



SOUTHERN NEVADA
WATER AUTHORITY

Water Resources Division

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

March 2010

Prepared by
Southern Nevada Water Authority
Water Resources Division
P.O. Box 99956
Las Vegas, Nevada 89193-9956

Submitted to the
Nevada State Engineer and the
Spring Valley Stipulation
Executive Committee

This document's use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the Southern Nevada Water Authority. Although trademarked names are used, a trademark symbol does not appear after every occurrence of a trademarked name. Every attempt has been made to use proprietary trademarks in the capitalization style used by the manufacturer.

Suggested citation: Southern Nevada Water Authority, 2010, 2009 Spring Valley hydrologic monitoring and mitigation plan status and data report: Southern Nevada Water Authority, Las Vegas, Nevada, Doc. No. WRD-ED-0007, 120 p.

CONTENTS

List of Figures	iii
List of Tables	v
List of Acronyms and Abbreviations	vii
1.0 Introduction.....	1-1
1.1 Background.....	1-1
1.2 Major Activities Performed in 2009.....	1-3
1.3 Report Scope.....	1-4
2.0 SVMM Plan Status and Data	2-1
2.1 Exploratory- and Production-Well Monitoring	2-1
2.2 Existing-Well Monitoring Network	2-1
2.3 New Monitor Wells	2-5
2.3.1 Interbasin Monitoring Zone Network.....	2-5
2.3.2 Two Monitor Wells between the Zone and Closest Production Well ...	2-7
2.3.3 Two Monitor Wells between Shoshone Ponds and Closest Production Well	2-8
2.3.4 Cleveland Ranch Monitor Wells	2-8
2.3.5 Spring Monitoring Network.....	2-12
2.4 Aquifer Testing.....	2-14
2.5 Stream Discharge Measurements	2-14
2.5.1 Discharge Sites at Big Springs Creek and Cleve Creek.....	2-14
2.5.1.1 Cleve Creek	2-15
2.5.1.2 Big Springs Creek	2-15
2.5.2 Synoptic-Discharge Study of Big Springs and Lake Creeks	2-17
2.5.3 Relationship Between Big Springs and Basin-Fill and Carbonate-Rock Aquifers.....	2-17
2.6 Precipitation Station Network.....	2-17
2.7 Water-Chemistry-Sampling Program	2-19
2.8 Reporting	2-19
2.9 Proposed Schedule of Groundwater Withdrawals	2-21
3.0 Anticipated 2010 SNWA SVMM Plan Activities	3-1
4.0 References.....	4-1
Appendix A - Periodic Water-Level Measurements Collected at SNWA Exploratory and Test Wells	
Appendix B - Periodic Water-Level Measurement Data from the Spring Valley Existing-Well Monitoring Network	
Appendix C - Continuous Water-Level Measurement Data from the Spring Valley Existing-Well Monitoring Network	



CONTENTS (CONTINUED)

Appendix D - Spring-Monitoring Program Hydrologic and Field-Chemistry Data

Appendix E - SNWA and USGS Discharge Measurements and Hydrographs for Cleve Creek
and Big Springs Creek

Appendix F - Regional and High-Altitude Precipitation Data

FIGURES

NUMBER	TITLE	PAGE
1-1	Spring Valley Hydrographic Area 184.	1-2
2-1	SNWA Exploratory and Test Wells in Spring Valley (as of February 2010)	2-2
2-2	Spring Valley Existing-Well Monitoring Network	2-3
2-3	SNWA Interbasin Monitoring Zone Well Locations	2-6
2-4	Location of Monitor Wells near Shoshone Ponds	2-9
2-5	Location Map of Cleveland Ranch and Turnley Spring.	2-10
2-6	Monitoring Locations Associated with Cleveland Ranch	2-11
2-7	Spring Monitoring Locations	2-13
2-8	Cleve and Big Springs Creeks Gaging Stations	2-16
2-9	Big Springs Synoptic-Discharge Measurement Study Area, Snake Valley.	2-18
2-10	Precipitation Station Locations.	2-20



This Page Left Intentionally Blank

TABLES

NUMBER	TITLE	PAGE
2-1	Spring Valley Existing Well Monitoring Network.	2-4
2-2	SNWA Interbasin Monitoring Zone Well Locations	2-7
2-3	Spring Monitoring Locations	2-14
2-4	Cleve Creek and Big Springs Monitoring Locations	2-15
2-5	Precipitation Station Locations.	2-19
A-1	Periodic Water-Level Measurements Collected at SNWA Exploratory and Test Wells	A-1
B-1	Periodic Water-Level Measurement Data from the Spring Valley Existing-Well Monitoring Network	B-1
C-1	Well 383704114225001, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-2
C-2	Well 384039114232701, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-4
C-3	Well 384831114314301, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-6
C-4	Well 384745114224401, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-8
C-5	Well 390352114305401, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-10
C-6	Well 390803114251001, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-12
C-7	Well 393211114320701, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-14
C-8	Well 383023114115302, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-16
C-9	Well 184W502M, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-18



TABLES (CONTINUED)

NUMBER	TITLE	PAGE
C-10	Well 184W504M, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-20
C-11	Well 184W506M, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-22
C-12	Well 184W508M, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-24
C-13	Well SPR7007M, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-26
C-14	Well SPR7005M, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-28
C-15	Well SPR7008M, Calendar Year 2009 Water-Level Data, Daily Mean Values	C-30
D-1	Spring Valley Miscellaneous Discharge Data	D-1
D-2	Well SPR7007Z, Calendar Year 2009 Water-Level Data, Daily Mean Values	D-4
E-1	Big Springs Creek near Baker, Nevada (Combined Discharge).	E-1
E-2	10243700-Cleve Creek near Ely, Nevada (Discharge Measurements)	E-3
F-1	2009 Regional Precipitation Data	F-1
F-2	Recent (2005 – 2008) High-Altitude Precipitation Data	F-2

ACRONYMS

BLM	Bureau of Land Management
BWG	Biological Work Group
DOI	U.S. Department of the Interior
EC	Executive Committee
HA	hydrographic area
MOU	Memorandum of Understanding
NDWR	Nevada Division of Water Resources
NSE	Nevada State Engineer
NWIS	National Water Information System
SNPLMA	Southern Nevada Public Lands Management Act
SNWA	Southern Nevada Water Authority
TRP	Technical Review Panel
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator
WY	water year

ABBREVIATIONS

°C	degrees Celsius
afy	acre-feet per year
amsl	above mean sea level
bgs	below ground surface
cfs	cubic feet per second
ft	foot
gpm	gallons per minute
in.	inch
m	meter
mi	mile
mi ²	square mile



This Page Left Intentionally Blank

1.0 INTRODUCTION

The Southern Nevada Water Authority (SNWA) prepared this report to satisfy the requirements of the Spring Valley Monitoring and Mitigation Plan (SVMM Plan) (SNWA, 2009a) as approved by the Nevada State Engineer (NSE) on February 9, 2009, as required by NSE Ruling 5726. The location of Spring Valley is presented in [Figure 1-1](#). The hydrologic data contained in this report were also submitted to the NSE to meet the specified electronic format requirement.

This report also satisfies the hydrologic data reporting requirements of the Hydrologic Monitoring, Management, and Mitigation Plan (SV3M Plan) associated with the U.S. Department of the Interior (DOI) and SNWA Stipulation Agreement. The SVMM Plan contains all the elements of the SV3M Plan as well as monitoring related to existing non-federal water-right holders.

This report provides the NSE and Stipulation Technical Review Panel (TRP) with data collected in 2009 from hydrologic monitoring locations associated with the SV3M and SVMM Plans. This is the third annual status and data report. The first data report contained hydrologic data collected in 2007 and historically from the monitoring network (SNWA, 2008). The second data report contained hydrologic data collected in 2008 (SNWA, 2009b).

1.1 Background

SNWA holds groundwater rights in Spring Valley hydrographic area (HA) 184 for municipal and domestic purposes under permits 54003 through 54015, inclusive, as well as 54019 and 54020. These permits were granted by NSE in Ruling 5726 issued April 16, 2007, and total 60,000 afy following a staged development (NSE, 2007). The staged-development guidelines call for a minimum 10-year period during which a maximum of 40,000 afy can be pumped in any one year with a 10-consecutive-year average of at least 35,000 afy. At the end of the 10-year period and after a review of the findings of the staged-development period, SNWA may have the opportunity to develop the full 60,000 afy. Ruling 5726 required the development of hydrologic and biologic monitoring and mitigation plans, which were approved in February 2009.

On September 8, 2006, prior to the water-right application hearing, a Stipulation for Withdrawal of Protests (Stipulation) was established between SNWA and DOI on behalf of the Bureau of Indian Affairs, the Bureau of Land Management (BLM), the National Park Service, and the U.S. Fish and Wildlife Service (collectively known as the DOI Bureaus). This Stipulation requires that SNWA develop comprehensive hydrologic (SV3M Plan) and biologic monitoring plans, which are presented in Exhibits A and B of the Stipulation. As part of the Stipulation, an Executive Committee (EC) was established to oversee the implementation of the agreement. A TRP and Biological Work Group (BWG), composed of representatives of parties to the agreement, were also established to develop

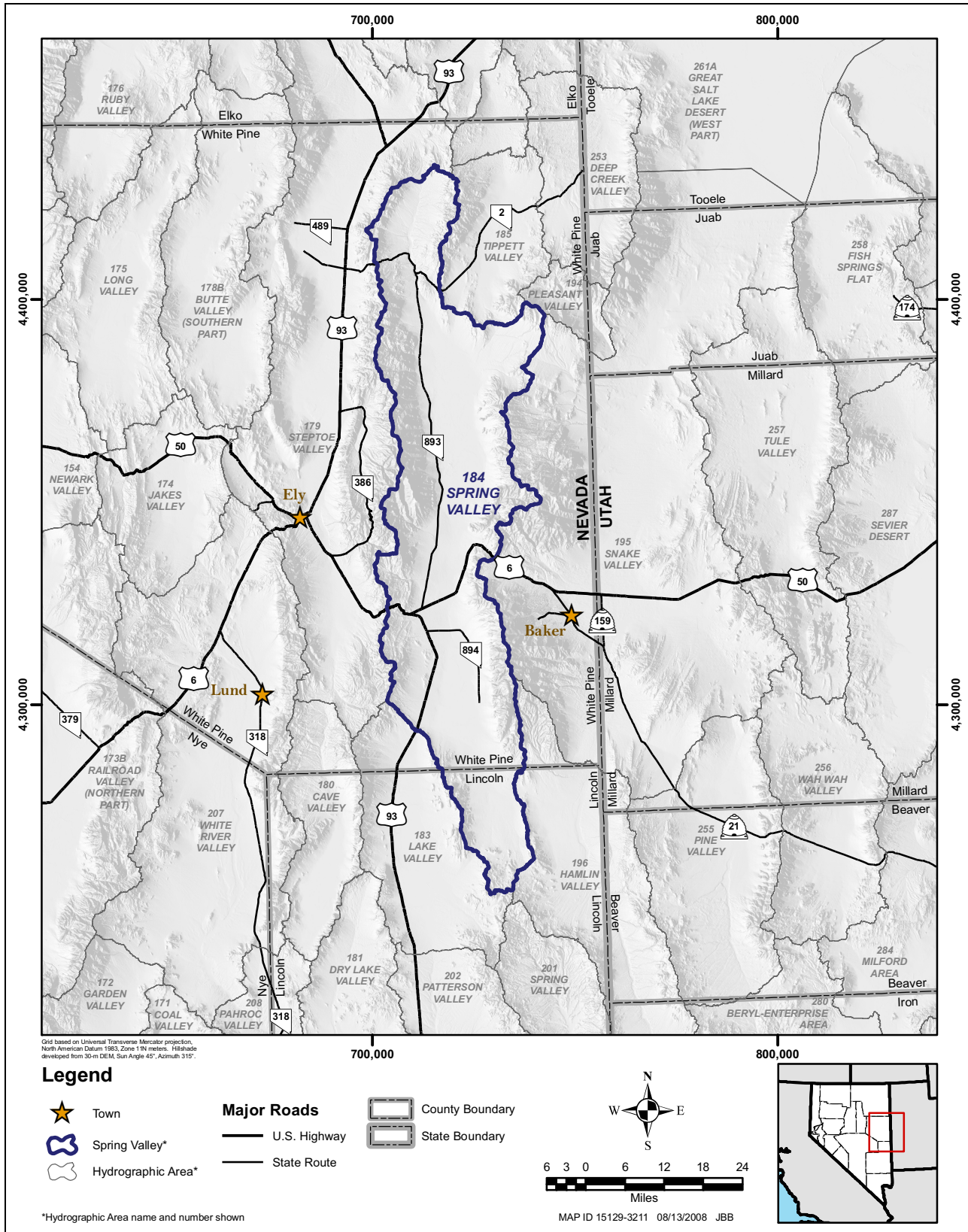


Figure 1-1
Spring Valley Hydrographic Area 184

and oversee implementation of monitoring and mitigation plans, review program data, and modify the monitoring plans, if necessary.

1.2 Major Activities Performed in 2009

Major activities associated with the SVMM Plan performed in 2009 were as follows:

- Received approval of the SVMM Plan from the NSE on February 9, 2009. The SVMM Plan contains all the elements of the SV3M Plan as well as additional monitoring at the Cleveland Ranch, Turnley Spring, and a future monitor well 1 mi north of the northernmost future production well on the east side of the valley.
- Obtained property access for and performed discharge monitoring at Turnley Spring as required in the SVMM Plan.
- Obtained BLM right-of-way and installed a flume and continuous discharge monitoring instrumentation at Rock Spring.
- Pursued property access to and monitoring locations associated with the Cleveland Ranch monitoring.
- Received BLM right-of-way access for five Interbasin Zone monitor wells and seven piezometer locations near spring monitoring network locations on BLM land.
- Continued to pursue BLM access for Shoshone Ponds monitor wells SPR7024M and SPR7024M2.
- Finished installing continuous-monitoring instrumentation at all 15 required sites in the existing-well monitoring network, including seven MX wells. The installation included datalogger and pressure transducer instrumentation and instrumentation housings.
- Completed a professional survey of elevation and coordinates for wells within the monitoring network. All future wells will be professionally surveyed after completion.
- Performed routine physical water-level measurements on required network monitor wells.
- Continued to participate in the Cooperative Funding Agreement with U.S. Geological Survey (USGS) and the Nevada Division of Water Resources (NDWR) to support the operation and maintenance of three high-altitude precipitation stations near Spring Valley and discharge gaging stations on Cleve and Big Springs creeks.
- Maintained the SNWA data-exchange web site accessible by the NSE, EC, TRP, and BWG. The web site contains project reports, monitoring network attributes, and hydrologic data.
- Worked cooperatively with the TRP to obtain updates on the Southern Nevada Public Lands Management Act (SNPLMA) Round 8 hydrologic monitoring program, which includes well



installations at the Great Basin National Park and near Big Springs. This collaboration included an update at the TRP meeting in fall 2009.

- Worked with BWG to finalize the Biological Monitoring Plan. This plan was completed and approved in February 2009.
- Pursued property access for the Big Springs Creek surface-water system synoptic-discharge study.

1.3 Report Scope

[Section 2.0](#) presents the status and data collected for each major element of the SVMM Plan. [Section 3.0](#) discusses the planned activities for 2010, and [Section 4.0](#) provides a list of references. Lastly, [Appendix A](#) through [Appendix F](#) present tables and graphs of the various data discussed in the report.

2.0 SVMM PLAN STATUS AND DATA

The hydrologic data collected in 2009 and the current status of each major element of the SVMM Plan are presented in this section.

2.1 Exploratory- and Production-Well Monitoring

The exploratory- and production-well monitoring section of the SVMM Plan states that SNWA shall record discharge and water levels in all completed SNWA production wells on a continuous basis. SNWA does not currently have any production wells associated with this project; however, continuous measurements will be collected from all future production wells. Water-level measurements are required in all SNWA exploratory wells at least quarterly. SNWA exploratory and test wells located in Spring Valley are presented in [Figure 2-1](#). Periodic water-level measurements and hydrographs for the exploratory and test wells not included in the existing-well network described below are presented in [Appendix A](#). After the beginning of groundwater withdrawal, the TRP will identify a representative number of exploratory wells for continuous measurement.

2.2 Existing-Well Monitoring Network

The SVMM Plan states that SNWA shall monitor water levels quarterly in 10 representative existing monitor wells and continuously in 15 representative existing monitor wells in the Spring Valley and Hamlin Valley HAs as approved by the TRP and NSE.

In 2007, the TRP selected 25 wells to include in the existing-well monitoring network. Wells were selected based upon integrity of construction, spatial distribution, and completion information. Wells included in the network are completed in carbonate-rock, volcanic, and basin-fill aquifers. The locations of the wells and the aquifers monitored are presented in [Figure 2-2](#). Simplified well-identification numbers relate to the list of wells presented in Table D.1-1 in SNWA (2006). Each well-identification number on the figure includes a Q or C designation for quarterly or continuous measurements.

An attribute table for wells included in this monitoring network, including well construction, location coordinates, and ground-surface elevation, is presented in [Table 2-1](#). A professional-grade survey of location coordinates and ground-surface and top-of-casing measuring-point elevations was performed for each well in 2008. A field report documenting attributes of each well included in the network, including well photos and map locations, has been posted on the SNWA.com\exchange web site.

The network includes wells owned by SNWA, USGS, and BLM and two wells owned by the Eldridge Ranch. All continuously monitored wells are owned by SNWA or USGS. SNWA and USGS developed a Memorandum of Understanding (MOU) to upgrade the well pads and install an

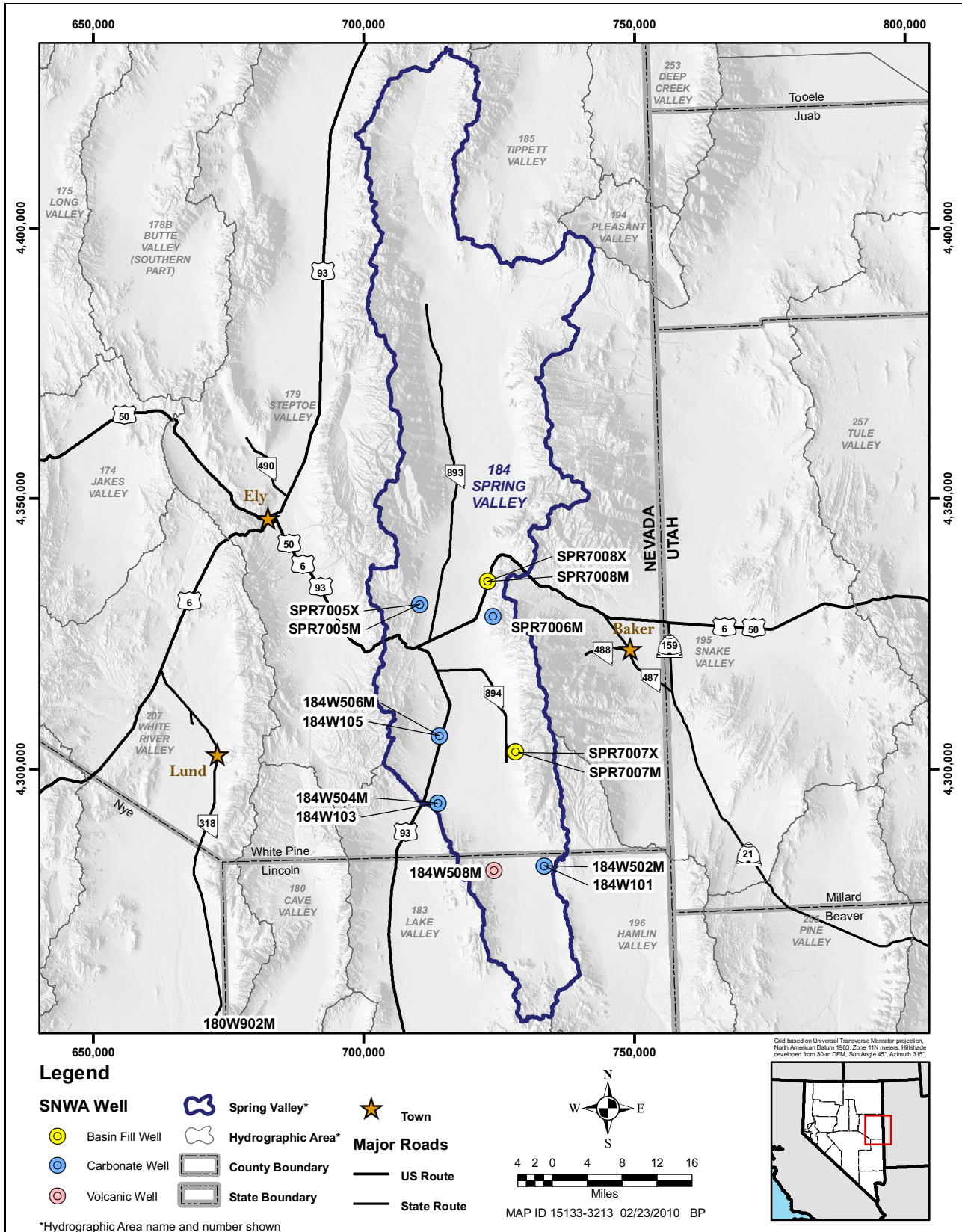


Figure 2-1
SNWA Exploratory and Test Wells in Spring Valley (as of February 2010)

