10 INJECTATE

COND	492	us/cm
PH	7.2	
TEMP	14.7	°C
ORP	N/A	mv
DO	2.1	mg/L
Fcl	0.3	mg/L

4-14-10 INJECTATE

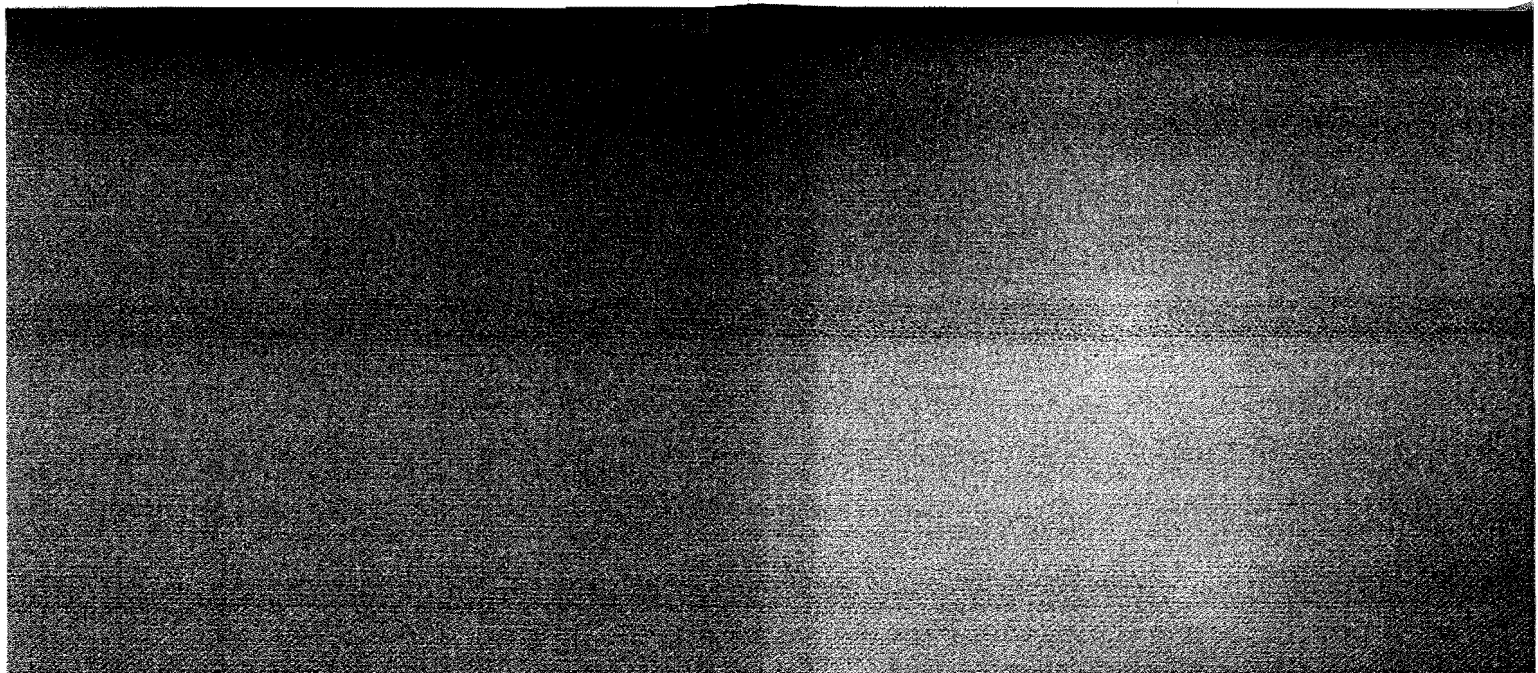
COND	476	us/cm
PH	7.2	
TEMP	15.7	°C
ORP	N/A	mv
DO	2.1	mg/L
Fcl	0.3	mg/L

5-10 INJECTATE

COND	487	us/cm
PH	7.4	
TEMP	16.1	°C
ORP	N/A	mv
DO	2.4	mg/L
Fcl	0.4	mg/L

5-4-10 INJECTATE

COND	492	us/cm
PH	7.3	
TEMP	16.1	°C
ORP	N/A	mv
DO	2.6	mg/L
Fcl	0.4	mg/L









## **APPENDIX B – WATER QUALITY DATA**



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montereybayanalytical@usa.net  
ELAP Certification Number: 2385

Wednesday, July 27, 2011

Pueblo Water Resources, Inc  
Michael Burke  
4478 Market St., Suite 705  
Ventura, CA 93003

**Lab Number: AA61441**

Collection Date/Time: 10/20/2009 13:40      Sample Collector: LINDBERG, T  
Submittal Date/Time: 10/20/2009 15:43      Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO <sub>3</sub> )	2320B	mg/L	239		2		10/20/2009
Ammonia-N	4500NH3 D	mg/L	Not detected		0.05		10/27/2009
Arsenic, Total	EPA200.8	ug/L	2		1	10	11/10/2009
Barium, Total	EPA200.8	ug/L	52		10	1000	11/10/2009
Bicarbonate (as HCO <sub>3</sub> <sup>-</sup> )	2320B	mg/L	292		10		6/3/2011
Boron, Total	EPA200.8	mg/L	0.08		0.01		11/10/2009
Calcium	EPA200.7	mg/L	90		1		10/30/2009
Carbonate as CaCO <sub>3</sub>	2320B	mg/L	Not Detected		10		10/22/2009
Chloride	EPA300.0	mg/L	104		1	250	10/22/2009
Fluoride	EPA300.0	mg/L	0.18		0.10	2.0	10/22/2009
Gross Alpha	EPA900.0	pCi/L	2.65 +/- 1.67	E		15	11/28/2009
Haloacetic Acids	EPA552	ug/L	Attached	E		60	10/26/2009
Hardness (as CaCO <sub>3</sub> )	2340B	mg/L	307		10		6/3/2011
Iron, Total	EPA 200.7	ug/L	60		50		10/28/2009
Iron, Dissolved	EPA 200.7	ug/L	Not detected		50	300	10/28/2009
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.2		10/27/2009
Langlier Index ( 60 deg. C)	2330B		0.47				6/3/2011
Lithium	EPA200.8	ug/L	20		1		11/10/2009
Magnesium	EPA200.7	mg/L	20		1		10/30/2009
Manganese, Dissolved	EPA 200.7	ug/L	Not detected		20	50	10/8/2009
Manganese, Total	EPA 200.7	ug/L	38		20	50	10/28/2009
Methane	EPA174/175	ug/L	0.50	E	0.4		11/3/2009
Molybdenum, Total	EPA200.8	ug/L	3		1	1000	11/10/2009
Nitrate as NO <sub>3</sub>	EPA300.0	mg/L	Not Detected		1	45	10/22/2009
Nitrate as NO <sub>3</sub> -N	EPA300.0	mg/L	Not detected		0.1	10	10/22/2009
Nitrite as Nitrogen	EPA300.0	mg/L	Not detected		0.1	1.00	10/22/2009

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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Wednesday, July 27, 2011

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Michael Burke  
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Ventura, CA 93003

**Lab Number: AA61441**

Collection Date/Time: 10/20/2009 13:40      Sample Collector: LINDBERG, T  
Submittal Date/Time: 10/20/2009 15:43      Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Nitrite as NO2-N	EPA300.0	mg/L	Not detected		0.1	1.00	10/22/2009
o-Phosphate-P	EPA300.0	mg/L	Not detected		0.05		10/22/2009
pH (Laboratory)	4500-H+B	STD. Units	7.1				10/20/2009
Phosphorus, Total	HACH 8190	mg/L	Not detected		0.03		10/24/2009
Potassium	EPA200.7	mg/L	4.4		0.5		10/30/2009
QC Anion Sum x 100	Calculation	%	96%				6/3/2011
QC Anion-Cation Balance	Calculation	%	2				6/3/2011
QC Cation Sum x 100	Calculation	%	100%				6/3/2011
QC Ratio TDS/SEC	Calculation		0.64				6/3/2011
Radium 226	EPA903.1	pCi/L	0.427+/- 0.335	E		3	12/3/2009
Selenium, Total	EPA200.8	ug/L	Not detected		2	50	11/10/2009
Sodium	EPA200.7	mg/L	85		1		10/30/2009
Specific Conductance (E.C)	2510B	umhos/cm	995		1	900	10/20/2009
Strontium, Total	EPA200.8	ug/L	422		5		11/10/2009
Sulfate	EPA300.0	mg/L	89		1	250	10/22/2009
Total Diss. Solids	2540C	mg/L	637		10	500	10/20/2009
Total Nitrogen	Calculation	mg/L	Not Detected		0.5		10/27/2009
Trihalomethanes	EPA524.2	ug/L	Attached	E		80	10/26/2009
Uranium by ICP/MS	EPA200.8	ug/L	0.9	J	1	30	11/10/2009
Vanadium, Total	EPA200.8	ug/L	Not detected		5	1000	11/10/2009
Zinc, Total	EPA200.8	ug/L	19		10	5000	11/10/2009

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

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Wednesday, July 27, 2011

Pueblo Water Resources, Inc  
Michael Burke  
4478 Market St., Suite 705  
Ventura, CA 93003

**Lab Number: AA61550**

Collection Date/Time: 10/22/2009 16:00 Sample Collector: LINDBERG, T  
Submittal Date/Time: 10/22/2009 16:35 Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	193		2		10/22/2009
Ammonia-N	4500NH3 D	mg/L	0.07		0.05		10/27/2009
Arsenic, Total	EPA200.8	ug/L	2		1	10	11/10/2009
Barium, Total	EPA200.8	ug/L	123		10	1000	11/10/2009
Boron, Total	EPA200.8	mg/L	0.08		0.01		11/10/2009
Calcium	EPA200.7	mg/L	71		1		10/30/2009
Chloride	EPA300.0	mg/L	85		1	250	10/23/2009
Gross Alpha	EPA900.0	pCi/L	2.67 +/- 1.59	E		15	11/28/2009
Iron, Total	EPA 200.7	ug/L	Not detected		50		10/28/2009
Iron, Dissolved	EPA 200.7	ug/L	Not detected		50	300	10/28/2009
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.2		10/27/2009
Lithium	EPA200.8	ug/L	10		1		11/10/2009
Magnesium	EPA200.7	mg/L	22		1		10/30/2009
Manganese, Dissolved	EPA 200.7	ug/L	Not detected		20	50	10/28/2009
Manganese, Total	EPA 200.7	ug/L	Not detected		20	50	10/28/2009
Methane	EPA174/175	ug/L	0.80	E	0.4		11/3/2009
Molybdenum, Total	EPA200.8	ug/L	5		1	1000	11/10/2009
Nitrate as NO3-N	EPA300.0	mg/L	0.2		0.1	10	10/23/2009
Nitrite as Nitrogen	EPA300.0	mg/L	Not detected		0.1	1.00	10/23/2009
Nitrite as NO2-N	EPA300.0	mg/L	Not detected		0.1	1.00	10/23/2009
o-Phosphate-P	EPA300.0	mg/L	0.20		0.05		10/23/2009
pH (Laboratory)	4500-H+B	STD. Units	7.6				10/22/2009
Phosphorus, Total	HACH 8190	mg/L	0.22		0.03		10/24/2009
Potassium	EPA200.7	mg/L	3.9		0.5		10/30/2009
Radium 226	EPA903.1	pCi/L	0.928+/-0.474	E		3	12/3/2009
Selenium, Total	EPA200.8	ug/L	Not detected		2	50	11/10/2009
Sodium	EPA200.7	mg/L	74		1		10/30/2009
Specific Conductance (E.C)	2510B	umhos/cm	812		1	900	10/22/2009
Strontium, Total	EPA200.8	ug/L	317		5		11/10/2009
Sulfate	EPA300.0	mg/L	87		1	250	10/23/2009

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

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D = Method deviates from standard method due to insufficient sample for MS/MSD



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Wednesday, July 27, 2011

Pueblo Water Resources, Inc  
Michael Burke  
4478 Market St., Suite 705  
Ventura, CA 93003

**Lab Number: AA61550**

Collection Date/Time: 10/22/2009 16:00      Sample Collector: LINDBERG, T  
Submittal Date/Time: 10/22/2009 16:35      Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Total Diss. Solids	2540C	mg/L	<b>520</b>		10	500	10/22/2009
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.5		10/27/2009
Uranium by ICP/MS	EPA200.8	ug/L	<b>1</b>		1	30	11/10/2009
Vanadium, Total	EPA200.8	ug/L	<b>Not detected</b>		5	1000	11/10/2009
Zinc, Total	EPA200.8	ug/L	<b>184</b>		10	5000	11/10/2009

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

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D = Method deviates from standard method due to insufficient sample for MS/MSD



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Sunday, January 10, 2010

MPWMA / Padre Associates  
Robert Marks / Joe Oliver  
P.O. Box 85  
Monterey, CA 93942-0085

**Lab Number: AA62276**

Collection Date/Time: 11/23/2009 11:00  
Submittal Date/Time: 11/23/2009 14:25

Sample Collector: LINDBERG T  
Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	Date Analyzed
Chloride	300.0	mg/L	<b>64</b>		1	11/23/2009
Haloacetic Acids	EPA 552	ug/L	<b>Attached</b>	E		12/2/2009
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		11/25/2009

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

J = Result is less than PQL



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ELAP Certification Number: 2385

Sunday, January 10, 2010

MPWMA / Padre Associates  
Robert Marks / Joe Oliver  
P.O. Box 85  
Monterey, CA 93442-0085

**Lab Number: AA62277**

Collection Date/Time: 11/23/2009 13:30  
Submittal Date/Time: 11/23/2009 14:25

Sample Collector: LINDBERG T  
Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	Date Analyzed
Chloride	300.0	mg/L	<b>62</b>		1	11/23/2009
Haloacetic Acids	EPA 552	ug/L	<b>Attached</b>	E		12/2/2009
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		11/25/2009

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

H = Analyzed outside of hold time

J = Result is less than PQL

ug/L : Micrograms per liter (=ppb)

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

PQL : Practical Quantitation Limit



David Holland  
Monterey Bay Analytical  
4 Justin Court Suite D  
Monterey, CA 93940

**BSK Submission #: 2009111614**

**BSK Sample ID #: 1188001**

Report Issue Date: 12/11/2009

Project ID:

Project Desc: MPWMD

Submission Comments:

Sample Type: Liquid

Date Sampled: 11/23/2009

Sample Description: ASR-1

Time Sampled: 1100

Sample Comments: 62276

Date Received: 11/24/2009

**Organics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromodichloromethane	EPA 524.2	11	µg/L	0.50	1	0.50	11/25/09	11/26/09
Bromoform	EPA 524.2	0.82	µg/L	0.50	1	0.50	11/25/09	11/26/09
Chloroform	EPA 524.2	18	µg/L	0.50	1	0.50	11/25/09	11/26/09
Dibromochloromethane	EPA 524.2	5.6	µg/L	0.50	1	0.50	11/25/09	11/26/09
Total Trihalomethanes	EPA 524.2	35	µg/L	-	-	N/A		
Dibromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/02/09	12/09/09
Dichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/02/09	12/09/09
Monobromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/02/09	12/09/09
Monochloroacetic Acid	EPA 552.2	ND	µg/L	2.0	1	2.0	12/02/09	12/09/09
Total Haloacetic Acids	EPA 552.2	ND	µg/L	-	-	N/A	12/10/09	12/10/09
Trichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/02/09	12/09/09

**Surrogate**

1,2-Dichlorobenzene-d4	EPA 524.2	77	% Rec	-	1	N/A	11/25/09	11/26/09
4-Bromofluorobenzene	EPA 524.2	82	% Rec	-	1	N/A	11/25/09	11/26/09
2,3-Dibromopropionic Acid	EPA 552.2	110	% Rec	-	1	N/A	12/02/09	12/09/09

mg/L: Milligrams/Liter (ppm)  
mg/Kg: Milligrams/Kilogram (ppm)  
µg/L: Micrograms/Liter (ppb)  
µg/Kg: Micrograms/Kilogram (ppb)  
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit  
DLR: Detection Limit for Reporting  
: PQL x Dilution  
ND: None Detected at DLR  
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time  
P: Preliminary result  
S: Suspect result. See Case Narrative for comments.  
E: Analysis performed by External laboratory.  
See External Laboratory Report attachments.  
MDC: Min Detectable Concentration

Report Authentication Code:



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**BSK Submission #: 2009111614**

**BSK Sample ID #: 1188002**

Report Issue Date: 12/11/2009

Project ID:

Project Desc: MPWMD

Submission Comments:

Sample Type: Liquid

Date Sampled: 11/23/2009

Sample Description: MW-1

Time Sampled: 1330

Sample Comments: 62277

Date Received: 11/24/2009

**Organics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromodichloromethane	EPA 524.2	7.4	µg/L	0.50	1	0.50	11/25/09	11/26/09
Bromoform	EPA 524.2	ND	µg/L	0.50	1	0.50	11/25/09	11/26/09
Chloroform	EPA 524.2	12	µg/L	0.50	1	0.50	11/25/09	11/26/09
Dibromochloromethane	EPA 524.2	0.96	µg/L	0.50	1	0.50	11/25/09	11/26/09
Total Trihalomethanes	EPA 524.2	20	µg/L	-	-	N/A		
Dibromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/02/09	12/09/09
Dichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/02/09	12/09/09
Monobromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/02/09	12/09/09
Monochloroacetic Acid	EPA 552.2	ND	µg/L	2.0	1	2.0	12/02/09	12/09/09
Total Haloacetic Acids	EPA 552.2	ND	µg/L	-	-	N/A	12/10/09	12/10/09
Trichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/02/09	12/09/09

**Surrogate**

1,2-Dichlorobenzene-d4	EPA 524.2	77	% Rec	-	1	N/A	11/25/09	11/26/09
4-Bromofluorobenzene	EPA 524.2	83	% Rec	-	1	N/A	11/25/09	11/26/09
2,3-Dibromopropionic Acid	EPA 552.2	120	% Rec	-	1	N/A	12/02/09	12/09/09

mg/L: Milligrams/Liter (ppm)  
mg/Kg: Milligrams/Kilogram (ppm)  
µg/L: Micrograms/Liter (ppb)  
µg/Kg: Micrograms/Kilogram (ppb)  
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit  
DLR: Detection Limit for Reporting  
: PQL x Dilution  
ND: None Detected at DLR  
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time  
P: Preliminary result  
S: Suspect result. See Case Narrative for comments.  
E: Analysis performed by External laboratory.  
See External Laboratory Report attachments.  
MDC: Min Detectable Concentration

Report Authentication Code:





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MPWMD  
Joe Oliver  
P.O. Box 85  
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Wednesday, February 03, 2010

**Lab Number: AA62629**

Collection Date/Time: 12/8/2009 14:20 Sample Collector: LINDBERG, T  
Submittal Date/Time: 12/8/2009 15:20 Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	185		2		12/9/2009
Ammonia-N	4500NH3 D	mg/L	0.11		0.05		12/28/2009
Arsenic, Total	200.8	ug/L	1		1	10	12/11/2009
Barium, Total	200.8	ug/L	84		10	1000	12/11/2009
Bicarbonate (as HCO3-)	2320B	mg/L	226		10		12/8/2009
Boron, Total	EPA200.8	mg/L	0.07		0.01		12/11/2009
Calcium	3111B	mg/L	60		1		12/20/2009
Carbonate as CaCO3	2320B	mg/L	Not detected		10		12/8/2009
Chloride	300.0	mg/L	69		1	250	12/9/2009
Dissolved Organic Carbon	SM5310-C	mg/L	0.95		0.2		12/16/2009
Fluoride	300.0	mg/L	0.20		0.10	2.0	12/9/2009
Gross Alpha	EPA 900.0	pCi/L	Attached	E		15	1/8/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	12/17/2009
Hardness (as CaCO3)	2340B	mg/L	232		10		2/3/2010
Iron, Dissolved	3111B	ug/L	Not detected		50	300	12/22/2009
Iron, Total	3111B	ug/L	Not detected		50	300	12/11/2009
Kjehldahl Nitrogen	4500-NH3 B,C.E	mg/L	Not detected		0.2		12/10/2009
Langlier Index ( 15 deg. C)	2330B		0.11				2/3/2010
Langlier Index ( 60 deg. C)	2330B		0.71				2/3/2010
Lithium	EPA 200.8	ug/L	15		1		12/11/2009
Magnesium	3111B	mg/L	20		1		12/20/2009
Manganese, Dissolved	3111B	ug/L	Not detected		20	50	12/22/2009
Manganese, Total	3111B	ug/L	33		20	50	12/10/2009
Methane	EPA 174/175	ug/L	0.63	E	0.4		12/11/2009
Molybdenum, Total	200.8	ug/L	4		1	1000	12/11/2009
Nitrate as NO3	300.0	mg/L	1		1	45	2/3/2010
Nitrate as NO3-N	300.0	mg/L	0.2		0.1	10	12/9/2009
Nitrite as NO2-N	300.0	mg/L	0.1		0.1	1.00	12/9/2009
o-Phosphate-P	300.0	mg/L	0.1		0.1		12/9/2009
pH (Laboratory)	4500-H+B	STD. Units	7.6				12/8/2009
Phosphorus, Total	HACH 8190	mg/L	0.22		0.03		12/18/2009
Potassium	3111B	mg/L	4.0		0.5		12/20/2009
QC Anion Sum x 100	Calculaltion	%	102%				2/3/2010
QC Anion-Cation Balance	Calculaltion	%	0				2/3/2010
QC Cation Sum x 100	Calculaltion	%	101%				2/3/2010
QC Ratio TDS/SEC	Calculation		0.68				2/3/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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Wednesday, February 03, 2010

**Lab Number: AA62629**

Collection Date/Time: 12/8/2009 14:20  
Submittal Date/Time: 12/8/2009 15:20

Sample Collector: LINDBERG, T  
Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Radium 226	EPA 903.1	pCi/L	<b>Attached</b>	E		3	1/4/2010
Selenium, Total	200.8	ug/L	<b>3</b>		2	50	12/11/2009
Sodium	3111B	mg/L	<b>64</b>		1		12/20/2009
Specific Conductance (E.C)	2510B	umhos/cm	<b>742</b>		1	900	12/9/2009
Strontium, Total	200.8	ug/L	<b>327</b>		5		12/11/2009
Sulfate	300.0	mg/L	<b>93</b>		1	250	12/9/2009
Total Diss. Solids	2540C	mg/L	<b>505</b>		10	500	12/11/2009
Total Nitrogen	Calculation	mg/L	<b>Not detected</b>		0.5		2/2/2010
Total Organic Carbon	SM5310C	mg/L	<b>1.00</b>	E	0.20		12/14/2009
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		80	12/15/2009
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1		12/11/2009
Vanadium, Total	200.8	ug/L	<b>Not detected</b>		5	1000	12/11/2009
Zinc, Total	200.8	ug/L	<b>155</b>		10	5000	12/11/2009

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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Wednesday, February 03, 2010

**Lab Number: AA62630**

Collection Date/Time: 12/8/2009 15:00 Sample Collector: LINDBERG, T  
Submittal Date/Time: 12/8/2009 15:20 Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	221		2		12/9/2009
Ammonia-N	4500NH3 D	mg/L	0.06		0.05		12/28/2009
Arsenic, Total	200.8	ug/L	3		1	10	12/11/2009
Barium, Total	200.8	ug/L	45		10	1000	12/11/2009
Bicarbonate (as HCO3-)	2320B	mg/L	270		10		12/8/2009
Boron, Total	EPA200.8	mg/L	0.08		0.01		12/11/2009
Calcium	3111B	mg/L	80		1		12/20/2009
Carbonate as CaCO3	2320B	mg/L	Not detected		10		12/8/2009
Chloride	300.0	mg/L	109		1	250	12/9/2009
Dissolved Organic Carbon	SM5310-C	mg/L	0.86		0.2		12/16/2009
Fluoride	300.0	mg/L	0.19		0.10	2.0	12/9/2009
Gross Alpha	EPA 900.0	pCi/L	Attached	E		15	1/8/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	12/17/2009
Hardness (as CaCO3)	2340B	mg/L	278		10		2/3/2010
Iron, Dissolved	3111B	ug/L	55		50	300	12/22/2009
Iron, Total	3111B	ug/L	Not detected		50	300	12/11/2009
Kjehldahl Nitrogen	4500-NH3 B,C.E	mg/L	Not detected		0.5		12/10/2009
Langlier Index ( 15 deg. C)	2330B		-0.21				2/3/2010
Langlier Index ( 60 deg. C)	2330B		0.38				2/3/2010
Lithium	EPA 200.8	ug/L	27		1		12/11/2009
Magnesium	3111B	mg/L	19		1		12/20/2009
Manganese, Dissolved	3111B	ug/L	Not detected		20	50	12/22/2009
Manganese, Total	3111B	ug/L	Not detected		20	50	12/10/2009
Methane	EPA 174/175	ug/L	1.3	E	0.4		12/11/2009
Molybdenum, Total	200.8	ug/L	3		1	1000	12/11/2009
Nitrate as NO3	300.0	mg/L	1		1	45	2/3/2010
Nitrate as NO3-N	300.0	mg/L	0.2		0.1	10	12/9/2009
Nitrite as NO2-N	300.0	mg/L	0.2		0.1	1.00	12/9/2009
o-Phosphate-P	300.0	mg/L	Not detected		0.1		12/9/2009
pH (Laboratory)	4500-H+B	STD. Units	7.1				12/8/2009
Phosphorus, Total	HACH 8190	mg/L	0.13		0.03		12/18/2009
Potassium	3111B	mg/L	4.5		0.5		12/20/2009
QC Anion Sum x 100	Calculaltion	%	108%				2/3/2010
QC Anion-Cation Balance	Calculaltion	%	-2				2/3/2010
QC Cation Sum x 100	Calculaltion	%	104%				2/3/2010
QC Ratio TDS/SEC	Calculation		0.7				2/3/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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Wednesday, February 03, 2010

