



Department of Energy  
Carlsbad Field Office  
P. O. Box 3090  
Carlsbad, New Mexico 88221  
January 28, 2011



Mr. Clint Marshall  
New Mexico Environment Department  
Ground Water Quality Bureau  
Mining and Environmental Compliance Section  
P.O. Box 26110  
Santa Fe, NM 87502

Subject: Semi-Annual Discharge Monitoring Report for July 1, 2010, through  
December 31, 2010

Dear Mr. Marshall:

The purpose of this letter is to transmit to you the Waste Isolation Pilot Plant Discharge Monitoring Report for the period of July 01, 2010, through December 31, 2010. This report is required by Discharge Permit 831.

If you have any questions about this report or require any additional information, please contact me at (575) 234-8128.

Sincerely,

Daniel J. Ferguson  
Site Regulatory Specialist

Enclosure

cc: w/o enclosure  
J. Bearzi, NMED \*ED  
M. Menetrey, NMED ED  
\*ED denotes electronic distribution



**WASTE ISOLATION PILOT PLANT (WIPP) SEMI-ANNUAL DISCHARGE  
MONITORING REPORT FOR DISCHARGE PLAN DP-831**

July 1, 2010 through December 31, 2010

**1.0 WIPP SEWAGE TREATMENT FACILITY AND H-19 EVAPORATION POND MONITORING AND REPORTING**

<b>Table 1 2010 Monthly Discharge Volumes to the Sewage Treatment System</b>	
<b>Month</b>	<b>Volume (gallons)</b>
July	429,300
August	203,600
September	232,910
October	195,300
November	93,500
December	173,500

Facultative Lagoon System Evaporation Pond B: None  
Facultative Lagoon System Evaporation Pond C: None

<b>Table 2 2010 Monthly Discharge Volumes to the H-19 Evaporation Pond</b>	
<b>Month</b>	<b>Volume (gallons)</b>
July	26,580
August	7,434
September	5,930
October	6,015
November	2,700
December	0

Table 3 contains a summary of the analytical results for the Sewage Treatment System and the H-19 Evaporation Pond. Miscellaneous non-hazardous water disposed of in the H-19 Evaporation Pond (Table 2) was 700-Fan condensate water, Exhaust Shaft Interception Borehole water, brine removed from the Exhaust Shaft Sump, and purged water from groundwater monitoring activities.

<b>Table 3 Sewage Treatment Facility and H-19 Analytical Data Summary</b>					
<b>Analyte</b>	<b>Sample Date</b>	<b>Influent Pond 2A</b>	<b>Pond B</b>	<b>Pond C</b>	<b>H-19</b>
Nitrate (mg/L)	8/24/10	ND	NA	NA	NA
TKN (mg/L)	8/24/10	86	NA	NA	NA
TDS (mg/L)	8/24/10	575	<b>388,000</b>	NS	<b>351,000</b>
Sulfate (mg/L)	8/24/10	60	<b>63,000</b>	NS	<b>1,300</b>
Chloride (mg/L)	8/24/10	70	<b>140,000</b>	NS	<b>250,000</b>

ND: Not detected, analyte below the detection limit

NA: Not analyzed, parameters not required

NS: Not sampled, the pond was out of service for liner replacement.

Bold: Concentration exceeds the standards listed in 20.6.2.3103 NMAC for Human Health and Domestic Water Supply

During this reporting period the liner was replaced in the Evaporation Pond C at the Sewage Treatment Facility which completed the commitments by DOE that were approved by the Ground Water Quality Bureau in a letter dated December 22, 2005, *Conditional Approval of the Corrective Action Plan based on the Sewage Lagoon Leak Testing Results and Liner Integrity Evaluation*.

## 2.0 INFILTRATION CONTROL MONITORING AND ACTIVITIES

Table 4 contains the analytical results for the WIPP Site Infiltration Controls (Salt Pile Evaporation Pond, Salt Storage Extension Evaporation Basin and Ponds 1, 2, and A).

<b>Evaporation Pond Location</b>	<b>Chloride (mg/L)</b>	<b>Sulfate (mg/L)</b>	<b>TDS (mg/L)</b>	<b>Water Depth (ft)/Volume (cubic feet)</b>
Salt Pile Evaporation Pond	<b>220,000</b>	<b>17,000</b>	<b>338,000</b>	0.3 / (309,000)
Salt Storage Extension Evaporation Basin	<b>57,000</b>	270	<b>85,300</b>	5.9 / (500,000)
Pond 1	140	44	397	2.5 / (279,756)
Pond 2	<b>580</b>	7.1	1,000	5.9 / (1,757,662)
Pond A	200	11	394	4.2 / (4,047,306)

Bold: Concentration exceeds the standards listed in 20.6.2.3103 NMAC for Human Health and Domestic Water Supply

During this reporting period, only minor maintenance to repair small incidental liner tears discovered during routine monthly inspections has been necessary to maintain components of the infiltration controls, primarily the covered Salt Storage Area and associated run-off ditches.

## 3.0 SUMMARY OF ACTIVITIES RELATED TO THE SHALLOW SUBSURFACE WATER MONITORING AND SAMPLING PROGRAM

Water levels in the shallow wells (PZ-1 through PZ-15, C-2811, C-2505, C-2506, and C-2507), Figure 1, were obtained September 9-14, 2010, and December 3-6, 2010, and are included in Table 5. These were taken on the quarterly milestones outlined in the Ground Water Monitoring Schedule, in the September 9, 2008, DP-831 Modification. Total rainfall in the area of WIPP for this reporting period was 7.25 inches compared to 8.71 inches for the same time period in 2009. The annual rainfall for 2010 was 13.06 inches compared to 12.53 inches in 2009. Total rainfall in 2010 was slightly more than the average annual rainfall for the region of 12.92 inches reported by the National Oceanic and Atmospheric Administration.

In 2010, the general water level trend for the Shallow Subsurface Water (SSW) monitoring points was an average decrease in elevation of 0.30 feet; a decrease of 0.26 feet excluding the Site and Preliminary Design Validation monitoring points. The largest water level elevation decreases were measured in PZ-13 and PZ-3. In 2010 PZ-13 decreased in elevation 0.64 feet and PZ-3 decreased 0.62 feet. Wells located near lined ponds also experienced decreases in water level elevation, varying from 0.28 feet in PZ-10 to 0.12 feet in PZ-12 for 2010. Although the rainfall for 2010 was slightly above average annual rates, water level elevations have been decreasing in the years since the liners were installed on the salt pile and the evaporation ponds. Overall water level elevation trends indicate that, in combination with lower rainfall since 2008, the liners are reducing infiltration enough to see an effect.

Figure 2 presents a potentiometric surface map of water level elevations recorded in the SSW monitoring points for December 2010. Appendix A presents historical hydrographs of all SSW monitoring points since installation.

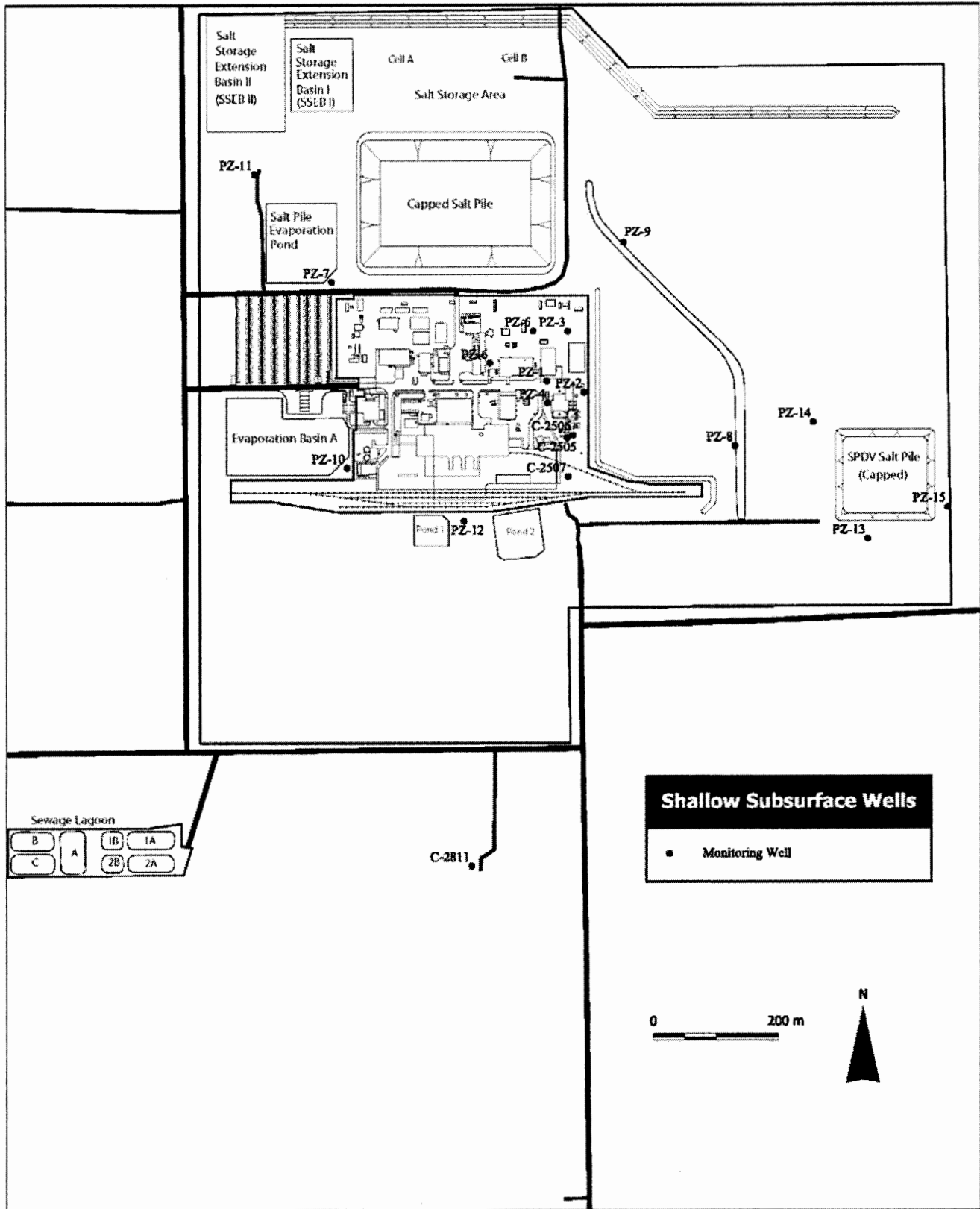
WQSP-6A was sampled during September 2010. WQSP-6A data are provided in Table 5. Sulfate, nitrate, chloride, and total dissolved solids (TDS) concentrations were detected in WQSP-6A samples at concentrations exceeding standards of 20.6.2.3103 NMAC, *Standards for Ground Water of 10,000 mg/L TDS Concentration or*

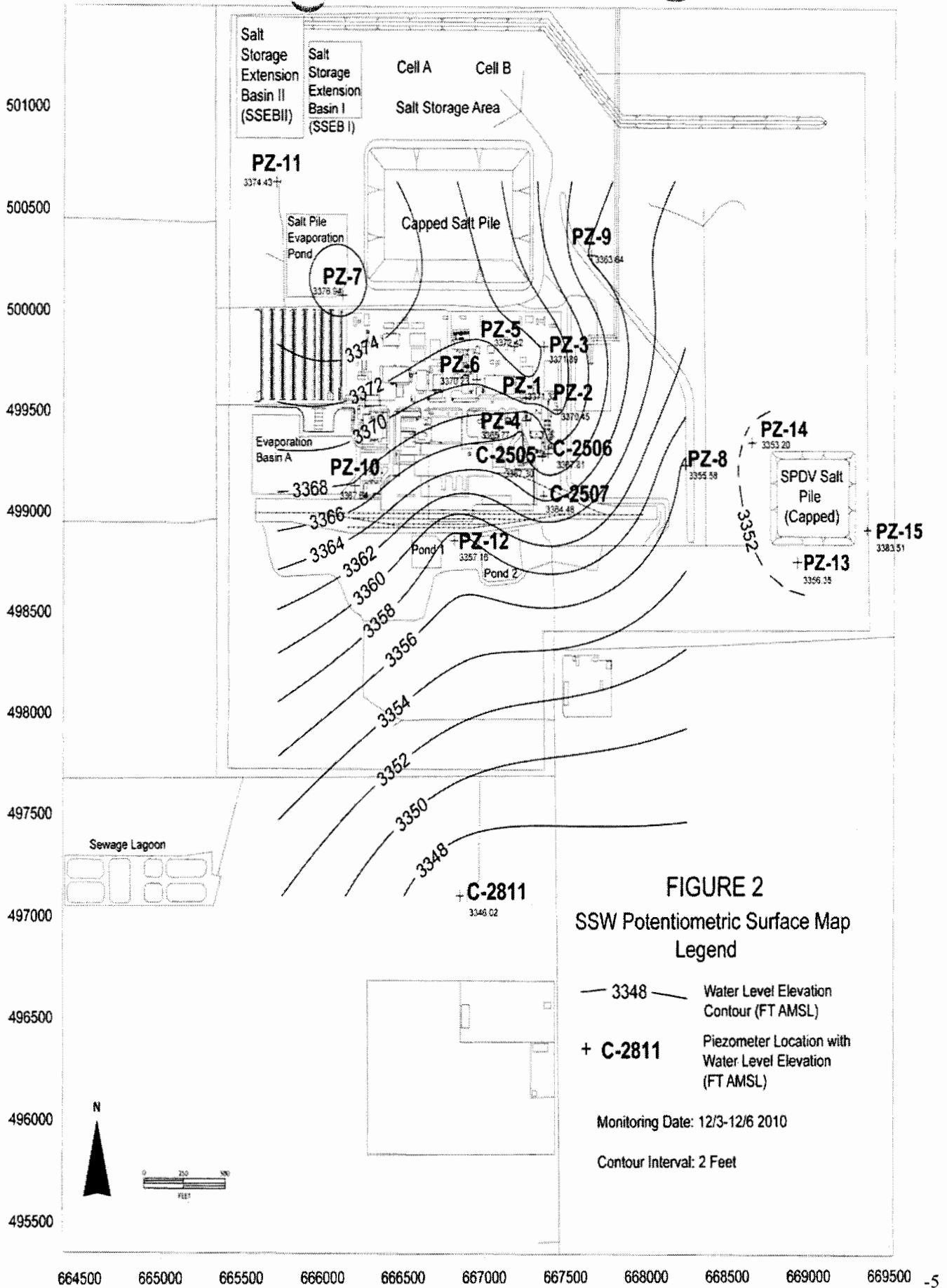
*Less for Human Health and Domestic Water Supply.* Although the concentrations were higher than the standards, they are less than background concentrations established in the *Waste Isolation Pilot Plant RCRA Background Groundwater Quality Baseline Report* (DOE/WIPP 98-2285). Total Kjeldahl nitrogen (TKN) was below the detection limit of 1 mg/L. The shallow subsurface water identified at the WIPP site has not impacted the Dewey Lake groundwater in WQSP-6A based on the consistency of analyzed parameters in WQSP-6A.