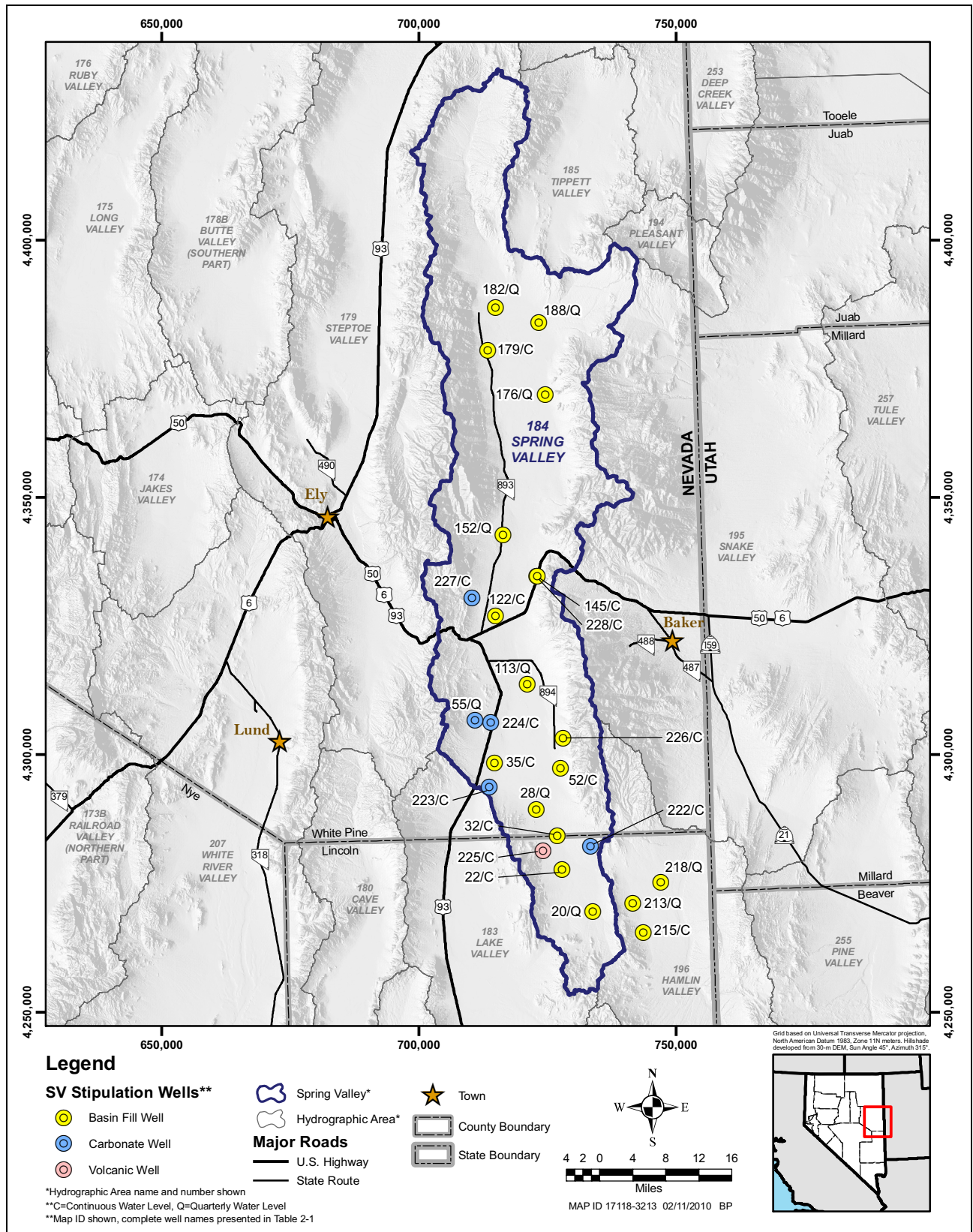


Figure 2-2
Spring Valley Existing-Well Monitoring Network



**Table 2-1
Spring Valley Existing-Well Monitoring Network**

Map ID	Site Number	Station Local Number	Location ^a		Surface Elevation (ft amsl)	Completion Date	Drill Depth (ft bgs)	Well Depth (ft bgs)	Well Casing Diameter (in.)	Screened Interval (ft bgs)	Open Interval (ft bgs)	Aquifer	Monitor Frequency
			UTM Northing (m)	UTM Easting (m)									
22	383704114225001	184 N09 E68 30AAAB 1 USGS-MX (Spring Valley S.)	4,277,594.57	727,759.99	6,002.52	8/7/1980	700	679	11	559 to 679	50 to 700	Basin Fill	Continuous
32	384039114232701	184 N10 E68 31CD 1 USGS-MX	4,284,275.68	726,871.51	5,896.49	---	---	150	2	---	50 to 150	Basin Fill	Continuous
35	384831114314301	184 N11 E66 23AB 1 USGS-MX	4,298,411.13	714,633.01	5,842.94	---	102	102	2	---	50 to 102	Basin Fill	Continuous
52	384745114224401	184 N11 E68 19DCDC 1 USGS-MX (Spring Valley)	4,297,304.22	727,554.19	5,900.18	---	200	200	2	---	50 to 200	Basin Fill	Continuous
122	390352114305401	184 N14 E66 24BDDD 1 USGS-MX (Spring Valley N.)	4,326,894.19	714,873.84	5,846.04	1980	---	160	2	---	50 to 160	Basin Fill	Continuous
145	390803114251001	184 N15 E67 26CA 1 USGS-MX	4,334,740.47	722,963.02	5,727.21	---	---	200	2	---	50 to 200	Basin Fill	Continuous
179	393211114320701	184 N19 E66 11B 1	4,378,627.03	713,381.69	5,698.43	4/22/1960	---	400	---	---	50 to 400	Basin Fill	Continuous
215	383023114115302	196 N08 E69 35DC 2 USGS-MX (Hamilin Valley S.)	4,265,403.02	743,597.36	5,837.67	8/7/1980	520	435	2	320 to 420	35 to 520	Basin Fill	Continuous
222	184W502M	184 N09 E68 11 BD 2	4,282,116.34	733,294.42	6,189.72	1/25/2007	1,828	1,799	8	495 to 1,779	58 to 1,828	Carbonate	Continuous
223	184W504M	184 N11 E66 34 DD 2	4,293,712.49	713,647.12	5,900.11	11/17/2006	1,040	1,020	8	309 to 999	61 to 1,040	Carbonate	Continuous
224	184W506M	184 N12 E66 26 BA 2	4,306,214.21	713,939.81	6,014.04	10/19/2006	1,160	1,140	8	430 to 1,120	80 to 1,160	Carbonate	Continuous
225	184W508M	184 N09 E67 11 DB 1	4,281,308.68	724,070.89	6,056.19	12/15/2006	1,180	1,160	8	376 to 1,140	241 to 1,180	Volcanic	Continuous
226	SPR7007M	184 N11 E68 05 BC 2	4,303,146.59	727,976.03	6,017.73	8/17/2007	1,040	1,020	8	300 to 1,000	101 to 1,040	Basin Fill	Continuous
227	SPR7005M	184 N14 E66 09 AB 2	4,330,471.51	710,372.44	6,395.68	7/10/2007	1,412	1,404	8	663 to 1,383	439 to 1,412	Carbonate	Continuous
228	SPR7008M	184 N15 E67 26 CD 2	4,334,702.61	722,865.27	5,704.86	7/25/2007	960	946	8	226 to 926	54 to 960	Basin Fill	Continuous
20	383351114180201	184 N08 E68 14A 1 USBLM	4,269,504.76	733,845.43	6,184.22	---	---	495	6	50 to 495	50 to 495	Basin Fill	Quarterly
28	384310114261401	184 N10 E67 22AA 1 USGS-MX (Spring V Central)	4,289,331.34	722,826.33	5,853.54	---	---	100	2	---	50 to 100	Basin Fill	Quarterly
55	184 N12 E66 21CD 1	184 N12 E66 21CD 1	4,306,700.53	710,871.15	6,370.31	9/13/1966	631	633	6	3 to 631	3 to 631	Carbonate	Quarterly
113	385636114265501	184 N13 E67 33DDA 1	4,313,590.54	721,086.82	5,769.73	---	---	---	36	---	---	Basin Fill	Quarterly
152 ^b	391224114293601	184 N18 E66 36DBAD 1 USBLM - Cieve Creek Well	4,342,683.25	716,362.90	5,870.25	---	---	---	---	---	---	Basin Fill	Quarterly
176	392703114230501	184 N18 E67 01CCAA 1	4,369,956.56	724,523.82	5,587.78	---	---	42	38	---	---	Basin Fill	Quarterly
182	184 N20 E66 13AB 1	184 N20 E66 13AB 1	4,386,884.19	714,871.84	5,774.93	6/26/1966	907	296	16	135 to 296	---	Basin Fill	Quarterly
188	393442114231801	184 N20 E67 26ABBD 1 USBLM	4,383,955.15	723,240.35	5,708.77	---	130	130	6	---	50 to 130	Basin Fill	Quarterly
213	383325114134901	196 N08 E69 15B 1	4,271,103.41	741,539.28	5,729.98	---	---	110	6	---	50 to 110	Basin Fill	Quarterly
218	383533114102901	196 N08 E70 06B 1 USBLM - Monument Well	4,275,166.91	747,014.36	5,676.76	7/22/1947	---	164	6	111 to 115/ 152 to 164	---	Basin Fill	Quarterly

^aAll coordinates are Universal Transverse Mercator, North American Datum, 1983, Zone 11.

^bThe Cieve Creek well will be replaced by a new monitor well approximately 1 mi to the north.

Well-construction data are based upon best available information from well logs, MX Project Report, and direct field measurements.

equipment housing and pressure transducer and datalogger instrumentation at seven USGS well locations. The well-upgrade program began in 2008 and was completed in 2009.

The Cleve Creek Well (site number 391224114293601) will be dropped from the network and replaced with new paired shallow and deeper monitor wells located approximately 1 mi to the north of the existing Cleve Creek Well. These wells will be associated with additional required spring and groundwater monitoring in the vicinity of the Cleveland Ranch as described in [Section 2.3.4](#). The construction details of the existing Cleve Creek well are not documented. A new monitor well will provide higher-quality data as well as more information on the lithologic and hydrogeologic characteristics of the surficial aquifer. This monitor well will be installed along with other SNWA wells associated with Cleveland Ranch monitoring.

The discrete water-level data collected in 2009 for each monitoring network well are presented in [Appendix B](#). Historic data are presented on hydrographs for the wells monitored quarterly. [Appendix C](#) presents the 2009 daily mean values derived from continuous data collection, and hydrographs presenting both discrete and continuous data from monitoring network wells where continuous groundwater-level data collection is required. Some of the early historical data collected at certain well locations are approximate or are omitted because of uncertainty associated with collection methods and procedures or variations in the reference point used for the measurement at the time of collection.

2.3 New Monitor Wells

The SVMM Plan requires the installation of new monitor wells at specific locations. New well locations and design were selected with the approval of the NSE and TRP. This section presents a description and the current status of the new wells. SNWA has received right-of-way approval for a portion of the planned wells located on BLM land. Status of the rights-of-way for each related element of the program are also presented.

2.3.1 Interbasin Monitoring Zone Network

The Stipulation Agreement established an Interbasin Monitoring Zone (Zone) and requires data collection intended to characterize the hydraulic gradient from Spring Valley to Snake Valley via Hamlin Valley. In the fall of 2007, the TRP selected six wells to include in the Zone monitoring program. The network includes carbonate monitor well 184W502M, which was installed in 2006, and five additional new well locations. The new locations include three carbonate and two basin-fill wells. The locations of the well sites and the Zone boundary are presented in [Figure 2-3](#), and the location coordinates for the wells are listed in [Table 2-2](#).

Right-of-way applications for the SNWA well sites in the Zone were submitted in 2007 and were approved by BLM in late 2009. After completion of each well, a short-term aquifer test will be performed, and water-chemistry samples will be collected. The wells will then be equipped with datalogger and pressure transducer instrumentation to collect continuous water-level data. A professional survey of location coordinates, ground-surface elevation, and top-of-casing

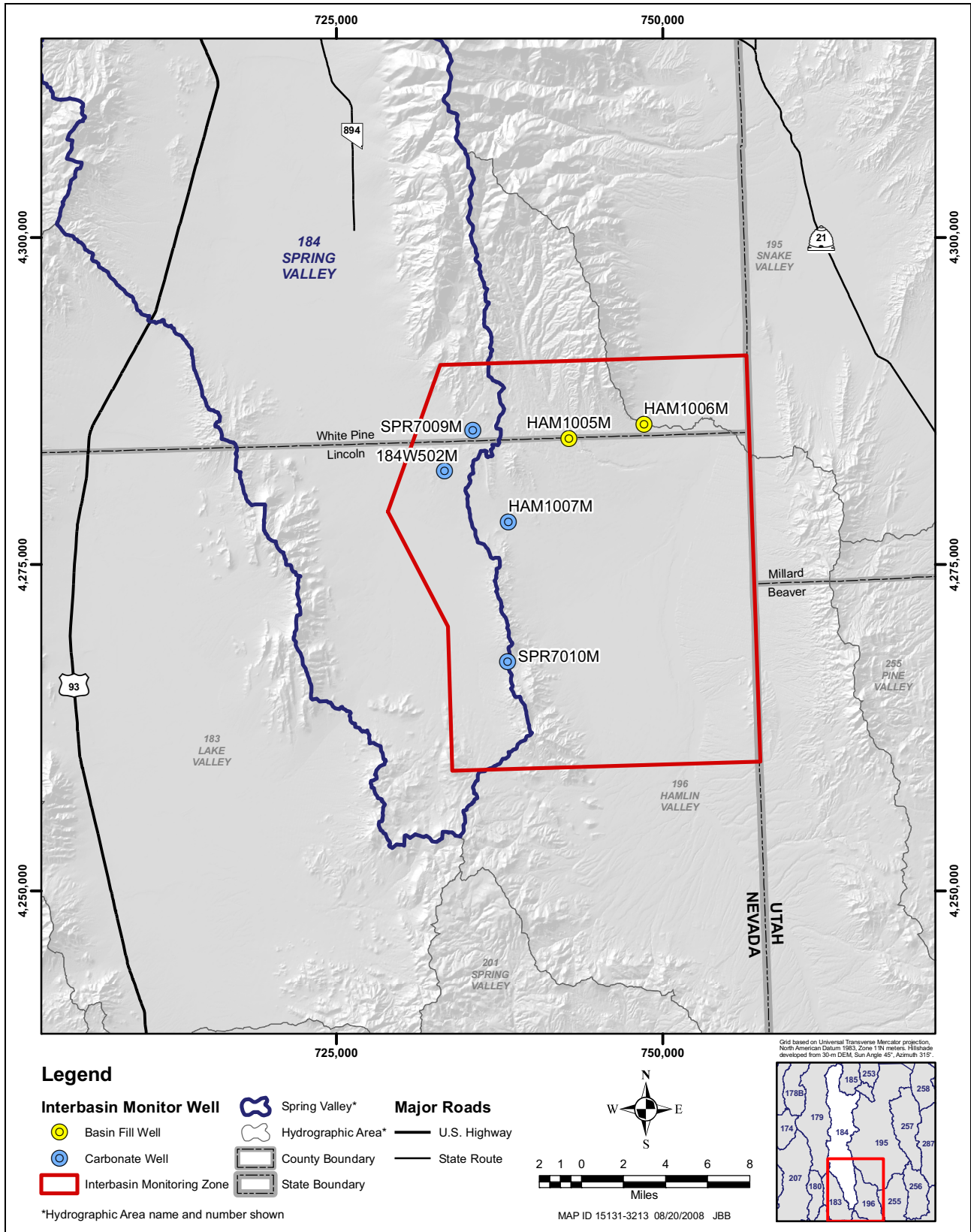


Figure 2-3
SNWA Interbasin Monitoring Zone Well Locations

**Table 2-2
SNWA Interbasin Monitoring Zone Well Locations**

Site Number	Station Local Number	Well Common Name	Location ^a		Estimated ^a Surface Elevation (ft amsl)
			UTM Northing (m)	UTM Easting (m)	
Basin Fill					
HAM1005M	196 N10 E69 02 BBA 1	Wash Alluvial Well	4,284,588	742,819	6,397
HAM1006M	196 N95 E70 32 AAD 1	Big Springs Well	4,285,699	748,554	5,797
Carbonate					
SPR7009M	184 N10 E68 36 ACC 1	North Carbonate Well	4,285,242	735,445	6,494
HAM1007M	196 N09 E69 20 BCB 1	Troughs Carbonate Well	4,279,203	737,774	6,025
SPR7010M	184 N08 E69 29 CBB 1	Limestone Hills Well	4,267,545	738,113	6,458
184W502M ^b	184 N09 E68 11 BD 2	184W502M	4,282,116.34	733,294.42	6,189.72

^aCoordinates and elevations are approximate and will be updated based upon a professional survey of the well location. All coordinates are Universal Transverse Mercator, North American Datum, 1983, Zone 11.

^bExisting well, professional survey complete.

measuring-point elevations will also be performed after completion. No target date for Zone well installations has been set as of the date of this report was submitted.

In addition to the new SNWA monitor wells, four existing basin-fill wells, which are included in the existing-well monitoring network, are located within the Zone. One of the existing wells, site number 383023114115302 USGS-MX well, was equipped in November 2008 with instrumentation to collect continuous water-level data. Furthermore, three additional new monitor wells, two carbonate and one basin-fill, are anticipated to be constructed within the Zone as part of the Round 8 SNPLMA Program. The SNPLMA program is not part of the SVMM Plan and is led by the DOI. A basin-fill monitor well constructed as part of this program, located northwest of Big Springs, was completed in fall 2009. The two remaining SNPLMA wells are planned to be completed southwest of Big Springs (target date 2010) and near the southern boundary of the Zone at the southern end of the Limestone Hills (completion dependent on program budget). After completion of the SNWA and SNPLMA drilling programs and establishment of the existing-well monitoring network, a total of 13 wells will be included in monitoring programs within the Zone.

2.3.2 Two Monitor Wells between the Zone and Closest Production Well

The SVMM Plan states that SNWA shall construct and equip two monitor wells in conjunction with the two SNWA production wells in Spring Valley that are proposed for construction closest to the Zone boundary, unless alternative sites are recommended by the TRP and approved by the EC and NSE.

The location of the two monitor wells will be determined after additional information is developed on the location of the two production wells closest to the Zone. After installation, the monitor wells will



be equipped with datalogger and pressure transducer instrumentation to collect continuous water-level data.

2.3.3 Two Monitor Wells between Shoshone Ponds and Closest Production Well

The SVMM Plan states that SNWA shall construct and equip two monitor wells in the vicinity of Shoshone Ponds. The wells are identified as SPR7024M and SPR7024M2 and were located with consensus of the TRP and NSE. The well locations are presented in [Figure 2-4](#). The 4-in.-diameter wells will be completed in the basin-fill aquifer at approximate depths of 300 and 700 ft bgs. The final completion depths will be dependent upon hydrogeologic conditions.

The right-of-way applications for the well sites were submitted in 2008 and are currently being reviewed. The new wells will be installed after BLM approval is obtained; therefore, the current target date for completion is dependent upon that approval. After well installation, a short-term pumping test will be performed, and water-chemistry samples will be collected. The wells will then be equipped with datalogger and pressure transducer instrumentation to collect continuous water-level data. A professional survey of location coordinates, ground-surface elevation, and top-of-casing measuring-point elevations will be performed.

2.3.4 Cleveland Ranch Monitor Wells

The SVMM Plan includes three additional requirements to document baseline hydrologic conditions. These requirements include (1) groundwater and spring discharge monitoring in the vicinity of the Cleveland Ranch owned by The Church of Jesus Christ of Latter-Day Saints (LDS Church), (2) spring discharge monitoring of Turnley Spring located on Sacramento Pass, and (3) an additional deep basin-fill or carbonate monitor well located 1 mi north of the northernmost future production well on the east side of Spring Valley based upon the configuration of production wells at the commencement of water export from the basin. The locations of Cleveland Ranch and Turnley Spring are presented in [Figure 2-5](#).

Monitoring locations in the vicinity of Cleveland Ranch are presented in [Figure 2-6](#) and will consist of the following elements:

- Eliminate the Cleve Creek well (site number 391224114293601) from the current monitoring network. Approximately 1 mi north of the Cleve Creek well, on an SNWA-approved BLM right-of-way, advance a borehole and install one monitor well to a depth that intersects the surficial water table. Install a separate monitor well approximately 200 ft deeper than the adjacent shallow well. The goal of paired wells is to determine and monitor changes to the vertical hydraulic gradient. Replacing the Cleve Creek well with these new wells will improve the network by providing more reliable data in this area.
- Drill two boreholes and complete nested shallow and deep monitor wells near the springs in the southeast part of Section 29, T16N, R67E. The shallow well will intersect the surficial water table. The deeper well will be screened in a permeable horizon approximately 100 to

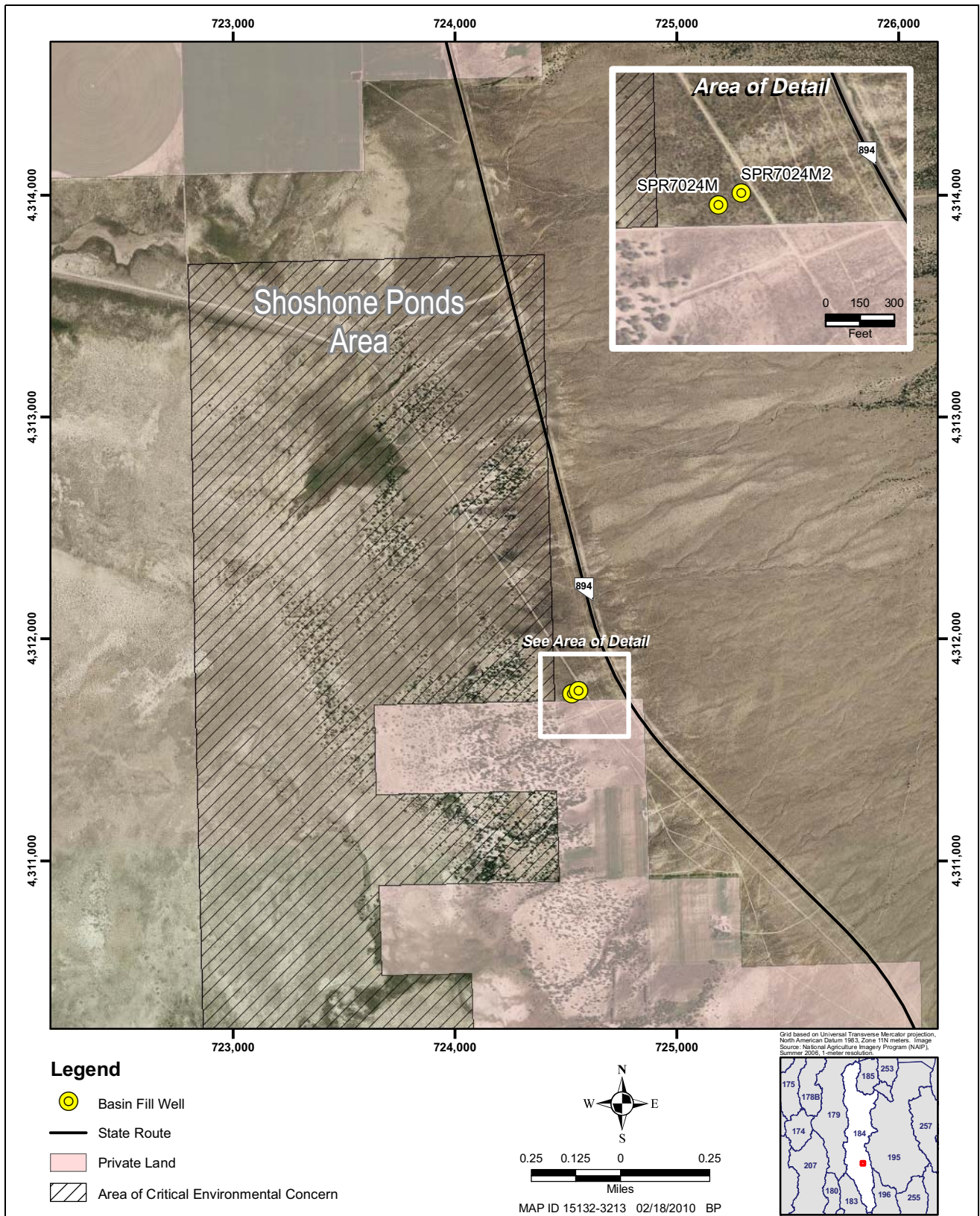


Figure 2-4
Location of Monitor Wells near Shoshone Ponds

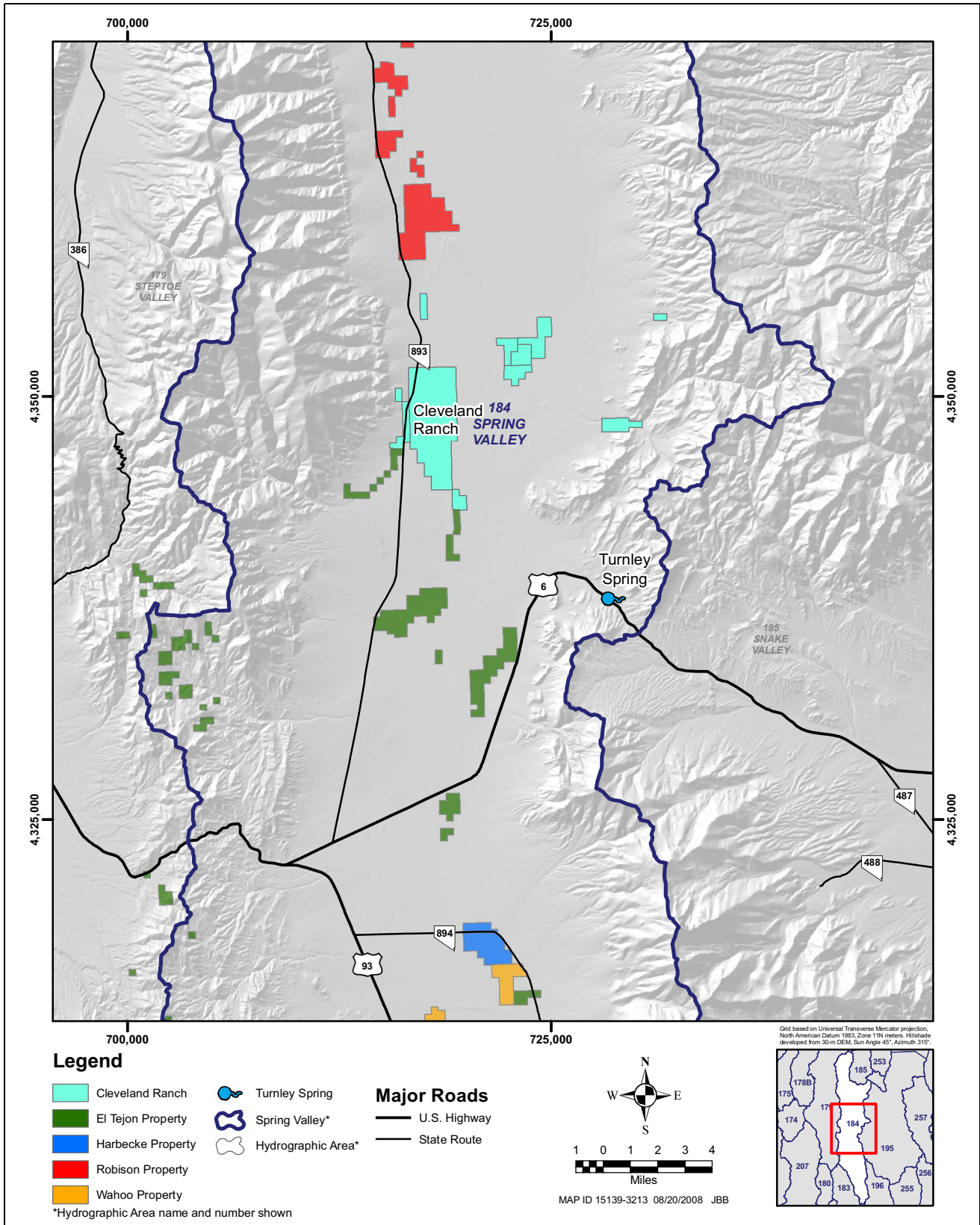
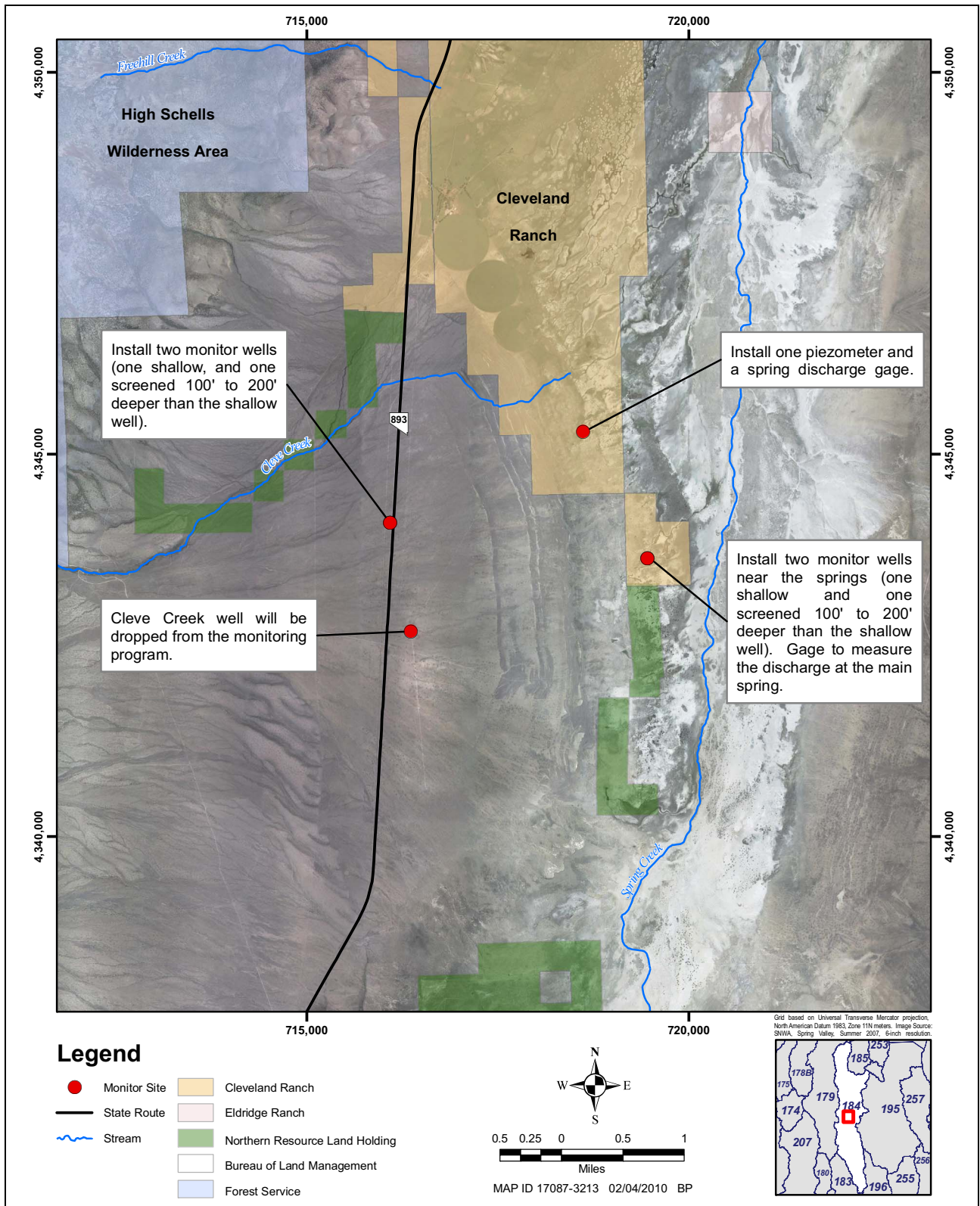


Figure 2-5
Location Map of Cleveland Ranch and Turnley Spring



Source for Cleveland and Eldridge Ranches: Michael Baker Corp. 1/5/2010.