**Lab Number: AA62630**

Collection Date/Time: 12/8/2009 15:00 Sample Collector: LINDBERG, T  
 Submittal Date/Time: 12/8/2009 15:20 Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Radium 226	EPA 903.1	pCi/L	<b>Attached</b>	E		3	1/4/2010
Selenium, Total	200.8	ug/L	<b>2</b>		2	50	12/11/2009
Sodium	3111B	mg/L	<b>83</b>		1		12/20/2009
Specific Conductance (E.C)	2510B	umhos/cm	<b>894</b>		1	900	12/9/2009
Strontium, Total	200.8	ug/L	<b>410</b>		5		12/11/2009
Sulfate	300.0	mg/L	<b>102</b>		1	250	12/9/2009
Total Diss. Solids	2540C	mg/L	<b>628</b>		10	500	12/11/2009
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.5		12/10/2009
Total Organic Carbon	SM5310C	mg/L	<b>0.89</b>		0.20		12/14/2009
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		80	12/15/2009
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1		12/11/2009
Vanadium, Total	200.8	ug/L	<b>Not detected</b>		5	1000	12/11/2009
Zinc, Total	200.8	ug/L	<b>67</b>		10	5000	12/11/2009

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD

## ANALYTICAL RESULTS

Project: MPWMD/62629/62630

Pace Project No.: 3020440

---

**Sample: ASR-1**                      **Lab ID: 3020440001**      Collected: 12/08/09 16:20      Received: 12/28/09 11:30      Matrix: Drinking Water  
PWS:                                      Site ID:                                      Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>5.36 ± 2.22 (2.81)</b>	pCi/L	01/08/10 12:43	12587-46-1	
Radium-228	EPA 904.0	<b>0.460 ± 0.337 (0.675)</b>	pCi/L	01/04/10 11:35	15262-20-1	

## ANALYTICAL RESULTS

Project: MPWMD/62629/62630

Pace Project No.: 3020440

---

**Sample: MW-1**                      **Lab ID: 3020440002**    Collected: 12/08/09 15:00    Received: 12/28/09 11:30    Matrix: Drinking Water  
PWS:                                      Site ID:                                      Sample Type:

---

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>4.10 ± 1.90 (2.89)</b>	pCi/L	01/08/10 13:11	12587-46-1	
Radium-228	EPA 904.0	<b>0.873 ± 0.360 (0.654)</b>	pCi/L	01/04/10 11:35	15262-20-1	





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**BSK Submission #: 2009120979**

**BSK Sample ID #: 1193998**

Report Issue Date: 12/24/2009

Project ID:

Project Desc: MPWMD

Submission Comments:

Sample Type: Liquid

Date Sampled: 12/08/2009

Sample Description: ASR-1

Time Sampled: 1420

Sample Comments: 62629

Date Received: 12/11/2009

**Inorganics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Dissolved Organic Carbon (DOC)	SM 5310-C	0.95	mg/L	0.20	1	0.20	12/16/09	12/16/09
Total Organic Carbon (TOC)	SM 5310-C	1.0	mg/L	0.20	1	0.20	12/14/09	12/14/09

**Organics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromodichloromethane	EPA 524.2	15	µg/L	0.50	1	0.50	12/14/09	12/15/09
Bromoform	EPA 524.2	1.2	µg/L	0.50	1	0.50	12/14/09	12/15/09
Chloroform	EPA 524.2	23	µg/L	0.50	1	0.50	12/14/09	12/15/09
Dibromochloromethane	EPA 524.2	8.8	µg/L	0.50	1	0.50	12/14/09	12/15/09
Total Trihalomethanes	EPA 524.2	48	µg/L	-	-	N/A		
Dibromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/15/09	12/17/09
Dichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/15/09	12/17/09
Monobromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/15/09	12/17/09
Monochloroacetic Acid	EPA 552.2	ND	µg/L	2.0	1	2.0	12/15/09	12/17/09
Total Haloacetic Acids	EPA 552.2	ND	µg/L	-	-	N/A	12/18/09	12/18/09
Trichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/15/09	12/17/09

**Surrogate**

1,2-Dichlorobenzene-d4	EPA 524.2	100	% Rec	-	1	N/A	12/14/09	12/15/09
4-Bromofluorobenzene	EPA 524.2	92	% Rec	-	1	N/A	12/14/09	12/15/09
2,3-Dibromopropionic Acid	EPA 552.2	110	% Rec	-	1	N/A	12/15/09	12/17/09

mg/L: Milligrams/Liter (ppm)  
mg/Kg: Milligrams/Kilogram (ppm)  
µg/L: Micrograms/Liter (ppb)  
µg/Kg: Micrograms/Kilogram (ppb)  
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit  
DLR: Detection Limit for Reporting  
: PQL x Dilution  
ND: None Detected at DLR  
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time  
P: Preliminary result  
S: Suspect result. See Case Narrative for comments.  
E: Analysis performed by External laboratory.  
See External Laboratory Report attachments.  
MDC: Min Detectable Concentration

Report Authentication Code:



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**BSK Submission #: 2009120979**

**BSK Sample ID #: 1193999**

Report Issue Date: 12/24/2009

Project ID:

Project Desc: MPWMD

Submission Comments:

Sample Type: Liquid

Date Sampled: 12/08/2009

Sample Description: MW-1

Time Sampled: 1500

Sample Comments: 62630

Date Received: 12/11/2009

**Inorganics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Dissolved Organic Carbon (DOC)	SM 5310-C	0.86	mg/L	0.20	1	0.20	12/16/09	12/16/09
Total Organic Carbon (TOC)	SM 5310-C	0.89	mg/L	0.20	1	0.20	12/14/09	12/14/09

**Organics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromodichloromethane	EPA 524.2	2.8	µg/L	0.50	1	0.50	12/14/09	12/15/09
Bromoform	EPA 524.2	ND	µg/L	0.50	1	0.50	12/14/09	12/15/09
Chloroform	EPA 524.2	5.4	µg/L	0.50	1	0.50	12/14/09	12/15/09
Dibromochloromethane	EPA 524.2	ND	µg/L	0.50	1	0.50	12/14/09	12/15/09
Total Trihalomethanes	EPA 524.2	8.2	µg/L	-	-	N/A		
Dibromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/17/09	12/19/09
Dichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/17/09	12/19/09
Monobromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/17/09	12/19/09
Monochloroacetic Acid	EPA 552.2	ND	µg/L	2.0	1	2.0	12/17/09	12/19/09
Total Haloacetic Acids	EPA 552.2	ND	µg/L	-	-	N/A	12/20/09	12/20/09
Trichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/17/09	12/19/09

**Surrogate**

1,2-Dichlorobenzene-d4	EPA 524.2	99	% Rec	-	1	N/A	12/14/09	12/15/09
4-Bromofluorobenzene	EPA 524.2	97	% Rec	-	1	N/A	12/14/09	12/15/09
2,3-Dibromopropionic Acid	EPA 552.2	100	% Rec	-	1	N/A	12/17/09	12/19/09

mg/L: Milligrams/Liter (ppm)

mg/Kg: Milligrams/Kilogram (ppm)

µg/L: Micrograms/Liter (ppb)

µg/Kg: Micrograms/Kilogram (ppb)

%Rec: Percent Recovered (surrogates)

Report Authentication Code:

PQL: Practical Quantitation Limit

DLR: Detection Limit for Reporting

: PQL x Dilution

ND: None Detected at DLR

pCi/L: Picocurie per Liter

H: Analyzed outside of hold time

P: Preliminary result

S: Suspect result. See Case Narrative for comments.

E: Analysis performed by External laboratory.

See External Laboratory Report attachments.

MDC: Min Detectable Concentration



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 ELAP Certification Number: 2385

**Lab Number: AA62584**

Collection Date/Time: 12/7/2009 16:10 Sample Collector: LINDBERG, T  
 Submittal Date/Time: 12/7/2009 16:10 Sample ID

**Sample Description: ASR-2**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	195		2		12/8/2009
Ammonia-N	4500NH3 D	mg/L	0.21		0.05		12/28/2009
Arsenic, Total	200.8	ug/L	5		1	10	12/11/2009
Barium, Total	200.8	ug/L	58		10	1000	12/11/2009
Bicarbonate (as HCO3-)	2320B	mg/L	238		10		12/8/2009
Boron, Total	EPA200.8	mg/L	0.10		0.01		12/11/2009
Calcium	3111B	mg/L	80		1		12/8/2009
Carbonate as CaCO3	2320B	mg/L	Not detected		10		12/8/2009
Chloride	300.0	mg/L	121		1	250	12/9/2009
Dissolved Organic Carbon	SM5310-C	mg/L	0.62	E	0.2		12/16/2009
Fluoride	300.0	mg/L	0.19		0.10	2.0	12/9/2009
Gross Alpha	EPA 900.0	pCi/L	Attached	E		15	1/8/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	12/15/2009
Hardness (as CaCO3)	2340B	mg/L	282		10		2/3/2010
Iron, Dissolved	3111B	ug/L	138		50	300	12/22/2009
Iron, Total	3111B	ug/L	164		50	300	12/11/2009
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.5		12/10/2009
Langlier Index ( 15 deg. C)	2330B		-0.07				2/3/2010
Langlier Index ( 60 deg. C)	2330B		0.53				2/3/2010
Lithium	EPA 200.8	ug/L	27		1		12/11/2009
Magnesium	3111B	mg/L	20		1		12/8/2009
Manganese, Dissolved	3111B	ug/L	40		20	50	12/22/2009
Manganese, Total	3111B	ug/L	36		20	50	12/10/2009
Methane	EPA 174/175	ug/L	0.54	E	0.4		12/11/2009
Molybdenum, Total	200.8	ug/L	11		1	1000	12/11/2009
Nitrate as NO3	300.0	mg/L	5		1	45	2/3/2010
Nitrate as NO3-N	300.0	mg/L	1.2		0.1	10	12/9/2009
Nitrite as Nitrogen	300.0	mg/L	Not detected		0.1	1.00	12/9/2009
Nitrite as NO2-N	300.0	mg/L	Not detected		0.1	1.00	12/9/2009
o-Phosphate-P	300.0	mg/L	Not detected		0.1		12/9/2009
pH (Laboratory)	4500-H+B	STD. Units	7.3				12/8/2009
Phosphorus, Total	HACH 8190	mg/L	0.07		0.03		12/18/2009
Potassium	3111B	mg/L	4.5		0.5		12/8/2009
QC Anion Sum x 100	Calculation	%	102%				2/3/2010

mg/L: Milligrams per liter ug/L : Micrograms per liter PQL : Practical Quantitation Limit MCL: Maximum Contamination Level  
 H = Analyzed outside of hold time E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

**Lab Number: AA62584**

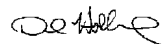
Collection Date/Time: 12/7/2009 16:10 Sample Collector: LINDBERG, T  
 Submittal Date/Time: 12/7/2009 16:10 Sample ID

**Sample Description: ASR-2**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
QC Anion-Cation Balance	Calculation	%	<b>0</b>				2/3/2010
QC Cation Sum x 100	Calculation	%	<b>102%</b>				2/3/2010
QC Ratio TDS/SEC	Calculation		<b>0.7</b>				2/3/2010
Radium 226	EPA 903.1	pCi/L	<b>Attached</b>	E		3	1/7/2010
Selenium, Total	200.8	ug/L	<b>3</b>		2	50	12/11/2009
Sodium	3111B	mg/L	<b>81</b>		1		12/8/2009
Specific Conductance (E.C)	2510B	umhos/cm	<b>912</b>		1	900	12/8/2009
Strontium, Total	200.8	ug/L	<b>435</b>		5		12/11/2009
Sulfate	300.0	mg/L	<b>93</b>		1	250	12/9/2009
Total Diss. Solids	2540C	mg/L	<b>640</b>		10	500	12/11/2009
Total Nitrogen	Calculation	mg/L	<b>1.2</b>		0.5		12/10/2009
Total Organic Carbon	SM5310C	mg/L	<b>0.84</b>	E	0.20		12/14/2009
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		80	12/14/2009
Uranium by ICP/MS	200.8	ug/L	<b>2</b>		1		12/11/2009
Vanadium, Total	200.8	ug/L	<b>Not detected</b>		5	1000	12/11/2009
Zinc, Total	200.8	ug/L	<b>27</b>		10	5000	12/11/2009

Sample Comments:

Report Approved by:



David Holland, Laboratory Director

## ANALYTICAL RESULTS

Project: MPWMD/62584

Pace Project No.: 3020438

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**Sample: ASR-2**                      **Lab ID: 3020438001**      Collected: 12/07/09 16:10      Received: 12/28/09 11:30      Matrix: Drinking Water  
PWS:                                      Site ID:                                      Sample Type:

---

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>2.72 ± 1.84 (2.96)</b>	pCi/L	01/08/10 13:11	12587-46-1	
Radium-228	EPA 904.0	<b>0.663 ± 0.387 (0.751)</b>	pCi/L	01/07/10 11:24	15262-20-1	

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**BSK Submission #: 2009120981**

**BSK Sample ID #: 1194013**

Report Issue Date: 12/18/2009

Project ID:

Project Desc: MPWMD

Submission Comments:

Sample Type: Liquid

Date Sampled: 12/07/2009

Sample Description: ASR-2

Time Sampled: 1610

Sample Comments: 62584

Date Received: 12/11/2009

**Inorganics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Dissolved Organic Carbon (DOC)	SM 5310-C	0.62	mg/L	0.20	1	0.20	12/16/09	12/16/09
Total Organic Carbon (TOC)	SM 5310-C	0.84	mg/L	0.20	1	0.20	12/14/09	12/14/09

**Organics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromodichloromethane	EPA 524.2	ND	µg/L	0.50	1	0.50	12/14/09	12/15/09
Bromoform	EPA 524.2	3.8	µg/L	0.50	1	0.50	12/14/09	12/15/09
Chloroform	EPA 524.2	ND	µg/L	0.50	1	0.50	12/14/09	12/15/09
Dibromochloromethane	EPA 524.2	1.2	µg/L	0.50	1	0.50	12/14/09	12/15/09
Total Trihalomethanes	EPA 524.2	5.0	µg/L	-	-	N/A		
Dibromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/15/09	12/17/09
Dichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/15/09	12/17/09
Monobromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/15/09	12/17/09
Monochloroacetic Acid	EPA 552.2	ND	µg/L	2.0	1	2.0	12/15/09	12/17/09
Total Haloacetic Acids	EPA 552.2	ND	µg/L	-	-	N/A	12/18/09	12/18/09
Trichloroacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/15/09	12/17/09

**Surrogate**

1,2-Dichlorobenzene-d4	EPA 524.2	100	% Rec	-	1	N/A	12/14/09	12/15/09
4-Bromofluorobenzene	EPA 524.2	90	% Rec	-	1	N/A	12/14/09	12/15/09
2,3-Dibromopropionic Acid	EPA 552.2	110	% Rec	-	1	N/A	12/15/09	12/17/09

mg/L: Milligrams/Liter (ppm)  
mg/Kg: Milligrams/Kilogram (ppm)  
µg/L: Micrograms/Liter (ppb)  
µg/Kg: Micrograms/Kilogram (ppb)  
%Rec: Percent Recovered (surrogates)  
Report Authentication Code:

PQL: Practical Quantitation Limit  
DLR: Detection Limit for Reporting  
: PQL x Dilution  
ND: None Detected at DLR  
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time  
P: Preliminary result  
S: Suspect result. See Case Narrative for comments.  
E: Analysis performed by External laboratory.  
See External Laboratory Report attachments.  
MDC: Min Detectable Concentration







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Page 1 of 2

Monday, April 05, 2010

**Lab Number: AA62820**

Collection Date/Time: 12/16/2009 16:25      Sample Collector: LINDBERG, T  
Submittal Date/Time: 12/16/2009 16:25      Sample ID

**Sample Description: ASR-1 Injectate**

Analyte	Method	Unit	Result	Qual	PQL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	129		2	12/21/2009
Ammonia-N	4500NH3 D	mg/L	Not detected		0.05	12/28/2009
Arsenic, Total	200.8	ug/L	Not detected		1	12/23/2009
Barium, Total	200.8	ug/L	63		10	12/23/2009
Bicarbonate (as HCO3-)	2320B	mg/L	157		10	12/21/2009
Boron, Total	EPA200.8	mg/L	0.04		0.01	12/23/2009
Calcium	3111B	mg/L	42		1	12/20/2009
Carbonate as CaCO3	2320B	mg/L	Not detected		10	12/21/2009
Chloramines	SM 4500-Cl G	mg/L	0.08		0.05	12/16/2009
Chloride	300.0	mg/L	27		1	12/18/2009
Dissolved Organic Carbon	SM5310-C	mg/L	1.3	E	0.2	12/28/2009
Fluoride	300.0	mg/L	0.20		0.10	12/18/2009
Gross Alpha	EPA 900.0	pCi/L	1.89 +/- 1.05	E		1/4/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		12/28/2009
Hardness (as CaCO3)	2340B	mg/L	167		10	4/5/2010
Iron, Dissolved	3111B	ug/L	Not detected		50	12/22/2009
Iron, Total	3111B	ug/L	Not detected		50	12/22/2009
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.2	12/22/2009
Langlier Index ( 15 deg. C)	2330B		-0.17			4/5/2010
Langlier Index ( 60 deg. C)	2330B		0.43			4/5/2010
Lithium	EPA 200.8	ug/L	4		1	12/23/2009
Magnesium	3111B	mg/L	15		1	12/20/2009
Manganese, Dissolved	3111B	ug/L	Not detected		20	12/22/2009
Manganese, Total	3111B	ug/L	Not detected		20	12/22/2009
Methane	EPA 174/175	ug/L	Not detected		5	12/30/2009
Molybdenum, Total	200.8	ug/L	2		1	12/23/2009
Nickel, Total	200.8	ug/L	2		1	12/23/2009
Nitrate as NO3	300.0	mg/L	0		1	4/5/2010
Nitrate as NO3-N	300.0	mg/L	0.1		0.1	12/18/2009
Nitrite as Nitrogen	300.0	mg/L	Not detected		0.1	12/18/2009
Nitrite as NO2-N	300.0	mg/L	Not detected		0.1	12/18/2009
o-Phosphate-P	300.0	mg/L	0.3		0.1	12/18/2009
pH (Laboratory)	4500-H+B	STD. Units	7.6			12/17/2009
Phosphorus, Total	HACH 8190	mg/L	0.32		0.03	12/25/2009
Potassium	3111B	mg/L	3.4		0.5	12/20/2009
QC Anion Sum x 100	Calculaltion	%	102%			4/5/2010
QC Anion-Cation Balance	Calculaltion	%	0			4/5/2010
QC Cation Sum x 100	Calculaltion	%	102%			4/5/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

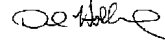
D = Method deviates from standard method due to insufficient sample for MS/MSD

J = Result is less than PQL

QC Ratio TDS/SEC	Calculation		<b>0.68</b>			4/5/2010
Radium 228	RA-05	pCi/L	<b>0.148+/- 0.29</b>	E		1/7/2010
Selenium, Total	200.8	ug/L	<b>Not detected</b>		2	12/23/2009
Sodium	3111B	mg/L	<b>44</b>		1	12/20/2009
Specific Conductance (E.C)	2510B	umhos/cm	<b>522</b>		1	12/21/2009
Strontium, Total	200.8	ug/L	<b>236</b>		5	12/23/2009
Sulfate	300.0	mg/L	<b>95</b>		1	12/18/2009
Total Diss. Solids	2540C	mg/L	<b>355</b>		10	12/18/2009
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.5	12/23/2009
Total Organic Carbon	SM5310C	mg/L	<b>1.6</b>	E	0.20	12/28/2009
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		12/28/2009
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1	12/23/2009
Vanadium, Total	200.8	ug/L	<b>2</b>		1	12/23/2009
Zinc, Total	200.8	ug/L	<b>296</b>		10	12/23/2009

Sample Comments:

Report Approved by:



David Holland  
Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD

J = Result is less than PQL



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**BSK Submission #: 2009121461**

**BSK Sample ID #: 1196398**

Report Issue Date: 01/04/2010

Project ID: 62820

Project Desc: MPWMD

Submission Comments:

Sample Type: Liquid

Date Sampled: 12/16/2009

Sample Description: ASR-1 Injectate

Time Sampled: 1400

Sample Comments: 62820

Date Received: 12/18/2009

**Inorganics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Dissolved Organic Carbon (DOC)	SM 5310-C	1.3	mg/L	0.20	1	0.20	12/28/09	12/28/09
Total Organic Carbon (TOC)	SM 5310-C	1.6	mg/L	0.20	1	0.20	12/28/09	12/28/09

**Organics**

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Bromodichloromethane	EPA 524.2	8.5	µg/L	0.50	1	0.50	12/28/09	12/29/09
Bromoform	EPA 524.2	0.66	µg/L	0.50	1	0.50	12/28/09	12/29/09
Chloroform	EPA 524.2	11	µg/L	0.50	1	0.50	12/28/09	12/29/09
Dibromochloromethane	EPA 524.2	5.5	µg/L	0.50	1	0.50	12/28/09	12/29/09
Total Trihalomethanes	EPA 524.2	26	µg/L	-	-	N/A		
Dibromoacetic Acid	EPA 552.2	2.2	µg/L	1.0	1	1.0	12/28/09	12/30/09
Dichloroacetic Acid	EPA 552.2	6.4	µg/L	1.0	1	1.0	12/28/09	12/30/09
Monobromoacetic Acid	EPA 552.2	ND	µg/L	1.0	1	1.0	12/28/09	12/30/09
Monochloroacetic Acid	EPA 552.2	ND	µg/L	2.0	1	2.0	12/28/09	12/30/09
Total Haloacetic Acids	EPA 552.2	14	µg/L	-	-	N/A	12/28/09	12/30/09
Trichloroacetic Acid	EPA 552.2	5.7	µg/L	1.0	1	1.0	12/28/09	12/30/09

**Surrogate**

1,2-Dichlorobenzene-d4	EPA 524.2	100	% Rec	-	1	N/A	12/28/09	12/29/09
4-Bromofluorobenzene	EPA 524.2	93	% Rec	-	1	N/A	12/28/09	12/29/09
2,3-Dibromopropionic Acid	EPA 552.2	100	% Rec	-	1	N/A	12/28/09	12/30/09

mg/L: Milligrams/Liter (ppm)  
mg/Kg: Milligrams/Kilogram (ppm)  
µg/L: Micrograms/Liter (ppb)  
µg/Kg: Micrograms/Kilogram (ppb)  
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit  
DLR: Detection Limit for Reporting  
: PQL x Dilution  
ND: None Detected at DLR  
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time  
P: Preliminary result  
S: Suspect result. See Case Narrative for comments.  
E: Analysis performed by External laboratory.  
See External Laboratory Report attachments.  
MDC: Min Detectable Concentration

Report Authentication Code:



## ANALYTICAL RESULTS

Project: MPWMD/62820

Pace Project No.: 3020469

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**Sample: ASR-1 iNJECTATE**      **Lab ID: 3020469001**      Collected: 12/16/09 14:00      Received: 12/28/09 10:30      Matrix: Drinking Water  
PWS:      Site ID:      Sample Type:

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Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>1.89 ± 1.05 (1.58)</b>	pCi/L	01/04/10 13:49	12587-46-1	
Radium-228	EPA 904.0	<b>0.148 ± 0.290 (0.650)</b>	pCi/L	01/07/10 14:05	15262-20-1	



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Thursday, March 11, 2010

**Lab Number: AA63479**

Collection Date/Time: 1/22/2010 11:30 Sample Collector: LINDBERG, T  
Submittal Date/Time: 1/22/2010 14:00 Sample ID