The SSW piezometers were sampled for field and general chemistry parameters in October 2010, as required by the September 9, 2008, modification to DP-831. Five piezometers were sampled on October 25, 2010, and six on October 26, 2010. Results for the field sampling parameters and laboratory analyses are presented in Table 5. Chloride concentrations exceeded values listed in 20.6.2.3103 NMAC for Human Health and Domestic Water Supply in all shallow piezometers sampled. The maximum chloride concentration was 190,000 mg/L in PZ-13, while the minimum concentration was 360 mg/L in PZ-10. Total dissolved solids concentrations exceeded 20.6.2.3103 NMAC values for Human Health and Domestic Water Supply in all shallow piezometers sampled, with the maximum concentration of 246,000 mg/L in PZ-13. Sulfate concentrations exceeded 20.6.2.3103 NMAC values for Human Health and Domestic Water Supply in 9 of 11 piezometers sampled with a maximum concentration of 4,300 mg/L in PZ-9.

Appendix B presents historical chemical analysis results for the SSW monitoring points obtained since incorporation into the DP-831 permit.

Figure 1 WIPP Site Map





**FIGURE 2**  
**SSW Potentiometric Surface Map**  
**Legend**

- 3348 — Water Level Elevation Contour (FT AMSL)
- + C-2811 Piezometer Location with Water Level Elevation (FT AMSL)

Monitoring Date: 12/3-12/6 2010

Contour Interval: 2 Feet

**Table 5**  
**SUMMARY OF SHALLOW SUBSURFACE WATER LEVELS, FIELD PARAMETERS, AND ANALYTICAL RESULTS**

Monitoring Site	Water Level Monitoring (Ft AMSL)		Field Parameters			General Chemistry Parameters					Other
	9/9-14/10	12/3-6/10	pH (SU)	Temp. (°C)	Specific Conductivity @25 °C (µS/cm)	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/L)
PZ-1	NM	3,371.32	6.38	24.0	114,900	10/26/10	NA	<b>1,800</b>	<b>62,000</b>	<b>96,100</b>	NA
PZ-2	3,370.39	3,370.45	NS	NS	NS	NS	NS	NS	NS	NS	NS
PZ-3	3,372.93	3,371.89	NS	NS	NS	NS	NS	NS	NS	NS	NS
PZ-4	3,365.52	3,365.77	NS	NS	NS	NS	NS	NS	NS	NS	NS
PZ-5	3,372.34	3,372.42	6.86	23.8	31,840	10/26/10	NA	<b>1,400</b>	<b>13,000</b>	<b>20,800</b>	NA
PZ-6	3,369.97	3,370.23	6.48	24.2	96,400	10/26/10	NA	<b>1,900</b>	<b>47,000</b>	<b>72,300</b>	NA
PZ-7	3,376.82	3,376.94	6.25	24.3	130,700	10/25/10	NA	<b>3,000</b>	<b>75,000</b>	<b>103,000</b>	NA
PZ-8	3,355.89	3,355.58	NA	NA	NA	NS	NA	NS	NS	NS	NS
PZ-9	3,363.96	3,363.64	6.26	19.9	165,900	10/26/10	NA	<b>4,300</b>	<b>95,000</b>	<b>149,000</b>	NA
PZ-10	3,367.99	3,367.84	7.15	23.6	2,358	10/25/10	NA	410	<b>360</b>	<b>1,530</b>	NA
PZ-11	3,374.31	3,374.43	6.37	23.2	122,900	10/25/10	NA	<b>2,300</b>	<b>77,000</b>	<b>100,000</b>	NA
PZ-12	3,357.29	3,357.16	6.80	22.1	16,200	10/25/10	NA	<b>960</b>	<b>5,800</b>	<b>10,300</b>	NA
PZ-13	3,356.64	3,356.35	Bailed			10/26/10	NA	<b>2,900</b>	<b>190,000</b>	<b>246,000</b>	NA
PZ-14	3,353.42	3,353.20	NS	NS	NS	NS	NA	NS	NS	NS	NS
PZ-15	3,383.68	3,383.51	NS	NS	NS	NS	NA	NS	NS	NS	NS
C-2811	3,345.70	3346.02	7.22	21.4	3,950	10/25/10	NA	370	<b>1,100</b>	<b>2,470</b>	NA
C-2505	3,367.13	3,367.30	NS	NS	NS	NS	NA	NS	NS	NS	NS
C-2506	3,367.65	3,367.81	NS	NS	NS	NS	NA	NS	NS	NS	NS
C-2507	3,364.38	3,364.48	6.91	21.7	11,060	10/26/10	NA	<b>980</b>	<b>3,500</b>	<b>7,120</b>	NA
WQSP-6a (Round 29)	3,196.81	3,196.72	7.51	22.7	3,910	9/23/10	6.34	<b>2,090</b>	<b>321</b>	<b>3,500</b>	<1.0

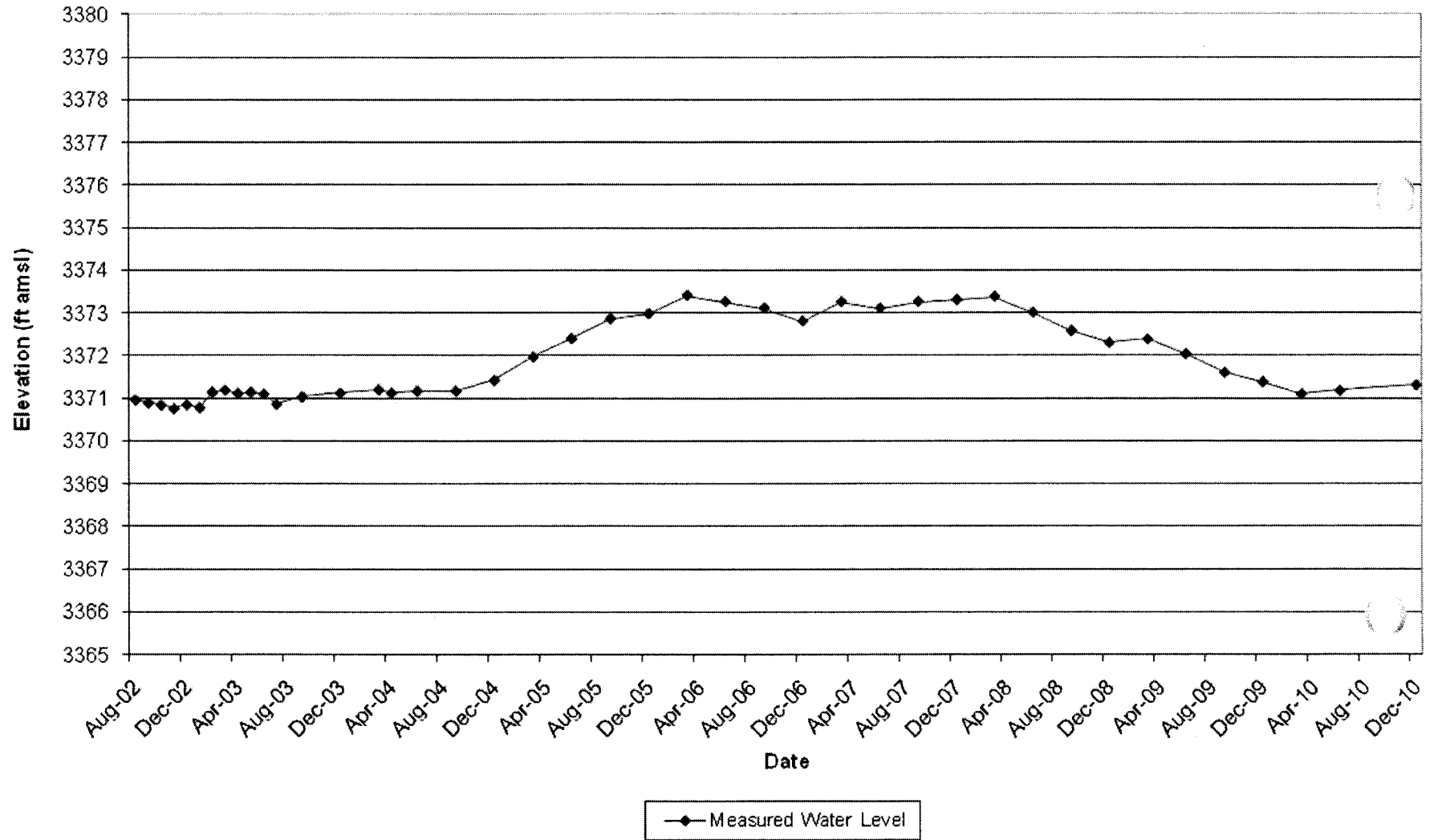
**Explanation:** NA: Not Analyzed, parameter not required, per permit conditions.  
NS: Not Sampled, not required per permit conditions  
NM: Not Measured, inaccessible due to Post Indicator Valve repairs  
PZ-13 Field Parameters were not measured since a bailer was used to collect the sample due to difficulty using Low-Flow pumps  
"Bold" concentrations exceed standards listed in 20.6.2.3103 NMAC for Human Health and Domestic Water Supply

## **Appendix A**

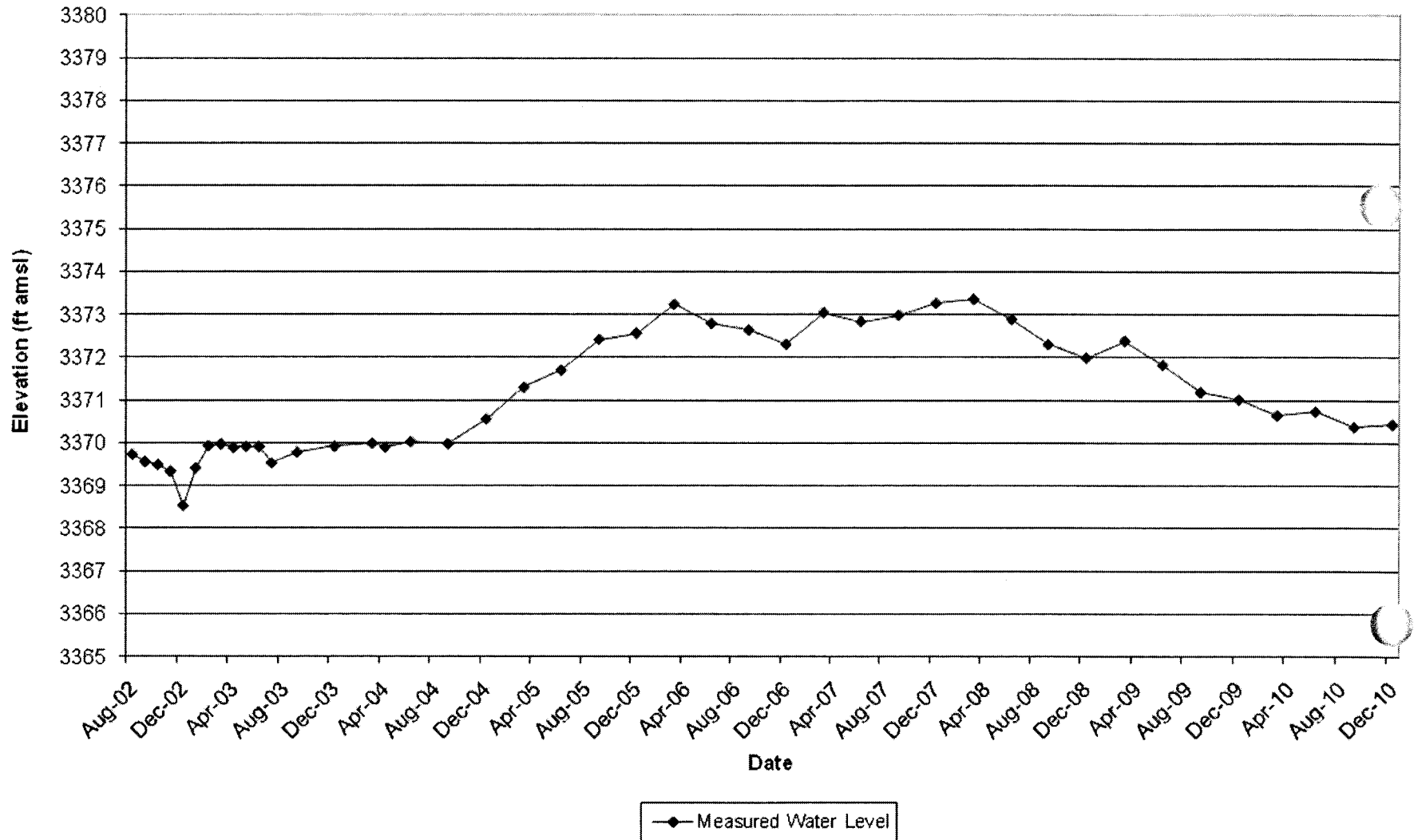
### **Historical Hydrographs for SSW Piezometers/Wells**