Figure 2-6
Monitoring Locations Associated with Cleveland Ranch



200 ft below the shallow well open interval. A device to gage the discharge of the main spring in this area will be installed, if practical.

- Install a piezometer and a device to gage spring discharge at a significant spring located in the southwest part of Section 20, T16, R67E.

The gage and well locations have been determined in consultation with the NSE and a representative from the LDS Church. An access agreement between the LDS Church and SNWA is being finalized.

2.3.5 Spring Monitoring Network

The SVMM Plan states that SNWA shall install, equip, and maintain at least one piezometer near 12 spring locations. In 2007, the TRP, in conjunction with the BWG and NSE, reviewed and conducted a field visit to potential spring monitoring locations. At that time, the group agreed to add an additional spring to the network for a total of 13 spring locations. Later, the NSE required Turnley Spring to be added to the network for discharge monitoring, as previously mentioned. Currently, a total of 14 springs are in the monitoring network with two additional springs associated with Cleveland Ranch to be added to the network after access permission is granted as described in [Section 2.3.4](#).

The spring monitoring network is spatially distributed across Spring Valley and includes locations on the Spring Valley floor, mountain-block, and range-front areas. Shallow piezometers are planned at up to 12 of the locations, depending on hydrogeologic conditions encountered. Two mountain-block springs, Turnley and Rock springs, will only be monitored for discharge. Discharge measurements will also be obtained at six spring locations where measuring of flow is technically feasible. These springs are Swallow, Minerva, Layton, South Millick, Keegan, and Willow. Spring monitoring locations are presented on [Figure 2-7](#). Spring location coordinates and surface-elevation data are presented in [Table 2-3](#). A field report documenting the attributes of these springs, including photos and maps, has been posted on the [SNWA.com\exchange](#) web site.

Right-of-way access was obtained from BLM for installation of a flume and continuous discharge monitoring instrumentation at Rock Spring. Installation was completed in fall 2009.

The 12 spring locations where piezometers are planned were finalized in summer 2007. Right-of-way applications for the seven piezometer sites located on BLM land were submitted in 2007 and approved in late 2009. The anticipated target date for completion of the piezometers is 2010. One piezometer (SPR7007Z) located at Minerva Spring, on SNWA property, was installed in 2008. A professional survey of location coordinates, ground-surface, and top-of-casing measuring-point elevation will be performed for each piezometer after completion. The piezometers will also be equipped with datalogger and pressure transducer instrumentation to collect continuous water-level data.

Hydrologic and water-quality data collected at Swallow, Minerva, Layton, South Millick, Keegan, Willow, Rock, and Turnley springs are presented in [Appendix D](#).

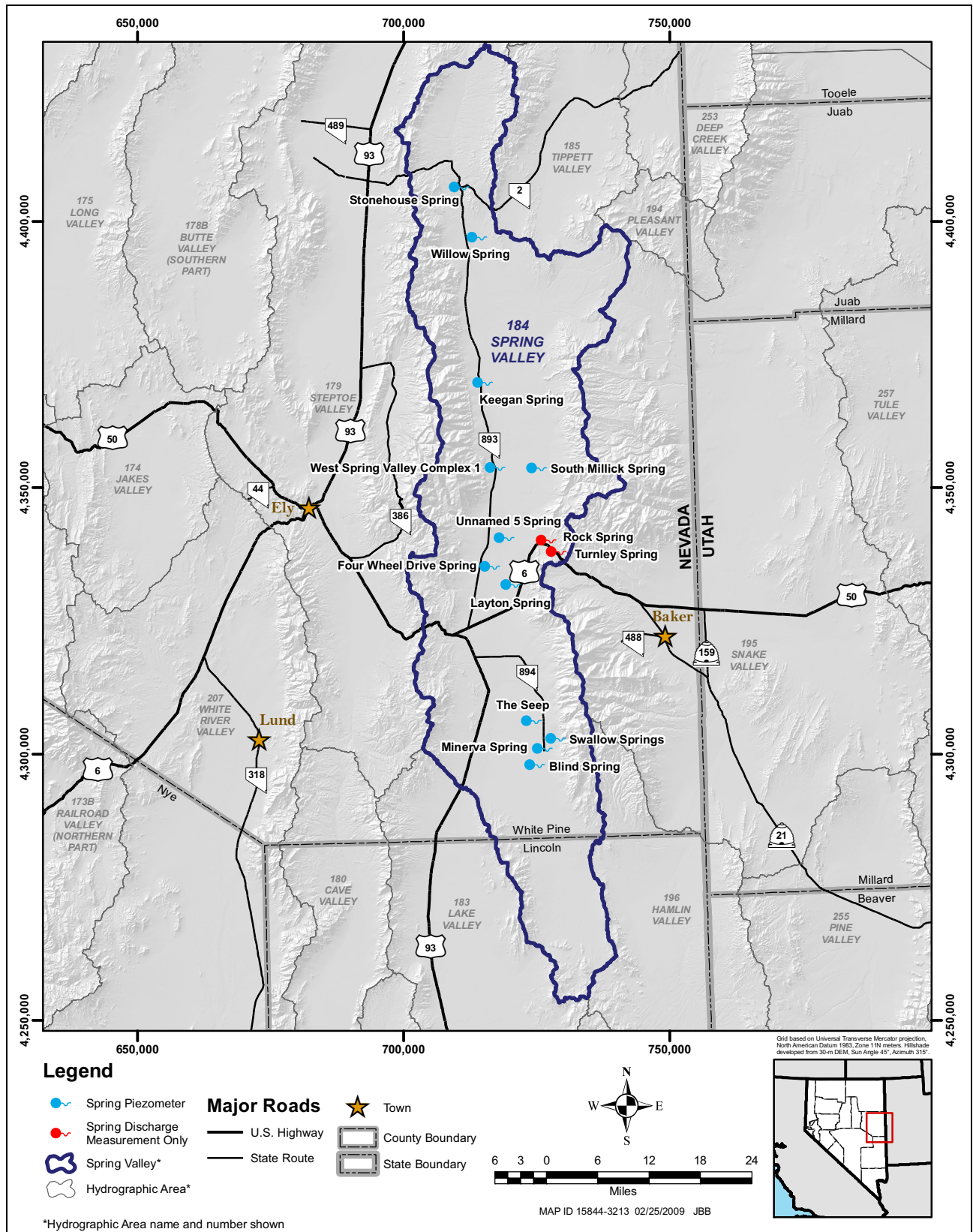


Figure 2-7
Spring Monitoring Locations



**Table 2-3
Spring Monitoring Locations**

Spring Name (Site Number)	Location ^a		Geology
	UTM Northing (m)	UTM Easting (m)	
4WD Spring	4,335,263	716,235	Basin Fill/Fan Margin
Blind Spring	4,298,008	724,733	Basin Fill/Valley Floor
Keegan Spring	4,369,762	714,908	Basin Fill/Fan Margin
Layton Spring	4,331,746	720,069	Basin Fill/Valley Floor
Minerva Spring ^b (SPR7007Z)	4,301,057.50	726,134.41	Basin Fill/Fan Margin
Rock Spring (discharge only)	4,340,195	726,796	Carbonate/Mountain Block
South Millick Spring	4,353,608	725,148	Basin Fill/Valley Floor
Stonehouse Spring	4,406,492	710,547	Basin Fill/Valley Floor
Turnley Spring (discharge only)	4,338,050	728,695	Carbonate/Mountain Block
Swallow Springs	4,302,902	728,648	Basin Fill/Range Front
The Seep	4,306,264	724,091	Basin Fill/Valley Floor
West Spring Valley Complex 1	4,353,816	717,270	Basin Fill/Fan Margin
Willow Spring	4,397,093	713,757	Basin Fill/Valley Floor
Unnamed 5 Spring	4,340,632	718,890	Basin Fill/Valley Floor

^aCoordinates are approximate and will be updated based upon a professional survey of the piezometer location. All coordinates are Universal Transverse Mercator, North American Datum, 1983, Zone 11.

^bExisting piezometer, professional survey complete.

2.4 Aquifer Testing

The SVMM Plan requires that two constant-rate tests be performed in Spring Valley, at the closest production well completed in basin-fill and carbonate-rock aquifers nearest to the Zone. To date, six nonrequired 72- to 120-hour constant-rate tests have been performed on SNWA test wells in Spring Valley. Results of those tests were included in previous reports. Aquifer tests are planned for future carbonate and basin-fill production wells closest to the Zone once they are completed.

2.5 Stream Discharge Measurements

2.5.1 Discharge Sites at Big Springs Creek and Cleve Creek

The SVMM Plan states that SNWA shall directly, or indirectly through funding of a third party, operate and maintain a discharge monitoring site on Big Springs Creek and Cleve Creek. Continuous stream-flow-monitoring gaging stations, which are funded by SNWA through a Cooperative Agreement with USGS and NDWR, are identified as Cleve Creek near Ely, Nevada, in Spring Valley and the north and south channels of Big Springs Creek near Baker, Nevada in Snake Valley. The gaging-station locations are presented in [Table 2-4](#) and [Figure 2-8](#). Throughout the year, SNWA also conducted miscellaneous stream discharge measurements at the sites. These data were provided to

**Table 2-4
Cleve Creek and Big Springs Monitoring Locations**

Station Number	Station Name	Basin Number	Stream Number	Location ^a		Watershed (mi ²)
				UTM Northing (m)	UTM Easting (m)	
1841611	Cleve Creek near Ely	184	18416	4,343,423	712,669	32.0
1951901	Big Springs at Gaging Station	195	19519	4,287,293	749,422	N/A

^aAll coordinates are Universal Transverse Mercator, North American Datum, 1983, Zone 11.

N/A = Not applicable

the USGS for inclusion into the records. Data collected in 2009 from these locations are presented in [Appendix E](#).

Miscellaneous discharge measurements performed by SNWA and USGS are presented in [Appendix E, Tables E-1 and E-2](#). All USGS data presented are considered preliminary. The continuous stream flow data for 2009 are presented in hydrographs along with miscellaneous discharge-measurement data and mean daily-discharge data for the entire period of record. Discharge data are also available through the National Water Information System (USGS, 2010).

2.5.1.1 Cleve Creek

Cleve Creek is located on the eastern slope of the Schell Creek Range. Stream flow is measured by the Cleve Creek near the Ely, Nevada, gaging station. The drainage area encompasses approximately 32 mi², making it the largest drainage area in Spring Valley. The USGS has maintained the Cleve Creek near the Ely, Nevada, gaging station intermittently since 1914. The complete period of record of Cleve Creek follows: June 1914 to December 1916; October 1959 to September 1967; October 1976 to September 1981; December 1982 to September 1987; and March 1990 through the present year (2009). A crest-stage partial record exists for the station from October 1967 to September 1976. The mean annual discharge over the period of record is 10.24 cfs, and the minimum and maximum mean annual discharges were 5.15 cfs in 1960 and 22.2 cfs in 1984. In 2007, the mean annual discharge was 8.26 cfs. The Water Year (WY) 2008 (October 1, 2007 to September 30, 2008) mean annual discharge was 6.66 cfs. The preliminary WY 2009 mean annual discharge was 7.94 cfs. Site attribute data are presented on the National Water Information System (NWIS) web site (USGS, 2010). In 2009, the preliminary data demonstrate below-average stream flow at the Cleve Creek gaging station as a result of several years of below-normal precipitation.

2.5.1.2 Big Springs Creek

Big Springs Creek is located at the base of the eastern slope of the southern Snake Range, approximately 17 mi south of Garrison, Utah. The spring discharge is measured by stream gaging stations located on the north and south channels near the spring orifice. Miscellaneous measurements have been collected since 1972. Although Meinzer (1911) describes the springs, a discharge estimate is not provided. In early 1972, Walker (1972) installed a series of graphic recorders and flumes to

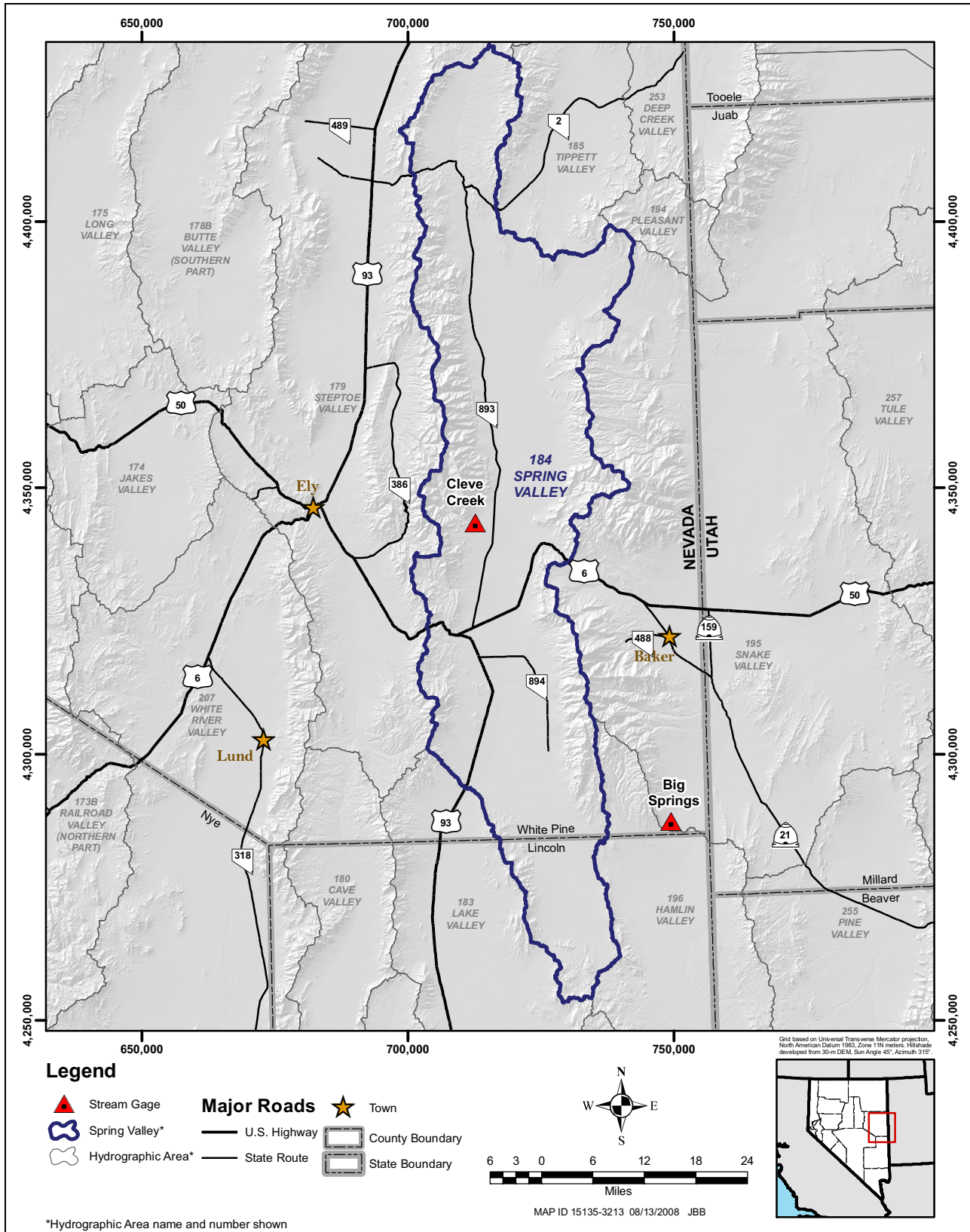


Figure 2-8
Cleve and Big Springs Creeks Gaging Stations

determine the discharge of these springs. These data collected by Walker also include the large spring located at Burbank, Utah.

In early 2005, the USGS, in cooperation with SNWA and NDWR, installed a gaging station at Big Springs. The record is published as Big Springs Creek South Channel near Baker, Nevada, and Big Springs Creek North Channel near Baker, Nevada. The USGS has maintained these gaging stations since 2005. The complete period of record of Big Springs Creek, both north and south channels, is April 2005 to present. The mean annual discharge for WY 2006–2009 for Big Springs Creek South Channel is 6.18 cfs, and the minimum and maximum mean annual discharges, respectively, were 6.02 cfs in 2007 and 6.33 cfs in 2008. For Big Springs Creek North Channel, the mean annual discharge over the period is 3.87 cfs, and the minimum and maximum mean annual discharges, respectively, were 3.70 cfs in 2009 and 4.00 cfs in 2006 (USGS, 2010). The 2009 mean annual discharge for each channel is provisional as of the date of this report.

2.5.2 Synoptic-Discharge Study of Big Springs and Lake Creeks

The SVMM Plan states that SNWA shall collect, or fund the collection of, at least two sets of synoptic-discharge measurements for the Big Springs Creek surface-water system from the spring orifice to Preuss Lake. The study area is presented in [Figure 2-9](#). Data would be collected during irrigation and nonirrigation seasons at least one year prior to groundwater withdrawals by SNWA. The collection would be repeated every five years after withdrawals begin. No target date has been determined for this task.

2.5.3 Relationship Between Big Springs and Basin-Fill and Carbonate-Rock Aquifers

The SVMM Plan states that SNWA shall work with the TRP to collect data to investigate the relationship between discharge at Big Springs and hydraulic head in the basin-fill and regional carbonate-rock aquifers. This task will be accomplished using hydrologic and water-chemistry data collected from Big Spring and new SNWA and SNPLMA-funded monitor wells.

2.6 Precipitation Station Network

The precipitation network includes three high-altitude precipitation stations located in the Snake and Schell Creek ranges; these stations are maintained and measured by USGS through a cooperative funding agreement with SNWA and NDWR. Four established precipitation stations located in Ely and McGill, Nevada, the Great Basin National Park, and Eskdale, Utah, which are national weather service cooperation sites, provide regional data. SNWA has also established additional valley-floor stations at Shoshone 5N, located on the east side of the valley at the Bransford Ranch and the Robison Ranch in northwest Spring Valley. The network precipitation stations are listed in [Table 2-5](#) and presented on [Figure 2-10](#).

Historical data from the high-altitude stations, including provisional 2009 data, are presented in [Appendix F](#). This appendix also contains precipitation data collected in 2009 from the four regional stations. Preliminary measured 2009 annual total precipitation at the Shoshone 5N and Robison

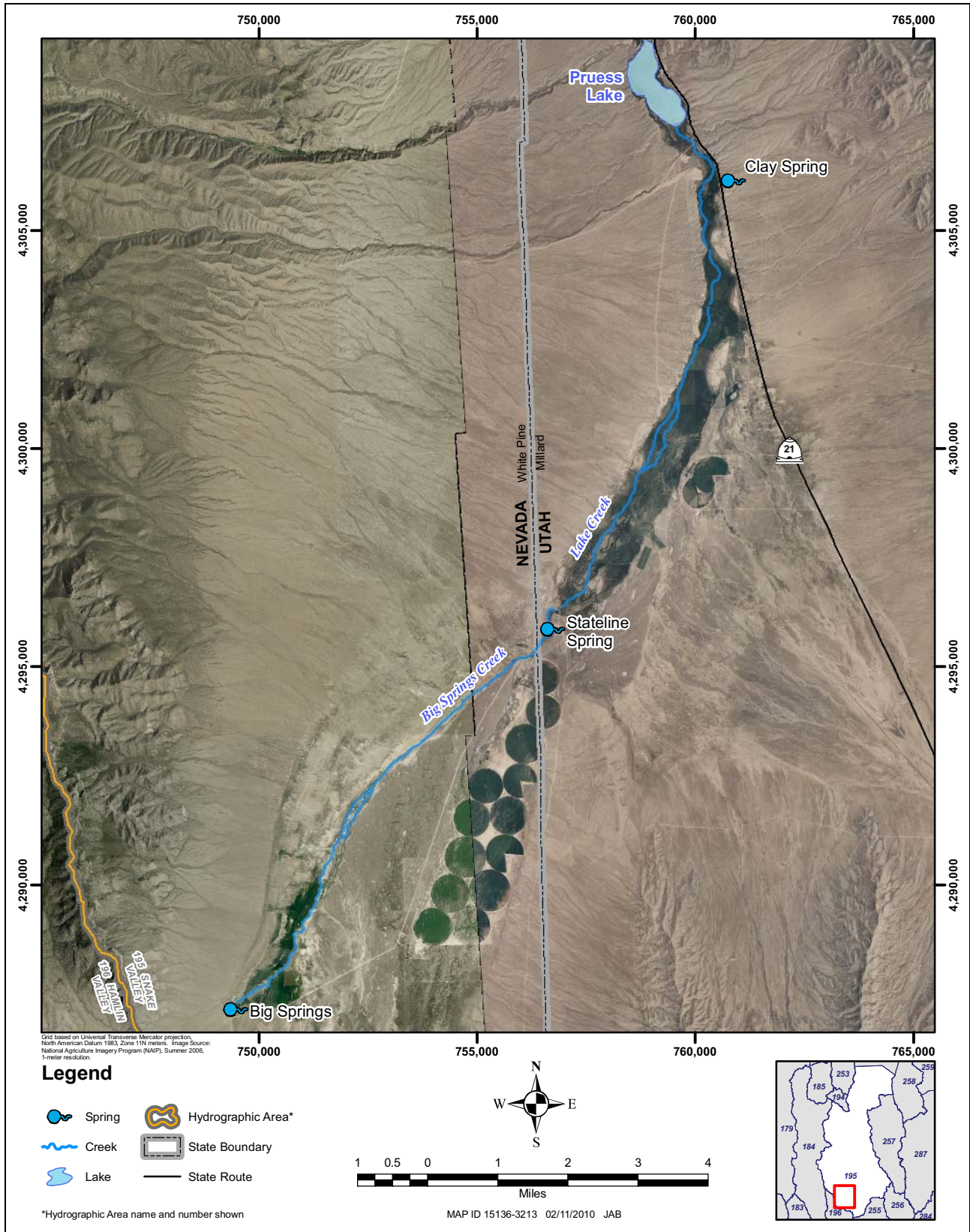


Figure 2-9
Big Springs Synoptic-Discharge Measurement Study Area, Snake Valley

**Table 2-5
Precipitation Station Locations**

Site Number	Station Name	Elevation (ft amsl)	Location ^a	
			UTM Northing (m)	UTM Easting (m)
391913114143101	Bulk Precipitation Station NW of Mt. Moriah	9,300	4,355,938	737,691
390946114364901	Bulk Precipitation Station on Cave Mountain	10,650	4,337,545	706,106
385409114185401	Mt. Washington Bulk Precipitation Station	10,440	4,309,376	732,764
267450	Shoshone 5N	5,930	4,310,746	725,419
---	Robison Ranch	5,695	4,378,103	713,347
263340	Great Basin National Park (GBNP)	6,830	4,320,462	741,031
264950	McGill	6,300	4,363,546	692,301
422607	Eskdale	4,980	4,334,157	763,696
262631	Ely WBO	6,260	4,350,419	685,436

^aAll coordinates are Universal Transverse Mercator, North American Datum, 1983, Zone 11

Ranch stations are 8.81 and 8.00 in., respectively. Additional data for these sites will become available as site instrumentation is upgraded to include continuous monitoring equipment.