**Sample Description: ASR-1 Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	126		2		1/26/2010
Ammonia-N	4500NH3 D	mg/L	Not detected		0.05		1/28/2010
Arsenic, Total	200.8	ug/L	Not detected		1	10	1/22/2010
Barium, Total	200.8	ug/L	56		10	1000	1/22/2010
Boron, Total	EPA200.8	mg/L	0.04		0.01		1/22/2010
Calcium	3111B	mg/L	42		1		2/2/2010
Chloramines	SM 4500-Cl G	mg/L	0.10		0.05		1/22/2010
Chloride	300.0	mg/L	27		1	250	1/26/2010
Dissolved Organic Carbon	SM5310-C	mg/L	Attached	E	0.2		1/29/2010
Gross Alpha	EPA 900.0	pCi/L	Attached	E		15	3/3/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	2/4/2010
Iron, Total	200.8	ug/L	Not detected		50	300	1/22/2010
Iron_Dissolved	EPA 200.8	ug/L	Not detected		50		1/22/2010
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.5		1/28/2010
Lithium	EPA 200.8	ug/L	6		1		1/22/2010
Magnesium	3111B	mg/L	14		1		2/2/2010
Manganese, Dissolved	200.8	ug/L	Not detected		10	50	1/22/2010
Manganese, Total	200.8	ug/L	Not detected		10	50	1/22/2010
Methane	EPA 174/175	ug/L	Attached	E	5		1/29/2010
Molybdenum, Total	200.8	ug/L	2		1	1000	1/22/2010
Nickel, Total	200.8	ug/L	2		2	100	1/22/2010
Nitrate as NO3-N	300.0	mg/L	Not detected		0.1	10	1/26/2010
Nitrite as Nitrogen	300.0	mg/L	Not detected		0.1	1.00	1/26/2010
o-Phosphate-P	300.0	mg/L	Not detected		0.1		1/26/2010
pH (Laboratory)	4500-H+B	STD. Units	7.6				1/26/2010
Phosphorus, Total	HACH 8190	mg/L	Not detected		0.03		2/16/2010
Potassium	3111B	mg/L	3.2		0.5		2/2/2010
Radium 226	EPA 903.1	pCi/L	Attached	E		3	3/3/2010
Selenium, Total	200.8	ug/L	3		2	50	1/22/2010
Sodium	3111B	mg/L	41		1		2/2/2010
Specific Conductance (E.C)	2510B	umhos/cm	528		1	900	1/26/2010
Strontium, Total	200.8	ug/L	216		5		1/22/2010
Sulfate	300.0	mg/L	82		1	250	1/26/2010
Total Diss. Solids	2540C	mg/L	385		10	500	1/25/2010
Total Nitrogen	Calculation	mg/L	Not Detected		0.2		1/29/2010
Total Organic Carbon	SM5310C	mg/L	Attached	E	0.20		1/30/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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ELAP Certification Number: 2385

MPWMD  
Joe Oliver  
P.O. Box 85  
Monterey, CA 93442-0085

Thursday, March 11, 2010

**Lab Number: AA63479**

Collection Date/Time: 1/22/2010 11:30 Sample Collector: LINDBERG, T  
Submittal Date/Time: 1/22/2010 14:00 Sample ID

**Sample Description: ASR-1 Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Total Trihalomethanes (THMs)	EPA 524.2	ug/L	<b>16</b>	E	0.5	80	1/30/2010
Bromodichloromethane	EPA 524.2	ug/L	<b>5.7</b>	E	0.5		1/30/2010
Bromoform	EPA 524.2	ug/L	<b>0.63</b>	E	0.5		1/30/2010
Chloroform	EPA 524.2	ug/L	<b>5.9</b>	E	0.5		1/30/2010
Dibromochloromethane	EPA 524.2	ug/L	<b>4.2</b>	E	0.5		1/30/2010
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1		1/22/2010
Vanadium, Total	200.8	ug/L	<b>2</b>		5	1000	1/22/2010
Zinc, Total	200.8	ug/L	<b>220</b>		10	5000	1/22/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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Thursday, March 11, 2010

**Lab Number: AA63480**

Collection Date/Time: 1/22/2010 13:30 Sample Collector: LINDBERG, T  
Submittal Date/Time: 1/22/2010 14:00 Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	140		2		1/26/2010
Ammonia-N	4500NH3 D	mg/L	Not detected		0.05		1/28/2010
Arsenic, Total	200.8	ug/L	5		1	10	1/22/2010
Barium, Total	200.8	ug/L	35		10	1000	1/22/2010
Boron, Total	EPA200.8	mg/L	0.05		0.01		1/22/2010
Calcium	3111B	mg/L	54		1		2/2/2010
Chloramines	SM 4500-Cl G	mg/L	Not detected		0.05		1/22/2010
Chloride	300.0	mg/L	28		1	250	1/26/2010
Dissolved Organic Carbon	SM5310-C	mg/L	Attached	E	0.2		1/29/2010
Gross Alpha	EPA 900.0	pCi/L	Attached	E		15	3/3/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	2/4/2010
Iron, Total	200.8	ug/L	Not detected		50	300	1/22/2010
Iron_Dissolved	EPA 200.8	ug/L	Not detected		50		1/22/2010
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.5		1/28/2010
Lithium	EPA 200.8	ug/L	10		1		1/22/2010
Magnesium	3111B	mg/L	11		1		2/2/2010
Manganese, Dissolved	200.8	ug/L	Not detected		10	50	1/22/2010
Manganese, Total	200.8	ug/L	Not detected		10	50	1/22/2010
Methane	EPA 174/175	ug/L	Attached	E	5		1/29/2010
Molybdenum, Total	200.8	ug/L	3		1	1000	1/22/2010
Nickel, Total	200.8	ug/L	Not detected		2	100	1/22/2010
Nitrate as NO3-N	300.0	mg/L	Not detected		0.1	10	1/26/2010
Nitrite as Nitrogen	300.0	mg/L	Not detected		0.1	1.00	1/26/2010
o-Phosphate-P	300.0	mg/L	Not detected		0.1		1/26/2010
pH (Laboratory)	4500-H+B	STD. Units	7.7				1/26/2010
Phosphorus, Total	HACH 8190	mg/L	Not detected		0.03		2/16/2010
Potassium	3111B	mg/L	4.6		0.5		2/2/2010
Radium 226	EPA 903.1	pCi/L	Attached	E		3	3/3/2010
Selenium, Total	200.8	ug/L	4		2	50	1/22/2010
Sodium	3111B	mg/L	43		1		2/2/2010
Specific Conductance (E.C)	2510B	umhos/cm	561		1	900	1/26/2010
Strontium, Total	200.8	ug/L	282		5		1/22/2010
Sulfate	300.0	mg/L	85		1	250	1/26/2010
Total Diss. Solids	2540C	mg/L	355		10	500	1/25/2010
Total Nitrogen	Calculation	mg/L	Not Detected		0.2		1/29/2010
Total Organic Carbon	SM5310C	mg/L	Attached	E	0.20		1/30/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD





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ELAP Certification Number: 2385

MPWMD  
Joe Oliver  
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Monterey, CA 93442-0085

Thursday, March 11, 2010

**Lab Number: AA63480**

Collection Date/Time: 1/22/2010 13:30  
Submittal Date/Time: 1/22/2010 14:00

Sample Collector: LINDBERG, T  
Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Total Trihalomethanes (THMs)	EPA 524.2	ug/L	<b>45</b>	E	0.5	80	1/30/2010
Dibromochloromethane	EPA 524.2	ug/L	<b>5.0</b>	E	0.5		1/30/2010
Bromoform	EPA 524.2	ug/L	<b>Not detected</b>	E	0.5		1/30/2010
Chloroform	EPA 524.2	ug/L	<b>26</b>	E	0.5		1/30/2010
Bromodichloromethane	EPA 524.2	ug/L	<b>14</b>	E	0.5		1/30/2010
Uranium by ICP/MS	200.8	ug/L	<b>1</b>		1		1/22/2010
Vanadium, Total	200.8	ug/L	<b>4</b>		5	1000	1/22/2010
Zinc, Total	200.8	ug/L	<b>24</b>		10	5000	1/22/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD









March 05, 2010

Client: Monterey Bay Analytical  
Address: 4 Justin Court Ste D  
Monterey, CA 93940

Received: 2/26/2010  
Project #: MPWMD/Pueblo

<u>Client ID#</u>	<u>Lab ID#</u>	<u>Collected</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Matrix</u>	<u>Method</u>	<u>DF</u>	<u>LOQ</u>	<u>Run</u>	<u>Analyst</u>
63479	1002772-01	22-Jan-10	Gross Alpha	ND +/- 1.1	pci/l	L	EPA 900.0	1	3	03-Mar-10	MO

<u>Client ID#</u>	<u>Lab ID#</u>	<u>Collected</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Matrix</u>	<u>Method</u>	<u>DF</u>	<u>LOQ</u>	<u>Run</u>	<u>Analyst</u>
63479	1002772-01	22-Jan-10	Radium-226	ND +/- 0.16	pci/l	L	EPA 903.0	1	1	03-Mar-10	MO

<u>Client ID#</u>	<u>Lab ID#</u>	<u>Collected</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Matrix</u>	<u>Method</u>	<u>DF</u>	<u>LOQ</u>	<u>Run</u>	<u>Analyst</u>
63480	1002772-02	22-Jan-10	Gross Alpha	ND +/- 1.0	pci/l	L	EPA 900.0	1	3	03-Mar-10	MO

<u>Client ID#</u>	<u>Lab ID#</u>	<u>Collected</u>	<u>Analyte</u>	<u>Result</u>	<u>Units</u>	<u>Matrix</u>	<u>Method</u>	<u>DF</u>	<u>LOQ</u>	<u>Run</u>	<u>Analyst</u>
63480	1002772-02	22-Jan-10	Radium-226	ND +/- 0.2	pci/l	L	EPA 903.0	1	1	03-Mar-10	MO



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Page 1 of 1

Tuesday, March 16, 2010

**Lab Number: AA63726**

Collection Date/Time: 2/3/2010 8:40 Sample Collector: LEAR, J  
Submittal Date/Time: 2/3/2010 9:30 Sample ID

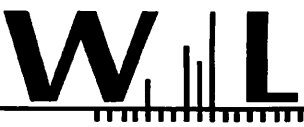
**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM 4500-Cl G	mg/L	0.12		0.05		2/3/2010
Chloride	300.0	mg/L	25		1	250	2/5/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	2/8/2010
Trihalomethanes	EPA 524.2	ug/L	Attached	E		80	2/8/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director



Certificate of Analysis

Report Date: Wednesday, February 10, 2010  
Received Date: Thursday, February 4, 2010  
Received Time: 8:20 am  
Turnaround Time: Normal

Client: Monterey Bay Analytical Services  
4 Justin Court, Suite D  
Monterey, CA 93940

Phones: (831) 375-6227  
Fax: (831) 641-0734

Attn: David Holland  
Project: MPWMD

P.O. #:

Lab Sample ID: 0B04004-01	Sample ID: Injectate									Matrix: Water
Sampled by: Lear, J	Sampled: 02/03/10 08:40	Sample Note: 63726								
Analyte	Result	DL	RL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Bromodichloromethane.....	7.1	0.13	0.50	ug/l	1x1	EPA 524.2	2/8/10	2/8/10 22:37	W0B0393	
Bromoform.....	0.67	0.17	0.50	ug/l	1x1	EPA 524.2	2/8/10	2/8/10 22:37	W0B0393	
Chloroform.....	5.7	0.17	0.50	ug/l	1x1	EPA 524.2	2/8/10	2/8/10 22:37	W0B0393	
Dibromochloromethane.....	5.6	0.19	0.50	ug/l	1x1	EPA 524.2	2/8/10	2/8/10 22:37	W0B0393	
THMs, Total.....	19		0.50	ug/l	1x1	EPA 524.2	2/8/10	2/8/10 22:37	W0B0393	
Surrogate: 1,2-Dichlorobenzene-d4	75 %		70-130							
Surrogate: 4-Bromofluorobenzene	79 %		70-130							
Dibromoacetic acid (dbaa).....	2.4	0.13	1.0	ug/l	1x1	EPA 552.2	2/5/10	2/9/10 0:57	W0B0232	
Dichloroacetic acid (dcaa).....	3.8	0.41	1.0	ug/l	1x1	EPA 552.2	2/5/10	2/9/10 0:57	W0B0232	
HAA5, Total.....	9.8		1.0	ug/l	1x1	EPA 552.2	2/5/10	2/9/10 0:57	W0B0232	
Monobromoacetic acid (mbaa).....	ND	0.21	1.0	ug/l	1x1	EPA 552.2	2/5/10	2/9/10 0:57	W0B0232	
Monochloroacetic acid (mcaa).....	ND	0.32	2.0	ug/l	1x1	EPA 552.2	2/5/10	2/9/10 0:57	W0B0232	
Trichloroacetic acid (tcaa).....	3.6	0.22	1.0	ug/l	1x1	EPA 552.2	2/5/10	2/9/10 0:57	W0B0232	
Surrogate: 2,3-Dibromopropionic acid	103 %		70-130							



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 ELAP Certification Number: 2385

**Lab Number: AA64033**

Collection Date/Time: 2/16/2010 14:00 Sample Collector: LEAR, J  
 Submittal Date/Time: 2/16/2010 14:15 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	129		2		2/17/2010
Ammonia-N	4500NH3 D	mg/L	0.05		0.05		2/21/2010
Arsenic, Total	200.8	ug/L	Not detected		1	10	3/5/2010
Barium, Total	200.8	ug/L	57		10	1000	3/5/2010
Bicarbonate (as HCO3-)	2320B	mg/L	157		10		3/16/2010
Boron, Total	EPA200.8	mg/L	0.38		0.01		3/5/2010
Calcium	3111B	mg/L	40		1		2/23/2010
Carbonate as CaCO3	2320B	mg/L	Not detected		10		2/17/2010
Chloramines	SM 4500-Cl G	mg/L	0.20		0.05		2/16/2010
Chloride	300.0	mg/L	26		1	250	2/17/2010
Dissolved Organic Carbon	SM5310-C	mg/L	1.1	E	0.2		2/26/2010
Fluoride	300.0	mg/L	0.33		0.10	2.0	2/17/2010
Gross Alpha	EPA 900.0	pCi/L	Attached	E		15	3/3/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	2/27/2010
Hardness (as CaCO3)	2340B	mg/L	153		10		3/16/2010
Iron, Dissolved	3111B	ug/L	Not detected		50	300	2/23/2010
Iron, Total	3111B	ug/L	Not detected		50	300	2/23/2010
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.2		3/3/2010
Langlier Index ( 15 deg. C)	2330B		-0.29				3/16/2010
Langlier Index ( 60 deg. C)	2330B		0.31				3/16/2010
Lithium	EPA 200.8	ug/L	7		1		3/5/2010
Magnesium	3111B	mg/L	13		1		2/23/2010
Manganese, Dissolved	3111B	ug/L	Not detected		20	50	2/23/2010
Manganese, Total	3111B	ug/L	Not detected		20	50	2/23/2010
Methane	EPA 174/175	ug/L	Not detected	E	0.4		2/22/2010
Molybdenum, Total	200.8	ug/L	3		1	1000	3/5/2010
Nickel, Total	200.8	ug/L	3		1	100	3/5/2010
Nitrate as NO3	300.0	mg/L	1		1	45	2/17/2010
Nitrate as NO3-N	300.0	mg/L	0.2		0.1	10	2/17/2010
Nitrite as Nitrogen	300.0	mg/L	Not detected		0.1	1.00	2/17/2010
Nitrite as NO2-N	300.0	mg/L	Not detected		0.1	1.00	2/17/2010
o-Phosphate-P	300.0	mg/L	Not detected		0.1		2/17/2010
pH (Laboratory)	4500-H+B	STD. Units	7.5				2/16/2010
Phosphorus, Total	HACH 8190	mg/L	Not detected		0.03		2/16/2010
Potassium	3111B	mg/L	2.8		0.5		2/23/2010
QC Anion Sum x 100	Calculation	%	96%				3/16/2010
QC Anion-Cation Balance	Calculation	%	2				3/16/2010
QC Cation Sum x 100	Calculation	%	101%				3/16/2010
QC Ratio TDS/SEC	Calculation		0.7				3/16/2010
Radium 226	EPA 903.1	pCi/L	Attached	E		3	3/3/2010

mg/L: Milligrams per liter ug/L : Micrograms per liter PQL : Practical Quantitation Limit MCL: Maximum Contamination Level  
 H = Analyzed outside of hold time E = Analysis performed by External Laboratory; See External Laboratory Report attachments.



**Lab Number: AA64033**

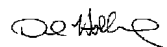
Collection Date/Time: 2/16/2010 14:00 Sample Collector: LEAR, J  
 Submittal Date/Time: 2/16/2010 14:15 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Selenium, Total	200.8	ug/L	<b>Not detected</b>		2	50	3/5/2010
Sodium	3111B	mg/L	<b>43</b>		1		2/23/2010
Specific Conductance (E.C)	2510B	umhos/cm	<b>494</b>		1	900	2/16/2010
Strontium, Total	200.8	ug/L	<b>218</b>		5		3/5/2010
Sulfate	300.0	mg/L	<b>69</b>		1	250	2/17/2010
Total Diss. Solids	2540C	mg/L	<b>348</b>		10	500	2/18/2010
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.5		3/4/2010
Total Organic Carbon	SM5310C	mg/L	<b>1.0</b>	E	0.20		2/26/2010
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		80	2/24/2010
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1		3/5/2010
Vanadium, Total	200.8	ug/L	<b>2</b>		1	1000	3/5/2010
Zinc, Total	200.8	ug/L	<b>286</b>		10	5000	3/5/2010

Sample Comments:

Report Approved by:



David Holland, Laboratory Director



**Certificate of Analysis**

David Holland  
Monterey Bay Analytical  
4 Justin Court Suite D  
Monterey, CA 93940

**Report Issue Date:** 03/02/2010 16:04  
**Received Date:** 02/19/2010  
**Received Time:** 07:30

**Lab Sample ID:** A0B0333-01      **Sample Description:** Injectate // 64033  
**Sample Date:** 02/16/2010 14:00  
**Sample Control Qualifiers:**      **Matrix:** Ground Water  
**Sample Type:** Grab      **Sampled by:** J Lear

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
---------	--------	--------	----	-------	------	-------	----------	----------	------------

**Total Trihalomethanes by EPA 524.2**

Bromodichloromethane	EPA 524.2	6.2	0.50	ug/L	1	A000187	02/23/10	02/24/10	
Bromoform	EPA 524.2	0.59	0.50	ug/L	1	A000187	02/23/10	02/24/10	
Chloroform	EPA 524.2	5.8	0.50	ug/L	1	A000187	02/23/10	02/24/10	
Dibromochloromethane	EPA 524.2	4.3	0.50	ug/L	1	A000187	02/23/10	02/24/10	
*Total Trihalomethanes	EPA 524.2	17		ug/L					
*Surrogate: 1,2-Dichlorobenzene-d4			101 %	Acceptable range: 70-130 %					
*Surrogate: 4-Bromofluorobenzene			93 %	Acceptable range: 70-130 %					

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	2.1	1.0	ug/L	1	A000272	02/25/10	02/27/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	4.8	1.0	ug/L	1	A000272	02/25/10	02/27/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A000272	02/25/10	02/27/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A000272	02/25/10	02/27/10	
*Total Haloacetic Acids (HAA)	EPA 552.2	11		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	3.7	1.0	ug/L	1	A000272	02/25/10	02/27/10	
Surrogate: 2,3-Dibromopropionic Acid			83 %	Acceptable range: 70-130 %					



Certificate of Analysis

David Holland
Monterey Bay Analytical
4 Justin Court Suite D
Monterey, CA 93940

Report Issue Date: 03/02/2010 16:04
Received Date: 02/19/2010
Received Time: 07:30

Lab Sample ID: A0B0333-01 Sample Description: Injectate // 64033
Sample Date: 02/16/2010 14:00
Sample Control Qualifiers: Matrix: Ground Water
Sample Type: Grab Sampled by: J Lear

Table with 10 columns: Analyte, Method, Result, RL, Units, Dil., Batch, Prepared, Analyzed, Qualifiers. Rows include Dissolved Organic Carbon and Total Organic Carbon.





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ELAP Certification Number: 2385

**Lab Number: AA64534**

Collection Date/Time: 3/10/2010 12:15      Sample Collector: LINDBERG, T.  
Submittal Date/Time: 3/10/2010 14:20      Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloride	300.0	mg/L	28		1	250	3/12/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	3/19/2010
Trihalomethanes	EPA 524.2	ug/L	Attached	E		80	3/18/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director



**Certificate of Analysis**

David Holland  
Monterey Bay Analytical  
4 Justin Court Suite D  
Monterey, CA 93940

**Report Issue Date:** 03/23/2010 15:50  
**Received Date:** 03/12/2010  
**Received Time:** 07:30

**Lab Sample ID:** A0C1017-01  
**Sample Date:** 03/10/2010 12:15  
**Sample Type:** Grab  
**Sample Control Qualifiers:**

**Client Project:** MPWMD  
**Matrix:** Water  
**Sampled by:** Lindberg, T

**Sample Description:** MW-1 // 64534

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
<b>Total Trihalomethanes by EPA 524.2</b>									
Bromodichloromethane	EPA 524.2	20	0.50	ug/L	1	A001120	03/18/10	03/18/10	
Bromoform	EPA 524.2	0.93	0.50	ug/L	1	A001120	03/18/10	03/18/10	
Chloroform	EPA 524.2	30	0.50	ug/L	1	A001120	03/18/10	03/18/10	
Dibromochloromethane	EPA 524.2	9.8	0.50	ug/L	1	A001120	03/18/10	03/18/10	
Total Trihalomethanes	EPA 524.2	60		ug/L					

*Surrogate: 1,2-Dichlorobenzene-d4* 105 % *Acceptable range: 70-130 %*  
*Surrogate: 4-Bromofluorobenzene* 95 % *Acceptable range: 70-130 %*

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	1.9	1.0	ug/L	1	A001005	03/16/10	03/19/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	6.3	1.0	ug/L	1	A001005	03/16/10	03/19/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A001005	03/16/10	03/19/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A001005	03/16/10	03/19/10	
Total Haloacetic Acids (HAA)	EPA 552.2	12		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	4.1	1.0	ug/L	1	A001005	03/16/10	03/19/10	

*Surrogate: 2,3-Dibromopropionic Acid* 103 % *Acceptable range: 70-130 %*



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Page 1 of 1

Thursday, March 25, 2010

**Lab Number: AA64322**

Collection Date/Time: 3/2/2010 13:40 Sample Collector: LINDBERG, T.  
Submittal Date/Time: 3/2/2010 16:00 Sample ID

**Sample Description: ASR-1 Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM 4500-Cl G	mg/L	0.15		0.05		2/26/2010
Chloride	300.0	mg/L	25		1	250	3/5/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	3/10/2010
Trihalomethanes	EPA 524.2	ug/L	Attached	E		80	3/12/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director



**Certificate of Analysis**

David Holland  
Monterey Bay Analytical  
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Monterey, CA 93940

**Report Issue Date:** 03/16/2010 9:59  
**Received Date:** 03/05/2010  
**Received Time:** 07:30

**Lab Sample ID:** A0C0473-01      **Sample Description:** ASR-1 Injectate // 64332  
**Sample Date:** 03/02/2010 13:40      **Client Project:** MPWMD  
**Sample Control Qualifiers:**      **Matrix:** Water  
**Sample Type:** Grab      **Sampled by:** J Lear

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**Total Trihalomethanes by EPA 524.2**

Bromodichloromethane	EPA 524.2	<b>6.9</b>	0.50	ug/L	1	A000835	03/11/10	03/12/10	
Bromoform	EPA 524.2	<b>0.64</b>	0.50	ug/L	1	A000835	03/11/10	03/12/10	
Chloroform	EPA 524.2	<b>8.4</b>	0.50	ug/L	1	A000835	03/11/10	03/12/10	
Dibromochloromethane	EPA 524.2	<b>4.4</b>	0.50	ug/L	1	A000835	03/11/10	03/12/10	
Total Trihalomethanes	EPA 524.2	<b>20</b>		ug/L					

*Surrogate: 1,2-Dichlorobenzene-d4*      107 %      *Acceptable range: 70-130 %*  
*Surrogate: 4-Bromofluorobenzene*      96 %      *Acceptable range: 70-130 %*

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	<b>2.1</b>	1.0	ug/L	1	A000642	03/06/10	03/10/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	<b>5.2</b>	1.0	ug/L	1	A000642	03/06/10	03/10/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A000642	03/06/10	03/10/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A000642	03/06/10	03/10/10	
Total Haloacetic Acids (HAA)	EPA 552.2	<b>12</b>		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	<b>4.3</b>	1.0	ug/L	1	A000642	03/06/10	03/10/10	

*Surrogate: 2,3-Dibromopropionic Acid*      95 %      *Acceptable range: 70-130 %*





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**Lab Number: AA64741**

Collection Date/Time: 3/17/2010 12:30 Sample Collector: LEAR, J  
 Submittal Date/Time: 3/17/2010 14:00 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	127		2		3/18/2010
Ammonia-N	4500NH3 D	mg/L	0.06		0.05		3/23/2010
Arsenic, Total	200.8	ug/L	Not detected		1	10	3/30/2010
Barium, Total	200.8	ug/L	55		10	1000	3/30/2010
Bicarbonate (as HCO3-)	2320B	mg/L	155		10		3/19/2010
Boron	4500B-B	mg/L	0.07		0.05		4/9/2010
Calcium	3111B	mg/L	41		1		3/30/2010
Carbonate as CaCO3	2320B	mg/L	Not detected		10		3/13/2010
Chloramines	SM 4500-Cl G	mg/L	0.11		0.05		3/17/2010
Chloride	300.0	mg/L	28		1	250	3/17/2010
Dissolved Organic Carbon	SM5310-C	mg/L	1.1	E	0.2		3/24/2010
Fluoride	300.0	mg/L	0.26		0.10	2.0	3/17/2010
Gross Alpha	EPA 900.0	pCi/L	Attached	E		15	4/11/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	3/25/2010
Hardness (as CaCO3)	2340B	mg/L	152		10		4/1/2010
Iron, Dissolved	3111B	ug/L	Not detected		50	300	3/30/2010
Iron, Total	3111B	ug/L	Not detected		50	300	3/30/2010
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.5		3/18/2010
Langlier Index ( 15 deg. C)	2330B		-0.17				3/30/2010
Langlier Index ( 60 deg. C)	2330B		0.43				3/30/2010
Lithium	EPA 200.8	ug/L	5		1		3/30/2010
Magnesium	3111B	mg/L	12		1		3/30/2010
Manganese, Dissolved	3111B	ug/L	Not detected		20	50	3/30/2010
Manganese, Total	3111B	ug/L	Not detected		20	50	3/30/2010
Methane	EPA 174/175	ug/L	Not detected	E	5		3/24/2010
Molybdenum, Total	200.8	ug/L	3		1	1000	3/30/2010
Nickel, Total	200.8	ug/L	Not detected		10	100	3/30/2010
Nitrate as NO3	300.0	mg/L	1		1	45	3/18/2010
Nitrate as NO3-N	300.0	mg/L	0.3		0.1	10	3/17/2010
Nitrite as Nitrogen	300.0	mg/L	Not detected		0.1	1.00	3/17/2010
Nitrite as NO2-N	300.0	mg/L	Not detected		0.1	1.00	3/17/2010
o-Phosphate-P	300.0	mg/L	0.2		0.1		3/17/2010
pH (Laboratory)	4500-H+B	STD. Units	7.6				3/18/2010
Phosphorus, Total	HACH 8190	mg/L	0.29		0.03		3/26/2010
Potassium	3111B	mg/L	2.9		0.5		3/30/2010
QC Anion Sum x 100	Calculaltion	%	97%				4/1/2010
QC Anion-Cation Balance	Calculaltion	%	2				4/1/2010
QC Cation Sum x 100	Calculaltion	%	101%				4/1/2010

mg/L: Milligrams per liter ug/L : Micrograms per liter PQL : Practical Quantitation Limit MCL: Maximum Contamination Level  
 H = Analyzed outside of hold time E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