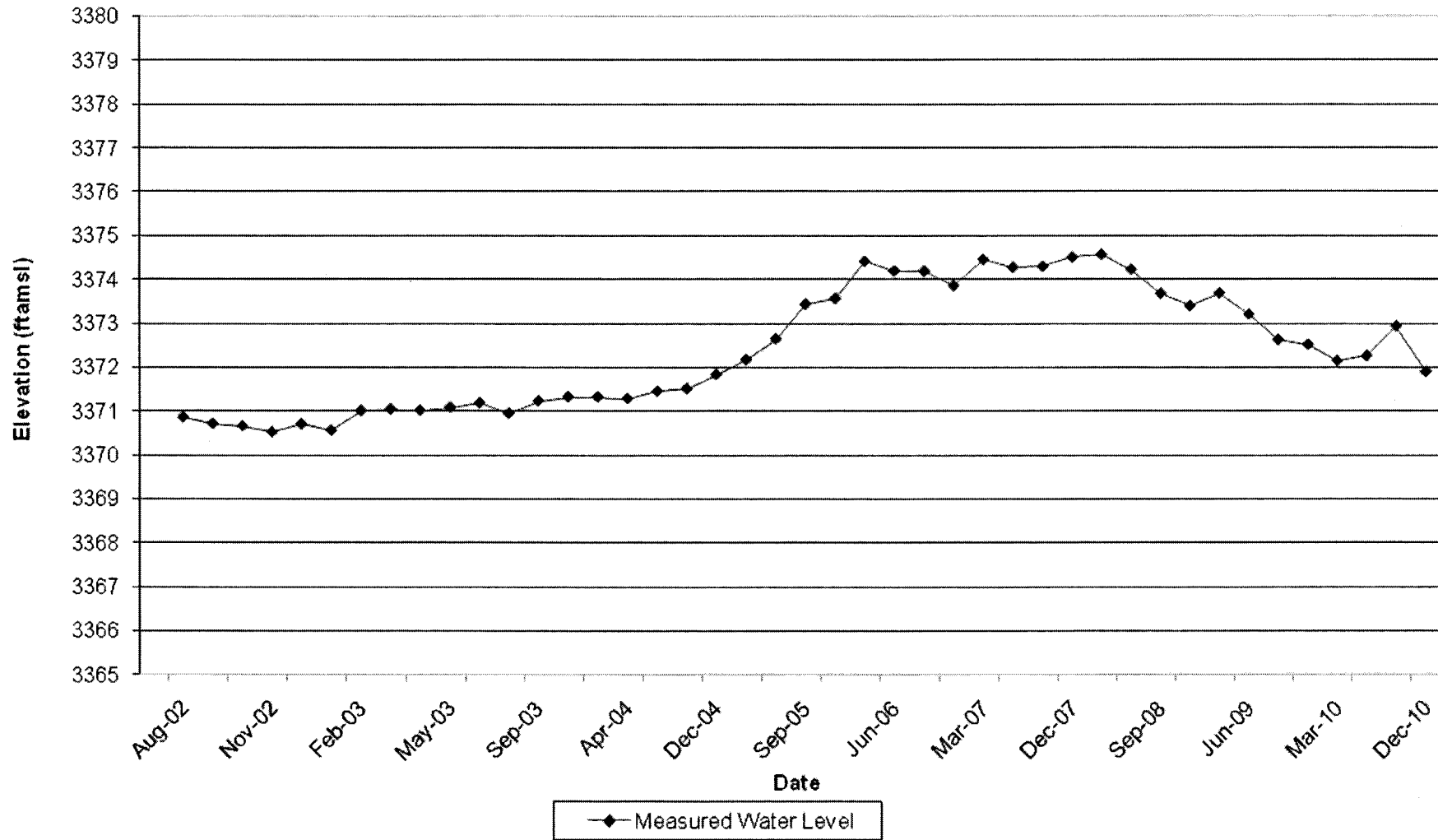
### PZ-01, Santa Rosa/Dewey Lake Historical Water Level Measurements



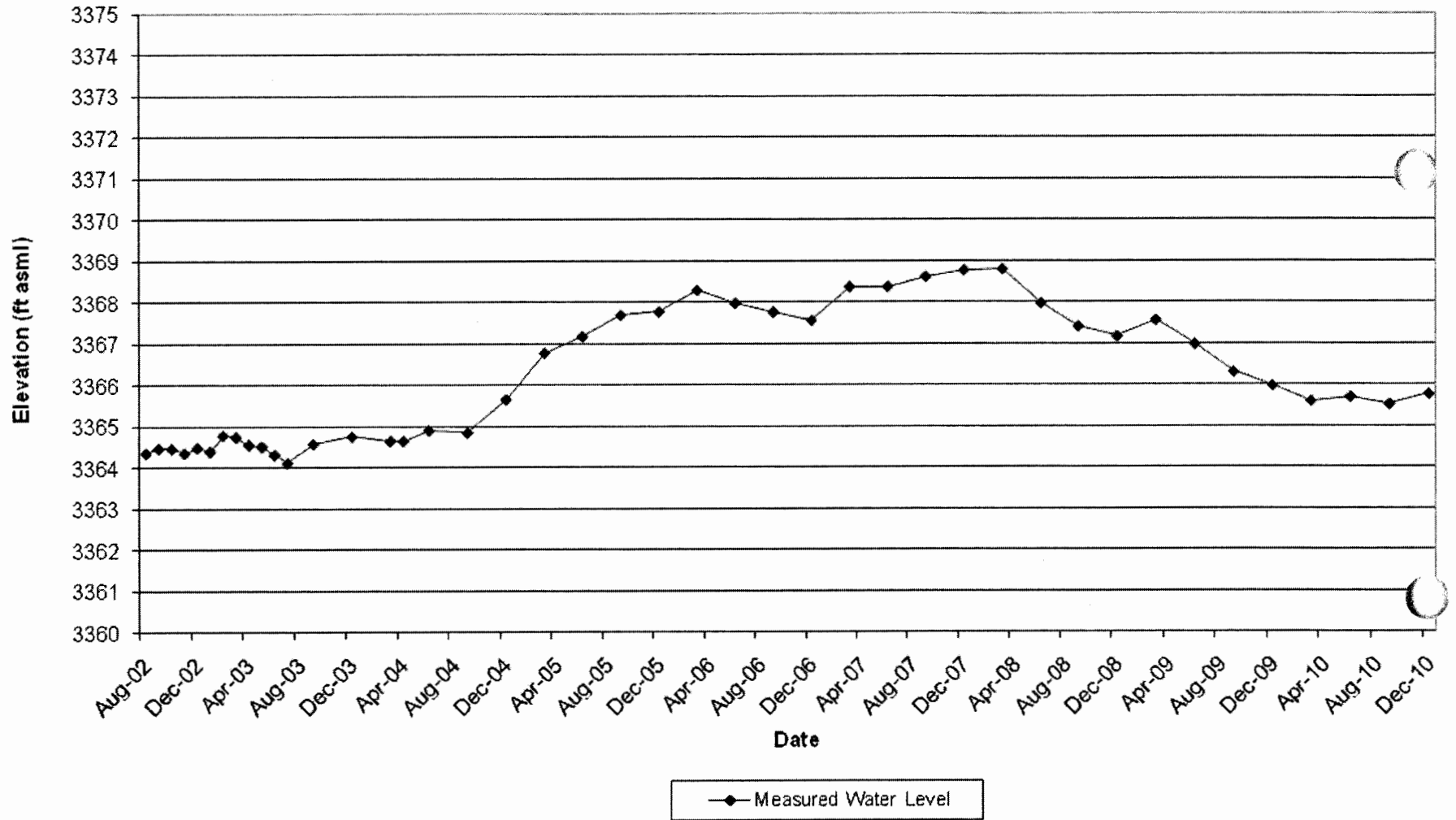
**PZ-02, Santa Rosa/Dewey Lake  
Historical Water Level Measurements**



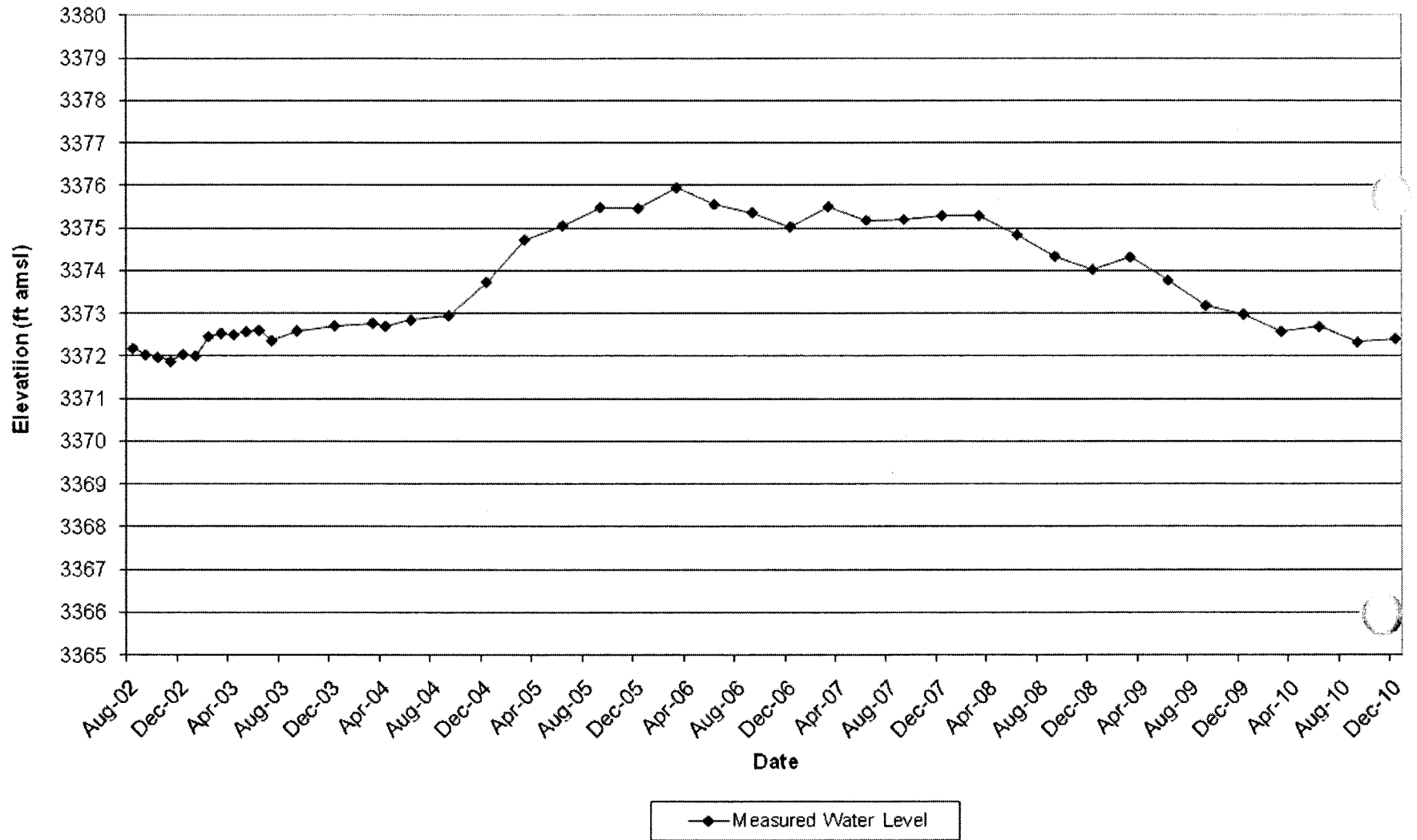
### PZ-03 Santa Rosa/Dewey Lake Historical Water Level Measurements



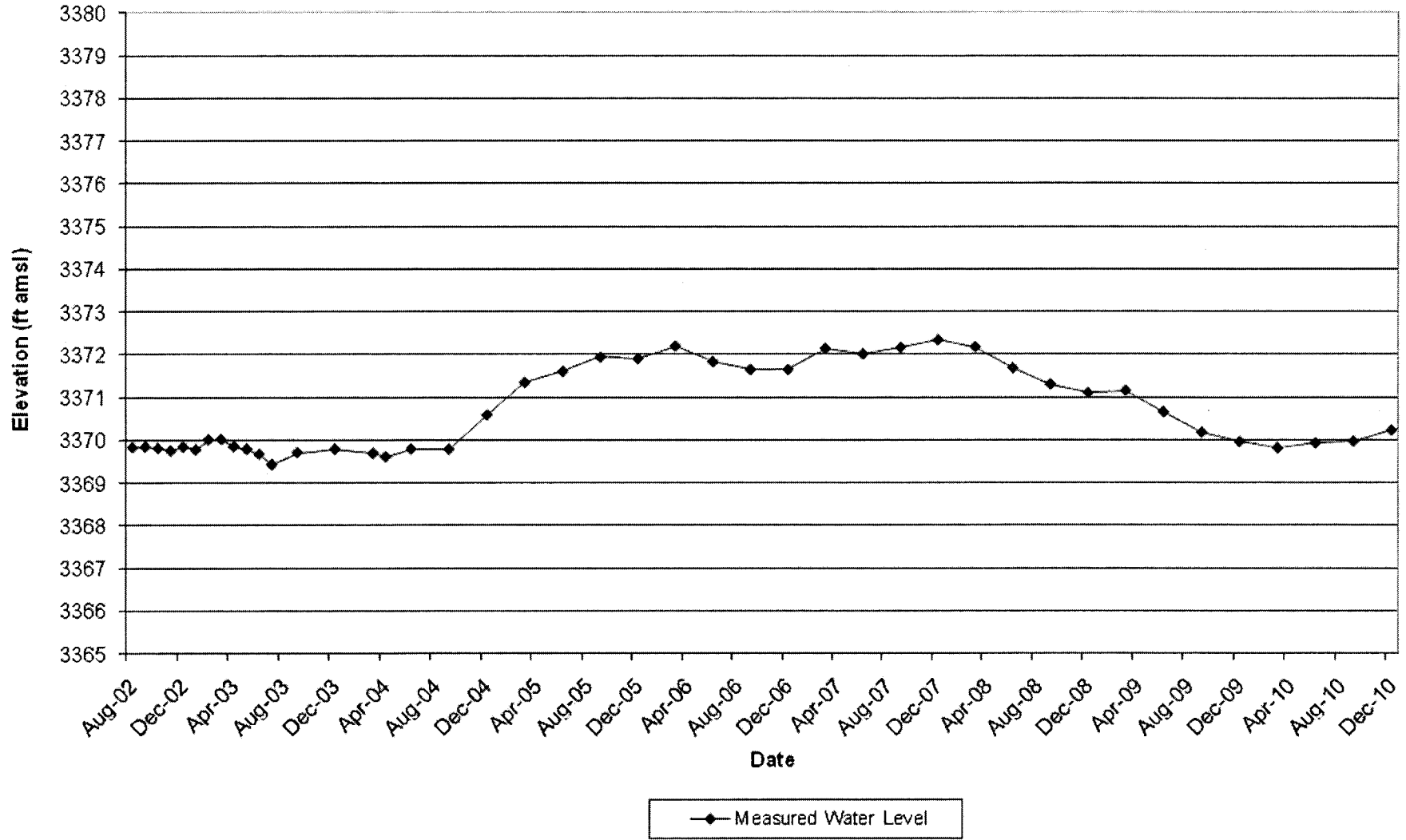
### PZ-04 Santa Rosa/Dewey Lake Historical Water Level Measurements