Data sources for precipitation information presented in this report are as follows:

- USGS data is cited from USGS National Water Information System (USGS, 2010)
- SNOTEL data is cited from U.S. Department of Agriculture Natural Resources Conservation Service (USDA), 2010
- National Weather Service data is cited from Western Regional Climate Center (WRCC), 2010.

2.7 Water-Chemistry-Sampling Program

The SVMM Plan states that SNWA shall collect and analyze water-chemistry samples for specific parameters at 40 locations selected from monitoring network wells, springs, and streams. Three rounds of samples will be collected at 6-month intervals for chemical analysis. The anticipated schedule for selecting locations and performing the first round of sampling is spring 2010. Water-chemistry analysis results from SNWA exploratory and test wells were presented in the 2007 and 2008 data reports (SNWA, 2008, 2009b).

2.8 Reporting

A data-exchange web site accessible by the NSE, EC, TRP, and BWG members was implemented in April 2008. This site replaced the existing file transfer protocol (FTP) site and contains project reports, monitoring network data, and TRP logistical information. The data-exchange web site will be used to distribute SVMM Plan monitoring data to the TRP within 90 days of collection. Data will also be submitted directly to the NSE on a quarterly basis in electronic format.

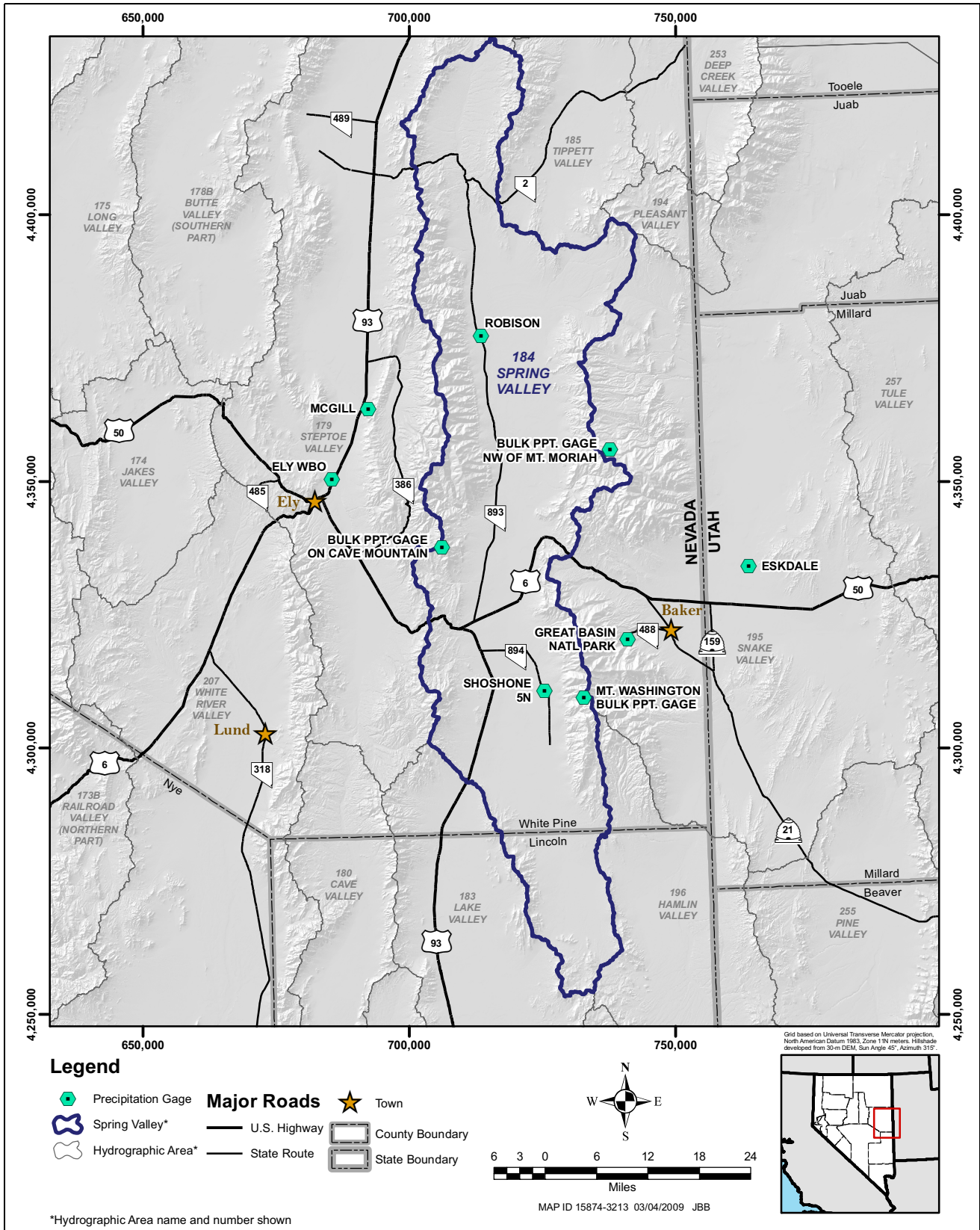


Figure 2-10
Precipitation Station Locations

2.9 Proposed Schedule of Groundwater Withdrawals

No groundwater production is scheduled for the next two years with the exception of short-term well development and performance testing of new wells. The duration of well-performance tests is usually one day. The duration of constant-rate aquifer testing is usually under one week.



This Page Left Intentionally Blank

3.0 ANTICIPATED 2010 SNWA SVMM PLAN ACTIVITIES

Anticipated SVMM Plan activities in 2010 are summarized below. Some activities are contingent upon property access or NSE and TRP approval.

- Complete the installation of 12 piezometers at the spring monitoring network locations. Each piezometer is planned to be equipped with integrated pressure transducer instrumentation to collect continuous water-level measurements. Construction is anticipated to be completed in 2010.
- Finalize an access agreement between the LDS Church and SNWA to implement the hydrologic monitoring program associated with the Cleveland Ranch. After the agreement is finalized, SNWA will work with the LDS Church representatives to establish and operate the monitoring network at Cleveland Ranch.
- Perform a professional-grade survey of location coordinates, ground-surface elevations, and top-of-casing measuring-point elevations at new monitoring network wells and piezometers.
- Continue to collect required quarterly and continuous water-level measurements at appropriate locations throughout 2010. Data will be reported quarterly to the TRP through the SNWA data-exchange web site. Data will be submitted to NSE in an approved electronic format and included in the annual data report to be submitted in March 2011.
- Work with the TRP to coordinate activities and share data with the SNPLMA Round 8 study conducted in Spring, Hamlin, and Snake valleys.
- Develop a work plan for the water-chemistry sampling program, including sample locations, methodology, and final parameter list. The anticipated target date for implementation of the sampling program is 2010.
- Ensure the operation and maintenance of discharge gaging stations on Cleve and Big Springs creeks are continued.

SNWA will continue to work with NSE and TRP participants to implement the SVMM Plan.



This Page Left Intentionally Blank

4.0 REFERENCES

- Meinzer, O.E., 1911, Ground water in Juab, Millard, and Iron counties Utah; U.S. Geological Survey Water-Supply Paper 277, p. 166.
- Nevada State Engineer (The Office of the State Engineer of The State of Nevada), 2007, The ruling (#5726) in the matter of applications 54003 through 54021, inclusive, filed to appropriate the underground waters of the Spring Valley hydrographic basin (184), White Pine County, Nevada.
- SNWA, see Southern Nevada Water Authority.
- Southern Nevada Water Authority, 2006, Water resources assessment for Spring Valley—Presentation to the Office of the Nevada State Engineer: Southern Nevada Water Authority, Las Vegas, Nevada, 167 p.
- Southern Nevada Water Authority, 2008, Spring Valley stipulation agreement hydrologic monitoring plan status and data report: Doc. No. WRD-ED-0001, Las Vegas, Nevada, 76 p.
- Southern Nevada Water Authority, 2009a, Spring Valley hydrologic monitoring and mitigation plan (Hydrographic Area 184): Doc. No. WRD-ED-0003, Las Vegas, Nevada, 38 p.
- Southern Nevada Water Authority, 2009b, 2008 Spring Valley hydrologic monitoring and mitigation plan status and data report: Doc. No. WRD-ED-0004, Las Vegas, Nevada, 109 p.
- USDA, see U.S. Department of Agriculture.
- U.S Department of Agriculture, 2010, Natural Resources Center Service (NRCS) National Water & Climate Center (WCC) [Internet], [accessed January 2010], available from <http://www.wcc.nrcs.usda.gov>.
- U.S. Geological Survey, 2010, National Water Information System (NWIS-Web) [Internet], available from <http://waterdata.usgs.gov/nwis/>.
- USGS, see U.S. Geological Survey.
- Walker, R., 1972, Investigation of Big Springs: Letter report from Big Springs Irrigation Company to the Office of Sevier River Commissioner, 9 p.
- Western Regional Climate Center (WRCC), 2010, [Internet], [accessed January 2010], available from <http://www.wrcc.dri.edu>.



WRCC, see Western Regional Climate Center.

Appendix A

Periodic Water-Level Measurements Collected at SNWA Exploratory and Test Wells

Table A-1
Periodic Water-Level Measurements Collected at
SNWA Exploratory and Test Wells
 (Page 1 of 2)

Site Number	Owner	Well Depth (ft bgs)	Surface Elevation (ft amsl)	Water Level			
				Date	Depth (ft bgs)	Site Status ^a	Measurement Method ^b
184W101	SNWA	1,749	6,190.90	1/22/2009	482.57	S	T
				2/24/2009	482.88	S	T
				4/15/2009	482.97	S	T
				5/20/2009	483.11	S	T
				7/1/2009	483.37	S	T
				8/11/2009	483.38	S	T
				9/22/2009	483.49	S	T
184W103	SNWA	1,017	5,899.06	1/22/2009	98.05	S	T
				2/25/2009	98.04	S	T
				4/15/2009	98.10	S	T
				5/18/2009	98.15	S	T
				7/1/2009	98.25	S	T
				8/12/2009	98.43	S	T
				9/23/2009	98.50	S	T
184W105	SNWA	1,135	6,007.30	1/22/2009	208.90	S	T
				4/15/2009	208.86	S	T
				5/21/2009	208.92	S	T
				7/1/2009	208.89	S	T
				8/12/2009	208.99	S	T
				9/23/2009	209.09	S	T
SPR7006M	SNWA	1,700	6,525.18	1/21/2009	770.33	S	T
				2/24/2009	770.36	S	T
				4/14/2009	770.05	S	T
				5/21/2009	769.11	S	T
				6/30/2009	767.80	S	T
				8/11/2009	768.18	S	T
				9/22/2009	769.09	S	T
SPR7008X	SNWA	960	5,703.98	1/21/2009	14.06	S	T
				2/24/2009	13.94	S	T
				4/14/2009	13.95	S	T
				5/19/2009	14.00	S	T
				6/30/2009	14.01	S	T
				8/11/2009	14.04	S	T
				9/22/2009	14.15	S	T
				11/3/2009	14.33	S	T



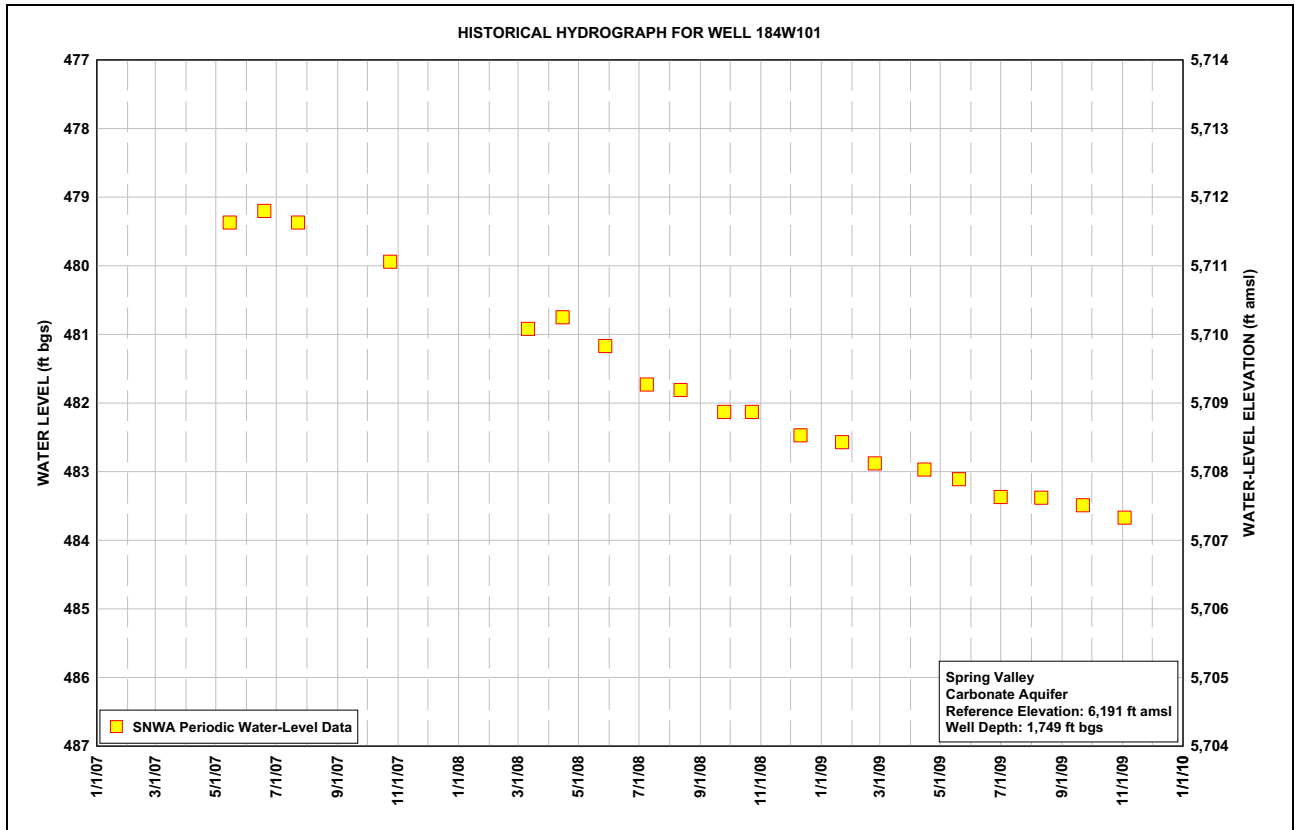
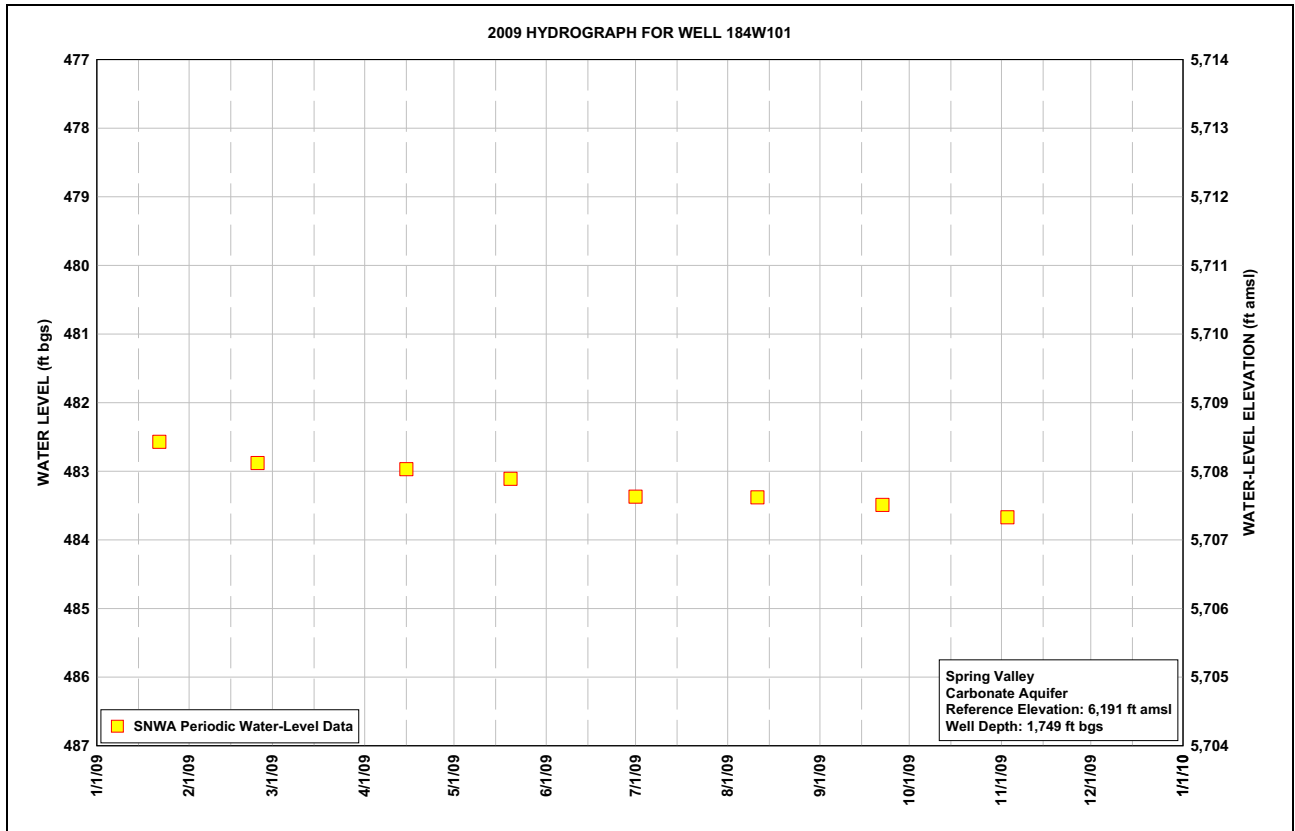
Table A-1
Periodic Water-Level Measurements Collected at
SNWA Exploratory and Test Wells
 (Page 2 of 2)

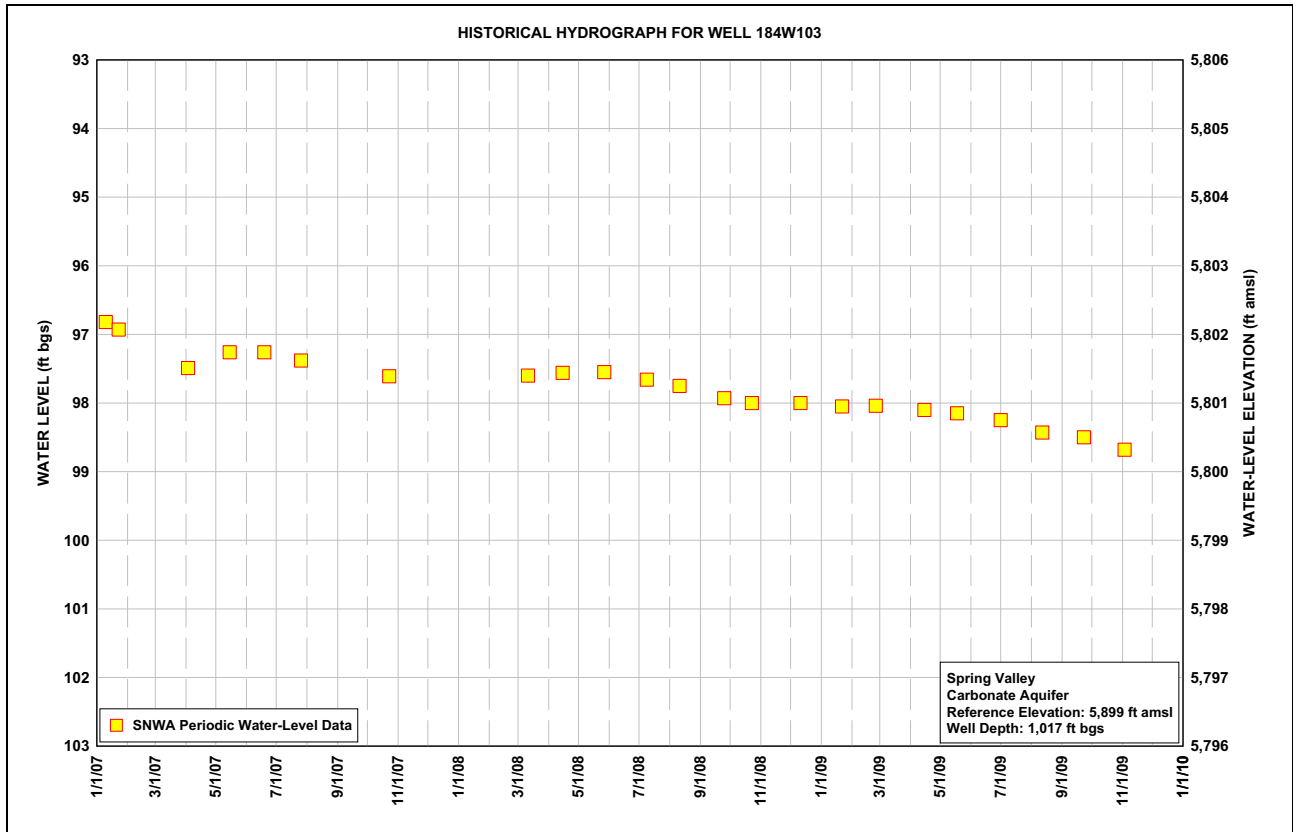
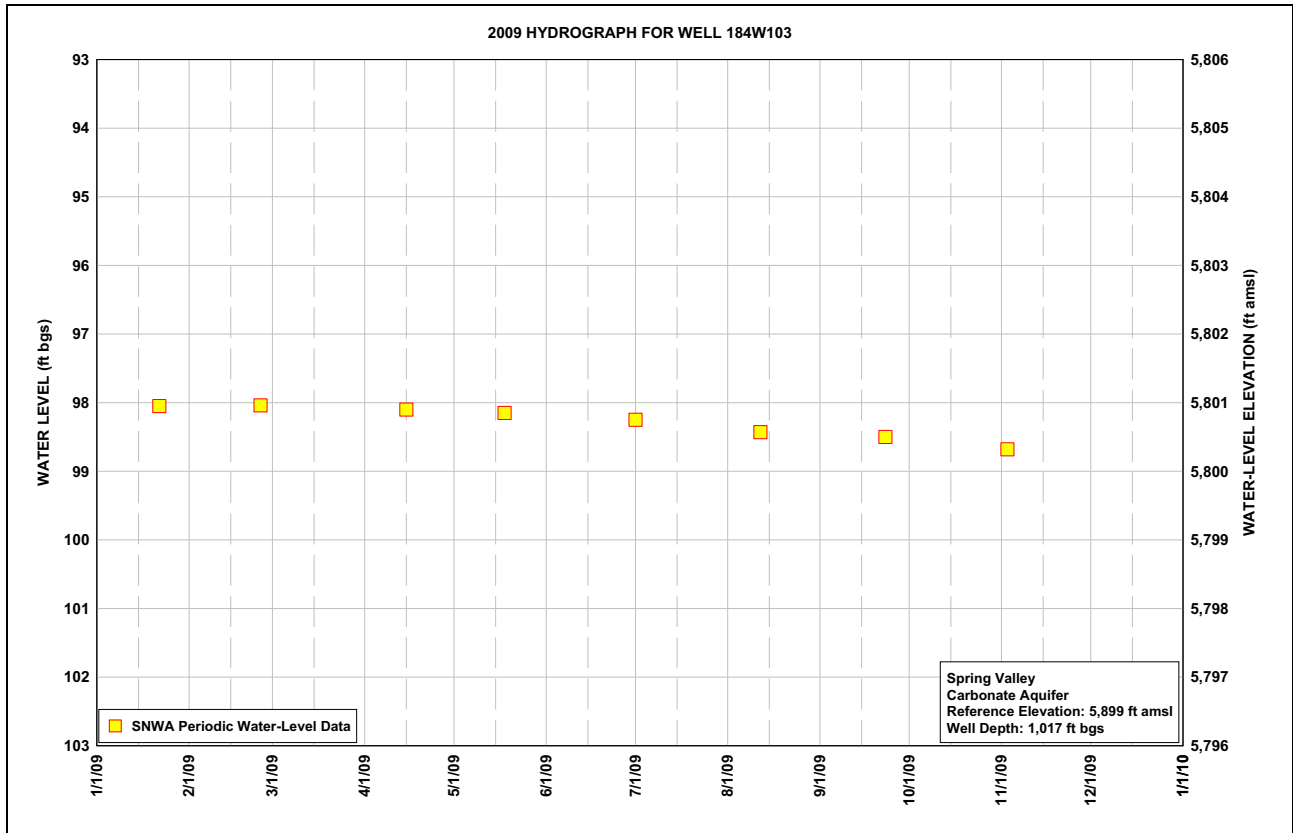
Site Number	Owner	Well Depth (ft bgs)	Surface Elevation (ft amsl)	Water Level			
				Date	Depth (ft bgs)	Site Status ^a	Measurement Method ^b
SPR7005X	SNWA	1,350	6,397.56	1/21/2009	496.06	S	T
				2/25/2009	496.18	S	T
				4/14/2009	496.07	S	T
				5/19/2009	495.92	S	T
				6/30/2009	495.34	S	T
				8/11/2009	495.24	S	T
				9/22/2009	495.41	S	T
				11/4/2009	495.71	S	T
SPR7007X	SNWA	1,020	6,017.53	1/22/2009	156.07	S	T
				2/24/2009	157.14	S	T
				4/15/2009	158.27	S	T
				5/20/2009	156.25	S	T
				6/30/2009	146.79	S	T
				8/11/2009	147.27	S	T
				9/22/2009	148.17	S	T
				11/3/2009	150.23	S	T