**Lab Number: AA64741**

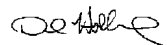
Collection Date/Time: 3/17/2010 12:30 Sample Collector: LEAR, J  
 Submittal Date/Time: 3/17/2010 14:00 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
QC Ratio TDS/SEC	Calculation		<b>0.61</b>				3/29/2010
Radium 226	EPA 903.1	pCi/L	<b>Attached</b>	E		3	4/14/2010
Selenium, Total	200.8	ug/L	<b>Not detected</b>		2	50	3/30/2010
Sodium	3111B	mg/L	<b>43</b>		1		3/30/2010
Specific Conductance (E.C)	2510B	umhos/cm	<b>493</b>		1	900	3/18/2010
Strontium, Total	200.8	ug/L	<b>200</b>		5		3/30/2010
Sulfate	300.0	mg/L	<b>68</b>		1	250	3/17/2010
Total Diss. Solids	2540C	mg/L	<b>300</b>		10	500	3/22/2010
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.5		3/19/2010
Total Organic Carbon	SM5310C	mg/L	<b>1.4</b>	E	0.20		3/23/2010
Total Trihalomethanes (THMs)	EPA 524.2	ug/L	<b>22</b>	E	0.5	80	3/23/2010
Chloroform	EPA 524.2	ug/L	<b>9.6</b>	E	0.5		3/23/2010
Bromoform	EPA 524.2	ug/L	<b>0.62</b>	E	0.5		3/23/2010
Bromodichloromethane	EPA 524.2	ug/L	<b>7.6</b>	E	0.5		3/23/2010
Dibromochloromethane	EPA 524.2	ug/L	<b>4.6</b>	E	0.5		3/23/2010
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1		3/30/2010
Vanadium, Total	200.8	ug/L	<b>Not detected</b>		5	1000	3/30/2010
Zinc, Total	200.8	ug/L	<b>194</b>		10	5000	3/30/2010

Sample Comments:

Report Approved by:



David Holland, Laboratory Director



**Certificate of Analysis**

David Holland  
Monterey Bay Analytical  
4 Justin Court Suite D  
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**Report Issue Date:** 03/29/2010 15:41  
**Received Date:** 03/19/2010  
**Received Time:** 07:45

**Lab Sample ID:** A0C1465-01      **Client Project:** MPWMD  
**Sample Date:** 03/17/2010 12:30      **Matrix:** Water  
**Sample Type:** Grab      **Sampled by:** J Lear  
**Sample Control Qualifiers:**

**Sample Description:** Injectate // 64741

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
<b><u>Total Trihalomethanes by EPA 524.2</u></b>									
Bromodichloromethane	EPA 524.2	7.6	0.50	ug/L	1	A001215	03/22/10	03/23/10	
Bromoform	EPA 524.2	0.62	0.50	ug/L	1	A001215	03/22/10	03/23/10	
Chloroform	EPA 524.2	9.6	0.50	ug/L	1	A001215	03/22/10	03/23/10	
Dibromochloromethane	EPA 524.2	4.6	0.50	ug/L	1	A001215	03/22/10	03/23/10	
Total Trihalomethanes	EPA 524.2	22		ug/L					
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			104 %	<i>Acceptable range: 70-130 %</i>					
<i>Surrogate: 4-Bromofluorobenzene</i>			93 %	<i>Acceptable range: 70-130 %</i>					

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	2.1	1.0	ug/L	1	A001261	03/23/10	03/25/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	6.5	1.0	ug/L	1	A001261	03/23/10	03/25/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A001261	03/23/10	03/25/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	2.5	2.0	ug/L	1	A001261	03/23/10	03/25/10	
Total Haloacetic Acids (HAA)	EPA 552.2	16		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	5.3	1.0	ug/L	1	A001261	03/23/10	03/25/10	
<i>Surrogate: 2,3-Dibromopropionic Acid</i>			106 %	<i>Acceptable range: 70-130 %</i>					



**Certificate of Analysis**

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**Report Issue Date:** 03/29/2010 15:41  
**Received Date:** 03/19/2010  
**Received Time:** 07:45

**Lab Sample ID:** A0C1465-01  
**Sample Date:** 03/17/2010 12:30  
**Sample Type:** Grab

**Client Project:** MPWMD  
**Sampled by:** J Lear  
**Matrix:** Water

**Sample Description:** Injectate // 64741

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**General Chemistry**

Dissolved Organic Carbon	SM 5310 C	1.1	0.20	mg/L	1	A001318	03/24/10	03/24/10	
Total Organic Carbon	SM 5310 C	1.4	0.20	mg/L	1	A001205	03/23/10	03/23/10	



## ANALYTICAL RESULTS

Project: MPWMD - 64741

Pace Project No.: 3025508

<b>Sample: Injectate</b>		<b>Lab ID: 3025508001</b>	Collected: 03/17/10 12:30	Received: 04/02/10 09:45	Matrix: Drinking Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>0.445 ± 0.694 (1.18)</b>	pCi/L	04/11/10 16:28	12587-46-1	
Radium-226	EPA 903.1	<b>0.418 ± 0.335 (0.189)</b>	pCi/L	04/14/10 12:35	13982-63-3	



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ELAP Certification Number: 2385

**Lab Number: AA65107**

Collection Date/Time: 4/3/2010 10:15 Sample Collector: LINDBERG T  
Submittal Date/Time: 4/3/2010 11:15 Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	Date Analyzed
Chloramines	SM 4500-Cl G	mg/L	<b>0.07</b>		0.05	4/3/2010
Chloride	300.0	mg/L	<b>26</b>		1	4/9/2010
Haloacetic Acids	EPA 552	ug/L	<b>Attached</b>	E		4/10/2010
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		4/8/2010

Sample Comments:

Report Approved by:

David Holland  
Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD

J = Result is less than PQL



**Certificate of Analysis**

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**Report Issue Date:** 04/12/2010 16:51  
**Received Date:** 04/06/2010  
**Received Time:** 11:58

**Lab Sample ID:** A0D0284-01  
**Sample Date:** 04/03/2010 10:15  
**Sample Type:** Grab  
**Sample Control Qualifiers:**

**Client Project:** MPWMD  
**Matrix:** Water  
**Sampled by:** T Lindberg

**Sample Description:** MW-1 // 65107

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
<b><u>Total Trihalomethanes by EPA 524.2</u></b>									
Bromodichloromethane	EPA 524.2	20	0.50	ug/L	1	A001857	04/07/10	04/08/10	
Bromoform	EPA 524.2	0.76	0.50	ug/L	1	A001857	04/07/10	04/08/10	
Chloroform	EPA 524.2	36	0.50	ug/L	1	A001857	04/07/10	04/08/10	
Dibromochloromethane	EPA 524.2	8.8	0.50	ug/L	1	A001857	04/07/10	04/08/10	
Total Trihalomethanes	EPA 524.2	65		ug/L					
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			102 %	<i>Acceptable range: 70-130 %</i>					
<i>Surrogate: 4-Bromofluorobenzene</i>			91 %	<i>Acceptable range: 70-130 %</i>					

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	2.2	1.0	ug/L	1	A001920	04/08/10	04/10/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	11	1.0	ug/L	1	A001920	04/08/10	04/10/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A001920	04/08/10	04/10/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A001920	04/08/10	04/10/10	
Total Haloacetic Acids (HAA)	EPA 552.2	23		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	9.6	1.0	ug/L	1	A001920	04/08/10	04/10/10	
<i>Surrogate: 2,3-Dibromopropionic Acid</i>			91 %	<i>Acceptable range: 70-130 %</i>					





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ELAP Certification Number: 2385

**Lab Number: AA65462**

Collection Date/Time: 4/14/2010 12:30 Sample Collector: LEAR, J  
 Submittal Date/Time: 4/14/2010 16:00 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	129		2	4/14/2010
Ammonia-N	4500NH3 D	mg/L	Not detected		0.05	4/27/2010
Arsenic, Total	200.8	ug/L	Not detected		1	4/23/2010
Barium, Total	200.8	ug/L	Not detected		10	4/23/2010
Bicarbonate (as HCO3-)	2320B	mg/L	157		10	4/16/2010
Boron	4500B-B	mg/L	Not detected		0.05	4/23/2010
Calcium	3111B	mg/L	42		1	4/23/2010
Carbonate as CaCO3	2320B	mg/L	Not detected		10	4/14/2010
Chloramines	SM 4500-Cl G	mg/L	0.09		0.05	4/14/2010
Chloride	300.0	mg/L	28		1	4/15/2010
Dissolved Organic Carbon	SM5310-C	mg/L	Attached	E	0.2	4/29/2010
Fluoride	300.0	mg/L	0.28		0.10	4/15/2010
Gross Alpha	EPA 900.0	pCi/L	0.187 +/-1.13	E		5/7/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		4/30/2010
Hardness (as CaCO3)	2340B	mg/L	158		10	5/10/2010
Iron, Dissolved	3111B	ug/L	Not detected		50	4/26/2010
Iron, Total	3111B	ug/L	Not detected		50	4/23/2010
Kjeldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.5	4/22/2010
Langlier Index ( 15 deg. C)	2330B		-0.25			4/26/2010
Langlier Index ( 60 deg. C)	2330B		0.35			4/26/2010
Lithium	EPA 200.8	ug/L	5		1	4/23/2010
Magnesium	3111B	mg/L	13		1	4/23/2010
Manganese, Dissolved	3111B	ug/L	Not detected		20	4/26/2010
Manganese, Total	3111B	ug/L	Not detected		20	4/23/2010
Methane	EPA 174/175	ug/L	Not detected	E	0.4	5/11/2010
Molybdenum, Total	200.8	ug/L	3		1	4/23/2010
Nickel, Total	200.8	ug/L	Not detected		10	4/23/2010
Nitrate as NO3	300.0	mg/L	Not detected		1	4/15/2010
Nitrate as NO3-N	300.0	mg/L	Not detected		0.1	4/15/2010
Nitrite as Nitrogen	300.0	mg/L	Not detected		0.1	4/15/2010
Nitrite as NO2-N	300.0	mg/L	Not detected		0.1	4/15/2010
o-Phosphate-P	300.0	mg/L	0.2		0.1	4/15/2010
pH (Laboratory)	4500-H+B	STD. Units	7.5			4/14/2010
Phosphorus, Total	HACH 8190	mg/L	0.25		0.03	4/22/2010
Potassium	3111B	mg/L	3.0		0.5	4/23/2010
QC Anion Sum x 100	Calculation	%	99%			5/10/2010
QC Anion-Cation Balance	Calculation	%	3			5/10/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

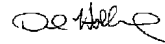
D = Method deviates from standard method due to insufficient sample for MS/MSD

J = Result is less than PQL

QC Cation Sum x 100	Calculation	%	<b>106%</b>			5/10/2010
QC Ratio TDS/SEC	Calculation		<b>0.61</b>			4/22/2010
Radium 226	EPA 903.1	pCi/L	<b>0.0662 +/-0.22</b>	E		5/10/2010
Selenium, Total	200.8	ug/L	<b>2</b>		2	4/23/2010
Sodium	3111B	mg/L	<b>40</b>		1	4/23/2010
Specific Conductance (E.C)	2510B	umhos/cm	<b>470</b>		1	4/15/2010
Strontium, Total	200.8	ug/L	<b>203</b>		5	4/23/2010
Sulfate	300.0	mg/L	<b>62</b>		1	4/15/2010
Total Diss. Solids	2540C	mg/L	<b>288</b>		10	4/19/2010
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.2	4/22/2010
Total Organic Carbon	SM5310C	mg/L	<b>Attached</b>	E	0.20	4/28/2010
Total Trihalomethanes (THMs)	EPA 524.2	ug/L	<b>21</b>	E	0.5	4/23/2010
Chloroform	EPA 524.2	ug/L	<b>8.6</b>	E	0.5	4/23/2010
Bromoform	EPA 524.2	ug/L	<b>0.71</b>	E	0.5	4/23/2010
Bromodichloromethane	EPA 524.2	ug/L	<b>6.9</b>	E	0.5	4/23/2010
Dibromochloromethane	EPA 524.2	ug/L	<b>4.8</b>	E	0.5	4/23/2010
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1	4/23/2010
Vanadium, Total	200.8	ug/L	<b>Not detected</b>		5	4/23/2010
Zinc, Total	200.8	ug/L	<b>183</b>		10	4/23/2010

Sample Comments:

Report Approved by:



David Holland  
Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD

J = Result is less than PQL

## ANALYTICAL RESULTS

Project: MPWMD/AA65462

Pace Project No.: 3026921

<b>Sample: Injectate</b>		<b>Lab ID: 3026921001</b>	Collected: 04/14/10 12:00	Received: 04/30/10 10:00	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0m	<b>0.187 ± 1.13 (2.96)</b>	pCi/L	05/07/10 08:33	12587-46-1	
Radium-226	EPA 903.1	<b>0.0662 ± 0.225 (0.487)</b>	pCi/L	05/10/10 12:04	13982-63-3	





**Certificate of Analysis**

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**Report Issue Date:** 05/03/2010 14:31  
**Received Date:** 04/21/2010  
**Received Time:** 07:40

**Lab Sample ID:** A0D1478-01  
**Sample Date:** 04/14/2010 12:30  
**Sample Type:** Grab  
**Sample Control Qualifiers:**

**Client Project:** MPWMD  
**Matrix:** Ground Water  
**Sampled by:** J Lear

**Sample Description:** Injectate // 65462

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
<b><u>Total Trihalomethanes by EPA 524.2</u></b>									
Bromodichloromethane	EPA 524.2	<b>6.9</b>	0.50	ug/L	1	A002540	04/22/10	04/23/10	
Bromoform	EPA 524.2	<b>0.71</b>	0.50	ug/L	1	A002540	04/22/10	04/23/10	
Chloroform	EPA 524.2	<b>8.6</b>	0.50	ug/L	1	A002540	04/22/10	04/23/10	
Dibromochloromethane	EPA 524.2	<b>4.8</b>	0.50	ug/L	1	A002540	04/22/10	04/23/10	
Total Trihalomethanes	EPA 524.2	<b>21</b>		ug/L					
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			113 %	<i>Acceptable range: 70-130 %</i>					
<i>Surrogate: 4-Bromofluorobenzene</i>			96 %	<i>Acceptable range: 70-130 %</i>					

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	<b>2.4</b>	1.0	ug/L	1	A002698	04/27/10	04/30/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	<b>5.5</b>	1.0	ug/L	1	A002698	04/27/10	04/30/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A002698	04/27/10	04/30/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	<b>2.8</b>	2.0	ug/L	1	A002698	04/27/10	04/30/10	
Total Haloacetic Acids (HAA)	EPA 552.2	<b>15</b>		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	<b>4.0</b>	1.0	ug/L	1	A002698	04/27/10	04/30/10	
<i>Surrogate: 2,3-Dibromopropionic Acid</i>			93 %	<i>Acceptable range: 70-130 %</i>					



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**Report Issue Date:** 05/03/2010 14:31  
**Received Date:** 04/21/2010  
**Received Time:** 07:40

**Lab Sample ID:** A0D1478-01  
**Sample Date:** 04/14/2010 12:30  
**Sample Type:** Grab

**Client Project:** MPWMD  
**Sampled by:** J Lear  
**Matrix:** Ground Water

**Sample Description:** Injectate // 65462

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**General Chemistry**

Dissolved Organic Carbon	SM 5310 C	1.1	0.20	mg/L	1	A002816	04/29/10	04/29/10	X01
Total Organic Carbon	SM 5310 C	1.4	0.20	mg/L	1	A002750	04/28/10	04/28/10	



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Page 1 of 1

Sunday, June 20, 2010

**Lab Number: AA66045**

Collection Date/Time: 5/7/2010 13:30 Sample Collector: LEAR, J  
Submittal Date/Time: 5/7/2010 15:45 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Haloacetic Acids	EPA 552	ug/L	<b>Attached</b>	E		60	5/19/2010
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		80	5/15/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director



**Certificate of Analysis**

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**Report Issue Date:** 05/25/2010 11:42  
**Received Date:** 05/13/2010  
**Received Time:** 07:40

**Lab Sample ID:** A0E0812-01  
**Sample Date:** 05/07/2010 13:30  
**Sample Type:** Grab  
**Sample Control Qualifiers:**

**Client Project:** MPWMD  
**Matrix:** Water  
**Sampled by:** J Lear

**Sample Description:** Injectate // 66045

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**Total Trihalomethanes by EPA 524.2**

Bromodichloromethane	EPA 524.2	<b>10</b>	0.50	ug/L	1	A003429	05/14/10	05/15/10	
Bromoform	EPA 524.2	<b>0.66</b>	0.50	ug/L	1	A003429	05/14/10	05/15/10	
Chloroform	EPA 524.2	<b>15</b>	0.50	ug/L	1	A003429	05/14/10	05/15/10	
Dibromochloromethane	EPA 524.2	<b>5.8</b>	0.50	ug/L	1	A003429	05/14/10	05/15/10	
Total Trihalomethanes	EPA 524.2	<b>32</b>		ug/L					

*Surrogate: 1,2-Dichlorobenzene-d4* 104 % *Acceptable range: 70-130 %*

*Surrogate: 4-Bromofluorobenzene* 89 % *Acceptable range: 70-130 %*

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	<b>2.3</b>	1.0	ug/L	1	A003452	05/15/10	05/19/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	<b>7.7</b>	1.0	ug/L	1	A003452	05/15/10	05/19/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	<b>2.0</b>	1.0	ug/L	1	A003452	05/15/10	05/19/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A003452	05/15/10	05/19/10	
Total Haloacetic Acids (HAA)	EPA 552.2	<b>19</b>		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	<b>7.2</b>	1.0	ug/L	1	A003452	05/15/10	05/19/10	

*Surrogate: 2,3-Dibromopropionic Acid* 97 % *Acceptable range: 70-130 %*





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Monday, June 21, 2010

**Lab Number: AA66124**

Collection Date/Time: 5/12/2010 11:00 Sample Collector: LEAR, J  
Submittal Date/Time: 5/12/2010 12:45 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	124		2		5/13/2010
Ammonia-N	4500NH3 D	mg/L	0.09		0.05		5/18/2010
Arsenic, Total	200.8	ug/L	Not detected		1	10	5/13/2010
Barium, Total	200.8	ug/L	61		10	1000	5/13/2010
Bicarbonate (as HCO3-)	2320B	mg/L	151		10		5/14/2010
Boron	4500B-B	mg/L	Not detected		0.05		5/13/2010
Calcium	3111B	mg/L	41		1		5/19/2010
Carbonate as CaCO3	2320B	mg/L	Not detected		10		5/13/2010
Chloramines	SM 4500-Cl G	mg/L	Not detected		0.05		5/12/2010
Chloride	300.0	mg/L	26		1	250	5/12/2010
Dissolved Organic Carbon	SM5310-C	mg/L	1.3	E	0.2		5/15/2010
Fluoride	300.0	mg/L	0.27		0.10	2.0	5/12/2010
Gross Alpha	EPA 900.0	pCi/L	-0.029+/-1.06	E		15	6/8/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	5/21/2010
Hardness (as CaCO3)	2340B	mg/L	160		10		5/26/2010
Iron, Dissolved	3111B	ug/L	Not detected		50	300	5/13/2010
Iron, Total	3111B	ug/L	55		50	300	5/13/2010
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.2		5/17/2010
Langlier Index ( 15 deg. C)	2330B		-0.29				5/26/2010
Langlier Index ( 60 deg. C)	2330B		0.31				5/26/2010
Lithium	EPA 200.8	ug/L	5		1		5/13/2010
Magnesium	3111B	mg/L	14		1		5/19/2010
Manganese, Dissolved	3111B	ug/L	Not detected		20	50	5/13/2010
Manganese, Total	3111B	ug/L	Not detected		20	50	5/13/2010
Methane	EPA 174/175	ug/L	Not detected	E	5		5/25/2010
Molybdenum, Total	200.8	ug/L	3		1	1000	5/13/2010
Nickel, Total	200.8	ug/L	Not detected		10	100	5/13/2010
Nitrate as NO3	300.0	mg/L	Not detected		0.2	45	5/12/2010
Nitrate as NO3-N	300.0	mg/L	Not detected		0.05	10	5/12/2010
Nitrite as Nitrogen	300.0	mg/L	Not detected		0.1	1.00	5/12/2010
Nitrite as NO2-N	300.0	mg/L	Not detected		0.1	1.00	5/12/2010
o-Phosphate-P	300.0	mg/L	0.5		0.05		5/12/2010
pH (Laboratory)	4500-H+B	STD. Units	7.5				5/12/2010
Phosphorus, Total	HACH 8190	mg/L	0.55		0.03		5/14/2010
Potassium	3111B	mg/L	2.9		0.5		5/19/2010
QC Anion Sum x 100	Calculation	%	98%				6/20/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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Monday, June 21, 2010

**Lab Number: AA66124**

Collection Date/Time: 5/12/2010 11:00 Sample Collector: LEAR, J  
Submittal Date/Time: 5/12/2010 12:45 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
QC Anion-Cation Balance	Calculation	%	<b>3</b>				6/20/2010
QC Cation Sum x 100	Calculation	%	<b>104%</b>				5/26/2010
QC Ratio TDS/SEC	Calculation		<b>0.63</b>				5/19/2010
Radium 226	EPA 903.1	pCi/L	<b>0.0535+/-0.348 E</b>			3	6/16/2010
Selenium, Total	200.8	ug/L	<b>Not detected</b>		2	50	5/13/2010
Sodium	3111B	mg/L	<b>41</b>		1		5/19/2010
Specific Conductance (E.C)	2510B	umhos/cm	<b>486</b>		1	900	5/13/2010
Strontium, Total	200.8	ug/L	<b>213</b>		5		5/13/2010
Sulfate	300.0	mg/L	<b>74</b>		1	250	5/12/2010
Total Diss. Solids	2540C	mg/L	<b>308</b>		10	500	5/13/2010
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.5		6/21/2010
Total Organic Carbon	SM5310C	mg/L	<b>1.3</b>	E	0.20		5/14/2010
Trihalomethanes	EPA 524.2	ug/L	<b>Attached</b>	E		80	5/19/2010
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1		5/13/2010
Vanadium, Total	200.8	ug/L	<b>Not detected</b>		5	1000	5/13/2010
Zinc, Total	200.8	ug/L	<b>242</b>		10	5000	5/13/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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Monday, June 21, 2010

**Lab Number: AA66125**

Collection Date/Time: 5/12/2010 10:30  
Submittal Date/Time: 5/12/2010 12:45

Sample Collector: LEAR, J  
Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM 4500-Cl G	mg/L	0.06		0.05		5/1/2010
Chloride	300.0	mg/L	24		1	250	5/12/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	5/21/2010
Trihalomethanes	EPA 524.2	ug/L	Attached	E		80	5/15/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



**Certificate of Analysis**

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**Report Issue Date:** 05/25/2010 15:53  
**Received Date:** 05/13/2010  
**Received Time:** 07:40

**Lab Sample ID:** A0E0811-01  
**Sample Date:** 05/12/2010 10:30  
**Sample Type:** Grab  
**Sample Control Qualifiers:**

**Matrix:** Water  
**Sampled by:** J Lear

**Sample Description:** MW-1 // 66125

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**Total Trihalomethanes by EPA 524.2**

Bromodichloromethane	EPA 524.2	<b>19</b>	0.50	ug/L	1	A003593	05/19/10	05/19/10	
Bromoform	EPA 524.2	<b>0.89</b>	0.50	ug/L	1	A003593	05/19/10	05/19/10	
Chloroform	EPA 524.2	<b>33</b>	0.50	ug/L	1	A003593	05/19/10	05/19/10	
Dibromochloromethane	EPA 524.2	<b>9.4</b>	0.50	ug/L	1	A003593	05/19/10	05/19/10	

*Surrogate: 1,2-Dichlorobenzene-d4* 93 % *Acceptable range: 70-130 %*  
*Surrogate: 4-Bromofluorobenzene* 88 % *Acceptable range: 70-130 %*