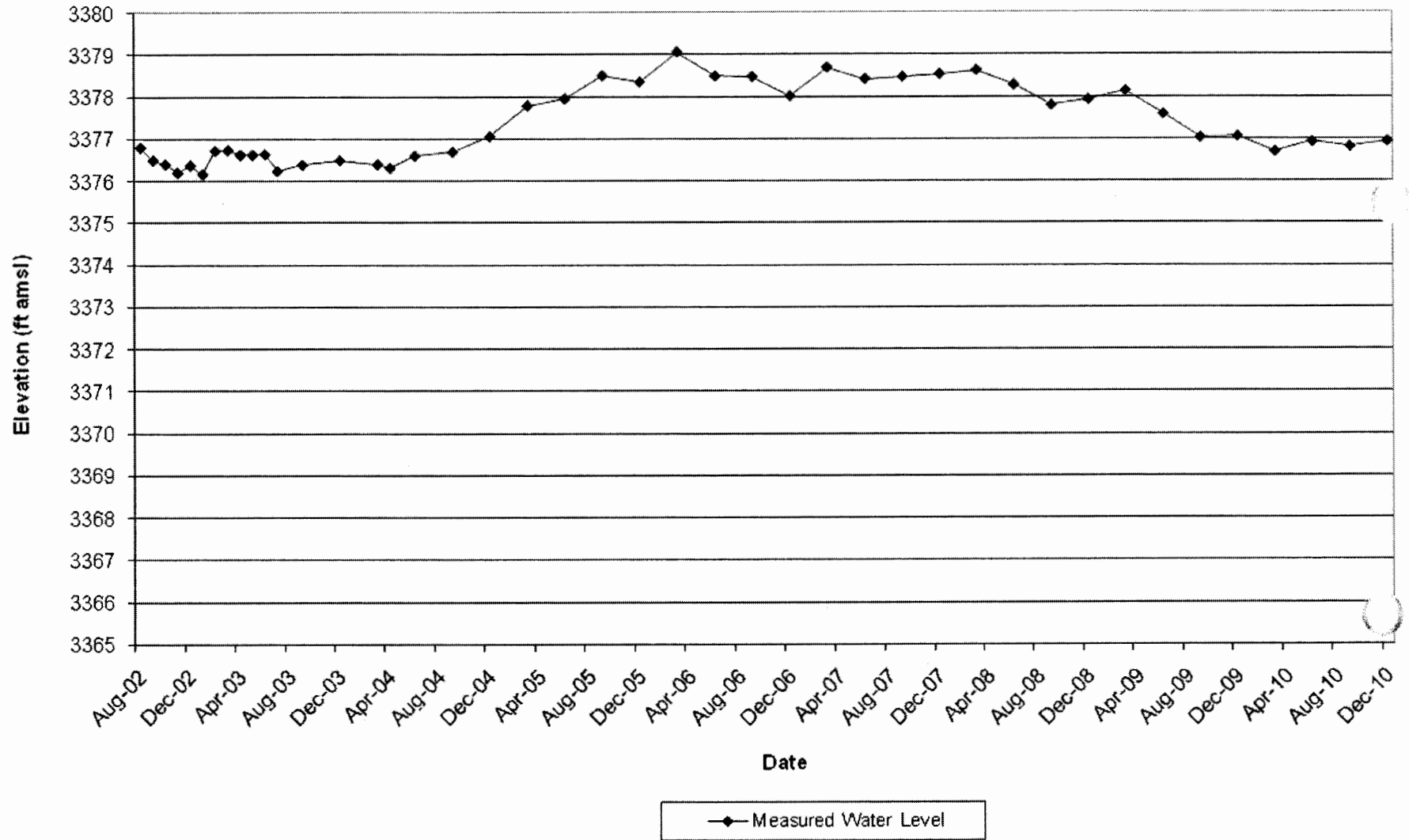
### PZ-05 Santa Rosa/Dewey Lake Historical Water Level Measurements



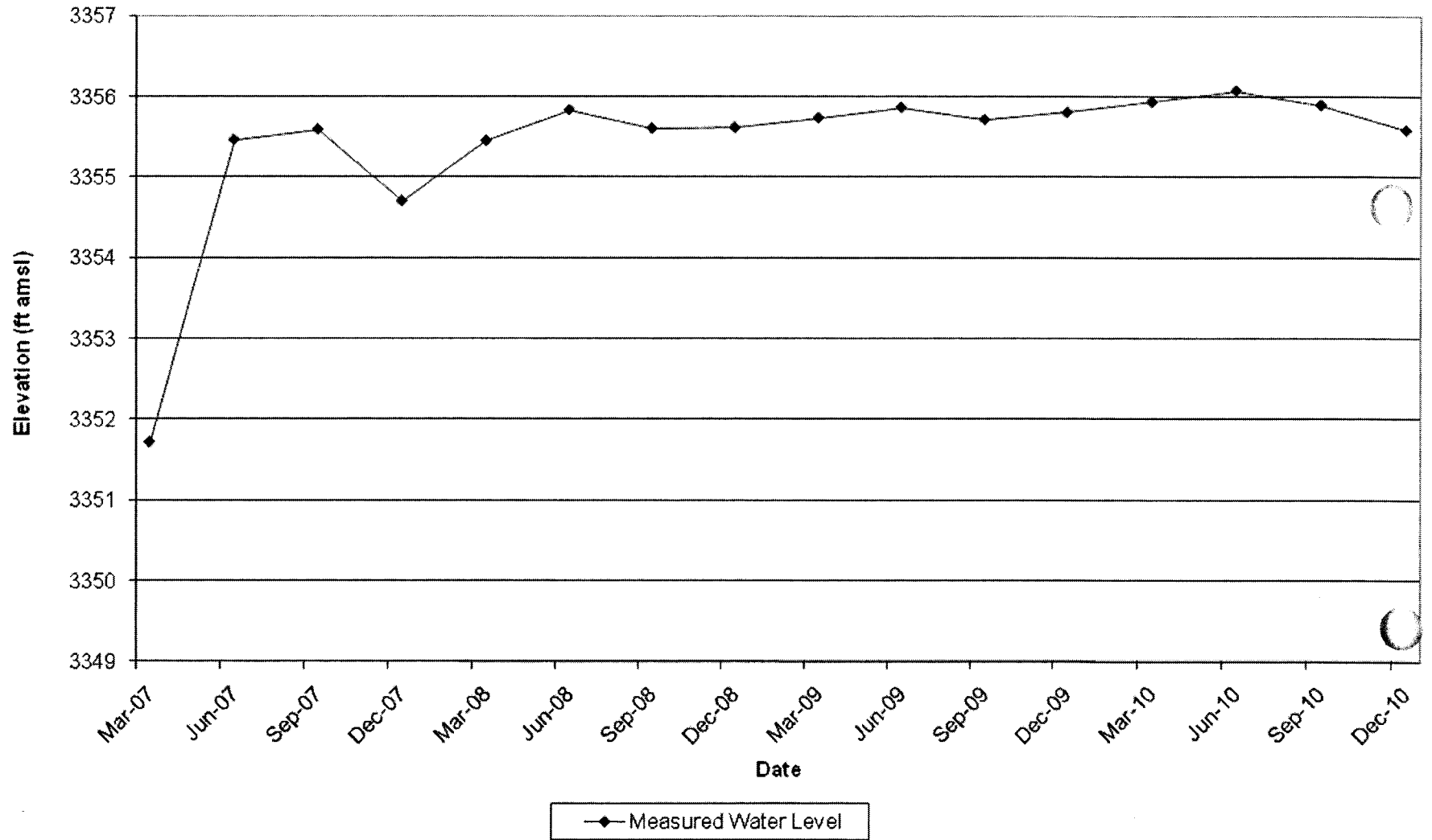
### PZ-06 Santa Rosa/Dewey Lake Historical Water Level Measurements