^a S = Static conditions

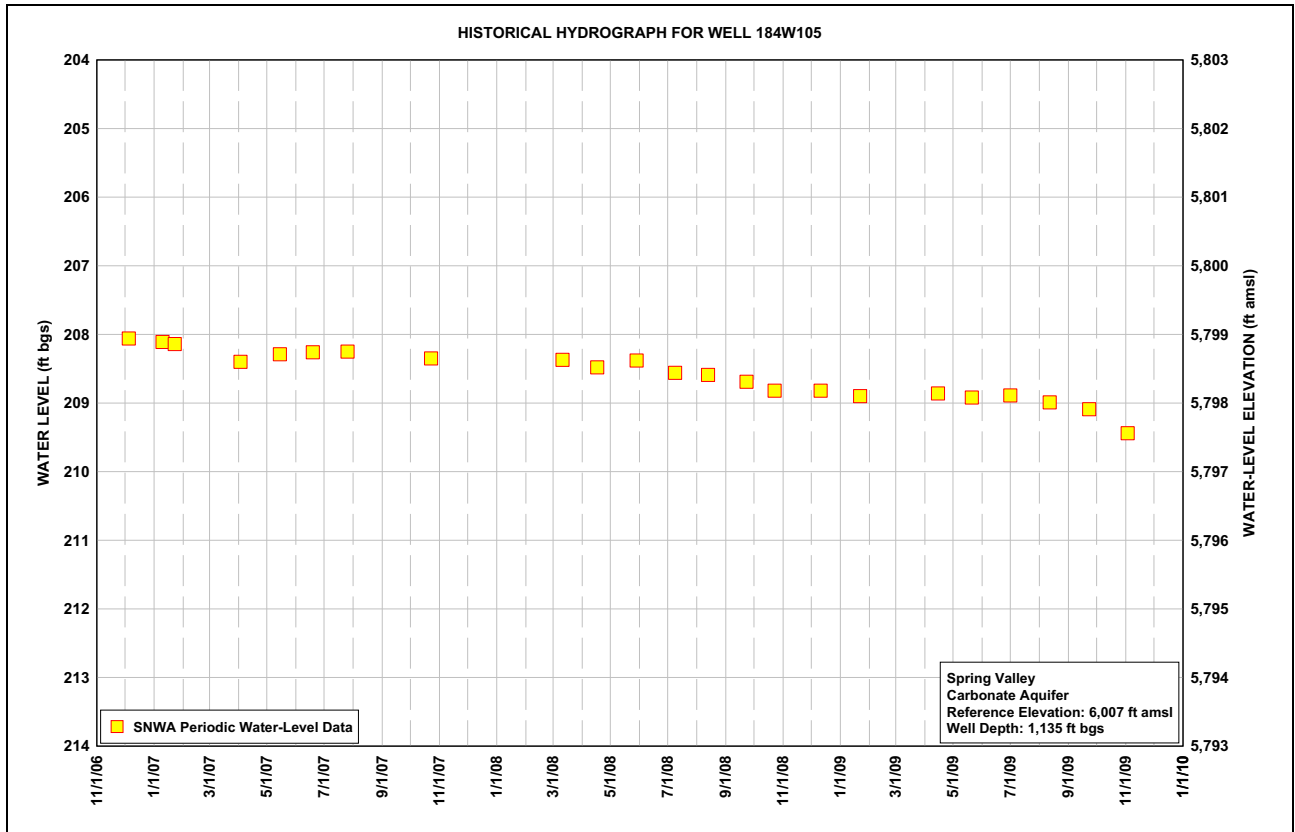
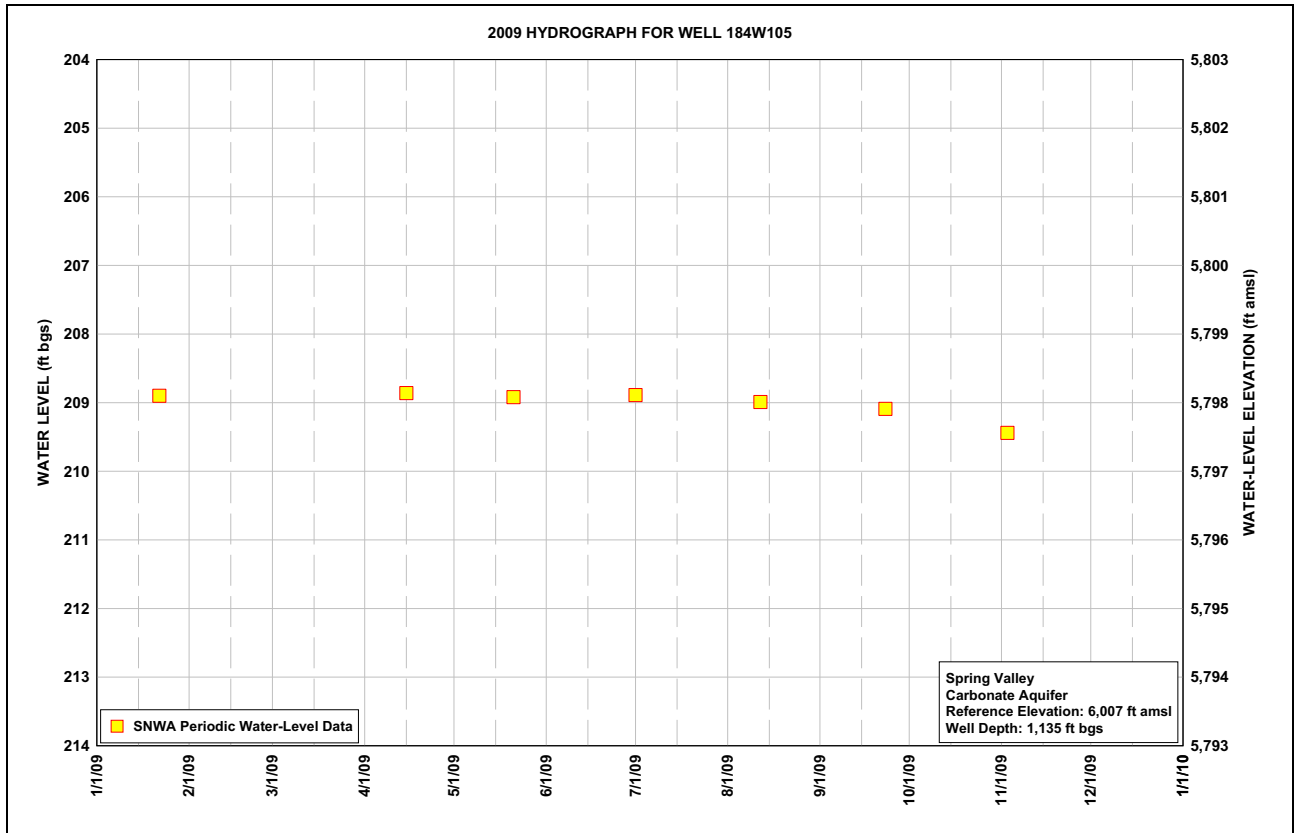
^b T = Electric tape measurement.

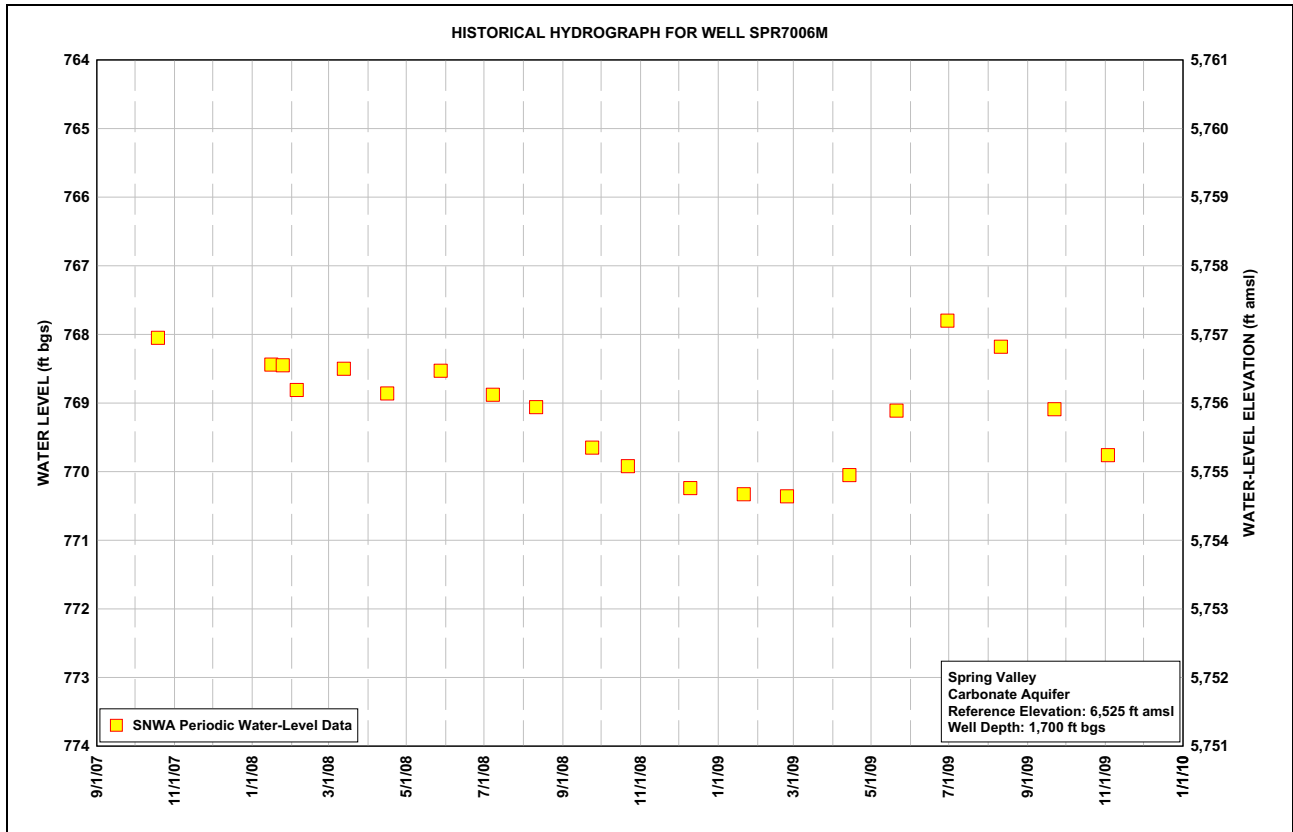
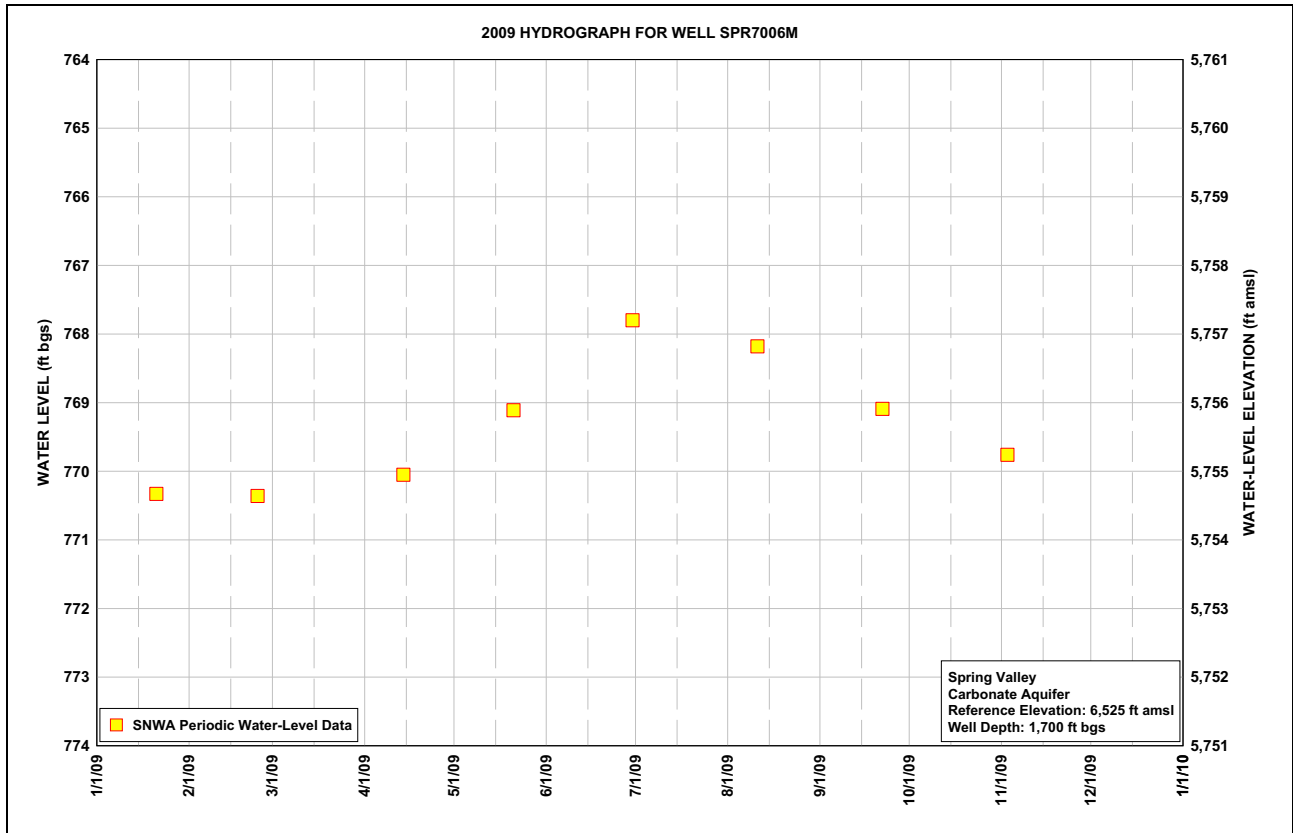
2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report



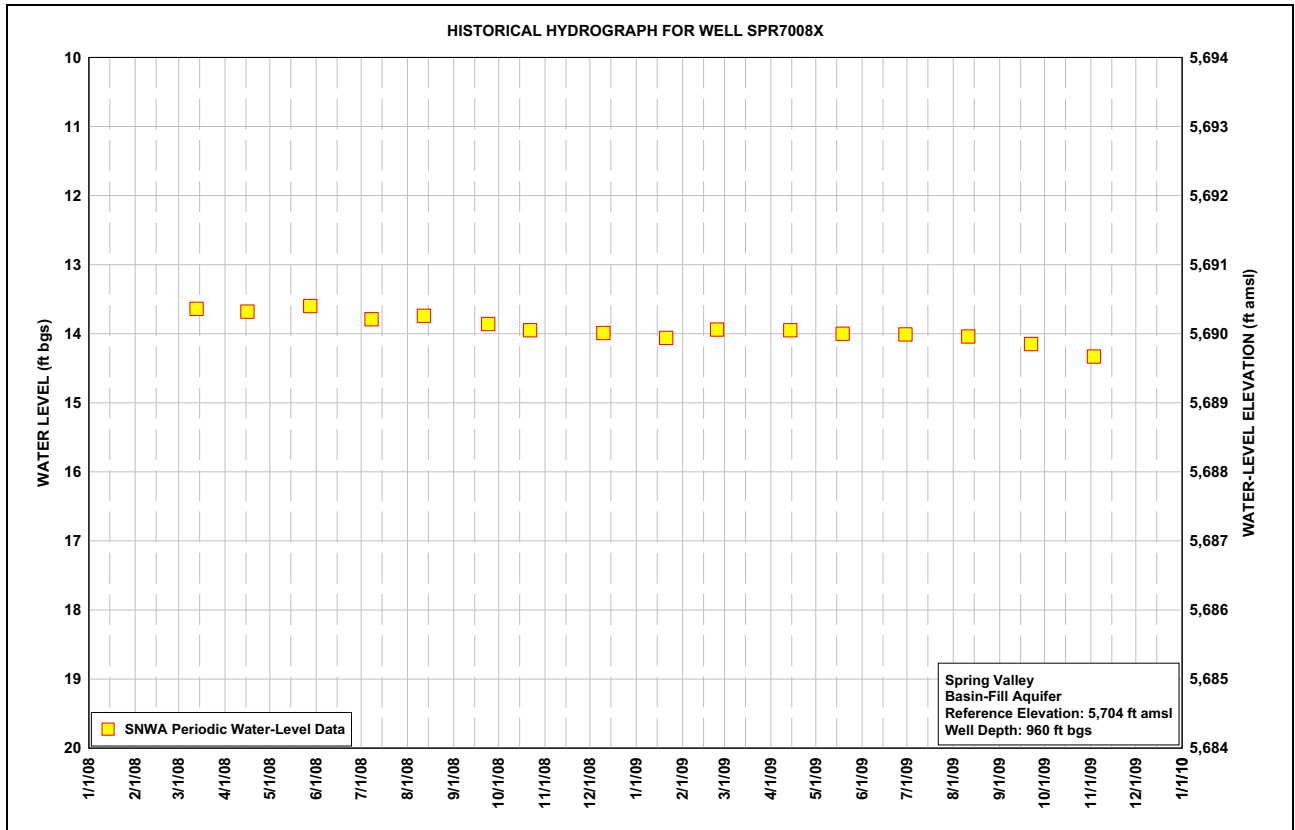
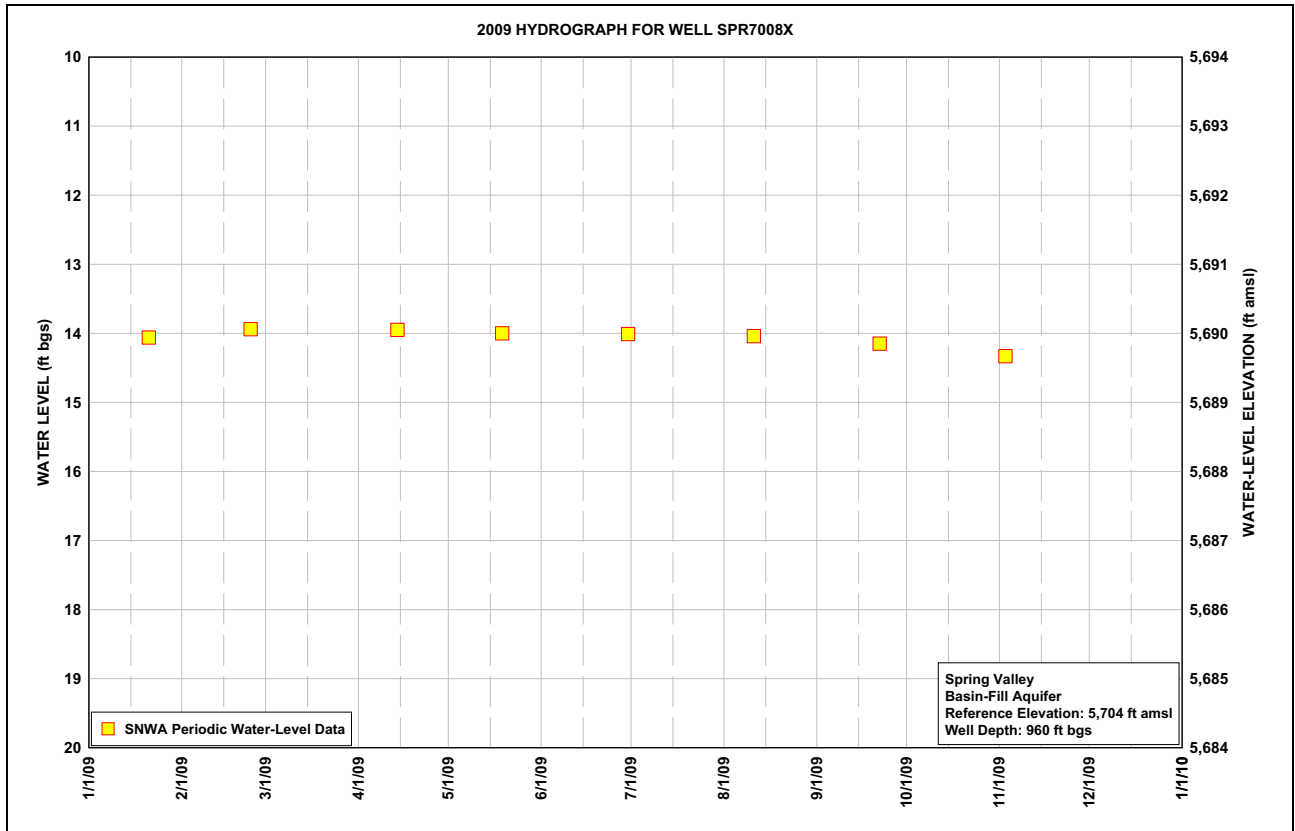