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	<b>2.2</b>	1.0	ug/L	1	A003586	05/19/10	05/21/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	<b>11</b>	1.0	ug/L	1	A003586	05/19/10	05/21/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A003586	05/19/10	05/21/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	<b>2.5</b>	2.0	ug/L	1	A003586	05/19/10	05/21/10	
Total Haloacetic Acids (HAA)	EPA 552.2	<b>24</b>		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	<b>8.9</b>	1.0	ug/L	1	A003586	05/19/10	05/21/10	

*Surrogate: 2,3-Dibromopropionic Acid* 83 % *Acceptable range: 70-130 %*



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Page 1 of 1

Wednesday, June 30, 2010

**Lab Number: AA66514**

Collection Date/Time: 6/2/2010 13:00 Sample Collector: LEAR, J  
Submittal Date/Time: 6/2/2010 14:15 Sample ID

**Sample Description: Injectate**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM 4500-Cl G	mg/L	Not detected		0.05		6/2/2010
Chloride	300.0	mg/L	23		1	250	6/3/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	6/17/2010
Trihalomethanes	EPA 524.2	ug/L	Attached	E		80	6/9/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director



**Certificate of Analysis**

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**Report Issue Date:** 06/17/2010 14:35  
**Received Date:** 06/04/2010  
**Received Time:** 07:15

**Lab Sample ID:** A0F0384-01      **Client Project:** MPWMD  
**Sample Date:** 06/02/2010 13:00      **Matrix:** Water  
**Sample Type:** Grab      **Sampled by:** J Lear  
**Sample Control Qualifiers:**  
**Sample Description:** Injectate // 66514

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**Total Trihalomethanes by EPA 524.2**

Bromodichloromethane	EPA 524.2	<b>8.6</b>	0.50	ug/L	1	A004316	06/08/10	06/09/10	
Bromoform	EPA 524.2	ND	0.50	ug/L	1	A004316	06/08/10	06/09/10	
Chloroform	EPA 524.2	<b>12</b>	0.50	ug/L	1	A004316	06/08/10	06/09/10	
Dibromochloromethane	EPA 524.2	<b>4.6</b>	0.50	ug/L	1	A004316	06/08/10	06/09/10	
Total Trihalomethanes	EPA 524.2	<b>25</b>		ug/L					

*Surrogate: 1,2-Dichlorobenzene-d4*      105 %      *Acceptable range: 70-130 %*  
*Surrogate: Bromofluorobenzene*      87 %      *Acceptable range: 70-130 %*

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	<b>2.2</b>	1.0	ug/L	1	A004498	06/11/10	06/17/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	<b>6.5</b>	1.0	ug/L	1	A004498	06/11/10	06/17/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A004498	06/11/10	06/17/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A004498	06/11/10	06/17/10	
Total Haloacetic Acids (HAA)	EPA 552.2	<b>15</b>		ug/L					
Trichloroacetic Acid (TCAA)	EPA 552.2	<b>6.6</b>	1.0	ug/L	1	A004498	06/11/10	06/17/10	

*Surrogate: 2,3-Dibromopropionic Acid*      100 %      *Acceptable range: 70-130 %*



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Page 1 of 1

Thursday, July 01, 2010

**Lab Number: AA66834**

Collection Date/Time: 6/15/2010 12:00 Sample Collector: LEAR J  
Submittal Date/Time: 6/15/2010 14:05 Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM 4500-Cl G	mg/L	Not detected		0.05		6/15/2010
Chloride	300.0	mg/L	26		1	250	6/17/2010
Haloacetic Acids	EPA 552	ug/L	Attached	E		60	6/26/2010
Trihalomethanes	EPA 524.2	ug/L	Attached	E		80	6/24/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director



**Certificate of Analysis**

David Holland  
Monterey Bay Analytical  
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**Report Issue Date:** 06/29/2010 14:02  
**Received Date:** 06/22/2010  
**Received Time:** 08:15

**Lab Sample ID:** A0F1632-01  
**Sample Date:** 06/15/2010 12:00  
**Sample Type:** Grab

**Client Project:** MPWMD  
**Sampled by:** J Lear  
**Matrix:** Ground Water

**Sample Description:** MW-1 // 66834

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**Total Trihalomethanes by EPA 524.2**

Bromodichloromethane	EPA 524.2	21	0.50	ug/L	1	A004979	06/23/10	06/24/10	
Bromoform	EPA 524.2	0.75	0.50	ug/L	1	A004979	06/23/10	06/24/10	
Chloroform	EPA 524.2	48	0.50	ug/L	1	A004979	06/23/10	06/24/10	
Dibromochloromethane	EPA 524.2	8.4	0.50	ug/L	1	A004979	06/23/10	06/24/10	

**[CALC]**

Total Trihalomethanes	EPA 524.2	78		ug/L					
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**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	2.7	1.0	ug/L	1	A004961	06/23/10	06/26/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	15	1.0	ug/L	1	A004961	06/23/10	06/26/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A004961	06/23/10	06/26/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	3.7	2.0	ug/L	1	A004961	06/23/10	06/26/10	
Trichloroacetic Acid (TCAA)	EPA 552.2	11	1.0	ug/L	1	A004961	06/23/10	06/26/10	

**[CALC]**

Total Haloacetic Acids (HAA)	EPA 552.2	33		ug/L					
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	<u>Method</u>	<u>Result</u>	
Surrogate: 1,2-Dichlorobenzene-d4	EPA 524.2	108 %	Acceptable range: 70-130 %
Surrogate: Bromofluorobenzene	EPA 524.2	93 %	Acceptable range: 70-130 %
Surrogate: 2,3-Dibromopropionic Acid	EPA 552.2	114 %	Acceptable range: 70-130 %





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 ELAP Certification Number: 2385

**Lab Number: AA66872**

Collection Date/Time: 6/16/2010 10:30 Sample Collector: LINDBERG, T  
 Submittal Date/Time: 6/16/2010 12:01 Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Arsenic, Total	200.8	ug/L	<b>Not detected</b>		1	10	6/25/2010
Barium, Total	200.8	ug/L	<b>58</b>		10	1000	6/25/2010
Chloramines	SM 4500-Cl G	mg/L	<b>Not detected</b>		0.05		6/16/2010
Chloride	300.0	mg/L	<b>28</b>		1	250	6/16/2010
Gross Alpha	EPA 900.0	pCi/L	<b>-0.108+/-1.22</b>	E		15	7/2/2010
Haloacetic Acids	EPA 552	ug/L	<b>37</b>	E		60	6/19/2010
Lithium	EPA 200.8	ug/L	<b>3</b>		1		6/25/2010
Methane	EPA 174/175	ug/L	<b>Not detected</b>	E	5		6/23/2010
Molybdenum, Total	200.8	ug/L	<b>2</b>		1	1000	6/25/2010
Radium 226	EPA 903.1	pCi/L	<b>-0.295+/-0.333</b>	E		3	7/12/2010
Selenium, Total	200.8	ug/L	<b>Not detected</b>		2	50	6/25/2010
Strontium, Total	200.8	ug/L	<b>222</b>		5		6/25/2010
Trihalomethanes	EPA 524.2	ug/L	<b>71</b>	E		80	6/18/2010
Uranium by ICP/MS	200.8	ug/L	<b>Not detected</b>		1		6/25/2010
Vanadium, Total	200.8	ug/L	<b>Not detected</b>		1	1000	6/25/2010
Zinc, Total	200.8	ug/L	<b>206</b>		10	5000	6/25/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director





**Certificate of Analysis**

**Report Date:** Wednesday, June 23, 2010  
**Received Date:** Thursday, June 17, 2010  
**Received Time:** 8:30 am  
**Turnaround Time:** Normal

**Client:** Monterey Bay Analytical Services  
 4 Justin Court, Suite D  
 Monterey, CA 93940

**Phones:** (831) 375-6227  
**Fax:** (831) 641-0734

**Attn:** David Holland  
**Project:** MPWMD

**P.O. #:**

Lab Sample ID: 0F17012-01	Sample ID: ASR-1									Matrix: Water
Sampled by: Lindberg,T	Sampled: 06/16/10 12:00	Sample Note: 66872								
Analyte	Result	DL	RL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Bromodichloromethane	23	0.13	0.50	ug/l	1x1	EPA 524.2	6/18/10	6/18/10 20:25	W0F0900	
Bromoform	0.87	0.17	0.50	ug/l	1x1	EPA 524.2	6/18/10	6/18/10 20:25	W0F0900	
Chloroform	36	0.17	0.50	ug/l	1x1	EPA 524.2	6/18/10	6/18/10 20:25	W0F0900	
Dibromochloromethane	11	0.19	0.50	ug/l	1x1	EPA 524.2	6/18/10	6/18/10 20:25	W0F0900	
THMs, Total	71		0.50	ug/l	1x1	EPA 524.2	6/18/10	6/18/10 20:25	W0F0900	
Surrogate: 1,2-Dichlorobenzene-d4	100 %		70-130							
Surrogate: 4-Bromofluorobenzene	100 %		70-130							
Dibromoacetic acid (dbaa)	3.3	0.13	1.0	ug/l	1x1	EPA 552.2	6/18/10	6/19/10 2:13	W0F0747	
Dichloroacetic acid (dcaa)	19	0.41	1.0	ug/l	1x1	EPA 552.2	6/18/10	6/19/10 2:13	W0F0747	
HAA5, Total	37		1.0	ug/l	1x1	EPA 552.2	6/18/10	6/19/10 2:13	W0F0747	
Monobromoacetic acid (mbaa)	ND	0.21	1.0	ug/l	1x1	EPA 552.2	6/18/10	6/19/10 2:13	W0F0747	
Monochloroacetic acid (mcaa)	ND	0.32	2.0	ug/l	1x1	EPA 552.2	6/18/10	6/19/10 2:13	W0F0747	
Trichloroacetic acid (tcaa)	15	0.22	1.0	ug/l	1x1	EPA 552.2	6/18/10	6/19/10 2:13	W0F0747	
Surrogate: 2,3-Dibromopropionic acid	111 %		70-130							

## ANALYTICAL RESULTS

Project: MPWMD/66872

Pace Project No.: 3030160

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**Sample: ASR-1 (66872)**      **Lab ID: 3030160001**      Collected: 06/16/10 10:30      Received: 06/24/10 10:30      Matrix: Drinking Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>-0.108 ± 1.22 (2.93)</b>	pCi/L	07/02/10 07:27	12587-46-1	
Radium-226	EPA 903.1	<b>-0.295 ± 0.333 (0.944)</b>	pCi/L	07/12/10 12:01	13982-63-3	



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Thursday, August 26, 2010

**Lab Number: AA68047**

Collection Date/Time: 7/29/2010 16:00 Sample Collector: LINDBERG, T  
Submittal Date/Time: 7/29/2010 16:20 Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	127		2		8/6/2010
Ammonia-N	4500NH3 D	mg/L	Not Detected		0.05		8/17/2010
Arsenic, Total	EPA200.8	ug/L	Not detected		1	10	8/3/2010
Barium, Total	EPA200.8	ug/L	55		10	1000	8/3/2010
Boron	EPA200.7	mg/L	Not detected		0.05		8/6/2010
Calcium	EPA200.7	mg/L	41		1		8/6/2010
Chloramines	SM4500-Cl G	mg/L	Not Detected		0.05		7/29/2010
Chloride	EPA300.0	mg/L	28		1	250	7/30/2010
Dissolved Organic Carbon	SM5310-C	mg/L	1.2	E	0.2		8/18/2010
Gross Alpha	EPA900.0	pCi/L	2.06+/-0.771	E		15	8/5/2010
Haloacetic Acids	EPA552	ug/L	20	E		60	8/6/2010
Iron	EPA 200.7	ug/L	25		10		8/6/2010
Iron, Dissolved	EPA 200.7	ug/L	19		10	300	8/6/2010
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.2		8/3/2010
Lithium	EPA200.8	ug/L	6		1		8/3/2010
Magnesium	EPA200.7	mg/L	7		1		8/6/2010
Manganese, Dissolved	EPA 200.7	ug/L	Not Detected		10	50	8/6/2010
Manganese, Total	EPA 200.7	ug/L	Not Detected		10	50	8/6/2010
Methane	EPA174/175	ug/L	Not detected	E	5		8/5/2010
Molybdenum, Total	EPA200.8	ug/L	3		1	1000	8/3/2010
Nitrate as NO3-N	EPA300.0	mg/L	0.06		0.05	10	7/30/2010
Nitrite as Nitrogen	EPA300.0	mg/L	Not detected		0.05	1.00	7/30/2010
Nitrite as NO2-N	EPA300.0	mg/L	Not detected		0.05	1.00	7/30/2010
o-Phosphate-P	EPA300.0	mg/L	0.23		0.05		7/30/2010
pH (Laboratory)	4500-H+B	STD. Units	7.3				7/29/2010
Phosphorus, Total	HACH 8190	mg/L	0.34		0.03		8/9/2010
Potassium	EPA200.7	mg/L	2.9		0.5		8/6/2010
Radium 226	EPA903.1	pCi/L	0.058+/-0.198	E		3	8/12/2010
Selenium, Total	EPA200.8	ug/L	3		2	50	8/3/2010
Sodium	EPA200.7	mg/L	42		1		8/6/2010
Specific Conductance (E.C)	2510B	umhos/cm	493		1	900	8/2/2010
Strontium, Total	EPA200.8	ug/L	217		5		8/3/2010
Sulfate	EPA300.0	mg/L	78		1	250	7/30/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



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Thursday, August 26, 2010

**Lab Number: AA68047**

Collection Date/Time: 7/29/2010 16:00      Sample Collector: LINDBERG, T  
Submittal Date/Time: 7/29/2010 16:20      Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Total Diss. Solids	2540C	mg/L	<b>308</b>		10	500	8/3/2010
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.2		8/9/2010
Total Organic Carbon	SM5310C	mg/L	<b>1.3</b>	E	0.20		8/10/2010
Dibromochloromethane	EPA 524.2	ug/L	<b>7.5</b>		0.5		8/4/2010
Bromodichloromethane	EPA 524.2	ug/L	<b>21</b>		0.5		8/4/2010
Chloroform	EPA 524.2	ug/L	<b>54</b>		0.5		8/4/2010
Total Trihalomethanes (THMs)	EPA 524.2	ug/L	<b>84</b>		0.5	80	8/4/2010
Bromoform	EPA 524.2	ug/L	<b>0.66</b>		0.5		8/4/2010
Uranium by ICP/MS	EPA200.8	ug/L	<b>Not detected</b>		1		8/3/2010
Vanadium, Total	EPA200.8	ug/L	<b>Not detected</b>		1	1000	8/3/2010
Zinc, Total	EPA200.8	ug/L	<b>196</b>		10	5000	8/3/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

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Thursday, August 26, 2010

**Lab Number: AA68048**

Collection Date/Time: 7/29/2010 16:00 Sample Collector: LINDBERG, T  
Submittal Date/Time: 7/29/2010 16:20 Sample ID

**Sample Description: MW1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	135		2		8/6/2010
Ammonia-N	4500NH3 D	mg/L	Not Detected		0.05		8/17/2010
Arsenic, Total	EPA200.8	ug/L	3		1	10	8/3/2010
Barium, Total	EPA200.8	ug/L	44		10	1000	8/3/2010
Boron	EPA200.7	mg/L	Not detected		0.05		8/6/2010
Calcium	EPA200.7	mg/L	50		1		8/6/2010
Chloramines	SM4500-Cl G	mg/L	Not Detected		0.05		7/29/2010
Chloride	EPA300.0	mg/L	30		1	250	7/30/2010
Dissolved Organic Carbon	SM5310-C	mg/L	1.1	E	0.2		8/18/2010
Gross Alpha	EPA900.0	pCi/L	4.43+/-1.37	E		15	8/5/2010
Haloacetic Acids	EPA552	ug/L	2.8	E		60	8/6/2010
Iron	EPA 200.7	ug/L	3310		10		8/6/2010
Iron, Dissolved	EPA 200.7	ug/L	Not Detected		10	300	8/6/2010
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	Not detected		0.2		8/3/2010
Lithium	EPA200.8	ug/L	10		1		8/3/2010
Magnesium	EPA200.7	mg/L	13		1		8/6/2010
Manganese, Dissolved	EPA 200.7	ug/L	Not Detected		10	50	8/6/2010
Manganese, Total	EPA 200.7	ug/L	111		10	50	8/6/2010
Methane	EPA174/175	ug/L	Not detected	E	5		8/5/2010
Molybdenum, Total	EPA200.8	ug/L	3		1	1000	8/3/2010
Nitrate as NO3-N	EPA300.0	mg/L	0.07		0.05	10	7/30/2010
Nitrite as Nitrogen	EPA300.0	mg/L	Not detected		0.05	1.00	7/30/2010
Nitrite as NO2-N	EPA300.0	mg/L	Not detected		0.05	1.00	7/30/2010
o-Phosphate-P	EPA300.0	mg/L	Not detected		0.05		7/30/2010
pH (Laboratory)	4500-H+B	STD. Units	7.6				7/29/2010
Phosphorus, Total	HACH 8190	mg/L	0.24		0.03		8/9/2010
Potassium	EPA200.7	mg/L	3.9		0.5		8/6/2010
Radium 226	EPA903.1	pCi/L	0.822+/-0.622	E		3	8/12/2010
Selenium, Total	EPA200.8	ug/L	Not detected		2	50	8/3/2010
Sodium	EPA200.7	mg/L	46		1		8/6/2010
Specific Conductance (E.C)	2510B	umhos/cm	499		1	900	8/2/2010
Strontium, Total	EPA200.8	ug/L	236		5		8/3/2010
Sulfate	EPA300.0	mg/L	80		1	250	7/30/2010

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

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Thursday, August 26, 2010

**Lab Number: AA68048**

Collection Date/Time: 7/29/2010 16:00      Sample Collector: LINDBERG, T  
Submittal Date/Time: 7/29/2010 16:20      Sample ID

**Sample Description: MW1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Total Diss. Solids	2540C	mg/L	<b>318</b>		10	500	8/3/2010
Total Nitrogen	Calculation	mg/L	<b>Not Detected</b>		0.2		8/9/2010
Total Organic Carbon	SM5310C	mg/L	<b>1.2</b>	E	0.20		8/10/2010
Total Trihalomethanes (THMs)	EPA 524.2	ug/L	<b>77</b>		0.5	80	8/4/2010
Dibromochloromethane	EPA 524.2	ug/L	<b>6.9</b>		0.5		8/4/2010
Bromoform	EPA 524.2	ug/L	<b>0.61</b>		0.5		8/4/2010
Bromodichloromethane	EPA 524.2	ug/L	<b>19</b>		0.5		8/4/2010
Chloroform	EPA 524.2	ug/L	<b>50</b>		0.5		8/4/2010
Uranium by ICP/MS	EPA200.8	ug/L	<b>Not detected</b>		1		8/3/2010
Vanadium, Total	EPA200.8	ug/L	<b>7</b>		1	1000	8/3/2010
Zinc, Total	EPA200.8	ug/L	<b>19</b>		10	5000	8/3/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD



### ANALYTICAL RESULTS

Project: Monterey Peninsula Water Mgmt.

Pace Project No.: 3031902

Sample: <b>ASR 1</b>		Lab ID: <b>3031902001</b>	Collected: 07/29/10 16:00	Received: 08/03/10 10:00	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0m	<b>2.06 ± 0.771 (0.155)</b>	pCi/L	08/05/10 18:53	12587-46-1	
Radium-226	EPA 903.1	<b>0.0583 ± 0.198 (0.429)</b>	pCi/L	08/12/10 12:47	13982-63-3	

Sample: <b>MW1</b>		Lab ID: <b>3031902002</b>	Collected: 07/29/10 16:00	Received: 08/03/10 10:00	Matrix: Water	
PWS:		Site ID:	Sample Type:			
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0m	<b>4.43 ± 1.37 (1.29)</b>	pCi/L	08/05/10 20:23	12587-46-1	
Radium-226	EPA 903.1	<b>0.822 ± 0.622 (0.763)</b>	pCi/L	08/12/10 12:47	13982-63-3	



**Certificate of Analysis**

David Holland  
Monterey Bay Analytical  
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Monterey, CA 93940

**Report Issue Date:** 08/10/2010 10:45  
**Received Date:** 08/03/2010  
**Received Time:** 08:00

**Lab Sample ID:** A0H0076-01  
**Sample Date:** 07/29/2010 16:00  
**Sample Type:** Grab

**Client Project:** Monterey Regional Water Management District  
**Sampled by:** J Lear  
**Matrix:** Drinking Water

**Sample Description:** ASR 1 // 68047

**General Chemistry**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
Total Organic Carbon	SM 5310 C	1.3	0.20	mg/L	1	A006966	08/10/10	08/10/10	

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**Total Trihalomethanes by EPA 524.2**

Bromodichloromethane	EPA 524.2	21	0.50	ug/L	1	A006763	08/04/10	08/04/10	
Bromoform	EPA 524.2	0.66	0.50	ug/L	1	A006763	08/04/10	08/04/10	
Chloroform	EPA 524.2	54	0.50	ug/L	1	A006763	08/04/10	08/04/10	
Dibromochloromethane	EPA 524.2	7.5	0.50	ug/L	1	A006763	08/04/10	08/04/10	

**[CALC]**

Total Trihalomethanes EPA 524.2 **84** ug/L

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	ND	1.0	ug/L	1	A006767	08/04/10	08/06/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	4.0	1.0	ug/L	1	A006767	08/04/10	08/06/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A006767	08/04/10	08/06/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A006767	08/04/10	08/06/10	
Trichloroacetic Acid (TCAA)	EPA 552.2	16	1.0	ug/L	1	A006767	08/04/10	08/06/10	

**[CALC]**

Total Haloacetic Acids (HAA) EPA 552.2 **20** ug/L

	<u>Method</u>	<u>Result</u>	
Surrogate: 1,2-Dichlorobenzene-d4	EPA 524.2	110 %	Acceptable range: 70-130 %
Surrogate: Bromofluorobenzene	EPA 524.2	87 %	Acceptable range: 70-130 %
Surrogate: 2,3-Dibromopropionic Acid	EPA 552.2	98 %	Acceptable range: 70-130 %



**Certificate of Analysis**

David Holland  
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**Report Issue Date:** 08/10/2010 10:45  
**Received Date:** 08/03/2010  
**Received Time:** 08:00

**Lab Sample ID:** A0H0076-02  
**Sample Date:** 07/29/2010 16:00  
**Sample Type:** Grab

**Client Project:** Monterey Regional Water Management District  
**Sampled by:** J Lear  
**Matrix:** Drinking Water

**Sample Description:** MW 1 // 68048

**General Chemistry**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
Total Organic Carbon	SM 5310 C	1.2	0.20	mg/L	1	A006966	08/10/10	08/10/10	

**Organics**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
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**Total Trihalomethanes by EPA 524.2**

Bromodichloromethane	EPA 524.2	19	0.50	ug/L	1	A006763	08/04/10	08/04/10	
Bromoform	EPA 524.2	0.61	0.50	ug/L	1	A006763	08/04/10	08/04/10	
Chloroform	EPA 524.2	50	0.50	ug/L	1	A006763	08/04/10	08/04/10	
Dibromochloromethane	EPA 524.2	6.9	0.50	ug/L	1	A006763	08/04/10	08/04/10	

**[CALC]**

Total Trihalomethanes EPA 524.2 77 ug/L

**Haloacetic Acids**

Dibromoacetic Acid (DBAA)	EPA 552.2	ND	1.0	ug/L	1	A006767	08/04/10	08/06/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	2.8	1.0	ug/L	1	A006767	08/04/10	08/06/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A006767	08/04/10	08/06/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A006767	08/04/10	08/06/10	
Trichloroacetic Acid (TCAA)	EPA 552.2	ND	1.0	ug/L	1	A006767	08/04/10	08/06/10	

**[CALC]**

Total Haloacetic Acids (HAA) EPA 552.2 2.8 ug/L

	Method	Result	Acceptable range:
Surrogate: 1,2-Dichlorobenzene-d4	EPA 524.2	108 %	70-130 %
Surrogate: Bromofluorobenzene	EPA 524.2	89 %	70-130 %
Surrogate: 2,3-Dibromopropionic Acid	EPA 552.2	96 %	70-130 %



Certificate of Analysis

David Holland
Monterey Bay Analytical
4 Justin Court Suite D
Monterey, CA 93940

Report Issue Date: 08/19/2010 11:39
Received Date: 08/10/2010
Received Time: 08:30

Lab Sample ID: A0H0710-01
Sample Date: 08/02/2010 12:45
Sample Type: Grab

Sampled by: Lindberg, T
Matrix: Water

Sample Description: PRTIW // 68120

General Chemistry

Table with 10 columns: Analyte, Method, Result, RL, Units, Dil., Batch, Prepared, Analyzed, Qualifiers. Row 1: Dissolved Organic Carbon, SM 5310 C, 0.79, 0.20, mg/L, 1, A007401, 08/18/10, 08/18/10



**Certificate of Analysis**

David Holland  
Monterey Bay Analytical  
4 Justin Court Suite D  
Monterey, CA 93940

**Report Issue Date:** 08/19/2010 11:39  
**Received Date:** 08/10/2010  
**Received Time:** 08:30

**Lab Sample ID:** A0H0710-02  
**Sample Date:** 08/02/2010 14:45  
**Sample Type:** Grab

**Sampled by:** Lindberg, T  
**Matrix:** Water

**Sample Description:** SCS-Deep // 68121

**General Chemistry**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
Dissolved Organic Carbon	SM 5310 C	0.54	0.20	mg/L	1	A007401	08/18/10	08/18/10	