### PZ-07 Santa Rosa/Dewey Lake Historical Water Level Measurements

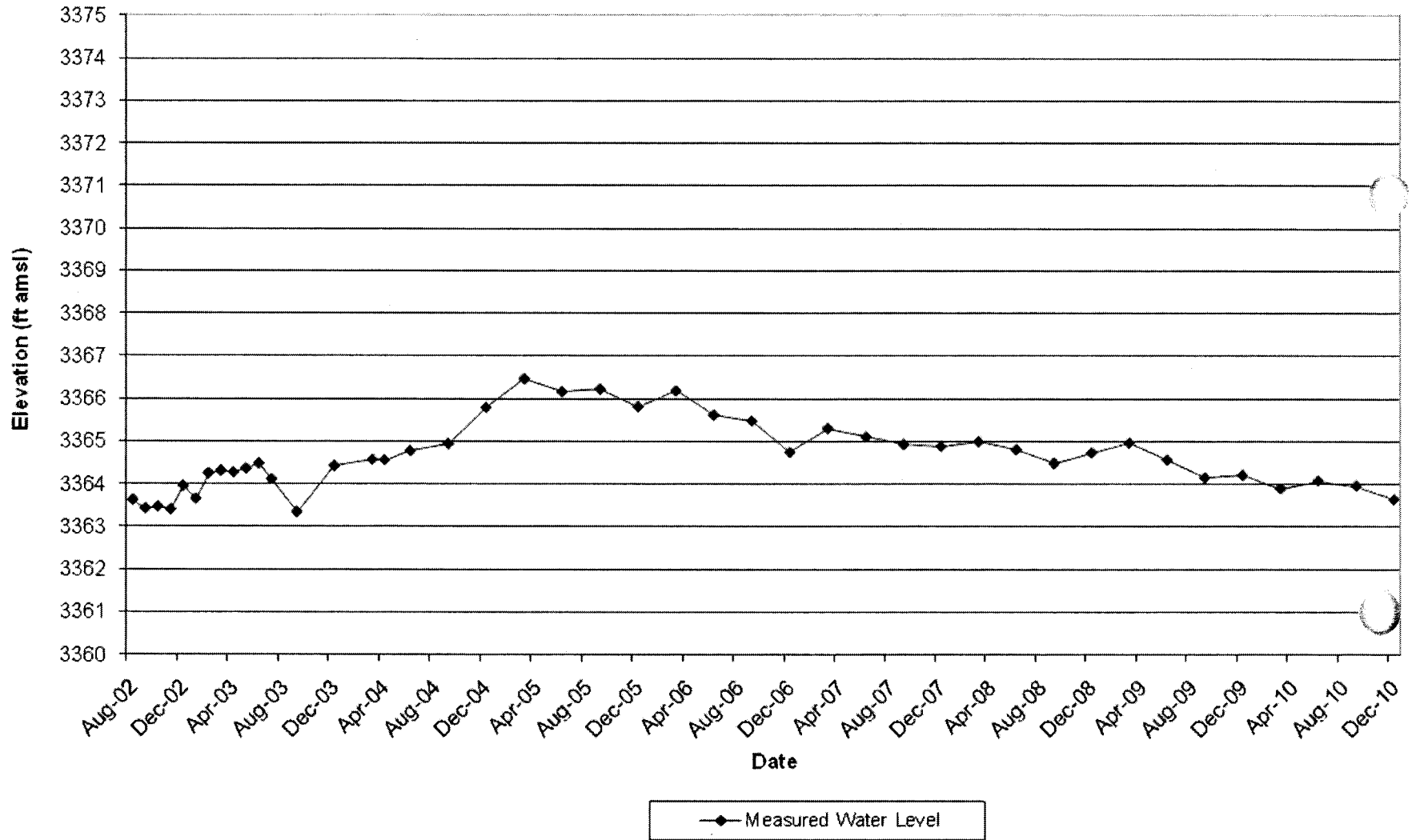


### PZ-08 Santa Rosa/Dewey Lake Historical Water Level Measurements

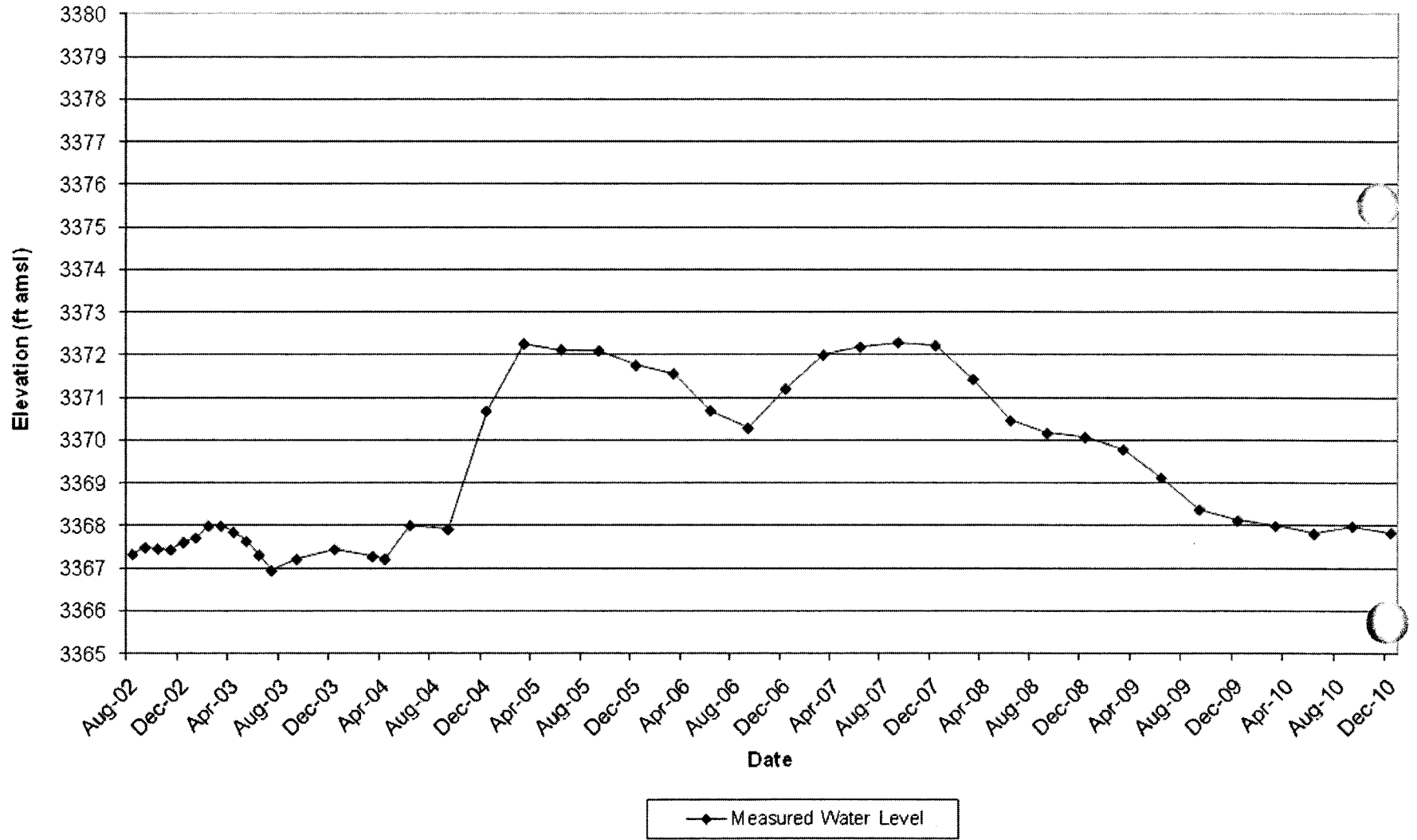




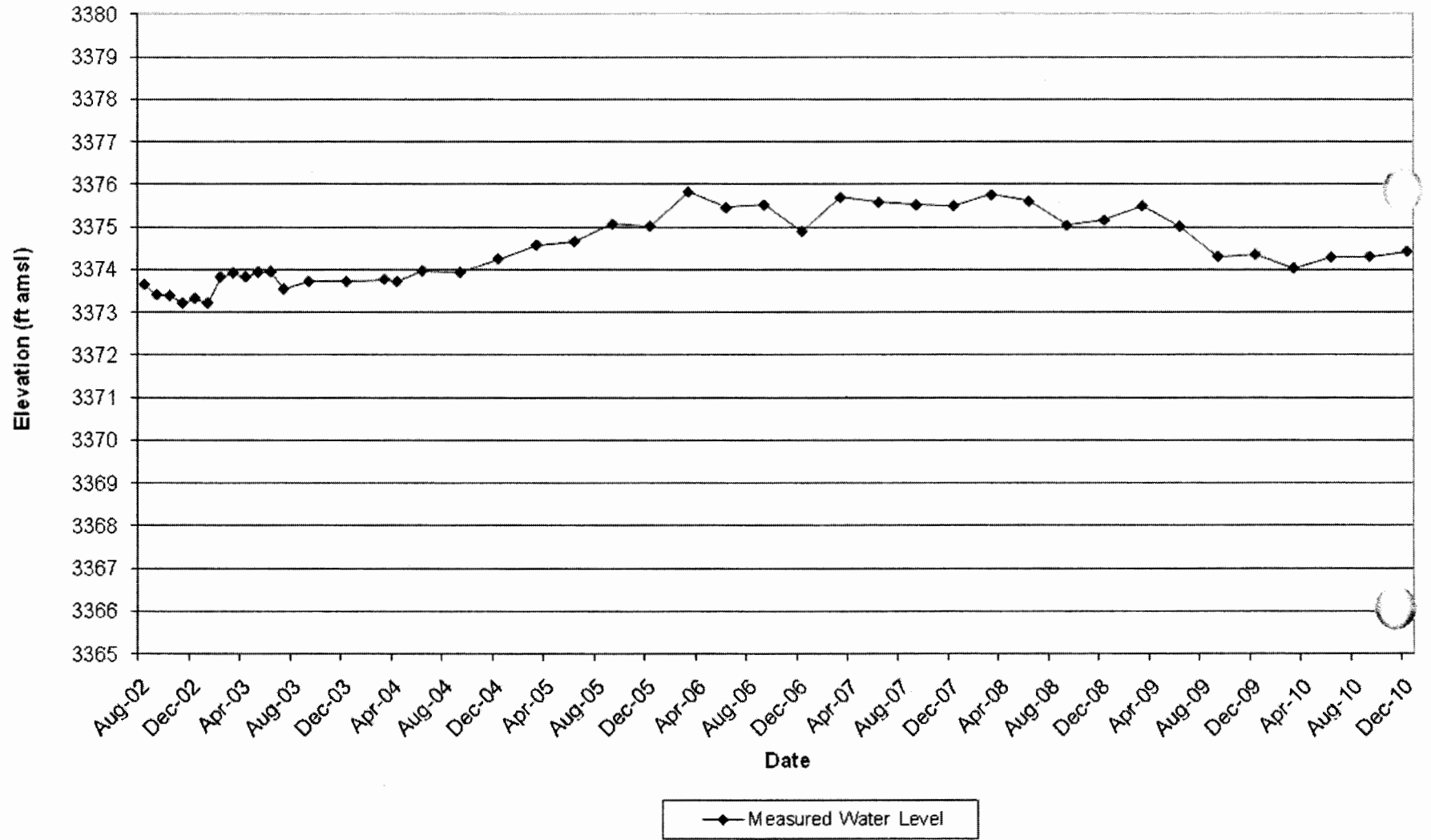
### PZ-09 Santa Rosa/Dewey Lake Historical Water Level Measurements



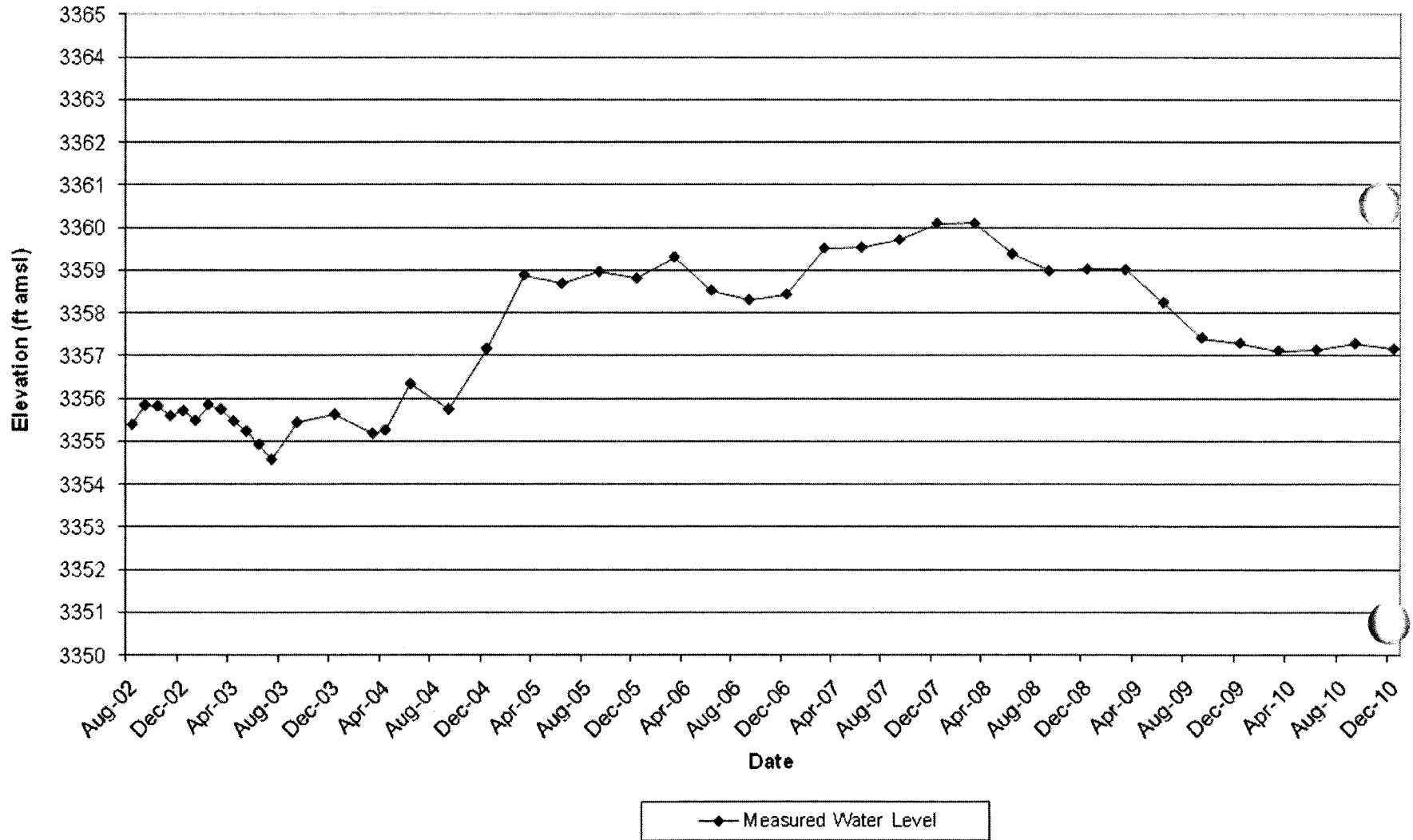
## PZ-10 Santa Rosa/Dewey Lake Historical Water Level Measurements



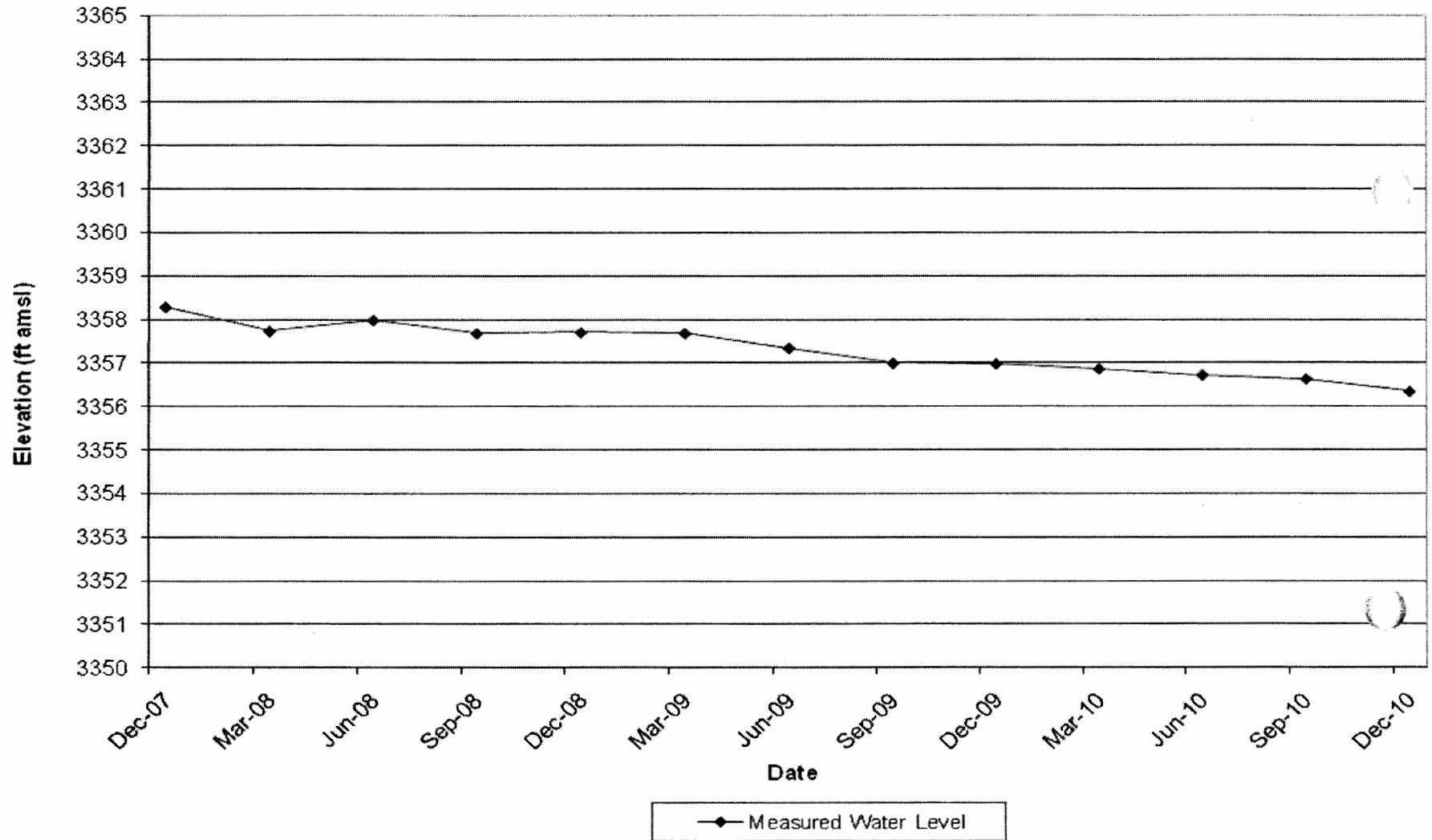
### PZ-11 Santa Rosa/Dewey Lake Historical Water Level Measurements