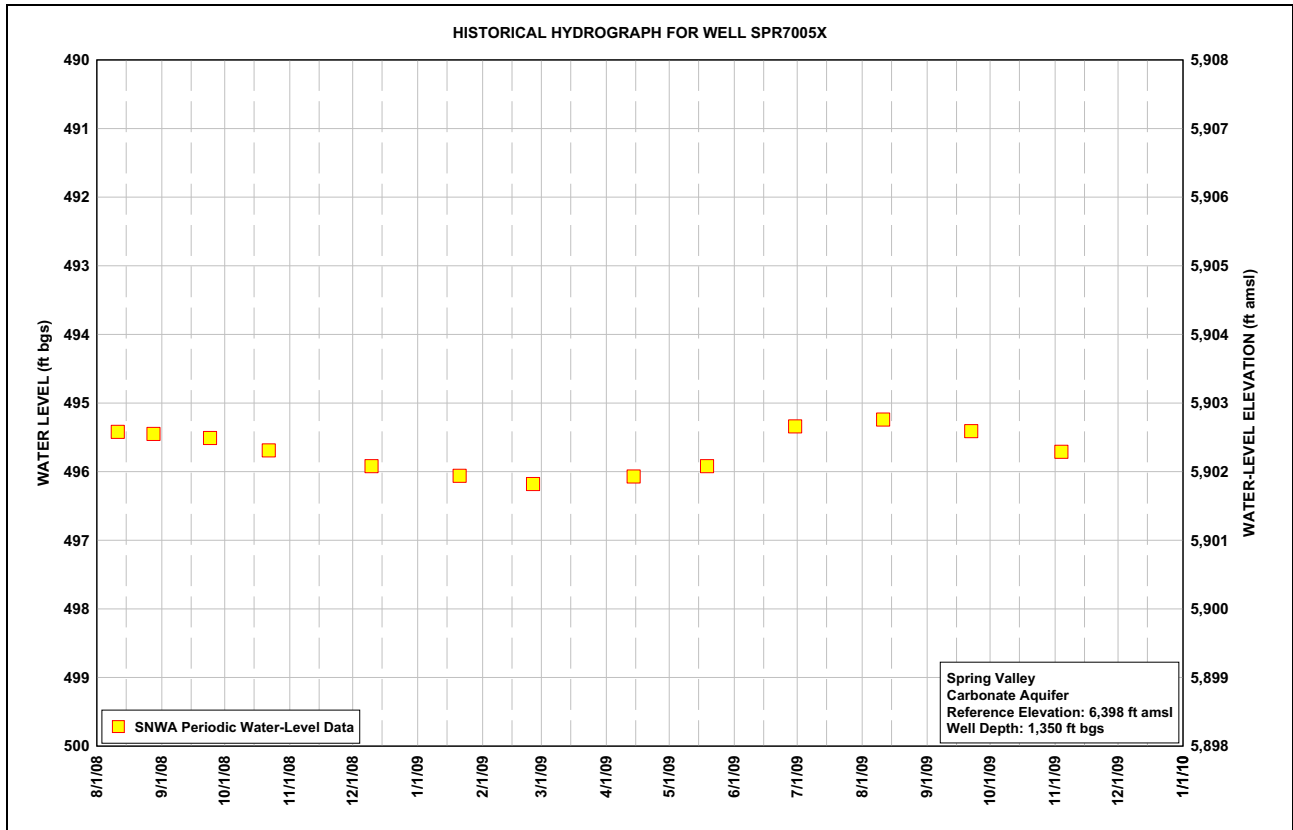
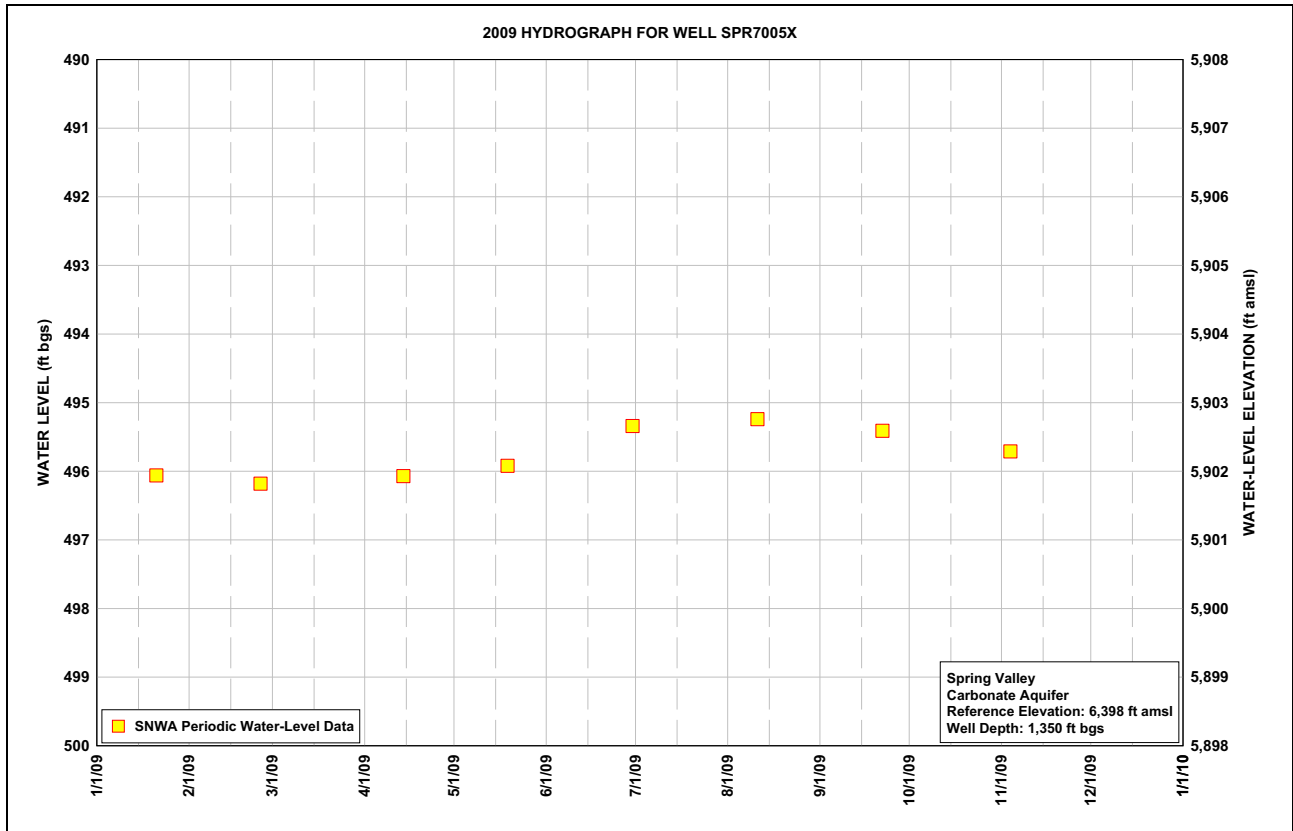
2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report



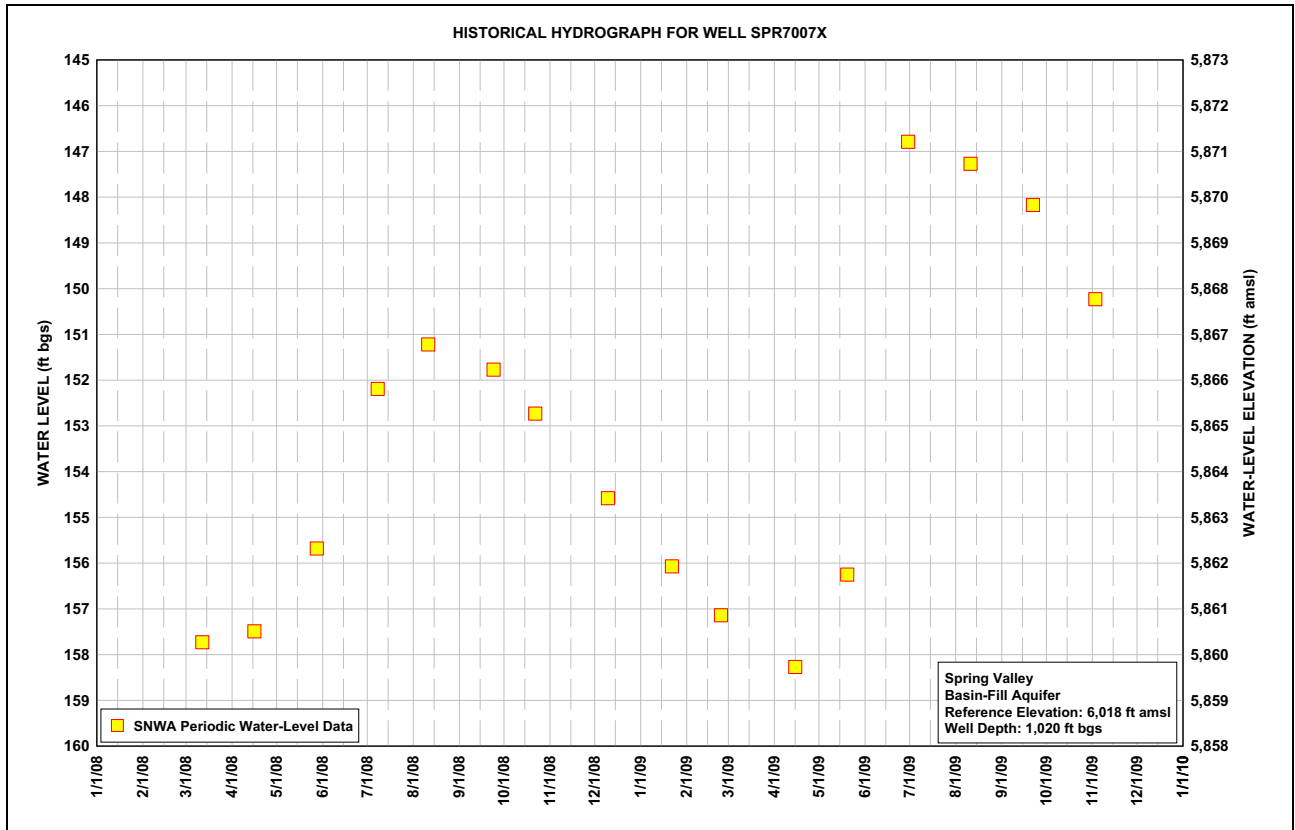
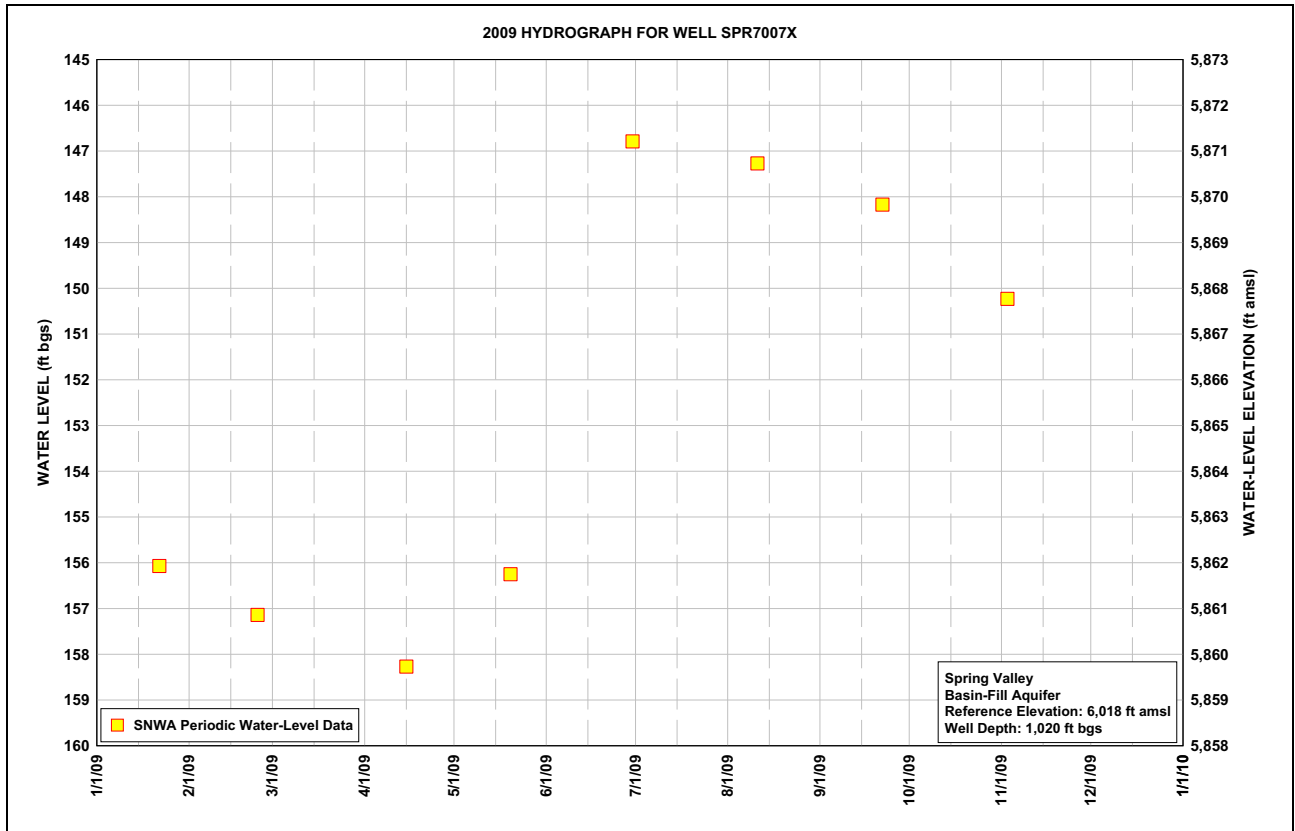


2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report





2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report





This Page Left Intentionally Blank

Appendix B

Periodic Water-Level Measurement Data from the Spring Valley Existing-Well Monitoring Network

Table B-1
Periodic Water-Level Measurement Data from
the Spring Valley Existing-Well Monitoring Network
 (Page 1 of 6)

Map ID	Site Number	Station Local Number	Well Depth (ft bgs)	Surface Elevation (ft amsl)	Water Level			
					Date	Depth-to-Water (ft bgs)	Well Status ^a	Measurement Method ^b
22	383704114225001 ^c	184 N09 E68 30AAAB 1 USGS-MX (Spring Valley S.)	679	6,002.52	1/22/2009	224.95	S	T
					2/25/2009	224.94	S	T
					4/15/2009	225.02	S	T
					5/13/2009	225.16	S	T
					5/20/2009	224.95	S	T
					7/1/2009	225.00	S	T
					8/12/2009	224.97	S	T
					9/23/2009	224.97	S	T
					11/3/2009	225.01	S	T
32	384039114232701 ^c	184 N10 E68 31CD 1 USGS-MX	150	5,896.49	1/22/2009	118.38	S	T
					4/15/2009	118.31	S	T
					5/21/2009	118.33	S	T
					7/1/2009	118.36	S	T
					8/11/2009	118.33	S	T
					9/22/2009	118.28	S	T
					11/3/2009	118.36	S	T
35	384831114314301 ^c	184 N11 E66 23AB 1 USGS-MX	102	5,842.94	1/22/2009	47.11	S	T
					4/14/2009	47.07	S	T
					5/13/2009	47.19	S	T
					5/21/2009	47.14	S	T
					7/1/2009	47.12	S	T
					8/12/2009	47.24	S	T
					9/23/2009	47.24	S	T
					11/3/2009	47.36	S	T
52	384745114224401 ^c	184 N11 E68 19DCDC 1 USGS-MX (Spring Valley)	200	5,900.18	1/22/2009	98.76	S	T
					2/24/2009	98.90	S	T
					4/15/2009	99.07	S	T
					5/18/2009	99.16	S	T
					6/30/2009	99.31	S	T
					8/11/2009	99.45	S	T
					9/22/2009	99.50	S	T
					10/7/2009	99.53	S	T
					11/3/2009	99.66	S	T
122	390352114305401 ^c	184 N14 E66 24BBBB 1 USGS-MX (Spring Valley N.)	160	5,846.04	1/21/2009	38.80	S	T
					2/25/2009	38.75	S	T
					4/14/2009	38.70	S	T
					5/12/2009	38.69	S	T
					5/19/2009	38.59	S	T
					6/30/2009	38.61	S	T
					8/11/2009	38.70	S	T
					9/22/2009	38.76	S	T
					11/3/2009	38.79	S	T



Table B-1
Periodic Water-Level Measurement Data from
the Spring Valley Existing-Well Monitoring Network
 (Page 2 of 6)

Map ID	Site Number	Station Local Number	Well Depth (ft bgs)	Surface Elevation (ft amsl)	Water Level			
					Date	Depth-to-Water (ft bgs)	Well Status ^a	Measurement Method ^b
145	390803114251001 ^c	184 N15 E67 26CA 1 USGS-MX	200	5,727.21	1/21/2009	40.20	S	T
					2/24/2009	40.16	S	T
					4/14/2009	40.17	S	T
					5/12/2009	40.19	S	T
					5/19/2009	39.71	S	T
					6/30/2009	39.78	S	T
					8/11/2009	39.91	S	T
					9/22/2009	40.03	S	T
					11/3/2009	40.10	S	T
179	393211114320701 ^c	184 N19 E66 11B 1	400	5,698.43	1/21/2009	43.62	S	T
					2/26/2009	43.85	S	T
					4/14/2009	44.01	S	T
					5/19/2009	43.84	S	T
					6/30/2009	43.05	S	T
					7/14/2009	42.92	S	T
					8/11/2009	43.14	S	T
					9/22/2009	43.82	S	T
					11/4/2009	44.15	S	T
215	383023114115302 ^c	196 N08 E69 35DC 2 USGS-MX (Hamlin Valley S.)	435	5,837.67	1/22/2009	174.00	S	T
					2/25/2009	174.18	S	T
					4/15/2009	174.54	S	T
					5/20/2009	174.70	S	T
					6/29/2009	174.55	S	T
					8/12/2009	174.42	S	T
					9/21/2009	174.35	S	T
					11/2/2009	174.43	S	T
222	184W502M ^c	184 N09 E68 11 BD 2	1,799	6,189.72	1/22/2009	481.54	S	T
					2/24/2009	481.87	S	T
					4/15/2009	482.00	S	T
					5/20/2009	482.18	S	T
					7/1/2009	482.41	S	T
					7/13/2009	482.33	S	T
					8/11/2009	482.43	S	T
					9/22/2009	482.55	S	T
					11/3/2009	482.71	S	T

Table B-1
Periodic Water-Level Measurement Data from
the Spring Valley Existing-Well Monitoring Network
 (Page 3 of 6)

Map ID	Site Number	Station Local Number	Well Depth (ft bgs)	Surface Elevation (ft amsl)	Water Level			
					Date	Depth-to-Water (ft bgs)	Well Status ^a	Measurement Method ^b
223	184W504M ^c	184 N11 E66 34 DD 2	1,020	5,900.11	1/22/2009	99.80	S	T
					2/25/2009	99.83	S	T
					4/15/2009	99.82	S	T
					5/18/2009	99.79	S	T
					7/1/2009	99.92	S	T
					7/13/2009	99.92	S	T
					7/15/2009	100.08	S	T
					8/12/2009	100.17	S	T
					9/23/2009	100.18	S	T
					11/3/2009	100.27	S	T
224	184W506M ^c	184 N12 E66 26 BA 2	1,140	6,014.04	1/22/2009	215.48	S	T
					4/15/2009	215.53	S	T
					5/21/2009	215.58	S	T
					7/1/2009	215.62	S	T
					7/13/2009	215.58	S	T
					7/15/2009	215.61	S	T
					8/12/2009	215.65	S	T
					9/23/2009	215.75	S	T
					11/3/2009	215.88	S	T
225	184W508M ^c	184 N09 E67 11 DB 1	1,160	6,056.19	1/22/2009	276.60	S	T
					2/25/2009	276.53	S	T
					4/15/2009	276.56	S	T
					5/20/2009	276.67	S	T
					7/1/2009	276.71	S	T
					7/13/2009	276.73	S	T
					7/14/2009	276.69	S	T
					8/12/2009	276.76	S	T
					9/23/2009	276.72	S	T
					11/3/2009	276.86	S	T
226	SPR7007M ^c	184 N11 E68 05 BC 2	1,020	6,017.73	1/22/2009	156.23	S	T
					2/24/2009	157.26	S	T
					4/15/2009	158.41	S	T
					5/20/2009	156.29	S	T
					6/30/2009	146.87	S	T
					8/11/2009	147.45	S	T
					9/22/2009	148.31	S	T
					11/3/2009	150.24	S	T



Table B-1
Periodic Water-Level Measurement Data from
the Spring Valley Existing-Well Monitoring Network
 (Page 4 of 6)

Map ID	Site Number	Station Local Number	Well Depth (ft bgs)	Surface Elevation (ft amsl)	Water Level			
					Date	Depth-to-Water (ft bgs)	Well Status ^a	Measurement Method ^b
227	SPR7005M ^c	184 N14 E66 09 AB 2	1,404	6,395.68	1/21/2009	494.16	S	T
					2/25/2009	494.34	S	T
					4/14/2009	494.20	S	T
					5/19/2009	493.99	S	T
					6/30/2009	493.45	S	T
					7/13/2009	493.29	S	T
					7/14/2009	493.37	S	T
					8/11/2009	493.37	S	T
					9/22/2009	493.52	S	T
					11/4/2009	493.83	S	T
228	SPR7008M ^c	184 N15 E67 26 CD 2	946	5,704.86	1/21/2009	14.30	S	T
					2/24/2009	14.23	S	T
					4/14/2009	14.21	S	T
					5/19/2009	14.30	S	T
					6/30/2009	14.25	S	T
					8/4/2009	14.30	S	T
					8/11/2009	14.29	S	T
					9/22/2009	14.42	S	T
					11/3/2009	14.34	S	T
20	383351114180201	184 N08 E68 14A 1 USBLM	495	6,184.22	2/25/2009	406.49	S	T
					4/15/2009	406.62	S	T
					5/20/2009	406.57	S	T
					6/29/2009	406.46	S	T
					8/12/2009	406.53	S	T
					9/23/2009	406.55	S	T
					11/2/2009	406.62	S	T
28	384310114261401	184 N10 E67 22AA 1 USGS-MX (Spring V Central)	100	5,853.54	1/22/2009	65.02	S	T
					4/15/2009	65.14	S	T
					5/21/2009	65.16	S	T
					7/1/2009	65.24	S	T
					8/12/2009	65.28	S	T
					9/23/2009	65.27	S	T
					11/3/2009	65.38	S	T
55	184 N12 E66 21CD 1	184 N12 E66 21CD 1	633	6,370.31	1/22/2009	569.22	S	T
					4/14/2009	569.31	S	T
					5/21/2009	569.96	S	T
					7/1/2009	569.72	S	T
					8/12/2009	569.83	S	T
					9/23/2009	569.91	S	T
					11/3/2009	570.19	S	T

Table B-1
Periodic Water-Level Measurement Data from
the Spring Valley Existing-Well Monitoring Network
 (Page 5 of 6)

Map ID	Site Number	Station Local Number	Well Depth (ft bgs)	Surface Elevation (ft amsl)	Water Level			
					Date	Depth-to-Water (ft bgs)	Well Status ^a	Measurement Method ^b
113	385636114265501	184 N13 E67 33DDA 1	---	5,769.73	1/22/2009	8.30	S	T
					4/14/2009	7.15	S	T
					5/20/2009	7.15	S	T
					7/1/2009	7.52	S	T
					8/11/2009	8.16	S	T
					9/23/2009	8.35	S	T
152	391224114293601 ^d	184 N16 E66 36DBAD 1 USBLM - Cleve Creek Well	---	5,870.25	1/21/2009	208.44	S	S
					2/23/2009	208.39	S	S
					4/14/2009	208.33	S	S
					5/19/2009	208.38	S	S
					6/30/2009	208.09	S	S
					8/11/2009	208.35	S	S
					9/22/2009	208.65	S	S
					11/4/2009	208.88	S	S
176	392703114230501	184 N18 E67 01CCAA 1	42	5,587.78	1/21/2009	35.06	S	T
					4/13/2009	33.15	P	T
					5/19/2009	33.11	P	T
					6/30/2009	40.70	P	T
					8/11/2009	36.62	P	T
					9/22/2009	35.57	P	T
					11/4/2009	33.25	P	T
182	184 N20 E66 13AB 1	184 N20 E66 13AB 1	296	5,774.93	1/21/2009	129.14	S	S
					2/26/2009	129.32	S	S
					4/14/2009	129.39	S	S
					5/19/2009	129.52	S	S
					6/30/2009	128.39	S	S
					8/11/2009	128.39	S	S
					9/22/2009	128.99	S	S
					11/4/2009	129.24	S	S



Table B-1
Periodic Water-Level Measurement Data from
the Spring Valley Existing-Well Monitoring Network
 (Page 6 of 6)

Map ID	Site Number	Station Local Number	Well Depth (ft bgs)	Surface Elevation (ft amsl)	Water Level			
					Date	Depth-to-Water (ft bgs)	Well Status ^a	Measurement Method ^b
188	393442114231801	184 N20 E67 26ABBD 1 USBLM	130	5,708.77	1/21/2009	118.12	S	S
					4/14/2009	118.18	S	S
					5/19/2009	118.19	S	S
					6/30/2009	118.16	S	S
					8/11/2009	118.23	S	S
					9/22/2009	118.22	S	T
					11/4/2009	118.19	S	T
213	383325114134901	196 N08 E69 15B 1	110	5,729.98	1/22/2009	70.47	S	T
					2/25/2009	70.52	S	T
					4/15/2009	70.61	S	T
					5/20/2009	70.76	S	T
					6/29/2009	70.97	S	T
					8/12/2009	71.03	S	T
					9/21/2009	70.93	S	T
11/2/2009	70.82	S	T					
218	383533114102901	196 N08 E70 06B 1 USBLM - Monument Well	164	5,676.76	1/22/2009	89.68	S	S
					2/25/2009	89.69	S	S
					4/15/2009	89.69	S	S
					5/20/2009	89.71	S	S
					6/29/2009	89.68	S	S
					8/12/2009	89.73	S	S
					9/21/2009	89.76	S	S
11/2/2009	89.77	S	S					