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 ELAP Certification Number: 2385

**Lab Number: AA69141**

Collection Date/Time: 9/10/2010 10:45 Sample Collector: LEAR J  
 Submittal Date/Time: 9/10/2010 12:44 Sample ID

**Sample Description: ASR 1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Arsenic, Total	EPA200.8	ug/L	Not Detected		1	10	9/21/2010
Barium, Total	EPA200.8	ug/L	57		10	1000	9/21/2010
Chloramines	SM4500-Cl G	mg/L	Not Detected				9/10/2010
Chloride	EPA300.0	mg/L	29		1	250	9/11/2010
Gross Alpha	EPA900.0	pCi/L	-0.152 ± 0.825	E		15	9/25/2010
Haloacetic Acids	EPA552	ug/L	Not Detected	E		60	9/21/2010
Lithium	EPA200.8	ug/L	6		1		9/21/2010
Methane	EPA174/175	ug/L	Not Detected	E	5		9/17/2010
Molybdenum, Total	EPA200.8	ug/L	5		1	1000	9/21/2010
Radium 226	EPA903.1	pCi/L	-0.071 ± 0.239	E		3	9/27/2010
Selenium, Total	EPA200.8	ug/L	2		2	50	9/21/2010
Strontium, Total	EPA200.8	ug/L	216		5		9/21/2010
Trihalomethanes	EPA524.2	ug/L	77	E		80	9/20/2010
Uranium by ICP/MS	EPA200.8	ug/L	Not Detected		1		9/21/2010
Vanadium, Total	EPA200.8	ug/L	Not Detected		1	1000	9/21/2010
Zinc, Total	EPA200.8	ug/L	187		10	5000	9/21/2010

Sample Comments:

**Lab Number: AA69142**

Collection Date/Time: 9/10/2010 10:20 Sample Collector: LEAR J  
 Submittal Date/Time: 9/10/2010 12:44 Sample ID

**Sample Description: MW 1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Haloacetic Acids	EPA552	ug/L	9.1	E		60	9/21/2010
Trihalomethanes	EPA524.2	ug/L	9.6	E		80	9/20/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director





## ANALYTICAL RESULTS

Project: Monterey Peninsula Water Mgmt.  
Pace Project No.: 3034173

**Sample: ASR 1/69141**      **Lab ID: 3034173001**      Collected: 09/10/10 10:45      Received: 09/16/10 10:00      Matrix: Drinking Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	EPA 900.0	<b>-0.152 ± 0.825 (2.22)</b>	pCi/L	09/25/10 19:39	12587-46-1	
Radium-226	EPA 903.1	<b>-0.071 ± 0.239 (0.655)</b>	pCi/L	09/27/10 13:16	13982-63-3	



Monterey Bay Analytical Services  
4 Justin Court, Suite D  
Monterey CA, 93940

**Report ID:** 0115018  
**Project ID:** Monterey Peninsula water  
Management Distric

**Date Received:** 09/15/10 10:30  
**Date Reported:** 09/23/10 16:47

**0115018-01 ASR-1**

**Sampled:** 09/10/10 10:45

**Sampled By:** lear, J

**Matrix:** Water

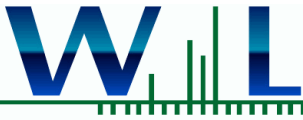
**Sample Note:** 66872

**HAAs by EPA 552.2**

Method: EPA 552.2	Batch: W0I0645	Prepared: 09/17/10 07:41	Analyzed: 09/21/10 18:56	Analyst: aal		
Analyte	Result	MDL	MRL	Units	Dilution	Qualifier
Dibromoacetic acid (dbaa)	ND	0.13	1.0	ug/l	1x1	
Dichloroacetic acid (dcaa)	ND	0.41	1.0	ug/l	1x1	
HAA5, Total	ND		1.0	ug/l	1x1	
Monobromoacetic acid (mbaa)	ND	0.21	1.0	ug/l	1x1	
Monochloroacetic acid (mcaa)	ND	0.32	2.0	ug/l	1x1	
Trichloroacetic acid (tcaa)	ND	0.22	1.0	ug/l	1x1	
<i>Surrogate: 2,3-Dibromopropionic acid</i>	96 %		70-130			

**Volatile Organic Compounds by EPA Method 524.2**

Method: EPA 524.2	Batch: W0I0805	Prepared: 09/20/10 08:38	Analyzed: 09/20/10 17:16	Analyst: mdt		
Analyte	Result	MDL	MRL	Units	Dilution	Qualifier
<b>Bromodichloromethane</b>	<b>20</b>	0.13	0.50	ug/l	1x1	
<b>Bromoform</b>	<b>0.60</b>	0.17	0.50	ug/l	1x1	
<b>Chloroform</b>	<b>48</b>	0.17	0.50	ug/l	1x1	
<b>Dibromochloromethane</b>	<b>8.3</b>	0.19	0.50	ug/l	1x1	
<b>THMs, Total</b>	<b>77</b>		0.50	ug/l	1x1	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	100 %		70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	96 %		70-130			



Monterey Bay Analytical Services  
4 Justin Court, Suite D  
Monterey CA, 93940

**Report ID:** 0115018  
**Project ID:** Monterey Peninsula water  
Management Distric

**Date Received:** 09/15/10 10:30  
**Date Reported:** 09/23/10 16:47

**0115018-02 MW1**

**Sampled:** 09/10/10 10:20

**Sampled By:** lear, J

**Matrix:** Water

**Sample Note:** 66872

**HAAs by EPA 552.2**

Method: EPA 552.2	Batch: W010645	Prepared: 09/17/10 07:41	Analyzed: 09/21/10 19:23	Analyst: aal		
Analyte	Result	MDL	MRL	Units	Dilution	Qualifier
Dibromoacetic acid (dbaa)	ND	0.13	1.0	ug/l	1x1	
<b>Dichloroacetic acid (dcaa)</b>	<b>1.9</b>	0.41	1.0	ug/l	1x1	
<b>HAA5, Total</b>	<b>9.1</b>		1.0	ug/l	1x1	
Monobromoacetic acid (mbaa)	ND	0.21	1.0	ug/l	1x1	
Monochloroacetic acid (mcaa)	ND	0.32	2.0	ug/l	1x1	
<b>Trichloroacetic acid (tcaa)</b>	<b>7.2</b>	0.22	1.0	ug/l	1x1	
<i>Surrogate: 2,3-Dibromopropionic acid</i>	<i>101 %</i>		<i>70-130</i>			

**Volatile Organic Compounds by EPA Method 524.2**

Method: EPA 524.2	Batch: W010660	Prepared: 09/16/10 00:00	Analyzed: 09/17/10 05:51	Analyst: dav		
Analyte	Result	MDL	MRL	Units	Dilution	Qualifier
<b>Bromodichloromethane</b>	<b>2.5</b>	0.13	0.50	ug/l	1x1	
Bromoform	ND	0.17	0.50	ug/l	1x1	
<b>Chloroform</b>	<b>6.0</b>	0.17	0.50	ug/l	1x1	
<b>Dibromochloromethane</b>	<b>1.1</b>	0.19	0.50	ug/l	1x1	
<b>THMs, Total</b>	<b>9.6</b>		0.50	ug/l	1x1	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	<i>106 %</i>		<i>70-130</i>			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>100 %</i>		<i>70-130</i>			



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 ELAP Certification Number: 2385

**Lab Number: AA70142**

Collection Date/Time: 10/8/2010 13:15 Sample Collector: LEAR J  
 Submittal Date/Time: 10/8/2010 13:50 Sample ID

**Sample Description: ASR-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Arsenic, Total	EPA200.8	ug/L	Not Detected		1	10	10/18/2010
Barium, Total	EPA200.8	ug/L	55		10	1000	10/18/2010
Chloramines	SM4500-Cl G	mg/L	Not Detected		0.05		10/8/2010
Chloride	EPA300.0	mg/L	34		1	250	10/8/2010
Gross Alpha	EPA900.0	pCi/L	1.09 ± 1.58	E		15	10/18/2010
Haloacetic Acids	EPA552	ug/L	7.9	E		60	10/16/2010
Lithium	EPA200.8	ug/L	6		1		10/18/2010
Methane	EPA174/175	ug/L	Not Detected	E	5		10/14/2010
Molybdenum, Total	EPA200.8	ug/L	5		1	1000	10/18/2010
Selenium, Total	EPA200.8	ug/L	2		2	50	10/18/2010
Strontium, Total	EPA200.8	ug/L	226		5		10/18/2010
Total Radium 226	EPA903.0	pCi/L	0.096 ± 0.165	E		3	10/22/2010
Trihalomethanes	EPA524.2	ug/L	65	E		80	10/15/2010
Uranium by ICP/MS	EPA200.8	ug/L	Not Detected		1		10/18/2010
Vanadium, Total	EPA200.8	ug/L	Not Detected		1	1000	10/18/2010
Zinc, Total	EPA200.8	ug/L	182		10	5000	10/18/2010

Sample Comments:

**Lab Number: AA70143**

Collection Date/Time: 10/8/2010 12:50 Sample Collector: LEAR J  
 Submittal Date/Time: 10/8/2010 13:50 Sample ID

**Sample Description: MW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM4500-Cl G	mg/L	Not Detected		0.05		10/8/2010
Chloride	EPA300.0	mg/L	30		1	250	10/8/2010
Haloacetic Acids	EPA552	ug/L	Not Detected	E		60	10/17/2010
Trihalomethanes	EPA524.2	ug/L	49	E		80	10/15/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director





Analytical Chemists  
October 25, 2010

Lab ID : SP 1010582-001  
Customer ID : 2-19144

**Monterey Bay Analytical Services**  
4 Justin Court  
Monterey, CA 93940

Sampled On : October 8, 2010-13:15  
Sampled By : J. Lear  
Received On : October 14, 2010-14:15  
Matrix : Drinking Water

Description : ASR-1  
Project : MPWMD

### Sample Result - Radio

Constituent	Result ± Error	MDA	Units	MCL/AL	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
<b>Radio Chemistry<sup>P-1</sup></b>								
Gross Alpha	1.09 ± 1.58	2.01	pCi/L	15/5	900.0	10/15/10:210778	900.0	10/18/10:213438
Total Alpha Radium (226)	0.096 ± 0.165	0.471	pCi/L	3	903.0	10/18/10:210864	903.0	10/22/10:213432

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (P) Plastic Preservatives: N/A

MDA = Minimum Detectable Activity (Calculated at the 95% confidence level) = Data utilized by DHS to determine matrix interference.  
MCL / AL = Maximum Contamination Level / Action Level. Alpha's Action Level of 5 pCi/L is based on the Assigned Value (AV).  
AV = (Gross Alpha Result + (0.84 x Error)). CCR Section 64442: Drinking Water Compliance Note: Do the following  
If Gross Alpha's (AV) exceeds 5 pCi/L run Uranium. If Gross Alpha's (AV) minus Uranium exceeds 5 pCi/L run Radium 226.

Drinking Water Compliance:  
Gross Alpha (AV) minus Uranium is less than or equal to 15 pCi/L  
Uranium is less than or equal to 20 pCi/L  
Radium 226 + Radium 228 is less than or equal to 5 pCi/L

Note: Samples are held for 3-6 months prior to disposal.



**Certificate of Analysis**

David Holland  
Monterey Bay Analytical  
4 Justin Court Suite D  
Monterey, CA 93940

**Report Issue Date:** 10/25/2010 14:30  
**Received Date:** 10/13/2010  
**Received Time:** 08:00

**Lab Sample ID:** A0J0916-01  
**Sample Date:** 10/08/2010 13:15  
**Sample Type:** Grab

**Client Project:** MPWMD  
**Sampled by:** J Lear  
**Matrix:** Drinking Water

**Sample Description:** ASR-1 // 70142

**Organics**

Analyte	Method	Result	RL	Units	RL Mult	Batch	Prepared	Analyzed	Qualifiers
<b><u>Total Trihalomethanes by EPA 524.2</u></b>									
Bromodichloromethane	EPA 524.2	15	0.50	ug/L	1	A010029	10/14/10	10/15/10	
Bromoform	EPA 524.2	0.60	0.50	ug/L	1	A010029	10/14/10	10/15/10	
Chloroform	EPA 524.2	44	0.50	ug/L	1	A010029	10/14/10	10/15/10	
Dibromochloromethane	EPA 524.2	5.8	0.50	ug/L	1	A010029	10/14/10	10/15/10	
<b><u>Total Trihalomethanes by EPA 524.2</u></b>									
Total Trihalomethanes	EPA 524.2	65		ug/L					
<b><u>Haloacetic Acids</u></b>									
Dibromoacetic Acid (DBAA)	EPA 552.2	ND	1.0	ug/L	1	A010058	10/14/10	10/16/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	2.3	1.0	ug/L	1	A010058	10/14/10	10/16/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A010058	10/14/10	10/16/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A010058	10/14/10	10/16/10	
Trichloroacetic Acid (TCAA)	EPA 552.2	5.6	1.0	ug/L	1	A010058	10/14/10	10/16/10	
<b><u>Haloacetic Acids</u></b>									
Total Haloacetic Acids (HAA)	EPA 552.2	7.9		ug/L					

	<u>Method</u>	<u>Result</u>	
Surrogate: Bromofluorobenzene	EPA 524.2	105 %	Acceptable range: 70-130 %
Surrogate: 2,3-Dibromopropionic Acid	EPA 552.2	86 %	Acceptable range: 70-130 %



**Certificate of Analysis**

David Holland  
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**Report Issue Date:** 10/25/2010 14:30  
**Received Date:** 10/13/2010  
**Received Time:** 08:00

**Lab Sample ID:** A0J0916-02  
**Sample Date:** 10/08/2010 12:50  
**Sample Type:** Grab

**Client Project:** MPWMD  
**Sampled by:** J Lear  
**Matrix:** Drinking Water

**Sample Description:** MW-1 // 70143

**Organics**

Analyte	Method	Result	RL	Units	RL Mult	Batch	Prepared	Analyzed	Qualifiers
<b><u>Total Trihalomethanes by EPA 524.2</u></b>									
Bromodichloromethane	EPA 524.2	12	0.50	ug/L	1	A010029	10/14/10	10/15/10	
Bromoform	EPA 524.2	ND	0.50	ug/L	1	A010029	10/14/10	10/15/10	
Chloroform	EPA 524.2	34	0.50	ug/L	1	A010029	10/14/10	10/15/10	
Dibromochloromethane	EPA 524.2	4.0	0.50	ug/L	1	A010029	10/14/10	10/15/10	
<b><u>Total Trihalomethanes by EPA 524.2</u></b>									
Total Trihalomethanes	EPA 524.2	49		ug/L					
<b><u>Haloacetic Acids</u></b>									
Dibromoacetic Acid (DBAA)	EPA 552.2	ND	1.0	ug/L	1	A010058	10/14/10	10/17/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	ND	1.0	ug/L	1	A010058	10/14/10	10/17/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A010058	10/14/10	10/17/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A010058	10/14/10	10/17/10	
Trichloroacetic Acid (TCAA)	EPA 552.2	ND	1.0	ug/L	1	A010058	10/14/10	10/17/10	
<b><u>Haloacetic Acids</u></b>									
Total Haloacetic Acids (HAA)	EPA 552.2	ND		ug/L					

	<u>Method</u>	<u>Result</u>	
Surrogate: Bromofluorobenzene	EPA 524.2	93 %	Acceptable range: 70-130 %
Surrogate: 2,3-Dibromopropionic Acid	EPA 552.2	91 %	Acceptable range: 70-130 %





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 ELAP Certification Number: 2385

**Lab Number: AA69616**

Collection Date/Time: 9/24/2010 12:30 Sample Collector: LINDBERG T  
 Submittal Date/Time: 9/24/2010 13:45 Sample ID

**Sample Description: SSMS TW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Alkalinity, Total (as CaCO3)	2320B	mg/L	232		2		9/27/2010
Ammonia-N	4500NH3 D	mg/L	0.18		0.05		10/1/2010
Arsenic, Total	EPA200.8	ug/L	6		1	10	10/5/2010
Barium, Total	EPA200.8	ug/L	44		10	1000	10/5/2010
Bicarbonate (as HCO3-)	2320B	mg/L	283		10		9/27/2010
Boron	EPA200.7	mg/L	0.06		0.05		9/28/2010
Calcium	EPA200.7	mg/L	72		0.5		9/28/2010
Carbonate as CaCO3	2320B	mg/L	Not Detected		10		9/27/2010
Chloramines	SM4500-Cl G	mg/L	Not Detected		0.05		9/24/2010
Chloride	EPA300.0	mg/L	107		1	250	9/24/2010
Dissolved Organic Carbon	SM5310-C	mg/L	0.58	E	0.2		10/21/2010
Fluoride	EPA300.0	mg/L	0.20		0.10	2.0	9/24/2010
Gross Alpha	EPA900.0	pCi/L	1.09+/-1.58	E		15	10/18/2010
Haloacetic Acids	EPA552	ug/L	Not Detected	E		60	10/2/2010
Hardness (as CaCO3)	2340B	mg/L	242		10		9/29/2010
Iron	EPA 200.7	ug/L	50		10		9/28/2010
Iron, Dissolved	EPA 200.7	ug/L	34		10	300	9/28/2010
Kjehldahl Nitrogen	4500-NH3 B,C,E	mg/L	0.5		0.2		10/2/2010
Langlier Index ( 15 deg. C)	2330B		0.39				10/4/2010
Langlier Index ( 60 deg. C)	2330B		0.98				10/4/2010
Lithium	EPA200.8	ug/L	28		1		10/5/2010
Magnesium	EPA200.7	mg/L	15		0.5		9/28/2010
Manganese, Dissolved	EPA 200.7	ug/L	28		10	50	9/28/2010
Manganese, Total	EPA 200.7	ug/L	29		10	50	9/28/2010
Methane	EPA174/175	ug/L	Not Detected	E	5		9/30/2010
Molybdenum, Total	EPA200.8	ug/L	8		1	1000	10/5/2010
Nickel, Total	EPA200.8	ug/L	Not Detected		10	100	10/5/2010
Nitrate as NO3	EPA300.0	mg/L	1		1	45	9/24/2010
Nitrate as NO3-N	EPA300.0	mg/L	0.13		0.05	10	9/24/2010
Nitrite as Nitrogen	EPA300.0	mg/L	Not Detected		0.05	1.00	9/24/2010
Nitrite as NO2-N	EPA300.0	mg/L	Not Detected		0.05	1.00	9/24/2010
o-Phosphate-P	EPA300.0	mg/L	Not Detected		0.05		9/24/2010
pH (Laboratory)	4500-H+B	STD. Units	7.7				9/24/2010
Phosphorus, Total	HACH 8190	mg/L	0.05		0.03		9/28/2010

mg/L: Milligrams per liter ug/L : Micrograms per liter PQL : Practical Quantitation Limit MCL: Maximum Contamination Level  
 H = Analyzed outside of hold time E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

**Lab Number: AA69616**

Collection Date/Time: 9/24/2010 12:30  
 Submittal Date/Time: 9/24/2010 13:45

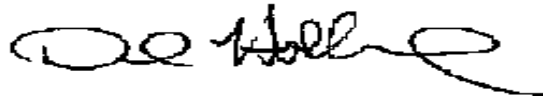
Sample Collector: LINDBERG T  
 Sample ID

**Sample Description: SSMS TW-1**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Potassium	EPA200.7	mg/L	4.4		0.1		9/28/2010
QC Anion Sum x 100	Calculation	%	100%				9/29/2010
QC Anion-Cation Balance	Calculation	%	2				9/29/2010
QC Cation Sum x 100	Calculation	%	105%				9/29/2010
QC Ratio TDS/SEC	Calculation		0.58				10/4/2010
Radium 226	EPA903.1	pCi/L	0.096+/-0.115	E		3	10/22/2010
Selenium, Total	EPA200.8	ug/L	3		2	50	10/5/2010
Sodium	EPA200.7	mg/L	97		0.5		9/28/2010
Specific Conductance (E.C)	2510B	umhos/cm	873		1	900	9/24/2010
Strontium, Total	EPA200.8	ug/L	367		5		10/5/2010
Sulfate	EPA300.0	mg/L	52		1	250	9/24/2010
Total Diss. Solids	2540C	mg/L	505		10	500	9/30/2010
Total Nitrogen	Calculation	mg/L	0.6		0.5		10/26/2010
Total Organic Carbon	SM5310C	mg/L	0.62	E	0.20		10/7/2010
Trihalomethanes	EPA524.2	ug/L	Not Detected	E		80	10/2/2010
Uranium by ICP/MS	EPA200.8	ug/L	3		1		10/5/2010
Vanadium, Total	EPA200.8	ug/L	Not Detected		1	1000	10/5/2010
Zinc, Total	EPA200.8	ug/L	Not Detected		10	5000	10/5/2010

Sample Comments:

Report Approved by:



David Holland, Laboratory Director

mg/L: Milligrams per liter    ug/L : Micrograms per liter    PQL : Practical Quantitation Limit    MCL: Maximum Contamination Level  
 H = Analyzed outside of hold time    E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

# Amended



## Certificate of Analysis

David Holland  
Monterey Bay Analytical  
4 Justin Court Suite D  
Monterey, CA 93940

**Report Issue Date:** 10/22/2010 16:28  
**Received Date:** 09/29/2010  
**Received Time:** 08:00

**Lab Sample ID:** A012205-01  
**Sample Date:** 09/24/2010 12:30  
**Sample Type:** Grab

**Client Project:** Monterey Peninsula Water Mgmt. District  
**Sampled by:** Lindberg, T  
**Matrix:** Drinking Water

**Sample Description:** SSMS-TW-1 // 69616

### General Chemistry

Analyte	Method	Result	RL	Units	RL Mult	Batch	Prepared	Analyzed	Qualifiers
Dissolved Organic Carbon	SM 5310 C	0.58	0.20	mg/L	1	A010400	10/21/10	10/21/10	
Total Organic Carbon	SM 5310 C	0.62	0.20	mg/L	1	A009749	10/07/10	10/07/10	

### Organics

Analyte	Method	Result	RL	Units	RL Mult	Batch	Prepared	Analyzed	Qualifiers
<b>Total Trihalomethanes by EPA 524.2</b>									
Bromodichloromethane	EPA 524.2	ND	0.50	ug/L	1	A009350	10/01/10	10/02/10	
Bromoform	EPA 524.2	ND	0.50	ug/L	1	A009350	10/01/10	10/02/10	
Chloroform	EPA 524.2	ND	0.50	ug/L	1	A009350	10/01/10	10/02/10	
Dibromochloromethane	EPA 524.2	ND	0.50	ug/L	1	A009350	10/01/10	10/02/10	

### Total Trihalomethanes by EPA 524.2

Total Trihalomethanes EPA 524.2 ND ug/L

### Haloacetic Acids

Dibromoacetic Acid (DBAA)	EPA 552.2	ND	1.0	ug/L	1	A009342	09/30/10	10/02/10	
Dichloroacetic Acid (DCAA)	EPA 552.2	ND	1.0	ug/L	1	A009342	09/30/10	10/02/10	
Monobromoacetic Acid (MBAA)	EPA 552.2	ND	1.0	ug/L	1	A009342	09/30/10	10/02/10	
Monochloroacetic Acid (MCAA)	EPA 552.2	ND	2.0	ug/L	1	A009342	09/30/10	10/02/10	
Trichloroacetic Acid (TCAA)	EPA 552.2	ND	1.0	ug/L	1	A009342	09/30/10	10/02/10	

### Haloacetic Acids

Total Haloacetic Acids (HAA) EPA 552.2 ND ug/L

	<u>Method</u>	<u>Result</u>	
Surrogate: Bromofluorobenzene	EPA 524.2	96 %	Acceptable range: 70-130 %
Surrogate: 2,3-Dibromopropionic Acid	EPA 552.2	100 %	Acceptable range: 70-130 %



Analytical Chemists  
October 25, 2010

Lab ID : SP 1010582-001  
Customer ID : 2-19144

**Monterey Bay Analytical Services**  
4 Justin Court  
Monterey, CA 93940

Sampled On : October 8, 2010-13:15  
Sampled By : J. Lear  
Received On : October 14, 2010-14:15  
Matrix : Drinking Water

Description : ASR-1  
Project : MPWMD

### Sample Result - Radio

Constituent	Result ± Error	MDA	Units	MCL/AL	Sample Preparation		Sample Analysis	
					Method	Date/ID	Method	Date/ID
<b>Radio Chemistry<sup>P,1</sup></b>								
Gross Alpha	1.09 ± 1.58	2.01	pCi/L	15/5	900.0	10/15/10:210778	900.0	10/18/10:213438
Total Alpha Radium (226)	0.096 ± 0.165	0.471	pCi/L	3	903.0	10/18/10:210864	903.0	10/22/10:213432

ND=Non-Detected. PQL=Practical Quantitation Limit. Containers: (P) Plastic Preservatives: N/A

MDA = Minimum Detectable Activity (Calculated at the 95% confidence level) = Data utilized by DHS to determine matrix interference.  
MCL / AL = Maximum Contamination Level / Action Level. Alpha's Action Level of 5 pCi/L is based on the Assigned Value (AV).  
AV = (Gross Alpha Result + (0.84 x Error)). CCR Section 64442: Drinking Water Compliance Note: Do the following  
If Gross Alpha's (AV) exceeds 5 pCi/L run Uranium. If Gross Alpha's (AV) minus Uranium exceeds 5 pCi/L run Radium 226.