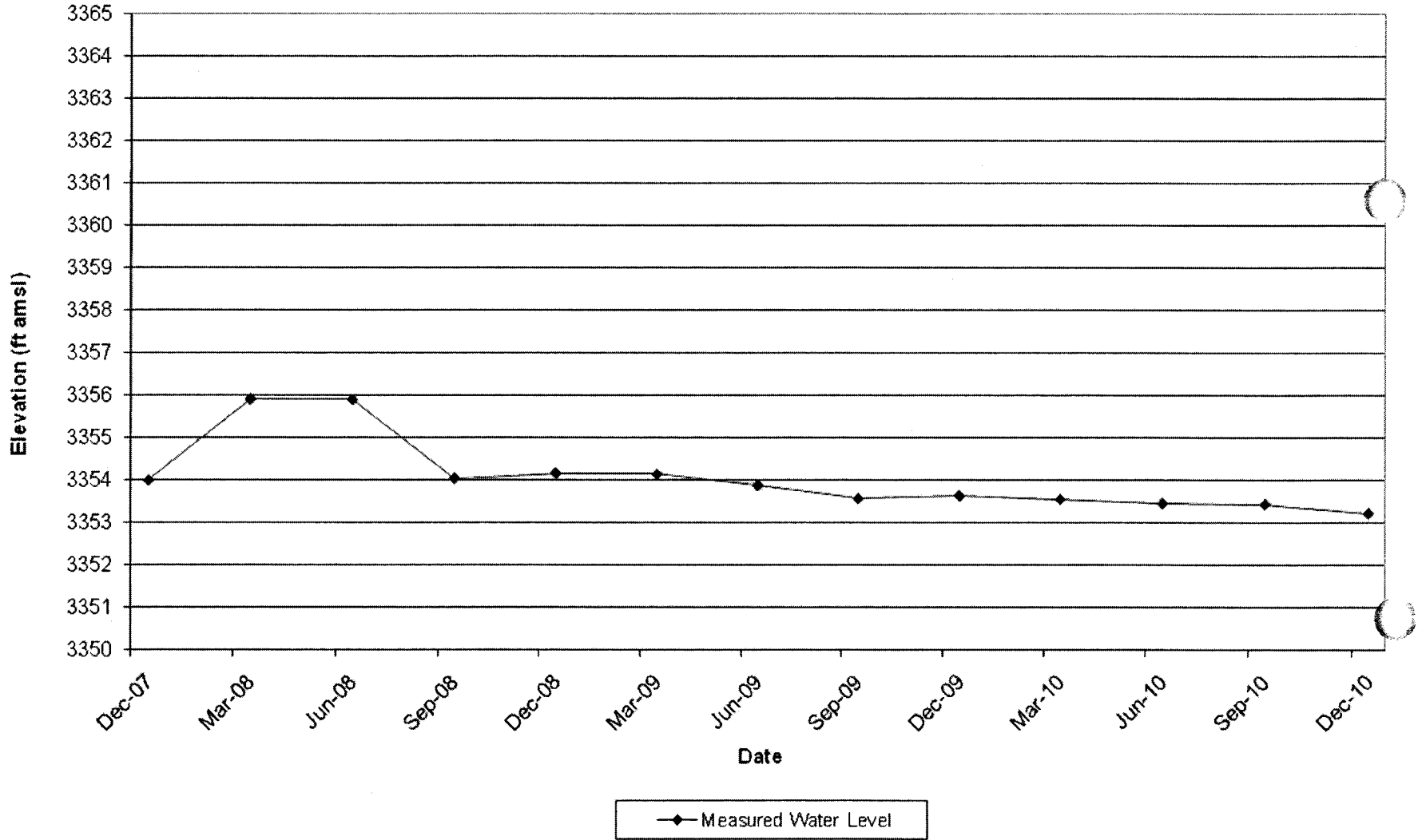
### PZ-12 Santa Rosa/Dewey Lake Historical Water Level Measurements



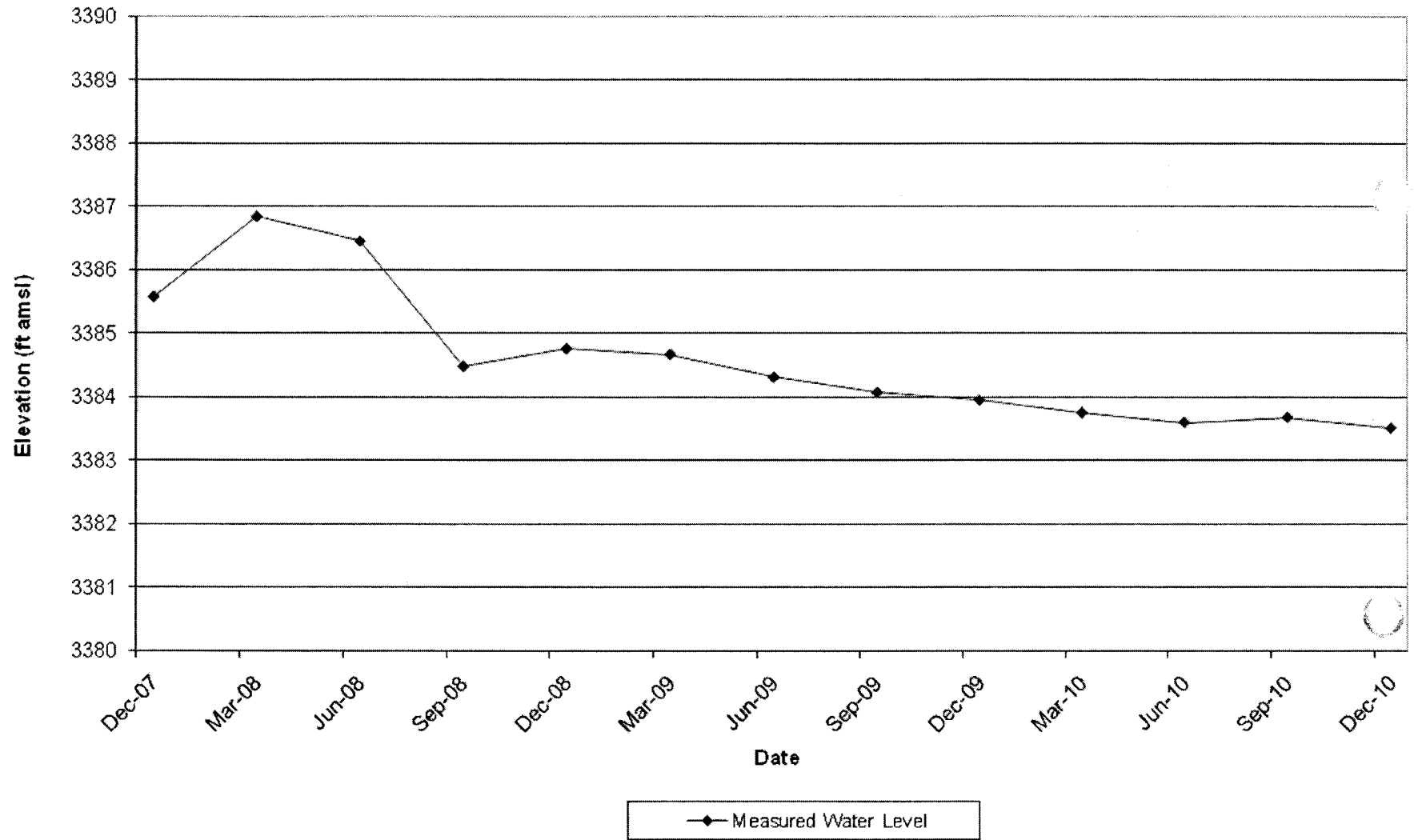
### PZ-13, Santa Rosa/Dewey Lake Historical Water Level Measurements



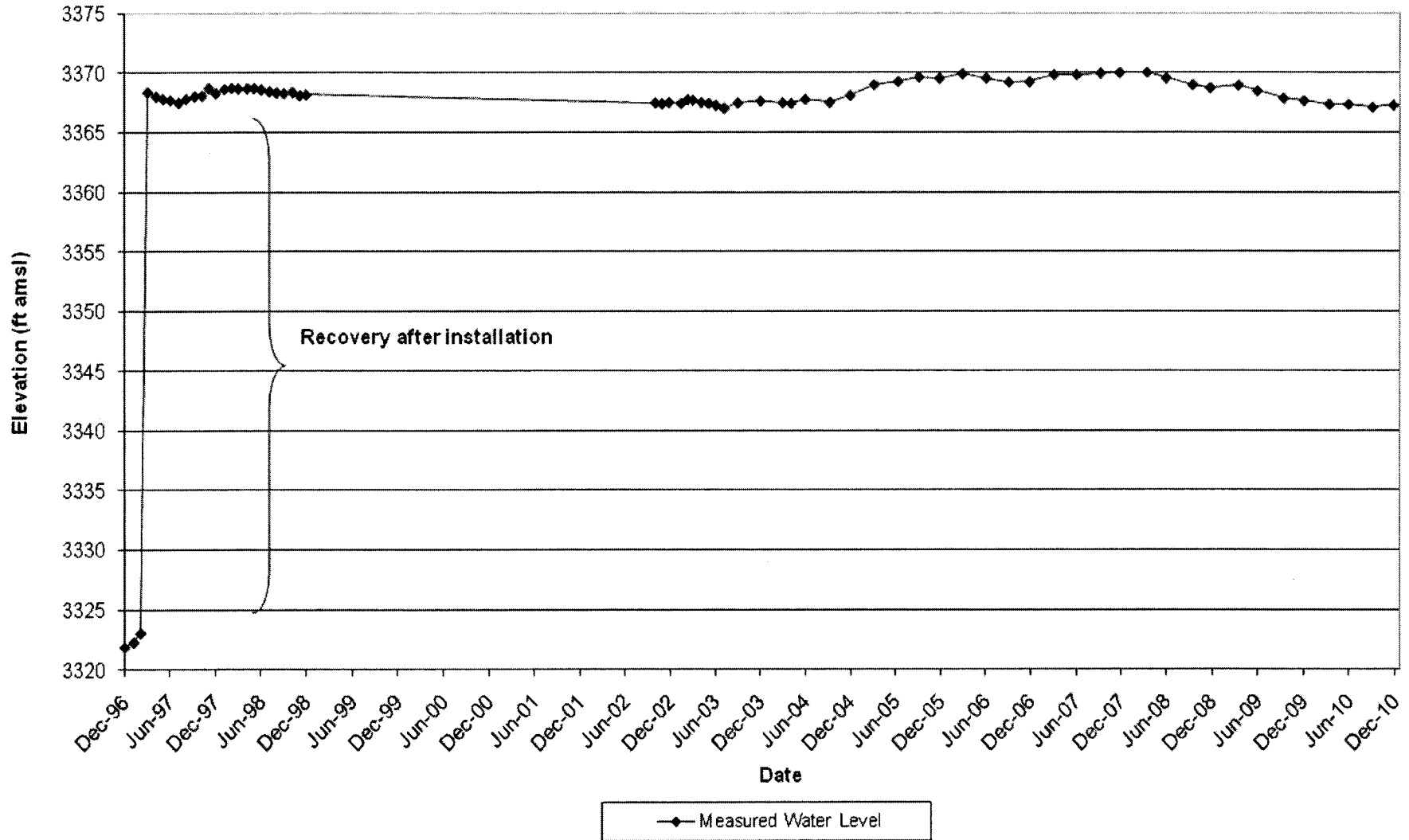
### PZ-14, Santa Rosa/Dewey Lake Historical Water Level Measurements