^aS = Static conditions, P = Pumping or recently pumping conditions

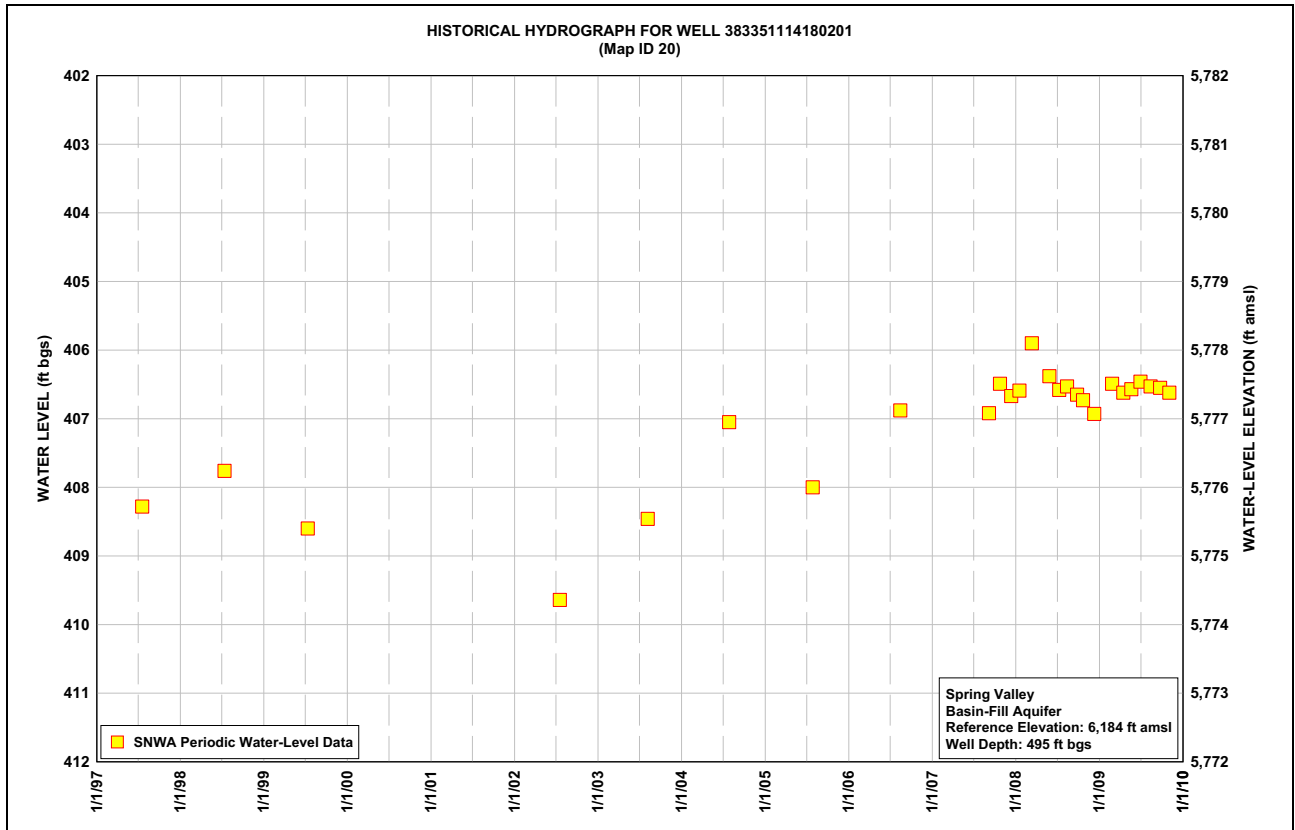
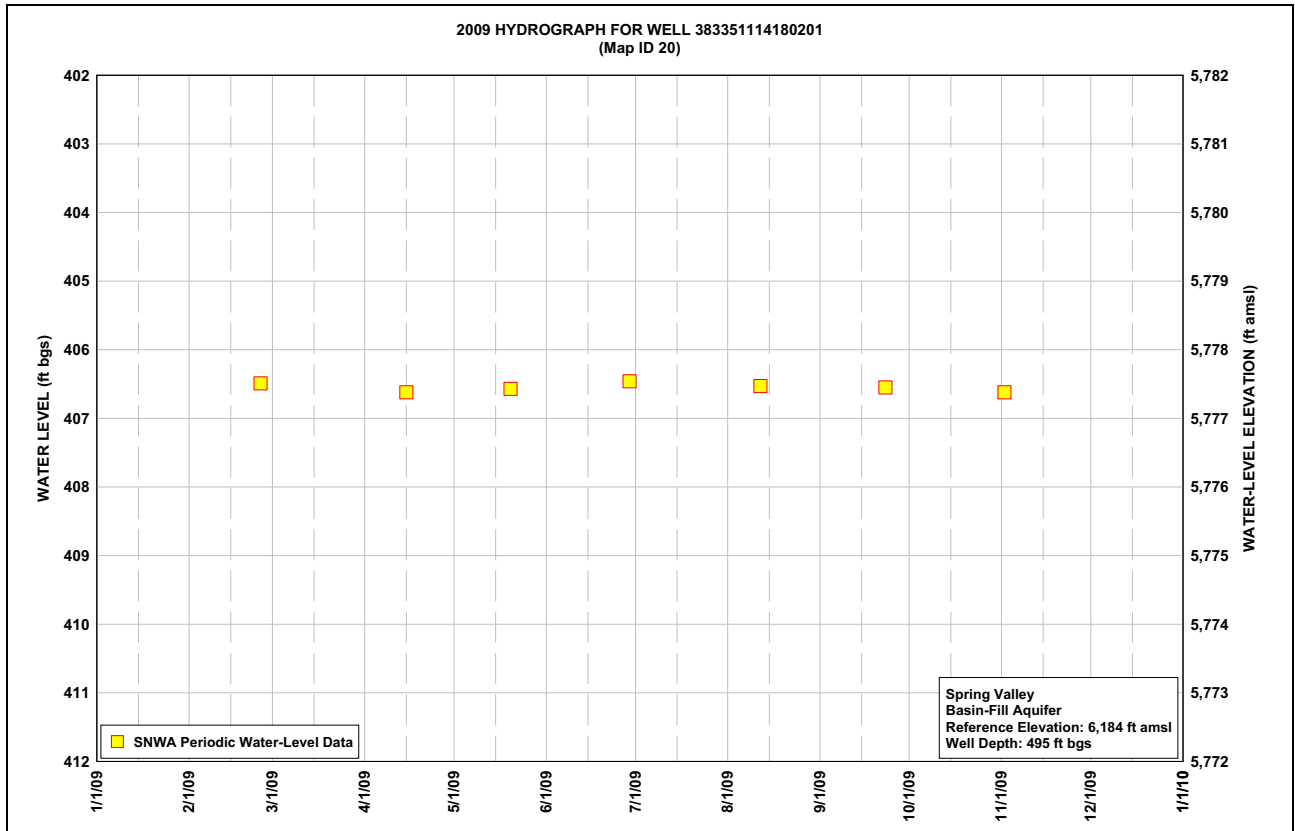
^bT = Electric tape measurement, S = Steel tape measurement

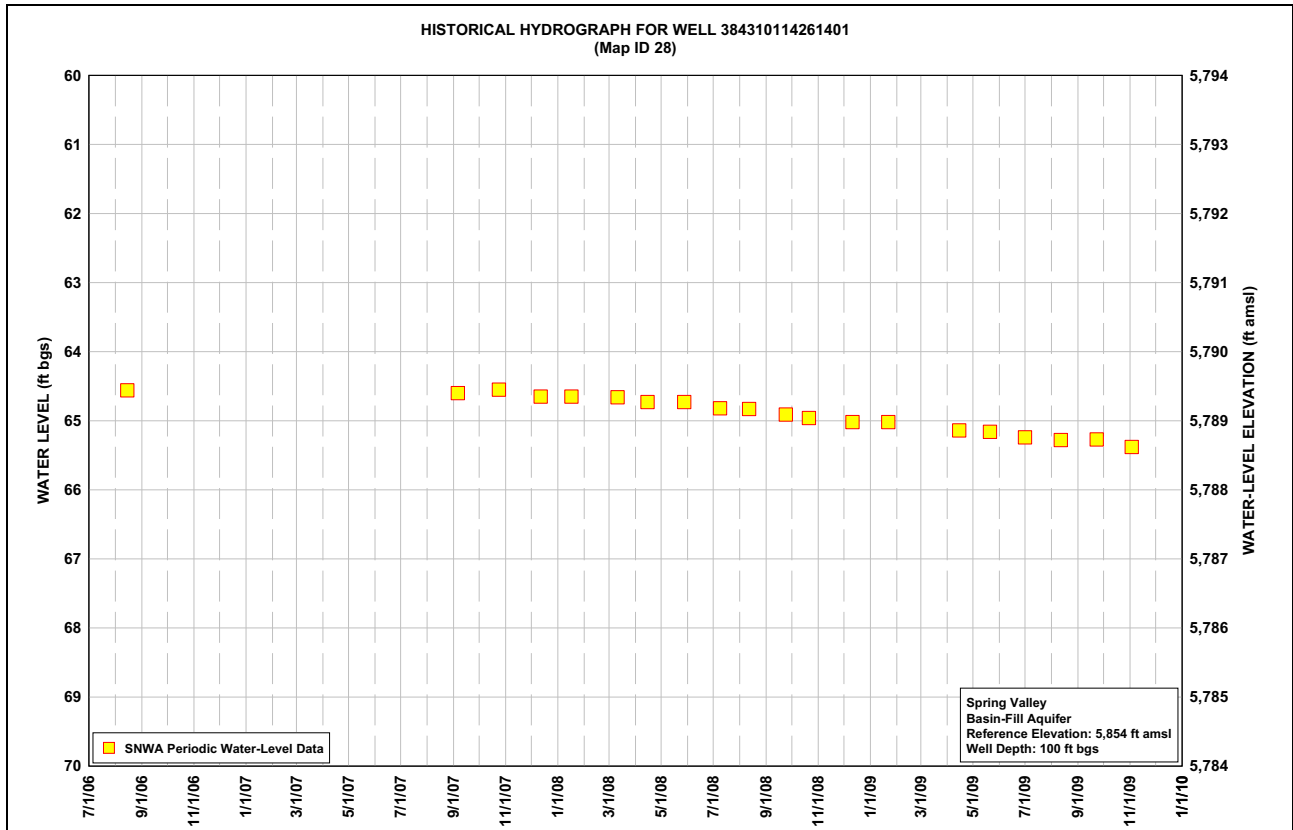
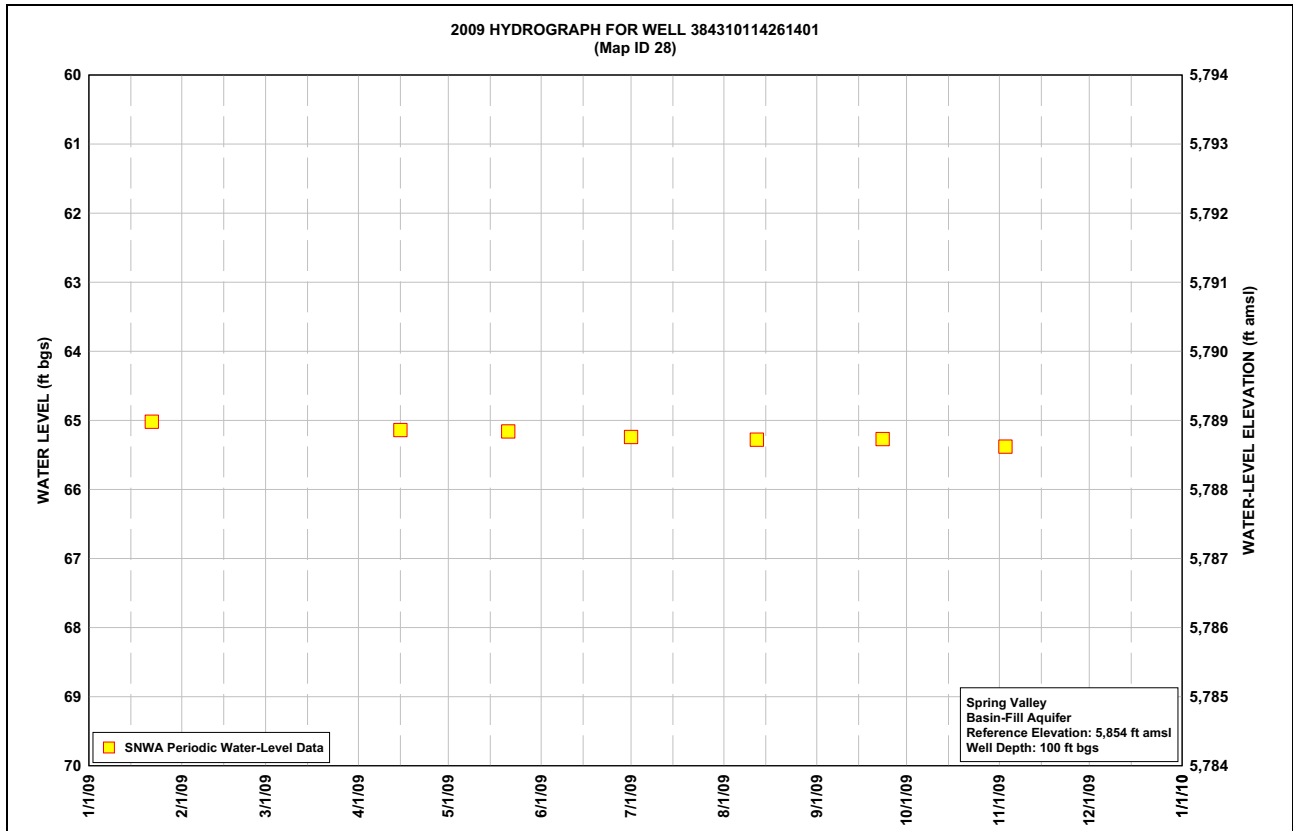
^c2009 and historical hydrographs with periodic and continuous data are presented in [Appendix C](#).

^dThe Cleve Creek well will be replaced by a new monitor well approximately 1 mi to the north.

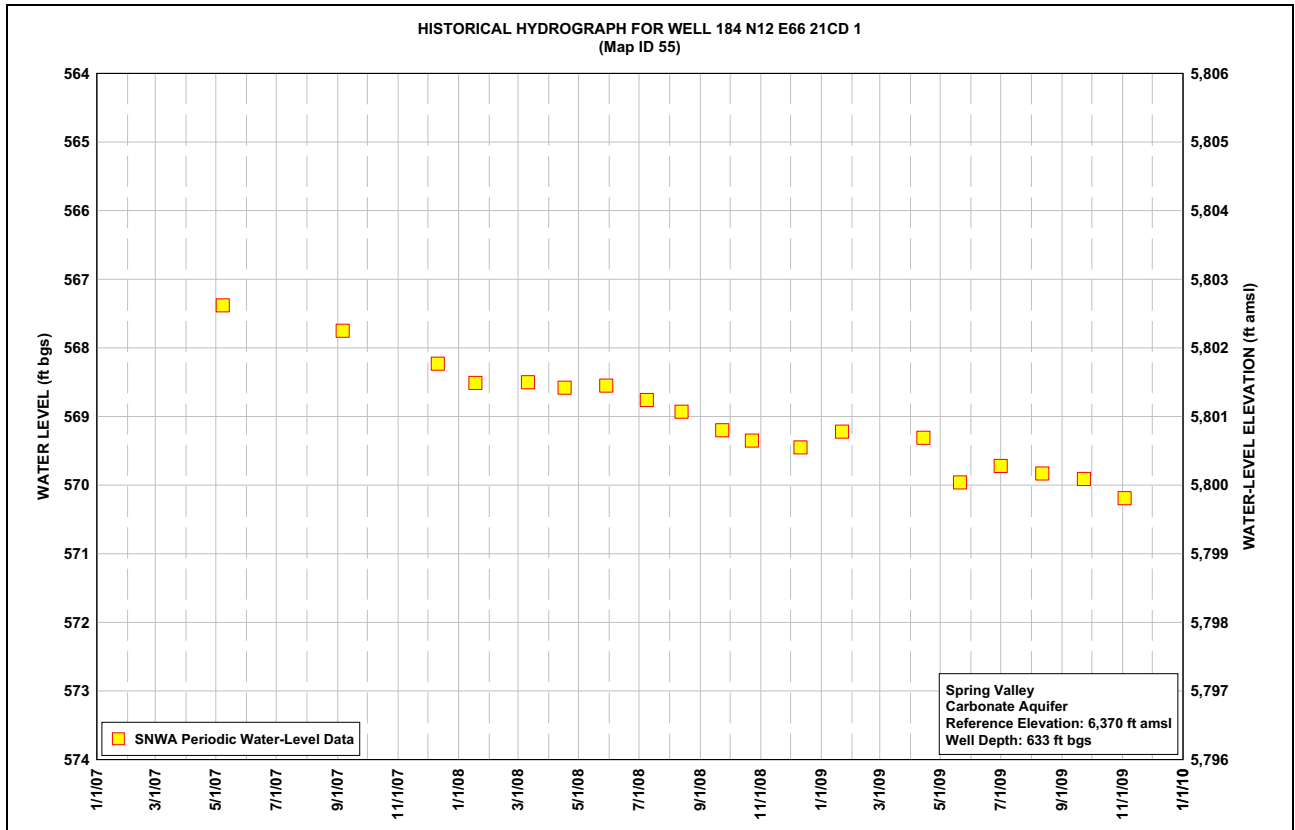
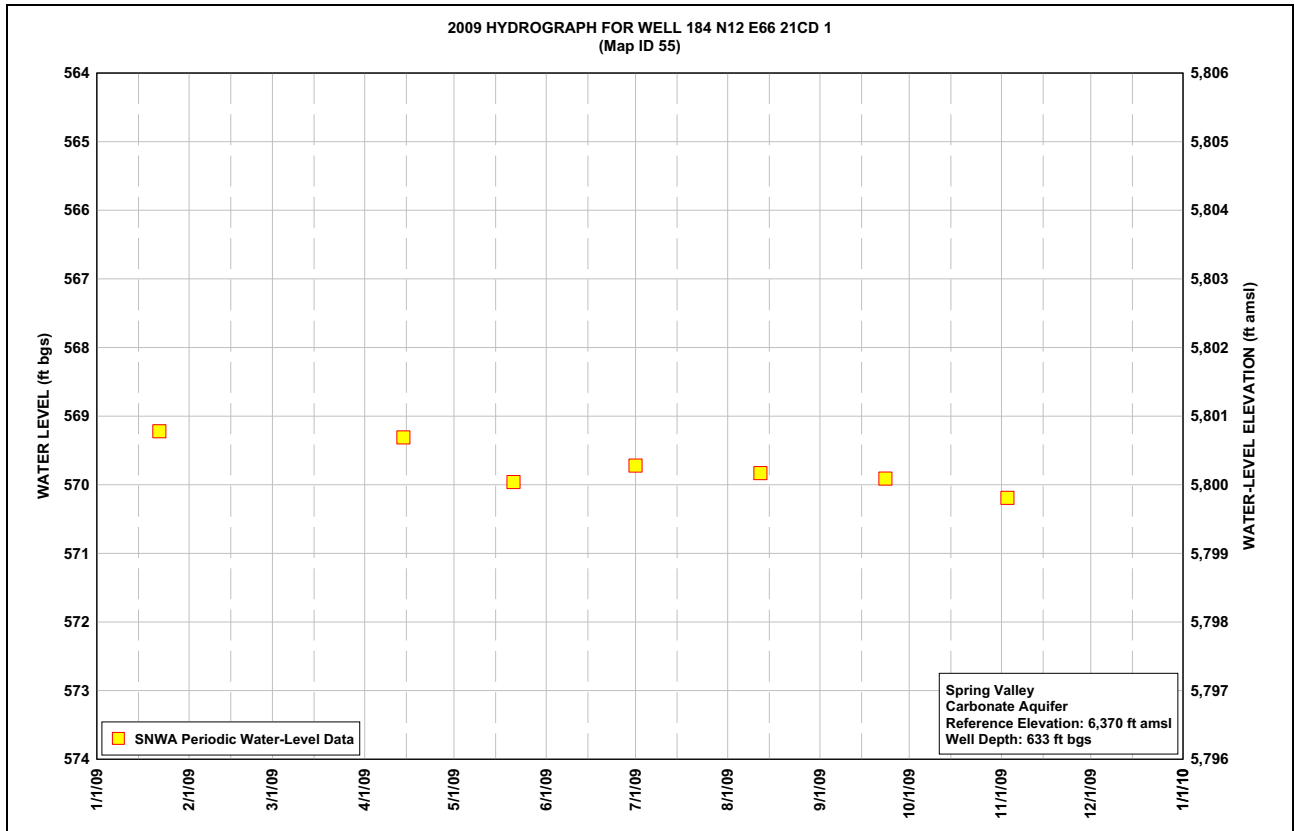
Note: SNWA Tape calibration program started in August of 2008.

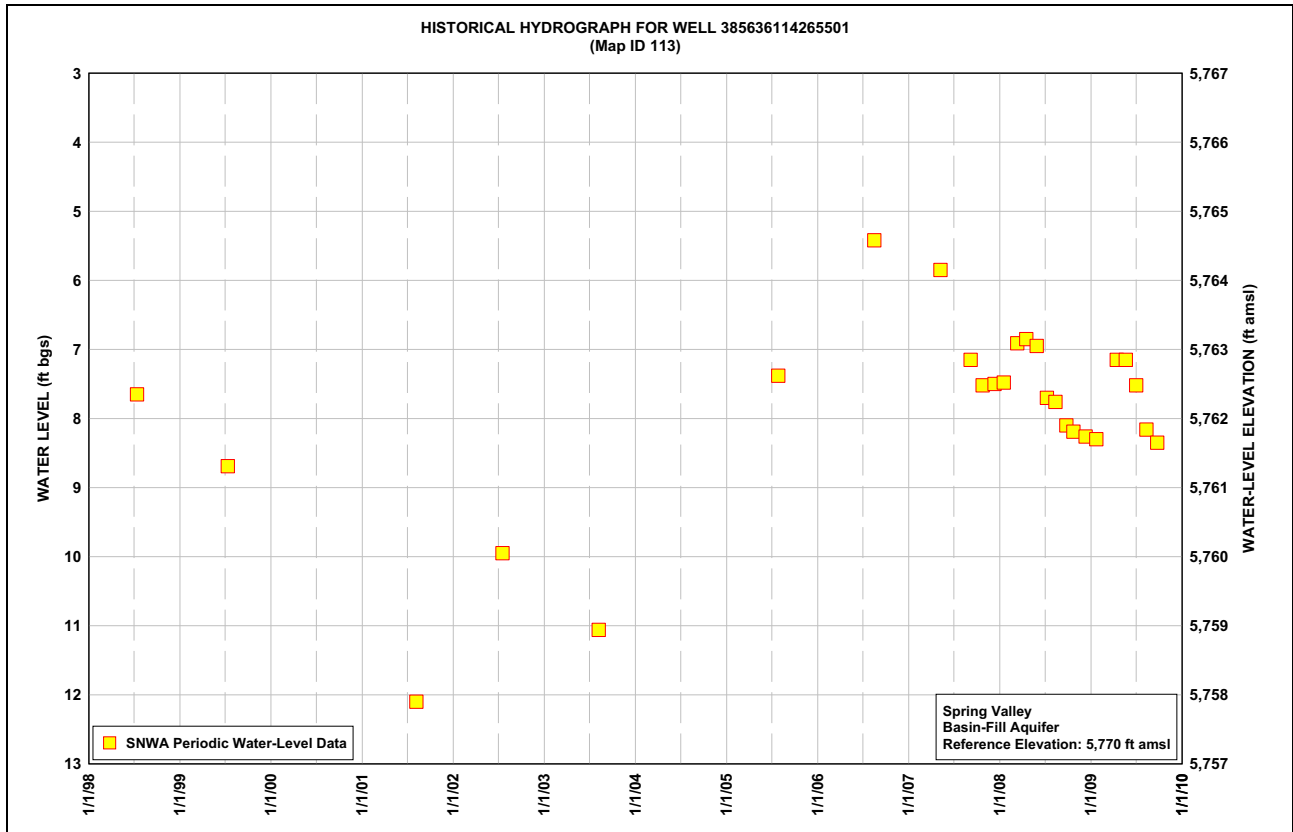
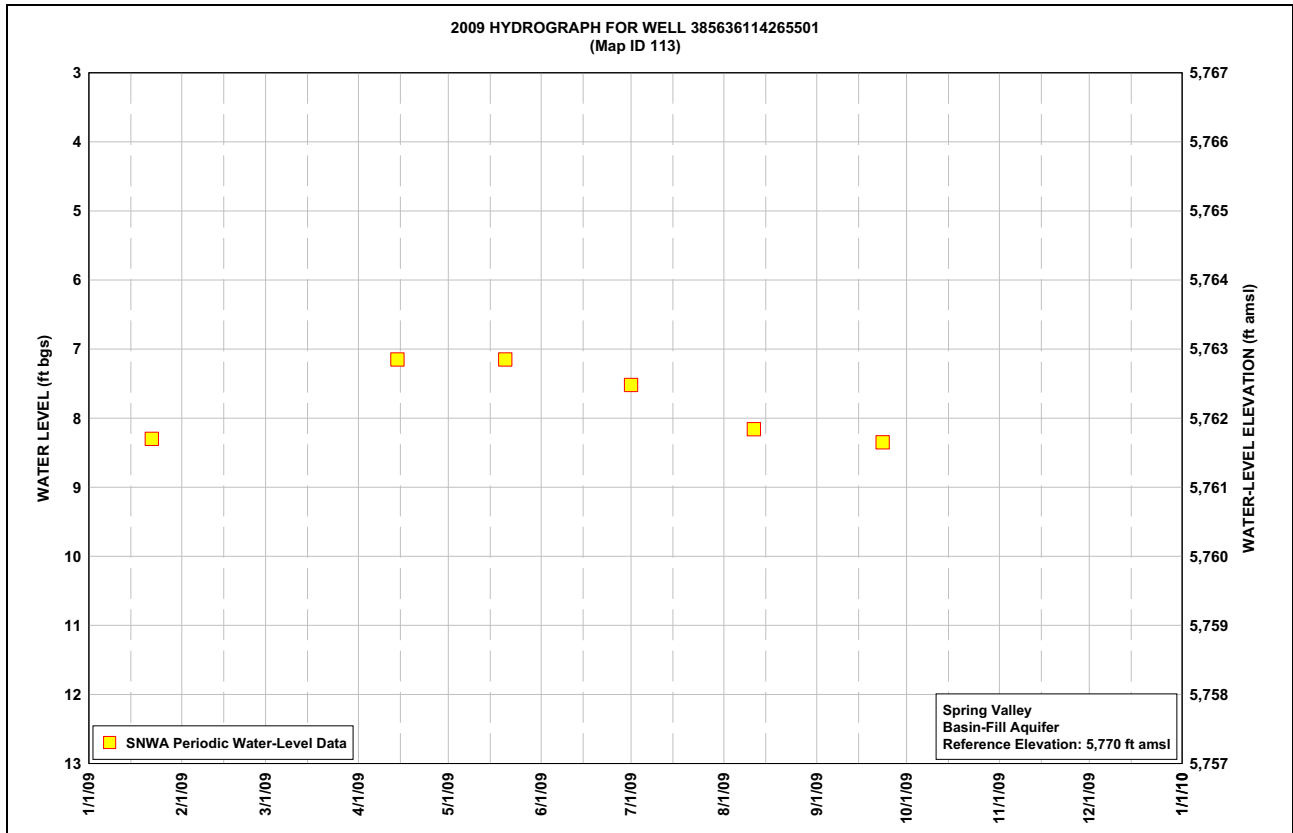
2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report