Drinking Water Compliance:  
Gross Alpha (AV) minus Uranium is less than or equal to 15 pCi/L  
Uranium is less than or equal to 20 pCi/L  
Radium 226 + Radium 228 is less than or equal to 5 pCi/L

Note: Samples are held for 3-6 months prior to disposal.





**PRIOR TO SHIPPING - COMPLETE ALL FIELDS**  
 Location: ORD GROVE WELL 02 SiteID: 2710004-024  
 Sample Type (RAW, EFF, DIST, etc.): RAW  
 Sampler's First Initial and Last Name: S. JACOBSON  
 Date Sampled: 07/08/10 Time Sampled: 1035 Military (24 hr) Format  
 Contact Person: SUSAN JACOBSON  
 Relinquished by: [Signature] 2  
 Date/Time Relinq: 07/08/10 2  
 For compliance purposes?: NO  
 State Reporting Required?: NO  
 CCR Report?: NO

COMMENTS: 1st g 2 (begin/end season) special  
 on-line ASR monitoring

Sample ID #	QC Type	Analysis	Method	Pre-Preservation	FIELD PRESERVATION			Analysis Codes
					Preservation Description	Date	Time	
CP30348		METALS	EPA 200.8	Nitric Acid	None			\$2008CAASR

(As, Ba, Fe, Mn, Mo, Se, Sr, V, Zn)  
 mpwmd  
 Cl<sub>2</sub> = NP  
 conduct = 873  
 Temp<sup>oc</sup> = 23.2  
 pH = 6.9  
 ORP = 212 mV  
 H<sub>2</sub>S = NP  
 DO = 5.0  
 Field  
 pH 4.97  
 TOC 21.4  
 Cl<sub>2</sub> 0.04 ppm  
 H<sub>2</sub>S 19 µg/L  
 conductivity (EC) 870  
 DO (mBAs) 6.00 ppm  
 DO  
 ORP  
 SDI  
 (1st air)

PWSID: CA2710004

CA 703

CHAIN OF CUSTODY # 10080989

Facility ID:

MONTEREY DISTRICT



PRIOR TO SHIPPING - COMPLETE ALL FIELDS

Location: ORD GROVE WELL 02 SiteID: 2710004-024

Sample Type (RAW, EFF, DIST, etc.) RAW

Sampler's First Initial and Last Name S. JACOBSON

Date Sampled 11/09/10 Time Sampled 1300 Military (24 hr) Format

Contact Person SUSAN JACOBSON

Relinquished by [Signature] 2

Date/Time Relinq 11/10/10 1630 2

For compliance purposes? NO

State Reporting by Lab? NO

CCR Report? NO

FOR LAB USE ONLY

AFFIX LABEL  
Temperature, °C  
Tracking #  
Shipping Method  
Received Date  
Received Time  
Received by

Lab Comments:

COMMENTS: 2nd of 2 Chgins (End of Season) monitoring  
abt gear - special bi-annual ASK.  
on-line

Sample ID #	QC Type	Analysis	Method	Pre-Preservation	FIELD PRESERVATION			Analysis Codes
					Preservation Description	Date	Time	
CP71785		METALS	EPA 200.8	Nitric Acid	None			\$2008CAASR

(As, Ba, Fe, Mn, Mo, Se, Sr, V, Zn)

MPWMD

ORP  
SDI

Field

pH 6.93  
Toc 22.9

Cl2 0.02

H2S 9 µg/L  
conductivity (EC) 665 µmhos  
DO (meas) 5.90

**PRIOR TO SHIPPING - COMPLETE ALL FIELDS**  
Location: PARALTA WELL  
SiteID: 2710004-048

Sample Type (RAW, EFF, DIST, etc.) RAW  
Sampler's First Initial and Last Name S. JACOBSON  
Date Sampled 07/08/10 1335 Military (24 hr) Format  
Contact Phone # 831-646-3259

Contact Person SUSAN JACOBSON  
Relinquished by [Signature] 2 3 4  
Date/Time Relinq [Signature] 2 3 4  
For compliance purposes? NO  
State Reporting Required? NO  
CCR Report?: NO

FOR LAB USE ONLY  
Temperature °C  
Tracking #  
Shipping Method  
Received Date  
Received Time  
Received by  
Lab Comments:

APRIL  
LABEL

COMMENTS: 1st & 2nd Season Special ASR monitoring

FIELD PRESERVATION		Analysis Codes	
Preservation Description	Date	Time	Initials
None			

Field

PH 7.48 (MPWMD = 6.8)  
TOC 22.1 (MPWMD = 21.6)  
Cl<sub>2</sub> 0.05 (MPWMD = ND)  
H<sub>2</sub>S 25 µg/L  
Conductivity (EC) 752  
MPWMD = 770  
DO (MBS) 6.70 ppm  
DO (MPWMD) 4.0 ppm  
ORP (MPWMD) 173 RmV  
SDI  
(NO air)

used chemetrics  
Vial Chem etec  
NOT working

(As, Ba, Fe, Mn, Mo, Se, Sr, V, Zn)

ND (MPWMD) ←



**CHAIN OF CUSTODY # 10080990**



**PRIOR TO SHIPPING - COMPLETE ALL FIELDS**

Location: PARALTA WELL SiteID: 2710004-048

Sample Type (RAW, EFF, DIST, etc.) RAW

Sampler's First Initial and Last Name S. JACOBSON

Date Sampled 11/09/10 Time Sampled 1330 Military (24 hr) Format

Contact Person SUSAN JACOBSON

Relinquished by 1 2 3 4

Date/Time Relinq 1 11/09/10 2 3 4

For compliance purposes? NO

State Reporting by Lab? NO

CCR Report?: NO

COMMENTS: 2nd of 2 Chg in / End of Season  
 no air. Special bi-annual ASK  
 on-line monitoring

FOR LAB USE ONLY

Temperature, °C

Tracking #

Shipping Method

Received Date

Received Time

Received by

Lab Comments:

**AFFIX LABEL**

Sample ID #	QC Type	Analysis	Method	Pre-Preservation	FIELD PRESERVATION			Analysis Codes
					Preservation Description	Date	Time	
CP71786		METALS	EPA 200.8	Nitric Acid	None			\$2008CAASR

(As, Ba, Fe, Mn, Mo, Se, Sr, V, Zn)

~~ASST~~  
 MPWMO  
 -ORP  
 -SDI

Field  
 pH 7.16  
 TOC 22.3  
 Cl2 0.00 ppm  
 H2S 0.027 ppm  
 conductivity = 760  
 DO (mBAS) = 5.90 ppm  
 ORP 578/11/09/10



AMERICAN WATER

**AMERICAN WATER WORKS SERVICE COMPANY, INC.**

Central Laboratory - 1115 South Illinois Street Belleville, IL 62220-3102  
Phone: (618)235-3600 - Fax: (618)235-6349



**DBP Analysis Report**

CALIFORNIA-AMERICAN WATER CO  
MONTEREY DISTRICT  
LESLIE JORDAN  
PO BOX 951  
MONTEREY CA 93942-0951

PWS ID: CA2710004  
County: MONTEREY  
Facility ID:  
Site ID: 2710004-024

Date of Report: 07/15/10  
Drinking Water Certification No.: 01161CA  
Federal Lab ID No.: IL00028

**Report Summary**

Location ORD GROVE WELL 02  
Sample Type RAW

Collection Date: 07/08/10  
Collection Time: 10:35  
SDG: 791029

Received Date: 07/09/10  
Received Time: 09:00  
Received Temp: 3 °C

**Case Narrative:**

TOTAL HAA (5) Result: 0  
TOTAL THM Result: 0

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Technical Director or Designee



CA 703

**10070042**

COC and Report Number

Starting Sample: CP62003

Page 1 of 2

## Report Details

Sample Number: CP62003

Regulated Haloacetic Acids	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
DIBROMOACETIC ACID		SM6251BMOD	82721		1.0	ND	ug/L	BC	07/14/10	21:13
DICHLOROACETIC ACID		SM6251BMOD	77288		1.0	ND	ug/L	BC	07/14/10	21:13
MONOBROMOACETIC ACID		SM6251BMOD	A-041		1.0	ND	ug/L	BC	07/14/10	21:13
MONOCHLOROACETIC ACID		SM6251BMOD			1.0	ND	ug/L	BC	07/14/10	21:13
TRICHLOROACETIC ACID		SM6251BMOD			1.0	ND	ug/L	BC	07/14/10	21:13
HAA5 TOTAL		SM6251BMOD	A-049	60	1.0	ND	ug/L	BC	07/14/10	21:13

Sample Number: CP62003

Unregulated Haloacetic Acids	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
BROMOCHLOROACETIC ACID		SM6251BMOD	A-038		1.0	ND	ug/L	BC	07/14/10	21:13

Sample Number: CP62006

Trihalomethanes	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
BROMOFORM		502.2R2.1	32104		0.5	ND	ug/L	CRK	07/09/10	22:06
BROMODICHLOROMETHANE		502.2R2.1	32101		0.5	ND	ug/L	CRK	07/09/10	22:06
CHLORODIBROMOMETHANE		502.2R2.1	32105		0.5	ND	ug/L	CRK	07/09/10	22:06
CHLOROFORM		502.2R2.1	32106		0.5	ND	ug/L	CRK	07/09/10	22:06
TOTAL TRIHALOMETHANES		502.2R2.1	82080	80	0.5	ND	ug/L	CRK	07/09/10	22:06



CA	703
<b>10070042</b>	
COC and Report Number	

Starting Sample: CP62003  
Page 2 of 2



AMERICAN WATER

**AMERICAN WATER WORKS SERVICE COMPANY, INC.**

Central Laboratory - 1115 South Illinois Street Belleville, IL 62220-3102  
Phone: (618)235-3600 - Fax: (618)235-6349



**Inorganic Chemical (IOC) Analysis Report**

CALIFORNIA-AMERICAN WATER CO  
MONTEREY DISTRICT  
LESLIE JORDAN  
PO BOX 951  
MONTEREY CA 93942-0951

PWS ID: CA2710004  
County: MONTEREY  
Facility:  
Site ID: 2710004-024

Date of Report: 07/15/10  
Drinking Water Certification No.: 01161CA  
Federal Lab ID No.: IL00028

**Report Summary**

Location ORD GROVE WELL 02  
Sample Type RAW

Collection Date: 07/08/10  
Collection Time: 10:35  
SDG: 791029

Received Date: 07/09/10  
Received Time: 09:00  
Received Temp: 3 °C

**Case Narrative:**

Results are at or above the reporting limit for the following analytes:

ARSENIC	MOLYBDENUM
SELENIUM	MANGANESE
BARIIUM	STRONTIUM

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Technical Director or Designee



CA	703
<b>10040543</b>	
COC and Report Number	

Starting Sample: CP30348

## Report Details

Sample Number: CP30348

ICP Metals	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time
IRON		200.7R4.4	01045	0.3(s)	0.06	ND	mg/L	LG	07/12/10 13:07
STRONTIUM		200.7R4.4			0.050	0.362	mg/L	LG	07/12/10 13:07

Sample Number: CP30348

ICP/MS Metals	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time
ARSENIC		200.8R5.4	01002	0.010	0.001	0.002	mg/L	LG	07/13/10 13:24
SELENIUM		200.8R5.4		0.05	0.002	0.006	mg/L	LG	07/13/10 13:24
BARIUM		200.8R5.4	01007	1	0.001	0.053	mg/L	LG	07/12/10 12:32
MANGANESE		200.8R5.4	01055	0.05(s)	0.010	0.018	mg/L	LG	07/12/10 12:32
ZINC		200.8R5.4	01092	5.0(s)	0.050	ND	mg/L	LG	07/12/10 12:32
MOLYBDENUM		200.8R5.4	01062		0.001	0.006	mg/L	LG	07/12/10 12:32
VANADIUM		200.8R5.4	01087		0.050	ND	mg/L	LG	07/12/10 12:32



CA	703
<b>10040543</b>	
COC and Report Number	

Starting Sample: CP30348



AMERICAN WATER

**AMERICAN WATER WORKS SERVICE COMPANY, INC.**

Central Laboratory - 1115 South Illinois Street Belleville, IL 62220-3102  
Phone: (618)235-3600 - Fax: (618)235-6349



**DBP Analysis Report**

CALIFORNIA-AMERICAN WATER CO  
MONTEREY DISTRICT  
LESLIE JORDAN  
PO BOX 951  
MONTEREY CA 93942-0951

PWS ID: CA2710004  
County: MONTEREY  
Facility ID:  
Site ID: 2710004-024

Date of Report: 12/03/10  
Lab Certification No.: 01161CA  
Federal Lab ID No.: IL00028

**Report Summary**

Location ORD GROVE WELL 02  
Sample Type RAW

Collection Date: 11/09/10  
Collection Time: 13:00  
SDG: 11121015

Received Date: 11/12/10  
Received Time: 09:00  
Received Temp: 6 °C

**Case Narrative:**

Results are at or above the reporting limit for the following analytes:

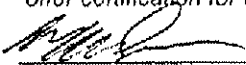
MONOCHLOROACETIC ACID

TOTAL HAA (5) Result: 1.8

TOTAL THM Result: 0

Revised report to correct DV Code per utility request

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\_\_\_\_\_  
Technical Director or Designee



CA 703

**10080195**

COC and Report Number

**REVISED  
12/3/2010**

Starting Sample: CP69594  
Page 1 of 2

## Report Details

Sample Number: CP69594

Regulated Haloacetic Acids	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
DIBROMOACETIC ACID		SM6251BMOD	82721		1.0	ND	ug/L	KAY	11/18/10	02:41
DICHLOROACETIC ACID		SM6251BMOD	77288		1.0	ND	ug/L	KAY	11/18/10	02:41
MONOBROMOACETIC ACID		SM6251BMOD	A-041		1.0	ND	ug/L	KAY	11/18/10	02:41
MONOCHLOROACETIC ACID		SM6251BMOD			1.0	1.8	ug/L	KAY	11/18/10	02:41
TRICHLOROACETIC ACID		SM6251BMOD			1.0	ND	ug/L	KAY	11/18/10	02:41
HAA5 TOTAL		SM6251BMOD	A-049	60	1.0	1.8	ug/L	KAY	11/18/10	02:41

Sample Number: CP69594

Unregulated Haloacetic Acids	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
BROMOCHLOROACETIC ACID		SM6251BMOD	A-038		1.0	ND	ug/L	KAY	11/18/10	02:41

Sample Number: CP69598

Trihalomethanes	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
BROMOFORM		502.2R2.1	32104		0.5	ND	ug/L	TD	11/12/10	23:35
BROMODICHLOROMETHANE		502.2R2.1	32101		0.5	ND	ug/L	TD	11/12/10	23:35
CHLORODIBROMOMETHANE		502.2R2.1	32105		0.5	ND	ug/L	TD	11/12/10	23:35
CHLOROFORM		502.2R2.1	32106		0.5	ND	ug/L	TD	11/12/10	23:35
TOTAL TRIHALOMETHANES		502.2R2.1	82080	80	0.5	ND	ug/L	TD	11/12/10	23:35

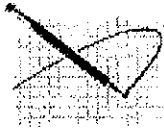


CA 703

**10080195**  
COC and Report Number

**REVISED**  
**12/3/2010**

Starting Sample: CP69594  
Page 2 of 2



Leslie  
Jordan/CAWC/AWWSC  
12/03/2010 12:52 PM

To Alyssa A Webb/SERVCO/AWWSC@AWW  
cc  
bcc

Subject November monitoring

Alyssa  
Can you please change the DVCode on a couple of samples?

Chain of Custody	Sample Location	Sample Date	Starting Sample	DVCode in
Powerflow 10080195 703	Actual DVCode Ord Grove Well 02	11/09/2010	CP69594	714
10080215 703	Paralta Well	11/09/2010	CP69671	714

Thank you

Leslie

Leslie Q. Jordan, Water Quality Superintendent  
California American Water  
Central Division  
leslie.jordan@amwater.com  
1-831-646-3258 (desk)  
1-831-236-7533 (cell)  
1-831-375-4367 (fax)





# Report Details

Sample Number: CP71785

ICP Metals	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time
IRON		200.7R4.4	01045	0.3(s)	0.06	ND	mg/L	JLG	11/15/10 12:46
STRONTIUM		200.7R4.4			0.050	0.370	mg/L	JLG	11/15/10 12:46

Sample Number: CP71785

ICP/MS Metals	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time
ARSENIC		200.8R5.4	01002	0.010	0.001	0.002	mg/L	LKR	11/18/10 13:50
BARIUM		200.8R5.4	01007	1	0.001	0.052	mg/L	LKR	11/18/10 13:50
MANGANESE		200.8R5.4	01055	0.05(s)	0.010	0.018	mg/L	LKR	11/18/10 13:50
SELENIUM		200.8R5.4	01147	0.05	0.002	0.007	mg/L	LKR	11/18/10 13:50
ZINC		200.8R5.4	01092	5.0(s)	0.050	ND	mg/L	LKR	11/18/10 13:50
MOLYBDENUM		200.8R5.4	01062		0.001	0.006	mg/L	LKR	11/18/10 13:50
VANADIUM		200.8R5.4	01087		0.050	ND	mg/L	LKR	11/18/10 13:50



CA 703  
10080989  
CDC and Report Number

Starting Sample: CP71785  
Page 2 of 2



**MONTEREY BAY ANALYTICAL SERVICES**

PRECISION • ACCURACY • DEPENDABILITY

4 Justin Court Suite D, Monterey, CA 93940

831.375.MBAS

montereybayanalytical@usa.net

ELAP Certification Number: 2385

Cal Am Water Company  
Susy Jacobson / Leslie Jordan  
511 Pacific Lodge Road, Suite 100  
Pacific Grove, CA 93950

Page 1 of 1

Thursday, August 12, 2010

**Lab Number: AA67417**

Collection Date/Time: 7/8/2010 10:35  
Submittal Date/Time: 7/8/2010 14:11

Sample Collector: JACOBSON S  
Sample ID

**Sample Description: Ord Grove Well 02**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM4500-Cl G	mg/L	Not detected		0.05		7/8/2010
Chlorine Residual (Field Test)	4500-Cl G	mg/L	0.04		0.05	2.00	7/8/2010
Dissolved Oxygen	4500-O G	mg/L	6.00		0.5		7/8/2010
Lithium	EPA200.8	ug/L	17		1		8/3/2010
Methane	EPA174/175	ug/L	1.0	E	5		7/22/2010

Sample Comments:

**Lab Number: AA67418**

Collection Date/Time: 7/8/2010 13:35  
Submittal Date/Time: 7/8/2010 14:11

Sample Collector: JACOBSON S  
Sample ID

**Sample Description: Paralta Well**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM4500-Cl G	mg/L	Not detected		0.05		7/8/2010
Chlorine Residual (Field Test)	4500-Cl G	mg/L	0.05		0.05	2.00	7/8/2010
Dissolved Oxygen	4500-O G	mg/L	6.70		0.5		7/8/2010
Lithium	EPA200.8	ug/L	21		1		8/3/2010
Methane	EPA174/175	ug/L	0.89	E	5		7/22/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter ug/L: Micrograms per liter PQL: Practical Quantitation Limit MCL: Maximum Contamination Level  
H = Analyzed outside of hold time E = Analysis performed by External Laboratory; See External Laboratory Report attachments.



**MONTEREY BAY ANALYTICAL SERVICES**

**PRECISION • ACCURACY • DEFENDABILITY**

4 Justin Court Suite D, Monterey, CA 93940

831.375.MBAS

montereybayanalytical@usa.net

ELAP Certification Number: 2385

Cal Am Water Company  
Susy Jacobson / Leslie Jordan  
511 Pacific Lodge Road, Suite 100  
Pacific Grove, CA 93950

Thursday, November 18, 2010

**Lab Number: AA70945**

Collection Date/Time: 11/9/2010 13:00 Sample Collector: JACOBSON, S  
Submittal Date/Time: 11/9/2010 14:15 Sample ID

**Sample Description: Ord Grove Well 02**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM4500-Cl G	mg/L	Not Detected		0.05		11/9/2010
Dissolved Oxygen	4500-O G	mg/L	7.95		0.5		11/9/2010
Lithium	EPA200.8	ug/L	24		1		11/12/2010
Methane	EPA174/175	ug/L	1.1	E	5		11/15/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD

**Certificate of Analysis**

Leslie Jordan  
 California American Water  
 PO Box 951  
 Monterey, CA 93942-0951

**Report Issue Date:** 8/13/2010 14:46  
**Received Date:** 07/15/2010  
**Received Time:** 09:00

**Lab Sample ID:** A0G1095-01

**Sample Date:** 07/08/2010 10:35

**Sample Type:** Grab

**Sampled by:** Susy Jacobson

**Matrix:** Ground Water

**Sample Description:** Ord Grove Well 02

**Metals**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
*Uranium	EPA 200.8	1.1	1.0	ug/L	1	A006346	07/26/10	07/26/10	
*Uranium, Radiological		0.73		pCi/L					

**Radiological**

Analyte	Method	Result	Units	MDA	Batch	Prepared	Analyzed	Qualifiers
*Gross Alpha	EPA 00-02	5.30	pCi/L	2.41	A006333	07/26/10	07/26/10	
*1.65 Sigma Uncertainty		0.360	±					



Pace Analytical Services, Inc.  
 1638 Roseytown Road - Suites 2,3,4  
 Greensburg, PA 15601  
 (724)850-5600

**ANALYTICAL RESULTS**

Project: A0G1095  
 Pace Project No.: 3031484

Sample: A0G1095-01/Ord Grove Well 02 Lab ID: 3031484001 Collected: 07/08/10 10:35 Received: 07/26/10 10:00 Matrix: Drinking Water

PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.91 ± 0.718 (0.484)	pCi/L	08/05/10 10:59	13982-63-3	
Radium-228	EPA 904.0	1.35 ± 0.486 (0.853)	pCi/L	08/11/10 12:17	15262-20-1	

Sample: A0G1095-02/Paralta Well Lab ID: 3031484002 Collected: 07/08/10 13:35 Received: 07/26/10 10:00 Matrix: Drinking Water

PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.03 ± 0.733 (0.677)	pCi/L	08/05/10 10:59	13982-63-3	
Radium-228	EPA 904.0	2.01 ± 0.513 (0.811)	pCi/L	08/11/10 12:18	15262-20-1	





Pace Analytical Services, Inc.  
 1638 Roseytown Road - Suites 2,3,4  
 Greensburg, PA 15601  
 (724)850-5600

**ANALYTICAL RESULTS**

Project: A0K0907  
 Pace Project No.: 3037757

Sample: A0K0907-01/Ord Grove Well 02 Lab ID: 3037757001 Collected: 11/09/10 13:00 Received: 11/23/10 10:00 Matrix: Drinking Water

PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	3.14 ± 0.938 (0.198)	pCi/L	12/09/10 13:22	13982-63-3	

Sample: A0K0907-02/Paralta Well Lab ID: 3037757002 Collected: 11/09/10 13:30 Received: 11/23/10 10:00 Matrix: Drinking Water

PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.12 ± 0.639 (0.694)	pCi/L	12/09/10 13:22	13982-63-3	



RADIOACTIVITY ANALYSIS (9/99)

Date of Report: 10/12/15 Sample ID No.3037757001/K0907-01  
 Laboratory Signature Lab  
 Name: PACE ANALYTICAL SERVICES, INC-GREENSBURG Director: *Carol Comaforemk 12/15/10*  
 Name of Sampler: Susy Jacobson Employed By: CA American Water  
 Date/Time Sample Date/Time Sample Date Analyses  
 Collected: 10/11/09/1300 Received @ Lab: 10/11/23/1000 Completed: 10/12/09

=====  
 System System  
 Name: CAL AM WATER COMPANY - MONTEREY Number: 2710004  
 Name or Number of Sample Source: ORD GROVE WELL 02 - RAW  
 \*\*\*\*\*  
 \* User ID: HEN Station Number: 2710004-024 \*  
 \* Date/Time of Sample: |10|11|09|1300| Laboratory Code: 0010 \*  
 \* YY MM DD TTTT YY MM DD \*  
 \* Date Analysis completed: |10|12|09| \*  
 \* Submitted by: Phone #: \*  
 \*\*\*\*\*

MCL REPORT	CHEMICAL	STORET	ANALYSES	DLR
UNITS		CODE	RESULTS	
pCi/L	TITLE 22 CALIFORNIA CODE OF REGULATIONS			
pCi/L	SECTION 64442 (22 CCR 64442)			
15 pCi/L	Gross Alpha	01501		3.0
pCi/L	Gross Alpha Counting Error	01502		
pCi/L	Gross Alpha MDA95 *	A-072		
20 pCi/L	Uranium	28012		1.0
pCi/L	Uranium Counting Error	A-028		
pCi/L	Uranium MDA95	A-073		
pCi/L	Radium 226	09501	3.14	1.0
pCi/L	Radium 226 Counting Error	09502	0.938	
pCi/L	Radium 226 MDA95	A-074		
pCi/L	Radium 228	11501		1.0
pCi/L	Radium 228 Counting Error	11502		
pCi/L	Radium 228 MDA95	A-075		
5 pCi/L	Ra 226 + Ra 228, Combined	11503		
pCi/L	Ra 226 + Ra 228 Counting Error, Combined	11504		
pCi/L	Ra 226 + Ra 229 MDA95, Combined	A-076		
pCi/L	RADIUM, TOTAL, (FOR NTNC ONLY, BY 903.0)			
pCi/L	Radium, Total	A-080		
pCi/L	Radium, Total, Counting Error	A-081		
pCi/L	Radium, Total, MDA95	A-082		
pCi/L	TITLE 22 CALIFORNIA CODE OF REGULATIONS			
pCi/L	SECTION 64443 (22 CCR 64443)			
50 pCi/L	Gross Beta	03501		4.0



	pCi/L Gross Beta Counting Error	03502		
	pCi/L Gross Beta MDA95	A-077		
4	pCi/L Gross Beta, Calculated Dose Equivalent *	A-071		
8	pCi/L Strontium 90	13501		2.0
	pCi/L Strontium 90 Counting Error	13502		
	pCi/L Strontium 90 MDA95	A-078		
20000	pCi/L Tritium	07000		1000
	pCi/L Tritium Counting Error	07001		
	pCi/L Tritium MDA95	A-079		
	pCi/L RADON			
	pCi/L Radon 222	82303		100.0
	pCi/L Radon 222 Counting Error	82302		
	pCi/L			
	pCi/L *MDA95 is Minimum Detectable Activity at			
	pCi/L the 95% confidence level, per			
	pCi/L 22 CCR 64442 and 64443.			
	pCi/L			
	pCi/L **Gross Beta, Calculated Total Body or			
	pCi/L Organ Dose Equivalent, Per 22 CCR 64443			
	pCi/L			

---

# BSK Analytical Laboratories

EDT

Date of Report: 10|12|17|1229

Sample ID No.: A0K0907-01

Laboratory Name: BSK Analytical Laboratories

Signature Lab Director: 

Name of Sampler: Susy Jacobson

Date/Time Sample Collected: 10|11|09|1300

Date/Time Sample Received @ Lab: 10|11|12|0745

Date Analyses Completed: 10|11|12

System Name: CAL AM WATER COMPANY - MONTEREY

System Number: 2710004

Name or Number of Sample Source: **ORD GROVE WELL 02 - RAW**

User ID: HEN

Station Number: 2710004-024

Date/Time of Sample: 10|11|09|1300

Laboratory Code: 5810

Submitted by: BSK Analytical Laboratories

Date Analyses Completed: 10|11|12

Phone #: 559-497-2888

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
<b>Title 22 California Code of Regulations, Section 64442 (22 CCR 64442)</b>					
15	pCi/L	Gross Alpha	01501	5.96	3.0
	pCi/L	Gross Alpha Counting Error	01502	± 0.350	
20	pCi/L	Uranium	28012	ND	1.0

**Certificate of Analysis**

Leslie Jordan  
 California American Water  
 PO Box 951  
 Monterey, CA 93942-0951

**Report Issue Date:** 12/17/2010 12:30  
**Received Date:** 11/12/2010  
**Received Time:** 07:45

**Lab Sample ID:** A0K0907-01  
**Sample Date:** 11/09/2010 13:00  
**Sample Type:** Grab

**Client Project:** ASR Bi-Annual Monitoring/Radiologicals  
**Sampled by:** Susy Jacobson  
**Matrix:** Ground Water

**Sample Description:** Ord Grove Well 02

**Metals**

Analyte	Method	Result	RL	Units	RL Mult	Batch	Prepared	Analyzed	Qual
*Uranium	EPA 200.8	1.0	1.0	ug/L	1	A011635	11/22/10	11/22/10	
*Uranium, Radiological		0.70		pCi/L					

**Radiological**

Analyte	Method	Result	Units	MDA	Batch	Prepared	Analyzed	Qual
*Gross Alpha	EPA 00-02	5.96	pCi/L	1.39	A011424	11/17/10	11/18/10	
*1.65 Sigma Uncertainty		0.350	±					



AMERICAN WATER

AMERICAN WATER WORKS SERVICE COMPANY, INC.