### PZ-15, Gatuna Historical Water Level Measurements

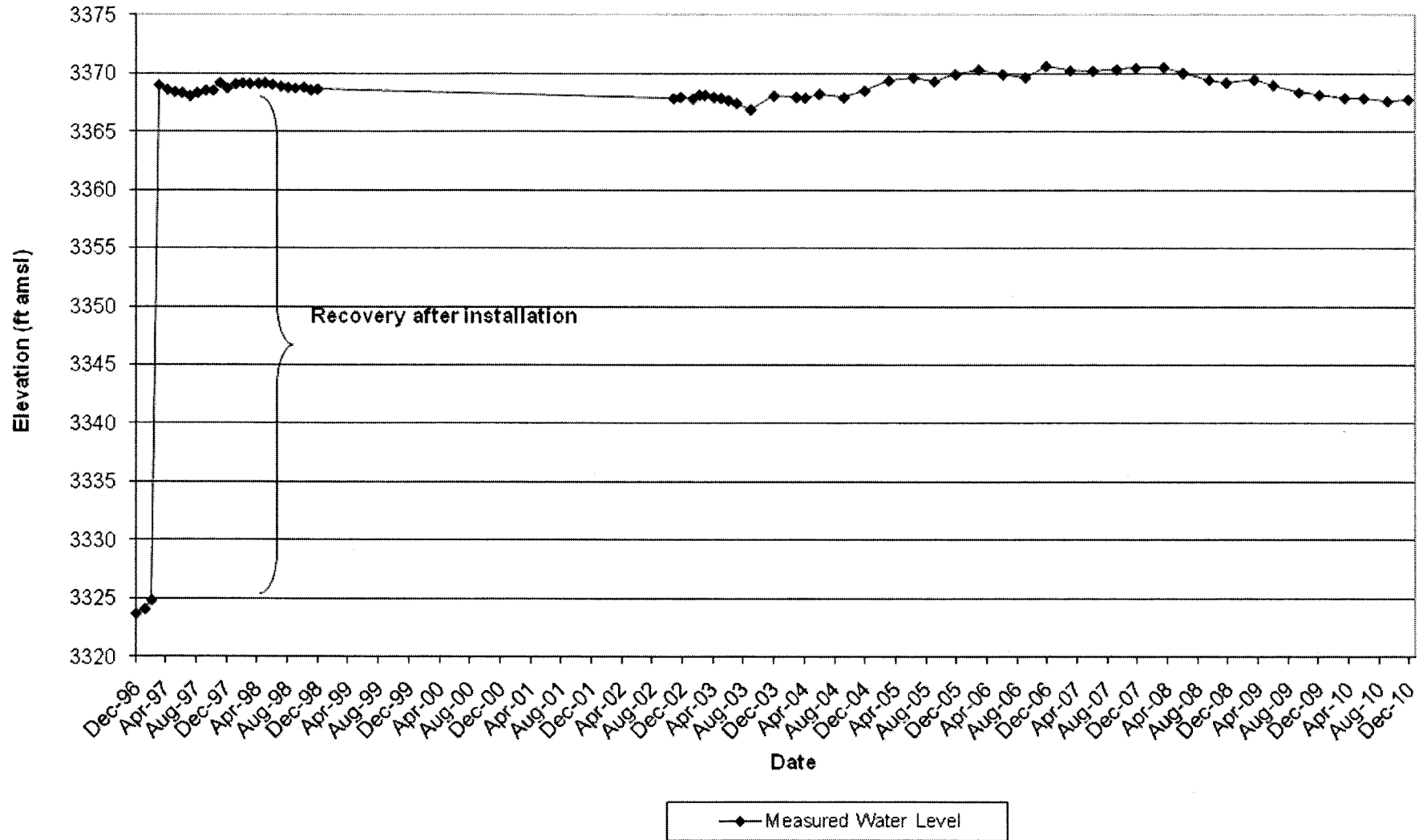


### C-2505 Santa Rosa/Dewey Lake Historical Water Level Measurements

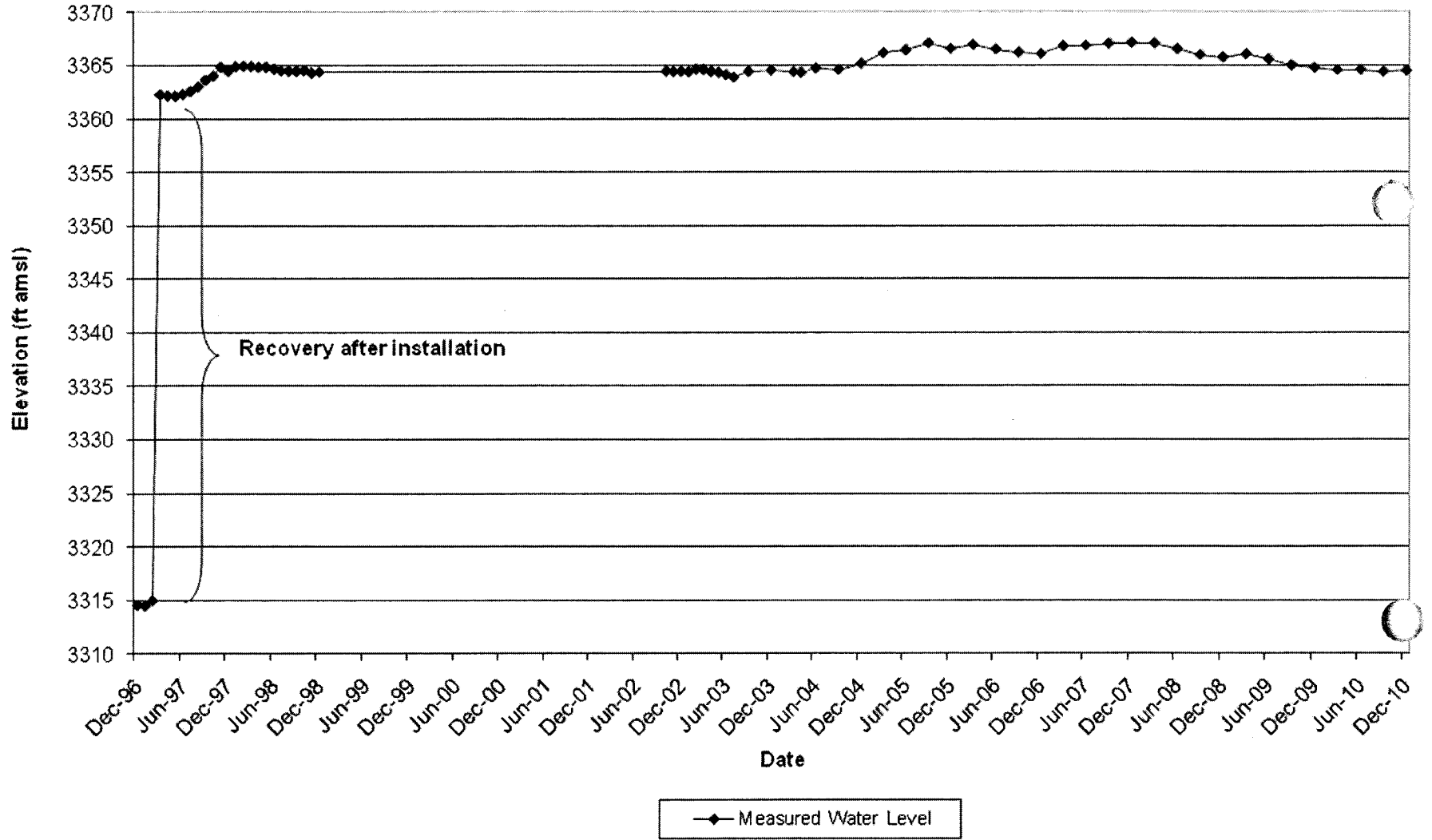




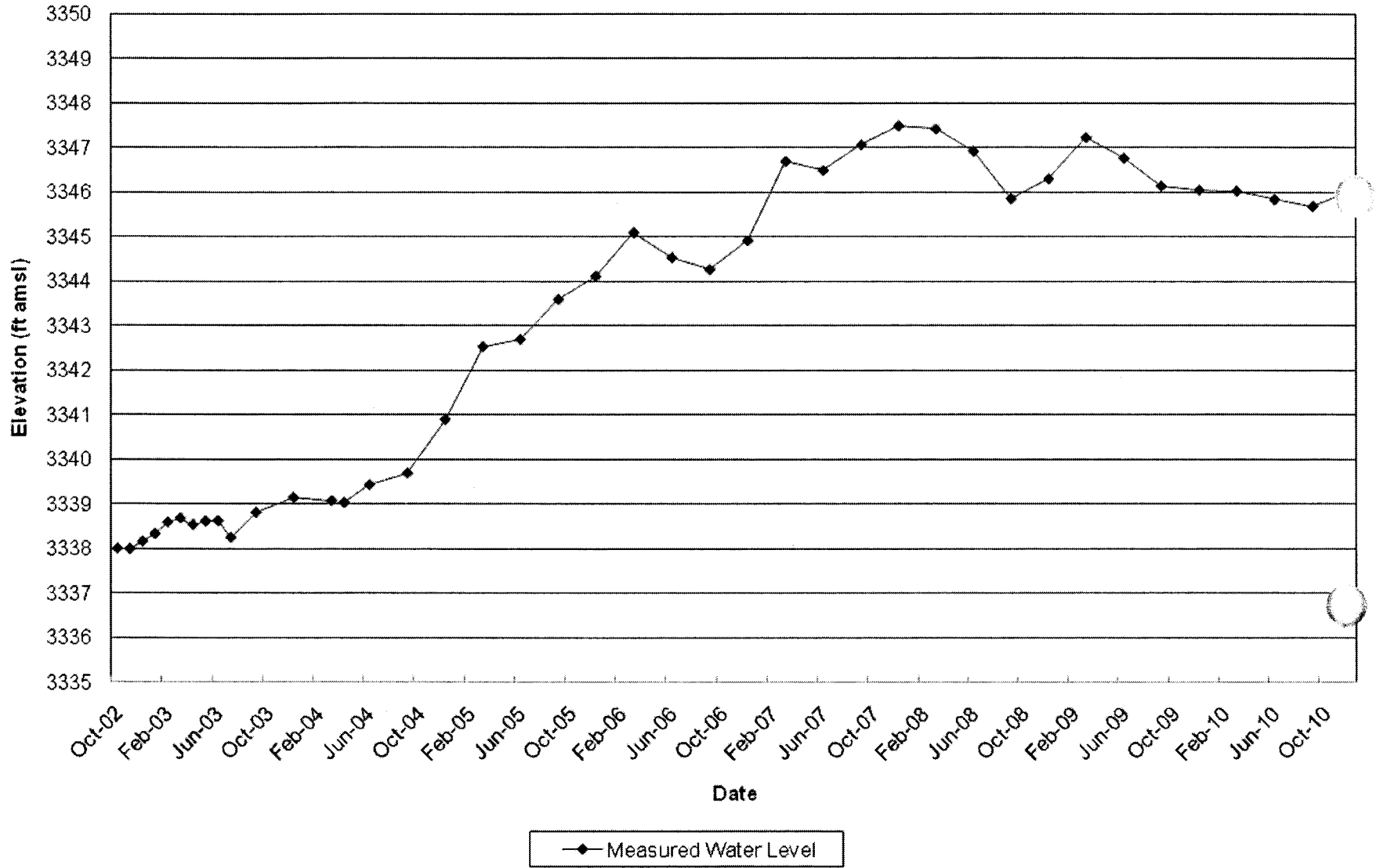
### C-2506 Santa Rosa/Dewey Lake Historical Water Level Measurements



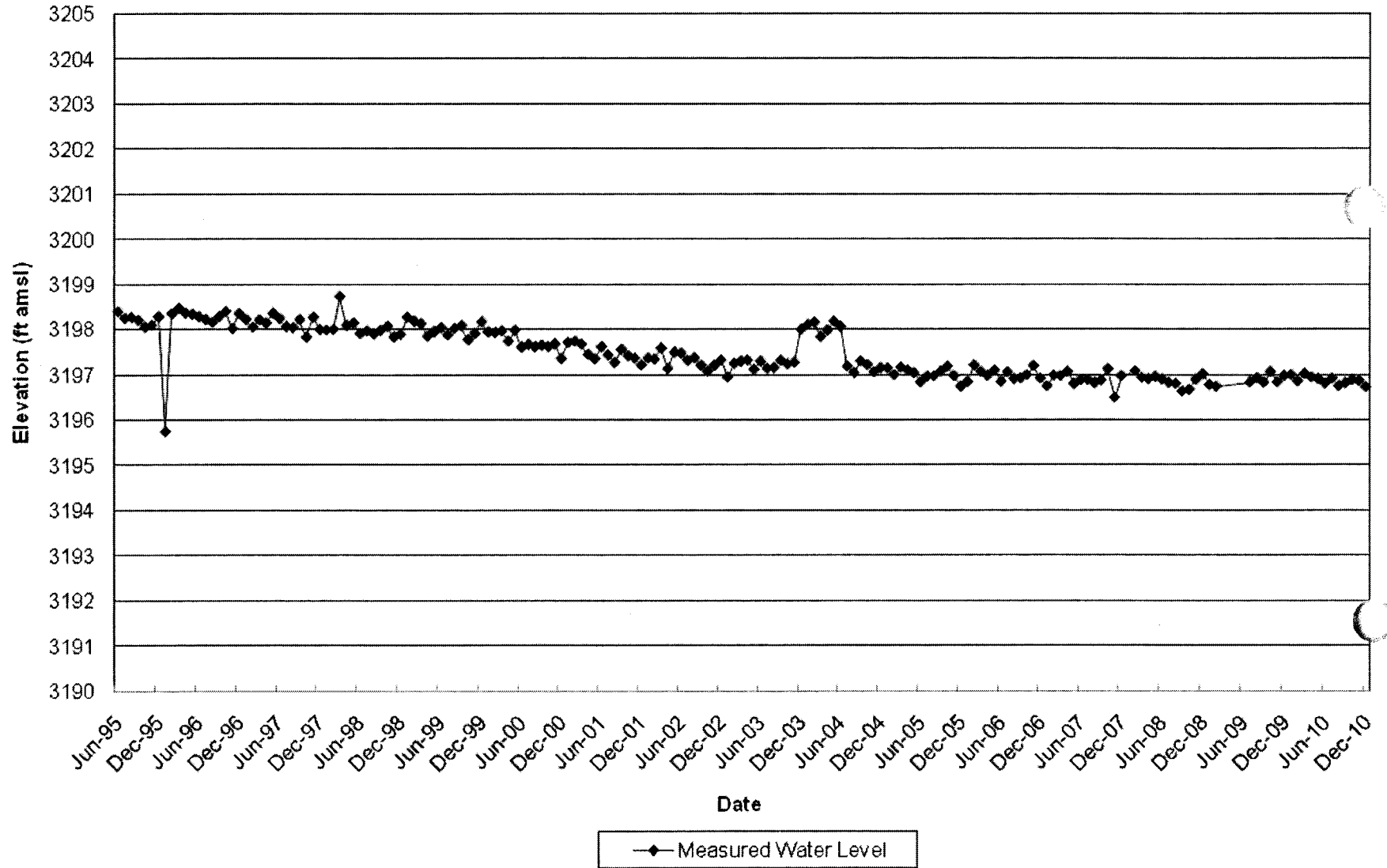
### C-2507 Santa Rosa/Dewey Lake Historical Water Level Measurements



### C-2811 Santa Rosa/Dewey Lake Historical Water Level Measurements



### WQSP-6A Historical Water Level Measurements



**Appendix B**  
**Historical Chemistry Data for SSW Piezometers/Wells**

Monitoring Site	General Chemistry Parameters					Trace Metals	
	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-1	6/21/04	<10	1,530	36,300	79,600	0.0440	<0.00500
PZ-1	11/09/04	1.30	6,530	45,700	85,800	0.106	<0.0100
PZ-1	5/17/05	1.47	2,640	62,300	100,500	0.0600	0.0770
PZ-1	10/11/05	2.59	1,950	54,900	74,800	0.0430	<0.0100
PZ-1	5/16/06	<2.5	2,490	62,400	113,000	0.0510	<0.0100
PZ-1	10/10/06	<1.00	1,390	55,300	70,200	<0.0500	<0.0250
PZ-1	5/09/07	2.70	2,220	63,000	107,000	<0.0500	<0.0250
PZ-1	10/09/07	<1.00	2,820	83,200	99,500	<0.1000	<0.0250
PZ-1	6/5/08	<2.0	2,100	57,000	98,000	0.667	0.00218
PZ-1	10/14/08	NA	2,200	59,000	94,000	NA	NA
PZ-1	05/19/09	NA	2,200	54,000	96,000	NA	NA
PZ-1	10/19/09	NA	2,300	66,000	101,000	NA	NA
PZ-1	5/25/10	NA	2,200	53,000	92,800	NA	NA
PZ-1	10/26/10	NA	1,800	62,000	96,100	NA	NA
PZ-5	6/21/04	20.7	1,340	28,800	55,200	0.0670	<0.00500
PZ-5	11/09/04	<2.50	1,820	47,800	86,000	0.0940	<0.0100
PZ-5	5/17/05	2.96	3,260	46,000	65,400	0.0930	0.0670
PZ-5	10/11/05	5.14	769	14,000	32,800	0.0620	<0.0100
PZ-5	5/16/06	2.56	1,520	18,300	32,600	0.0710	<0.0100
PZ-5	10/10/06	5.04	1,330	28,800	47,400	<0.0500	<0.0250
PZ-5	5/09/07	4.60	1,640	17,300	32,400	<0.0500	<0.0250
PZ-5	10/09/07	<1.00	1,880	19,400	28,700	0.0710	<0.005
PZ-5	6/5/08	5.7	1,500	19,000	33,000	0.0801	0.00317
PZ-5	10/14/08	NA	1,400	13,000	25,000	NA	NA
PZ-5	05/19/09	NA	1,500	13,000	24,000	NA	NA
PZ-5	10/19/09	NA	1,600	14,000	20,200	NA	NA
PZ-5	5/25/10	NA	1,400	13,000	21,900	NA	NA
PZ-5	10/26/10	NA	1,400	13,000	20,800	NA	NA
PZ-6	6/21/04	21.2	2,860	70,500	134,000	0.0170	<0.00500
PZ-6	11/09/04	4.89	13,000	75,400	113,000	0.0600	<0.0100
PZ-6	5/17/05	4.25	3,610	109,000	160,500	0.0500	0.0540
PZ-6	10/11/05	<20.0	2,850	83,800	106,000	0.0210	<0.0100
PZ-6	5/16/06	7.69	3,050	68,800	115,000	<0.0100	<0.0100
PZ-6	10/10/06	252	2,790	79,800	134,000	<0.0500	<0.0250
PZ-6	5/09/07	6.65	2,840	73,500	122,500	<0.0500	<0.0250
PZ-6	10/09/07	<1.00	3,080	81,000	105,000	<0.1000	<0.0250
PZ-6	6/5/08	6.1	2,100	47,000	81,000	0.0412	0.00259
PZ-6	10/14/08	NA	2,500	58,000	87,000	NA	NA
PZ-6	05/19/09	NA	2,700	61,000	89,000	NA	NA
PZ-6	10/19/09	NA	2,300	50,000	83,600	NA	NA
PZ-6	5/25/10	NA	2,300	47,000	82,100	NA	NA
PZ-6	10/26/10	NA	1,900	47,000	72,300	NA	NA
PZ-7	6/21/04	20.7	2,620	53,000	109,000	0.041	<0.00500
PZ-7	11/08/04	2.89	7,460	43,600	80,400	0.0880	<0.0100
PZ-7	5/16/05	4.02	2,530	42,100	65,900	0.0820	0.0940