Central Laboratory - 1115 South Illinois Street Belleville, IL 62220-3102

Phone: (618)235-3600 - Fax: (618)235-6349



DBP Analysis Report

CALIFORNIA-AMERICAN WATER CO  
MONTEREY DISTRICT  
LESLIE JORDAN  
PO BOX 951  
MONTEREY CA 93942-0951

PWS ID: CA2710004  
County: MONTEREY  
Facility ID:  
Site ID: 2710004-048

Date of Report: 07/15/10  
Drinking Water Certification No.: 01161CA  
Federal Lab ID No.: IL00028

Report Summary

Location	PARALTA WELL	Collection Date:	07/08/10	Received Date:	07/09/10
Sample Type	RAW	Collection Time:	13:35	Received Time:	09:00
		SDG:	791029	Received Temp:	3 °C

Case Narrative:

Results are at or above the reporting limit for the following analytes:

BROMODICHLOROMETHANE

CHLORODIBROMOMETHANE

CHLOROFORM

TOTAL HAA (5) Result: 0

TOTAL THM Result: 8.1

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Technical Director or Designee



CA	703
10070041	
COC and Report Number	

Starting Sample: CP61997

## Report Details

Sample Number: CP61997

Regulated Haloacetic Acids	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
DIBROMOACETIC ACID		SM6251BMOD	82721		1.0	ND	ug/L	BC	07/14/10	20:34
DICHLOROACETIC ACID		SM6251BMOD	77288		1.0	ND	ug/L	BC	07/14/10	20:34
MONOBROMOACETIC ACID		SM6251BMOD	A-041		1.0	ND	ug/L	BC	07/14/10	20:34
MONOCHLOROACETIC ACID		SM6251BMOD			1.0	ND	ug/L	BC	07/14/10	20:34
TRICHLOROACETIC ACID		SM6251BMOD			1.0	ND	ug/L	BC	07/14/10	20:34
HAA5 TOTAL		SM6251BMOD	A-049	60	1.0	ND	ug/L	BC	07/14/10	20:34

Sample Number: CP61997

Unregulated Haloacetic Acids	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
BROMOCHLOROACETIC ACID		SM6251BMOD	A-038		1.0	ND	ug/L	BC	07/14/10	20:34

Sample Number: CP62000

Trihalomethanes	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
BROMOFORM		502.2R2.1	32104		0.5	ND	ug/L	CRK	07/10/10	00:02
BROMODICHLOROMETHANE		502.2R2.1	32101		0.5	2.5	ug/L	CRK	07/10/10	00:02
CHLORODIBROMOMETHANE		502.2R2.1	32105		0.5	0.7	ug/L	CRK	07/10/10	00:02
CHLOROFORM		502.2R2.1	32106		0.5	4.9	ug/L	CRK	07/10/10	00:02
TOTAL TRIHALOMETHANES		502.2R2.1	82080	80	0.5	8.1	ug/L	CRK	07/10/10	00:02



CA	703
<b>10070041</b>	
COC and Report Number	

Starting Sample: CP61997



AMERICAN WATER

AMERICAN WATER WORKS SERVICE COMPANY, INC.

Central Laboratory - 1115 South Illinois Street Belleville, IL 62220-3102  
Phone: (618)235-3600 - Fax: (618)235-6349



Inorganic Chemical (IOC) Analysis Report

CALIFORNIA-AMERICAN WATER CO  
MONTEREY DISTRICT  
LESLIE JORDAN  
PO BOX 951  
MONTEREY CA 93942-0951

PWS ID: CA2710004  
County: MONTEREY  
Facility:  
Site ID: 2710004-048

Date of Report: 07/15/10  
Drinking Water Certification No.: 01161CA  
Federal Lab ID No.: IL00028

Report Summary

Location PARALTA WELL  
Sample Type RAW

Collection Date: 07/08/10  
Collection Time: 13:35  
SDG: 791029

Received Date: 07/09/10  
Received Time: 09:00  
Received Temp: 3 °C

Case Narrative:

Results are at or above the reporting limit for the following analytes:

ARSENIC	SELENIUM
MOLYBDENUM	MANGANESE
BARIUM	STRONTIUM

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Technical Director or Designee



CA 703

10040544

COC and Report Number

Starting Sample: CP30349

Page 1 of 2

## Report Details

Sample Number: CP30349

ICP Metals	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time
IRON		200.7R4.4	01045	0.3(s)	0.06	ND	mg/L	LG	07/12/10 13:12
STRONTIUM		200.7R4.4			0.050	0.296	mg/L	LG	07/12/10 13:12

Sample Number: CP30349

ICP/MS Metals	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time
ARSENIC		200.8R5.4	01002	0.010	0.001	0.002	mg/L	LG	07/13/10 13:28
SELENIUM		200.8R5.4		0.05	0.002	0.003	mg/L	LG	07/13/10 13:28
BARIUM		200.8R5.4	01007	1	0.001	0.051	mg/L	LG	07/12/10 12:35
MANGANESE		200.8R5.4	01055	0.05(s)	0.010	0.023	mg/L	LG	07/12/10 12:35
ZINC		200.8R5.4	01092	5.0(s)	0.050	ND	mg/L	LG	07/12/10 12:35
MOLYBDENUM		200.8R5.4	01062		0.001	0.009	mg/L	LG	07/12/10 12:35
VANADIUM		200.8R5.4	01087		0.050	ND	mg/L	LG	07/12/10 12:35

CA	703
----	-----

**10040544**

COC and Report Number

Starting Sample: CP30349

Page 2 of 2





AMERICAN WATER

AMERICAN WATER WORKS SERVICE COMPANY, INC.

Central Laboratory - 1115 South Illinois Street Belleville, IL 62220-3102  
Phone: (618)235-3600 - Fax: (618)235-6349



DBP Analysis Report

CALIFORNIA-AMERICAN WATER CO  
MONTEREY DISTRICT  
LESLIE JORDAN  
PO BOX 951  
MONTEREY CA 93942-0951

PWS ID: CA2710004  
County: MONTEREY  
Facility ID:  
Site ID: 2710004-048

Date of Report: 12/03/10  
Lab Certification No.: 01161CA  
Federal Lab ID No.: IL00028

Report Summary

Location PARATTA WELL  
Sample Type RAW

Collection Date: 11/09/10  
Collection Time: 13:30  
SDG: 11121015

Received Date: 11/12/10  
Received Time: 09:00  
Received Temp: 6 °C

Case Narrative:

Results are at or above the reporting limit for the following analytes:

MONOCHLOROACETIC ACID                      BROMODICHLOROMETHANE  
CHLOROFORM

TOTAL HAA (5) Result: 1.2

TOTAL THM Result: 5.2

Revised report to correct DV Code per utility request

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Technical Director or Designee



CA 703  
10080215  
COC and Report Number

REVISED  
12/3/2010

Starting Sample: CP69671  
Page 1 of 2



## Report Details

Sample Number: CP69671

Regulated Haloacetic Acids	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
DIBROMOACETIC ACID		SM6251BMOD	82721		1.0	ND	ug/L	KAY	11/18/10	03:21
DICHLOROACETIC ACID		SM6251BMOD	77288		1.0	ND	ug/L	KAY	11/18/10	03:21
MONOBROMOACETIC ACID		SM6251BMOD	A-041		1.0	ND	ug/L	KAY	11/18/10	03:21
MONOCHLOROACETIC ACID		SM6251BMOD			1.0	1.2	ug/L	KAY	11/18/10	03:21
TRICHLOROACETIC ACID		SM6251BMOD			1.0	ND	ug/L	KAY	11/18/10	03:21
HAA5 TOTAL		SM6251BMOD	A-049	60	1.0	1.2	ug/L	KAY	11/18/10	03:21

Sample Number: CP69671

Unregulated Haloacetic Acids	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
BROMOCHLOROACETIC ACID		SM6251BMOD	A-038		1.0	ND	ug/L	KAY	11/18/10	03:21

Sample Number: CP69674

Trihalomethanes	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time	
BROMOFORM		502.2R2.1	32104		0.5	ND	ug/L	TD	11/13/10	02:43
BROMODICHLOROMETHANE		502.2R2.1	32101		0.5	1.1	ug/L	TD	11/13/10	02:43
CHLORODIBROMOMETHANE		502.2R2.1	32105		0.5	ND	ug/L	TD	11/13/10	02:43
CHLOROFORM		502.2R2.1	32106		0.5	4.1	ug/L	TD	11/13/10	02:43
TOTAL TRIHALOMETHANES		502.2R2.1	82080	80	0.5	5.2	ug/L	TD	11/13/10	02:43



CA 703

**10080215**

COC and Report Number

**REVISED**  
**12/3/2010**

Starting Sample: CP69671

Page 2 of 2



AMERICAN WATER

AMERICAN WATER WORKS SERVICE COMPANY, INC.

Central Laboratory - 1115 South Illinois Street Belleville, IL 62220-3102  
Phone: (618)235-3600 - Fax: (618)235-6349



Inorganic Chemical (IOC) Analysis Report

CALIFORNIA-AMERICAN WATER CO  
MONTEREY DISTRICT  
LESLIE JORDAN  
PO BOX 951  
MONTEREY CA 93942-0951

PWS ID: CA2710004  
County: MONTEREY  
Facility:  
Site ID: 2710004-048

Date of Report: 11/19/10  
Drinking Water Certification No.: 01161CA  
Federal Lab ID No.: IL00028

Report Summary

Location: PARALTA WELL  
Sample Type: RAW

Collection Date: 11/09/10  
Collection Time: 13:30  
SDG: 11121014

Received Date: 11/12/10  
Received Time: 09:00  
Received Temp: 13 °C

Case Narrative:

Results are at or above the reporting limit for the following analytes:

ARSENIC	SELENIUM
MOLYBDENUM	MANGANESE
BARIUM	STRONTIUM

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\_\_\_\_\_  
Technical Director or Designee



CA 703  
10080990  
COC and Report Number

Starting Sample: CP71786  
Page 1 of 2

## Report Details

Sample Number: CP71786

ICP Metals	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time
IRON		200.7R4.4	01045	0.3(s)	0.06	ND	mg/L	JLG	11/15/10 12:50
STRONTIUM		200.7R4.4			0.050	0.313	mg/L	JLG	11/15/10 12:50

Sample Number: CP71786

ICP/MS Metals	Qualifier Code	Analysis Method	State Code	MCL	Reporting Limit	Result	Unit	Analyst	Analysis Date / Time
ARSENIC		200.8R5.4	01002	0.010	0.001	0.002	mg/L	LKR	11/18/10 13:54
BARIUM		200.8R5.4	01007	1	0.001	0.053	mg/L	LKR	11/18/10 13:54
MANGANESE		200.8R5.4	01055	0.05(s)	0.010	0.026	mg/L	LKR	11/18/10 13:54
SELENIUM		200.8R5.4	01147	0.05	0.002	0.003	mg/L	LKR	11/18/10 13:54
ZINC		200.8R5.4	01092	5.0(s)	0.050	ND	mg/L	LKR	11/18/10 13:54
MOLYBDENUM		200.8R5.4	01062		0.001	0.006	mg/L	LKR	11/18/10 13:54
VANADIUM		200.8R5.4	01087		0.050	ND	mg/L	LKR	11/18/10 13:54



CA 703  
**10080990**  
 COC and Report Number



Cal Am Water Company  
 Susy Jacobson / Leslie Jordan  
 511 Pacific Lodge Road, Suite 100  
 Pacific Grove, CA 93950

4 Justin Court Suite D, Monterey, CA 93940  
 831.375.MBAS  
 montereybayanalytical@usa.net  
 ELAP Certification Number: 2385

**Lab Number: AA67417**

Collection Date/Time: 7/8/2010 10:35 Sample Collector: JACOBSON S  
 Submittal Date/Time: 7/8/2010 14:11 Sample ID

**Sample Description: Ord Grove Well 02**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM4500-Cl G	mg/L	Not detected		0.05		7/8/2010
Chlorine Residual (Field Test)	4500-Cl G	mg/L	0.04		0.05	2.00	7/8/2010
Dissolved Oxygen	4500-O G	mg/L	6.00		0.5		7/8/2010
Lithium	EPA200.8	ug/L	17		1		8/3/2010
Methane	EPA174/175	ug/L	1.0	E	5		7/22/2010

Sample Comments:

**Lab Number: AA67418**

Collection Date/Time: 7/8/2010 13:35 Sample Collector: JACOBSON S  
 Submittal Date/Time: 7/8/2010 14:11 Sample ID

**Sample Description: Paralta Well**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM4500-Cl G	mg/L	Not detected		0.05		7/8/2010
Chlorine Residual (Field Test)	4500-Cl G	mg/L	0.05		0.05	2.00	7/8/2010
Dissolved Oxygen	4500-O G	mg/L	6.70		0.5		7/8/2010
Lithium	EPA200.8	ug/L	21		1		8/3/2010
Methane	EPA174/175	ug/L	0.69	E	5		7/22/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

Certificate of Analysis

Leslie Jordan  
 California American Water  
 PO Box 951  
 Monterey, CA 93942-0951

Report Issue Date: 8/13/2010 14:46  
 Received Date: 07/15/2010  
 Received Time: 09:00

Lab Sample ID: A0G1095-02

Sample Date: 07/08/2010 13:35

Sample Type: Grab

Sampled by: Susy Jacobson

Matrix: Ground Water

Sample Description: Paralta Well

**Metals**

Analyte	Method	Result	RL	Units	Dil.	Batch	Prepared	Analyzed	Qualifiers
*Uranium	EPA 200.8	ND	1.0	ug/L	1	A006346	07/26/10	07/26/10	
*Uranium, Radiological		< 0.67		pCi/L					

**Radiological**

Analyte	Method	Result	Units	MDA	Batch	Prepared	Analyzed	Qualifiers
*Gross Alpha	EPA 00-02	2.65	pCi/L	2.41	A006333	07/26/10	07/26/10	
*1.65 Sigma Uncertainty		0.290	±					



Pace Analytical Services, Inc.  
 1638 Roseytown Road - Suites 2,3,4  
 Greensburg, PA 15601  
 (724)850-5600

**ANALYTICAL RESULTS**

Project: A0G1095  
 Pace Project No.: 3031484

<b>Sample: A0G1095-01/Ord Grove Well 02</b>		<b>Lab ID: 3031484001</b>	Collected: 07/08/10 10:35	Received: 07/26/10 10:00	Matrix: Drinking Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.91 ± 0.718 (0.484)	pCi/L	08/05/10 10:59	13982-63-3	
Radium-228	EPA 904.0	1.35 ± 0.486 (0.853)	pCi/L	08/11/10 12:17	15262-20-1	

<b>Sample: A0G1095-02/Paralta Well</b>		<b>Lab ID: 3031484002</b>	Collected: 07/08/10 13:35	Received: 07/26/10 10:00	Matrix: Drinking Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	2.03 ± 0.733 (0.677)	pCi/L	08/05/10 10:59	13982-63-3	
Radium-228	EPA 904.0	2.01 ± 0.513 (0.811)	pCi/L	08/11/10 12:18	15262-20-1	





Pace Analytical Services, Inc.  
 1638 Roseytown Road - Suites 2,3,4  
 Greensburg, PA 15601  
 (724)850-5600

**ANALYTICAL RESULTS**

Project: A0K0907  
 Pace Project No.: 3037757

<b>Sample: A0K0907-01/Ord Grove Well 02</b>		<b>Lab ID: 3037757001</b>	Collected: 11/09/10 13:00	Received: 11/23/10 10:00	Matrix: Drinking Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	3.14 ± 0.938 (0.198)	pCi/L	12/09/10 13:22	13982-63-3	

<b>Sample: A0K0907-02/Paralta Well</b>		<b>Lab ID: 3037757002</b>	Collected: 11/09/10 13:30	Received: 11/23/10 10:00	Matrix: Drinking Water	
PWS:	Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	1.12 ± 0.639 (0.694)	pCi/L	12/09/10 13:22	13982-63-3	

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RADIOACTIVITY ANALYSIS (9/99)

Date of Report: 10/12/15 Sample ID No.3037757002/K0907-02
Laboratory Signature Lab
Name: PACE ANALYTICAL SERVICES, INC-GREENSBURG Director:
Name of Sampler:Susy Jacobson Employed By: CA American Water
Date/Time Sample Date/Time Sample Date Analyses
Collected:10/11/09/1300 Received @ Lab:10/11/23/1000 Completed:10/12/09

System System
Name:CAL AM WATER COMPANY - MONTEREY Number: 2710004
Name or Number of Sample Source:PARALTA WELL - RAW
\*\*\*\*\*
\* User ID: HEN Station Number: 2710004-C48 \*
\* Date/Time of Sample: [10|11|09|1300] Laboratory Code: 0010 \*
\* YY MM DD TTTT YY MM DD \*
\* Date Analysis completed: [10|12|09] \*
\* Submitted by: Phone #: \*
\*\*\*\*\*

Table with columns: MCL REPORT UNITS, CHEMICAL, STORET CODE, ANALYSES RESULTS, DLR. Rows include various radionuclide measurements such as Gross Alpha, Uranium, Radium 226, Radium 228, and Gross Beta with associated counts and error rates.



	pCi/L Gross Beta Counting Error	03502		
	pCi/L Gross Beta MDA95	A-077		
4	pCi/L Gross Beta, Calculated Dose Equivalent *	A-071		
8	pCi/L Strontium 90	13501		2.0
	pCi/L Strontium 90 Counting Error	13502		
	pCi/L Strontium 90 MDA95	A-078		
20000	pCi/L Tritium	07000		1000
	pCi/L Tritium Counting Error	07001		
	pCi/L Tritium MDA95	A-079		
	pCi/L RADON			
	pCi/L Radon 222	82303		100.0
	pCi/L Radon 222 Counting Error	82302		
	pCi/L			
	pCi/L *MDA95 is Minimum Detectable Activity at			
	pCi/L the 95% confidence level, per			
	pCi/L 22 CCR 64442 and 64443.			
	pCi/L			
	pCi/L **Gross Beta, Calculated Total Body or			
	pCi/L Organ Dose Equivalent, Per 22 CCR 64443			
	pCi/L			

---

# BSK Analytical Laboratories

EDT

Date of Report: 10|12|17|1229

Sample ID No.: AOK0907-02

Laboratory Name: BSK Analytical Laboratories

Signature Lab Director: *Jeff J. Jacobson*

Name of Sampler: Susy Jacobson

Date/Time Sample

Date/Time Sample

Date Analyses

Collected: 10|11|09|1330

Received @ Lab : 10|11|12|0745

Completed: 10|11|22

System Name: CAL AM WATER COMPANY - MONTEREY

System Number: 2710004

Name or Number of Sample Source: **PARALTA WELL - RAW**

User ID: HEN

Station Number: 2710004-048

Date/Time of Sample: 10|11|09|1330

Laboratory Code: 5810

Submitted by: BSK Analytical Laboratories

Date Analyses Completed: 10|11|22

Phone #: 559-497-2888

MCL	REPORTING UNITS	CHEMICAL	ENTRY #	ANALYSES RESULTS	DLR
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**Title 22 California Code of Regulations, Section 64442 (22 CCR 64442)**

15	pCi/L	Gross Alpha	01501	5.96	3.0
	pCi/L	Gross Alpha Counting Error	01502	± 0.350	
20	pCi/L	Uranium	28012	ND	1.0

Certificate of Analysis

Leslie Jordan  
California American Water  
PO Box 951  
Monterey, CA 93942-0951

Report Issue Date: 12/17/2010 12:30  
Received Date: 11/12/2010  
Received Time: 07:45

Lab Sample ID: A0K0907-02  
Sample Date: 11/09/2010 13:30  
Sample Type: Grab

Client Project: ASR Bi-Annual Monitoring/Radiologicals  
Sampled by: Susy Jacobson  
Matrix: Ground Water

Sample Description: Paralta Well

**Metals**

Analyte	Method	Result	RL	Units	RL Mult	Batch	Prepared	Analyzed	Qual
*Uranium	EPA 200.8	ND	1.0	ug/L	1	A011635	11/22/10	11/22/10	
*Uranium, Radiological		< 0.67		pCi/L					

**Radiological**

Analyte	Method	Result	Units	MDA	Batch	Prepared	Analyzed	Qual
*Gross Alpha	EPA 00-02	5.96	pCi/L	1.39	A011424	11/17/10	11/18/10	
*1.65 Sigma Uncertainty		0.350	±					



4 Justin Court Suite D, Monterey, CA 93940  
831.375.MBAS

montereybayanalytical@usa.net  
ELAP Certification Number: 2385

Cal Am Water Company  
Susy Jacobson / Leslie Jordan  
511 Pacific Lodge Road, Suite 100  
Pacific Grove, CA 93950

Thursday, November 18, 2010

**Lab Number: AA70946**

Collection Date/Time: 11/9/2010 13:30      Sample Collector: JACOBSON, S  
Submittal Date/Time: 11/9/2010 14:15      Sample ID

**Sample Description: Paralta Well**

Analyte	Method	Unit	Result	Qual	PQL	MCL	Date Analyzed
Chloramines	SM4500-Cl G	mg/L	<b>Not Detected</b>		0.05		11/9/2010
Dissolved Oxygen	4500-O G	mg/L	<b>5.90</b>		0.5		11/9/2010
Lithium	EPA200.8	ug/L	<b>30</b>		1		11/12/2010
Methane	EPA174/175	ug/L	<b>1.4</b>	E	5		11/15/2010

Sample Comments:

Report Approved by:

David Holland, Laboratory Director

mg/L: Milligrams per liter (=ppm)

ug/L : Micrograms per liter (=ppb)

PQL : Practical Quantitation Limit

H = Analyzed outside of hold time

E = Analysis performed by External Laboratory; See External Laboratory Report attachments.

D = Method deviates from standard method due to insufficient sample for MS/MSD