Shallow Subsurface Water Quality Sampling Results							
Monitoring Site	Sample Date	General Chemistry Parameters				Trace Metals	
		Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-7	10/10/05	6.37	2,770	61,000	88,000	0.0470	<0.0100
PZ-7	5/15/06	<5.3	3,190	54,100	139,000	0.0680	<0.0100
PZ-7	10/9/06	<1.00	2,890	66,800	81,500	<0.00100	<0.0500
PZ-7	5/07/07	5.15	3,190	64,800	119,000	<0.0200	0.0200
PZ-7	10/08/07	<1.00	2,660	45,600	65,000	0.0640	<0.00500
PZ-7	6/4/08	5.0	2,300	49,000	86,000	0.0635	0.00257
PZ-7	10/13/08	NA	1,700	27,000	42,000	NA	NA
PZ-7	05/18/09	NA	3,700	76,000	120,000	NA	NA
PZ-7	10/20/09	NA	4,200	67,000	106,000	NA	NA
PZ-7	5/24/10	NA	3,000	68,000	103,000	NA	NA
PZ-7	10/25/10	NA	3,000	75,000	103,000	NA	NA
PZ-8	10/15/07	0.677	500	7,440	15,000	0.039	<0.00500
PZ-8	6/6/08	1.8	630	11,000	16,000	0.0655	<0.001
PZ-9	6/21/04	<20.0	3,740	80,200	140,000	<0.0100	<0.00500
PZ-9	11/09/04	1.40	14,500	92,400	144,000	0.0660	<0.0100
PZ-9	5/17/05	2.82	5,090	182,000	164,000	0.0500	0.0710
PZ-9	10/11/05	<20.0	3,930	85,500	107,000	0.0220	<0.0100
PZ-9	5/16/06	3.01	4,350	84,700	153,000	0.0230	<0.0100
PZ-9	10/10/06	<20.0	3,370	102,000	135,000	<0.0500	<0.0250
PZ-9	5/09/07	3.28	4,320	89,600	164,000	<0.0500	<0.0250
PZ-9	10/09/07	<200	4,720	116,000	144,000	<0.0200	<0.0050
PZ-9	6/5/08	2.2	4,400	87,000	150,000	0.0351	0.00492
PZ-9	10/14/08	NA	4,100	96,000	140,000	NA	NA
PZ-9	05/19/09	NA	3,600	94,000	130,000	NA	NA
PZ-9	10/19/09	NA	4,000	77,000	139,000	NA	NA
PZ-9	5/25/10	NA	4,400	94,000	144,000	NA	NA
PZ-9	10/26/10	NA	4,300	95,000	149,000	NA	NA
PZ-10	6/14/04	3.81	469	368	1,714	0.0200	<0.00500
PZ-10	11/08/04	3.69	431	353	1,576	<0.0500	<0.0100
PZ-10	5/16/05	3.63	572	416	1,756	0.0440	0.0370
PZ-10	10/10/05	3.34	515	318	1,720	0.0150	<0.0100
PZ-10	5/15/06	3.42	539	460	1,830	0.0140	<0.0100
PZ-10	10/9/06	5.5	549	350	1,600	<0.00100	<0.0500
PZ-10	5/07/07	14.8	407	274	1,504	<0.0200	0.0200
PZ-10	10/08/07	<1.00	211	186	968	0.0260	<0.0050
PZ-10	6/4/08	4.5	390	300	1,500	0.0144	0.00119
PZ-10	10/13/08	NS	380	290	1,400	NA	NA
PZ-10	05/18/09	NS	530	460	1,800	NA	NA
PZ-10	10/20/09	NS	500	440	1,730	NA	NA
PZ-10	5/24/10	NS	500	370	1,680	NA	NA
PZ-10	10/25/10	NS	410	360	1,530	NA	NA
PZ-11	6/21/04	20.8	2,220	58,100	123,000	<0.0100	<0.00500
PZ-11	11/08/04	3.15	13,000	84,100	119,000	<0.0500	<0.0100
PZ-11	5/16/05	4.63	2,890	66,000	100,000	<0.0100	<0.0100

### Shallow Subsurface Water Quality Sampling Results

Monitoring Site	Sample Date	General Chemistry Parameters				Trace Metals	
		Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
PZ-11	10/10/05	<20.0	2,950	84,300	129,000	0.0130	<0.0100
PZ-11	5/15/06	<5.3	3,090	71,000	133,000	<0.0100	<0.0100
PZ-11	10/9/06	<1.00	2,550	85,800	123,000	<0.00100	<0.0500
PZ-11	5/07/07	3.84	2,620	68,700	135,000	<0.0200	<0.0100
PZ-11	10/08/07	<1.00	2,970	94,400	108,000	<0.0200	<0.0050
PZ-11	6/4/08	3.9	2,100	65,000	110,000	0.0149	0.00216
PZ-11	10/13/08	NA	3,000	79,000	110,000	NA	NA
PZ-11	05/18/09	NA	2,500	72,000	110,000	NA	NA
PZ-11	10/20/09	NA	3,200	64,000	112,000	NA	NA
PZ-11	5/24/10	NA	2,500	69,000	107,000	NA	NA
PZ-11	10/25/10	NA	2,300	77,000	100,000	NA	NA
PZ-12	6/14/04	11.2	773	5,320	9,700	0.0770	<0.00500
PZ-12	11/08/04	19.8	879	7,170	9,540	0.0660	<0.0100
PZ-12	5/16/05	8.85	679	3,730	5,890	0.0510	0.0540
PZ-12	10/10/05	426	805	3,790	7,740	0.0200	<0.0100
PZ-12	5/15/06	20.6	866	4,510	8,790	0.0190	<0.0100
PZ-12	10/9/06	13.2	795	5,340	9,150	<0.00100	<0.0500
PZ-12	5/07/07	10.8	831	3,780	7,010	<0.0200	0.0240
PZ-12	10/08/07	<1.00	958	4,310	6,200	0.0260	<0.0050
PZ-12	6/4/08	11	760	3,300	6,800	0.0291	0.00132
PZ-12	10/13/08	NS	850	3,300	7,000	NA	NA
PZ-12	05/18/09	NS	870	4,600	8,300	NA	NA
PZ-12	10/20/09	NS	980	6,500	10,100	NA	NA
PZ-12	5/24/10	NS	990	5,500	10,100	NA	NA
PZ-12	10/25/10	NS	990	5,800	10,300	NA	NA
PZ-13	10/10/07	12.4	2,670	150,000	245,500	<0.100	<0.00500
PZ-13	6/6/08	<200	2,600	170,000	240,000	0.0118	0.00316
PZ-13	10/13/08	NS	2,900	160,000	230,000	NA	NA
PZ-13	05/18/09	NS	3,300	180,000	240,000	NA	NA
PZ-13	10/20/09	NS	3,300	170,000	255,000	NA	NA
PZ-13	5/24/10	NS	3,000	170,000	240,000	NA	NA
PZ-13	10/26/10	NS	2,900	190,000	246,000	NA	NA
PZ-14	10/15/07	1.41	2,140	71,500	106,000	<0.0100	<0.00500
PZ-14	6/6/08	<100	3,300	130,000	180,000	0.0201	0.00168
PZ-15	10/15/07	2.97	169	764	2,060	0.022	<0.00500
PZ-15	6/6/08	12	160	460	1,600	0.00372	<0.001
C-2811	6/14/04	6.06	299	769	2,022	0.0470	<0.00500
C-2811	11/08/04	7.63	305	1,030	1,996	0.0540	<0.0100
C-2811	5/16/05	6.02	524	1,930	3,740	0.0580	0.0530
C-2811	10/10/05	7.48	584	2,250	4,410	0.0340	<0.0100
C-2811	5/15/06	6.94	511	1,760	3,740	0.0310	<0.0100
C-2811	10/9/06	6.05	402	1,310	2,100	<0.00100	<0.0500
C-2811	5/07/07	5.31	516	1,760	4,205	<0.0200	0.0310
C-2811	10/08/07	<1.00	635	2,980	3,860	0.0510	<0.0050



### Shallow Subsurface Water Quality Sampling Results

Monitoring Site	General Chemistry Parameters					Trace Metals	
	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
C-2811	6/4/08	5.7	390	1,300	2,800	0.00170	0.0350
C-2811	10/13/08	NA	320	1,000	2,100	NA	NA
C-2811	05/18/09	NA	360	1,200	2,300	NA	NA
C-2811	10/20/09	NA	320	1,000	2,120	NA	NA
C-2811	5/24/10	NA	340	920	2,090	NA	NA
C-2811	10/25/10	NA	370	1,100	2,470	NA	NA
C-2507	6/21/04	7.55	717	1,300	3,830	0.029	0.028
C-2507	11/09/04	7.58	824	1,380	3,350	0.0800	0.0140
C-2507	5/17/05	7.94	860	1,370	3,340	0.0780	0.0630
C-2507	10/11/05	6.13	920	1,630	3,240	0.0470	<0.0100
C-2507	5/16/06	7.37	1,040	1,930	5,300	0.0510	<0.0100
C-2507	10/10/06	2.9	943	3,640	1,740	<0.0500	<0.0250
C-2507	5/9/07	6.62	1,110	3,060	5,485	<0.0500	<0.0250
C-2507	10/9/07	<1.00	1,220	3,500	5,540	0.0550	0.007
C-2507	6/5/08	6.9	990	2,800	5,800	0.0637	0.00493
C-2507	10/14/08	NA	940	2,200	5,100	NA	NA
C-2507	5/19/09	NA	950	2,600	5,200	NA	NA
C-2507	10/19/09	NA	930	3,400	5,710	NA	NA
C-2507	5/25/10	NA	910	3,500	6,640	NA	NA
C-2507	10/26/10	NA	980	3,500	7,120	NA	NA
WQSP-6A	7/13/95	7.62	1,905	1,040	11,000	<0.006	<0.025
WQSP-6A	3/28/96	3.98	1,810	507	3,920	<0.013	<0.025
WQSP-6A	7/11/96	2.75	1,971	6,748	4,500	0.020	<0.025
WQSP-6A	4/10/97	4.64	2,240	675	3,960	0.017	<0.025
WQSP-6A	7/10/97	4.04	2,560	660	3,840	<0.050	<0.1000
WQSP-6A	6/10/98	6.19	1,950	644	4,120	0.016	0.0015
WQSP-6A	11/3/98	11.00	2,100	770	4,100	0.220	<0.500
WQSP-6A	5/26/99	7.00	1,900	540	3,800	<0.100	<0.050
WQSP-6A	11/10/99	9.40	1,900	540	3,800	<0.050	<0.050
WQSP-6A	5/24/00	7.50	2,100	530	3,800	0.0129	<0.020
WQSP-6A	11/30/00	6.70	1,900	480	3,700	<0.0130	<0.025
WQSP-6A	6/6/01	6.37	1,900	536	3,680	0.0385	<0.025
WQSP-6A	11/14/01	3.67	1,900	414	4,600	<0.050	<0.010
WQSP-6A	5/22/02	5.52	1,930	487	3,540	<0.050	<0.010
WQSP-6A	11/20/02	5.61	2,090	419	3,685	<0.050	<0.010
WQSP-6A	5/21/03	4.74	1,950	384	3,650	<0.123	<0.050
WQSP-6A	11/19/03	<0.01	1,950	391	3,955	<0.219	<0.025
WQSP-6A	5/26/04	9.61	1,970	416	3,646	<0.025	<0.025
WQSP-6A	11/17/04	6.72	1,960	491	3,655	<0.025	<0.025
WQSP-6A	4/20/05	5.98	1,920	432	3,700	0.057	<0.025
WQSP-6A	10/19/05	<0.01	1,940	360	3,430	<0.025	<0.025
WQSP-6A	5/3/06	2.5	2,210	450	3,200	<0.025	<0.025
WQSP-6A	9/20/06	6.00	2,120	360	3,515	<0.025	<0.025
WQSP-6A	3/7/07	5.78	2,170	484	3,355	<0.025	<0.025

### Shallow Subsurface Water Quality Sampling Results

Shallow Subsurface Water Quality Sampling Results							
	General Chemistry Parameters					Trace Metals	
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	Selenium (mg/L)	Chromium (mg/L)
WQSP-6A	9/12/07	5.47	1,950	350	3,400	<0.025	<0.025
WQSP-6A	3/12/08	4.67	2,090	378	3,400	<0.025	<0.025
Monitoring Site	Sample Date	Nitrate (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	TDS (mg/L)	TKN (mg/L)	
WQSP-6A	9/10/08	5.69	2,030	348	3,150	< 5	
WQSP-6A	3/4/09	5.90	2,100	350	3,500	<1.0	
WQSP-6A	9/10/09	6.30	2,100	350	3,640	<1.0	
WQSP-6A	3/03/10	6.55	2,145	330	3,545	<1.0	
WQSP-6A	9/23/10	6.34	2,090	321	3500	<1.0	
<b>NA: Not Analyzed, parameter not required, per permit conditions.</b> <b>NS: Not Sampled, not required per permit conditions</b>							