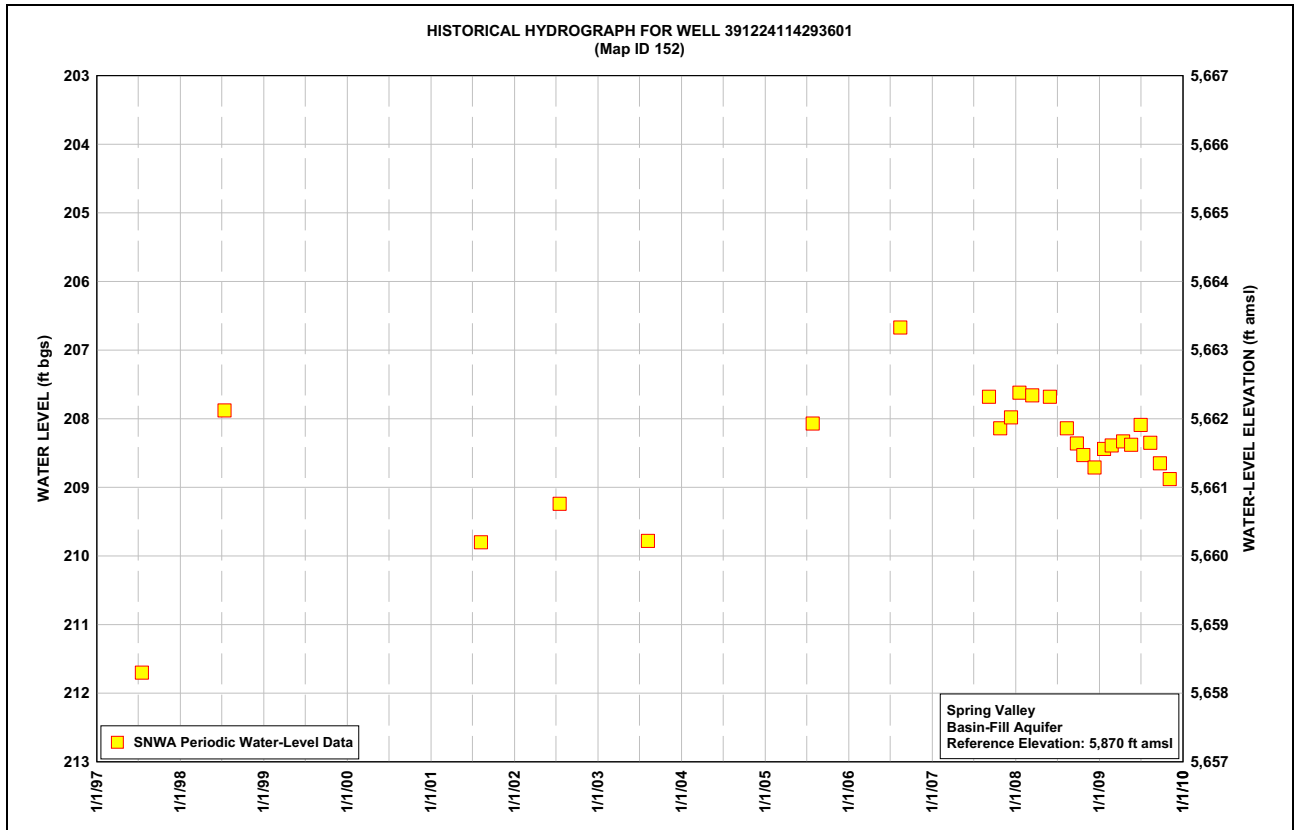
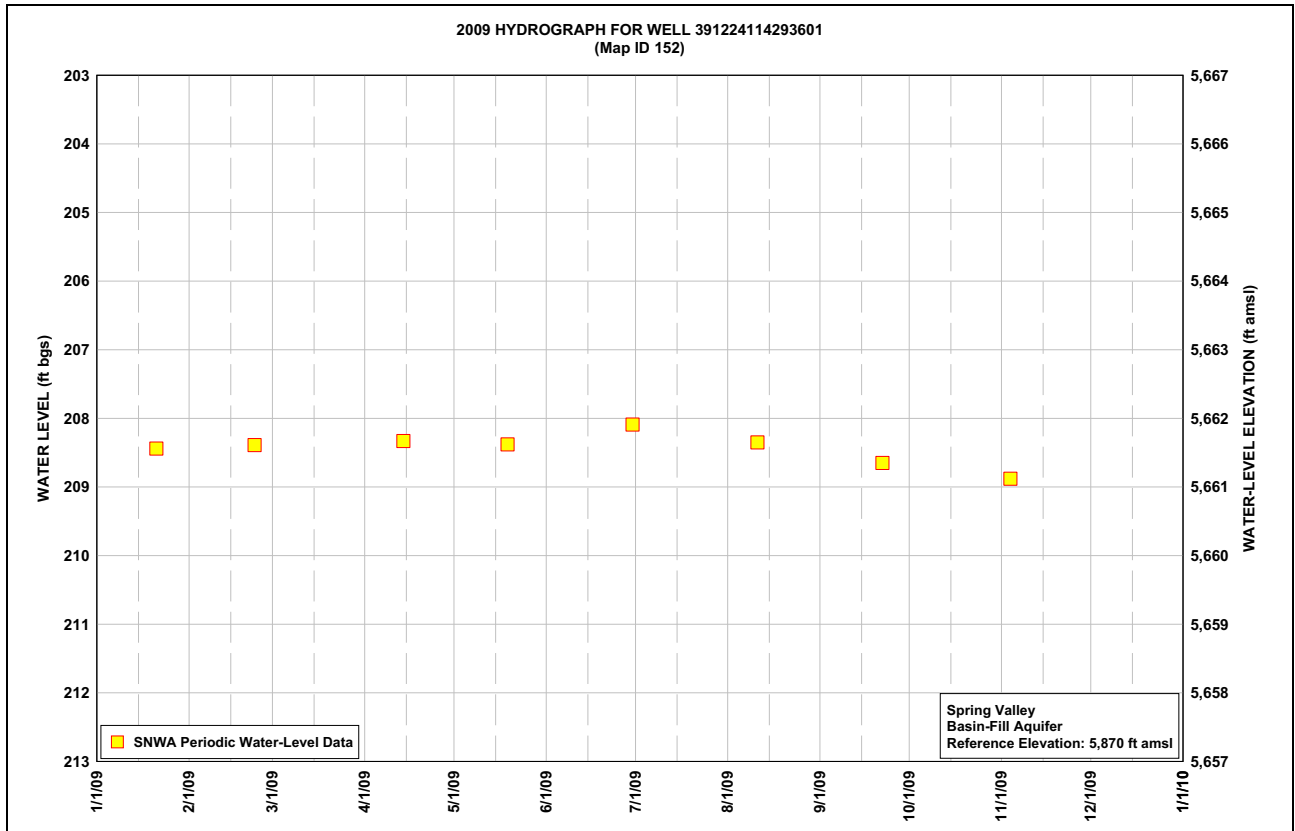


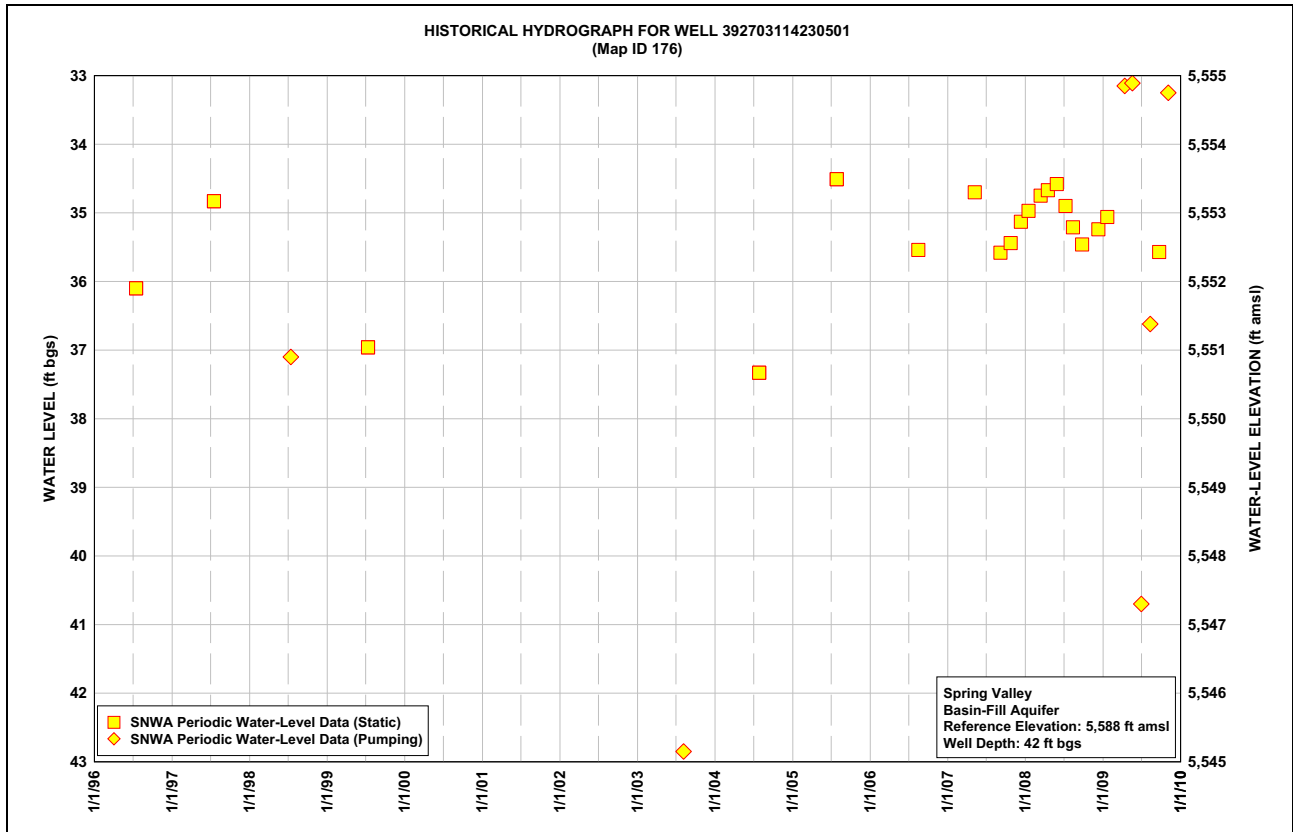
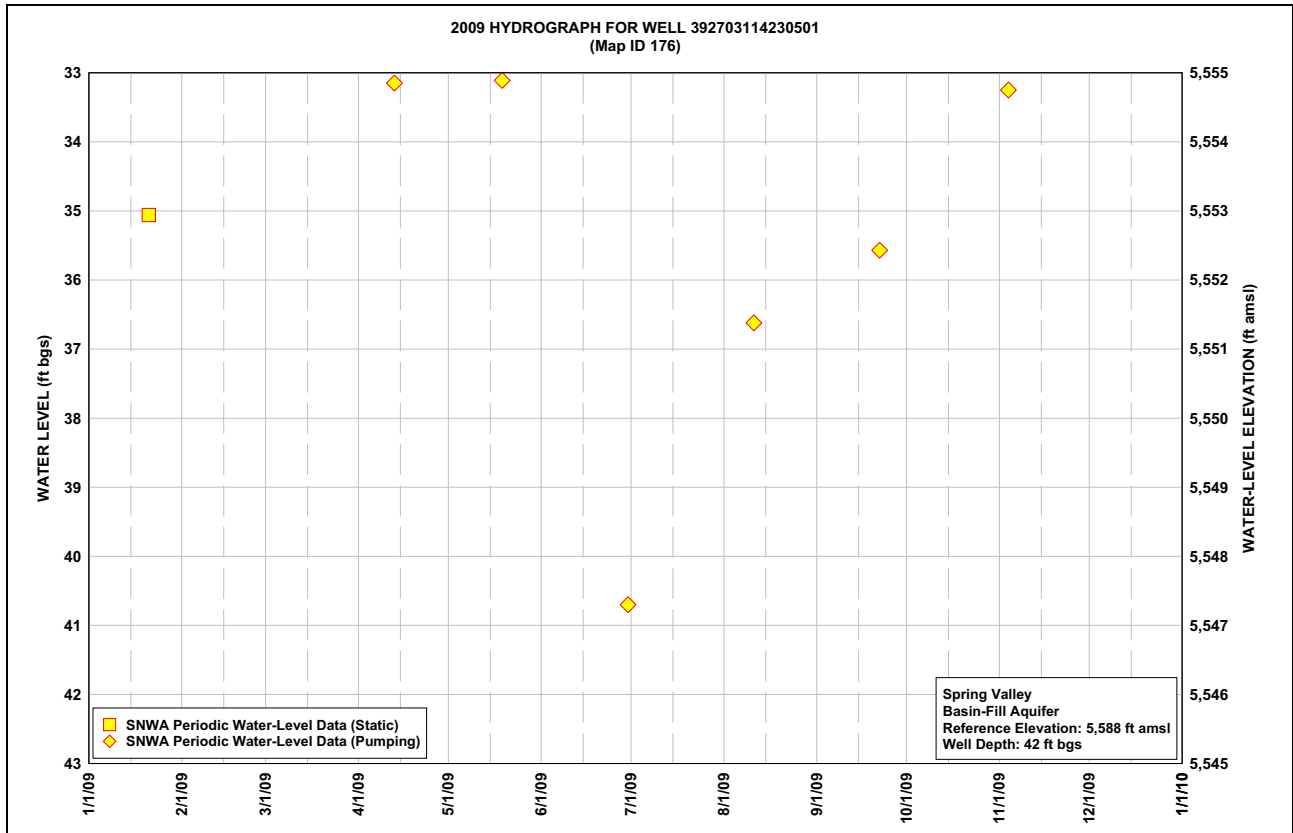
2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report



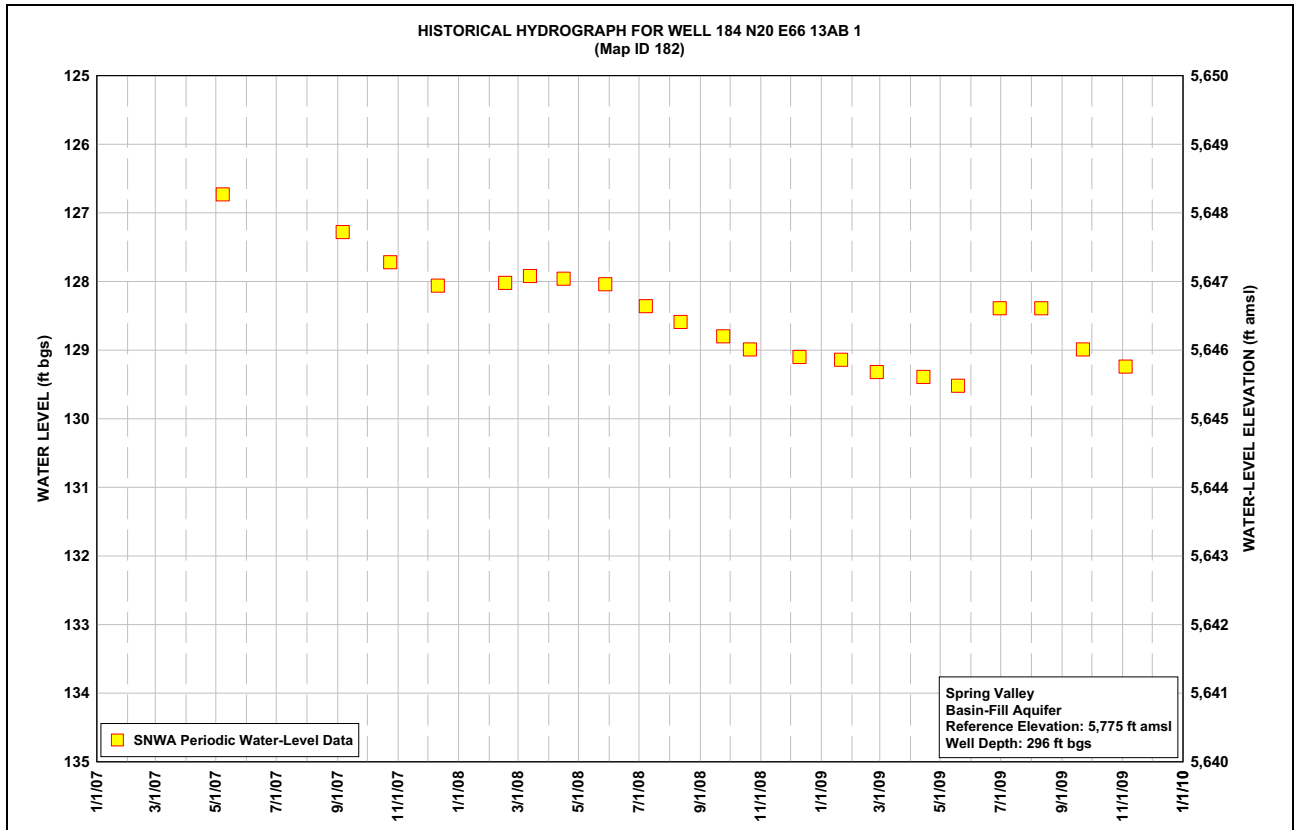
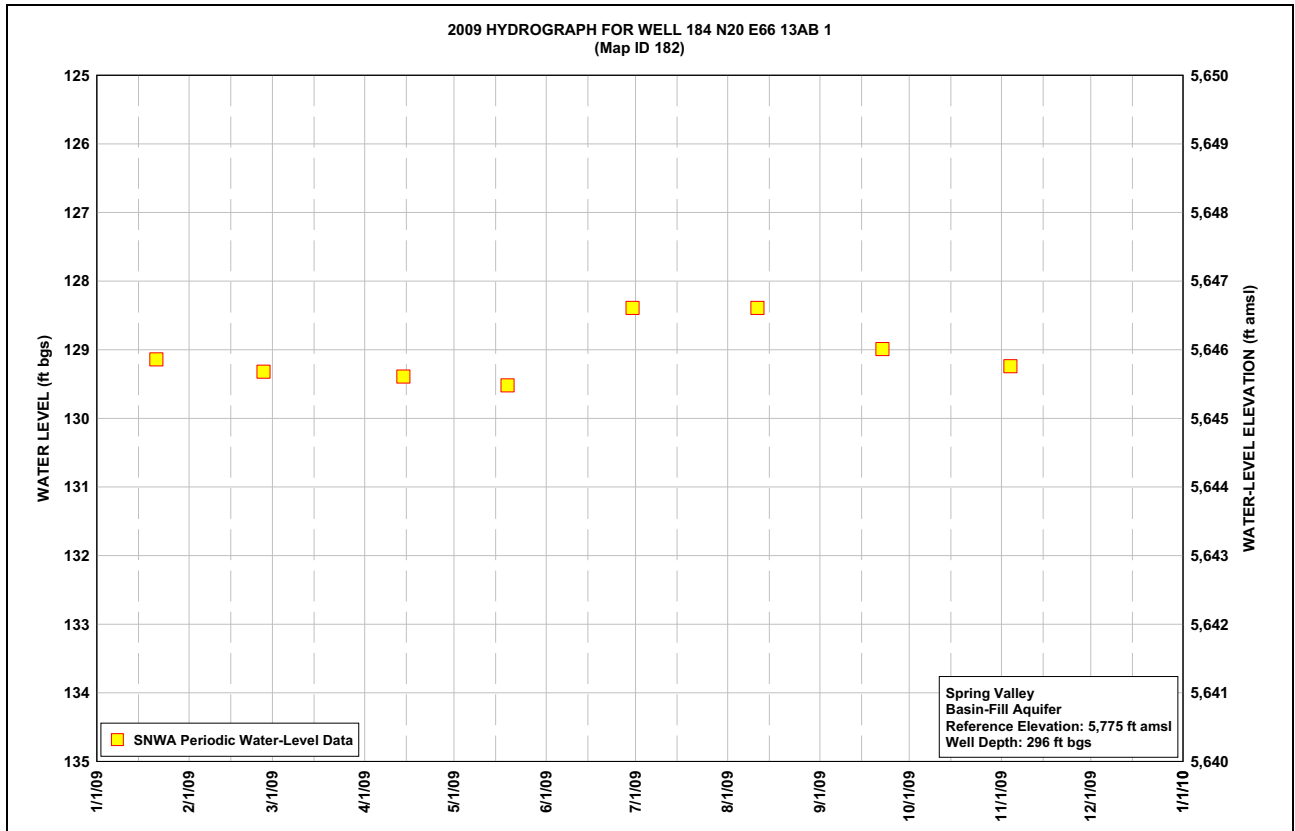


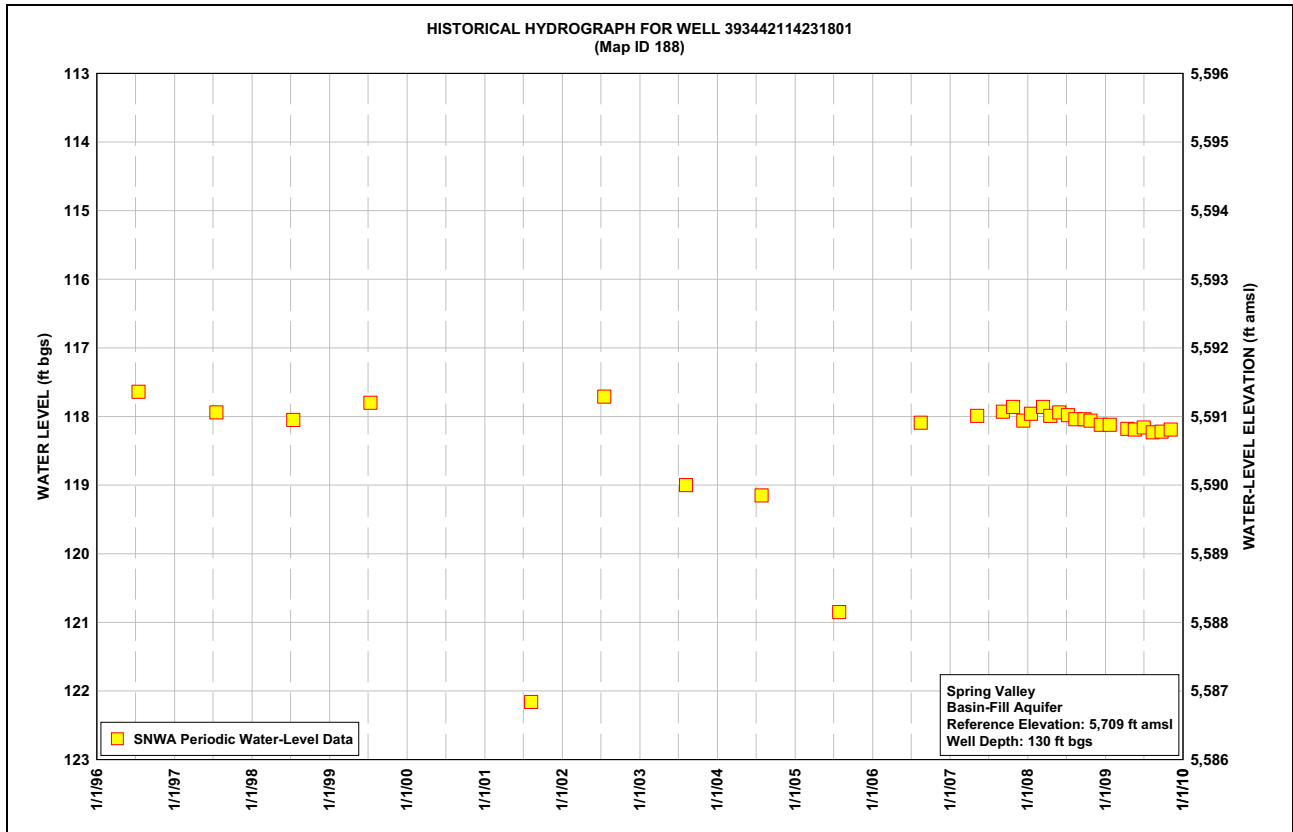
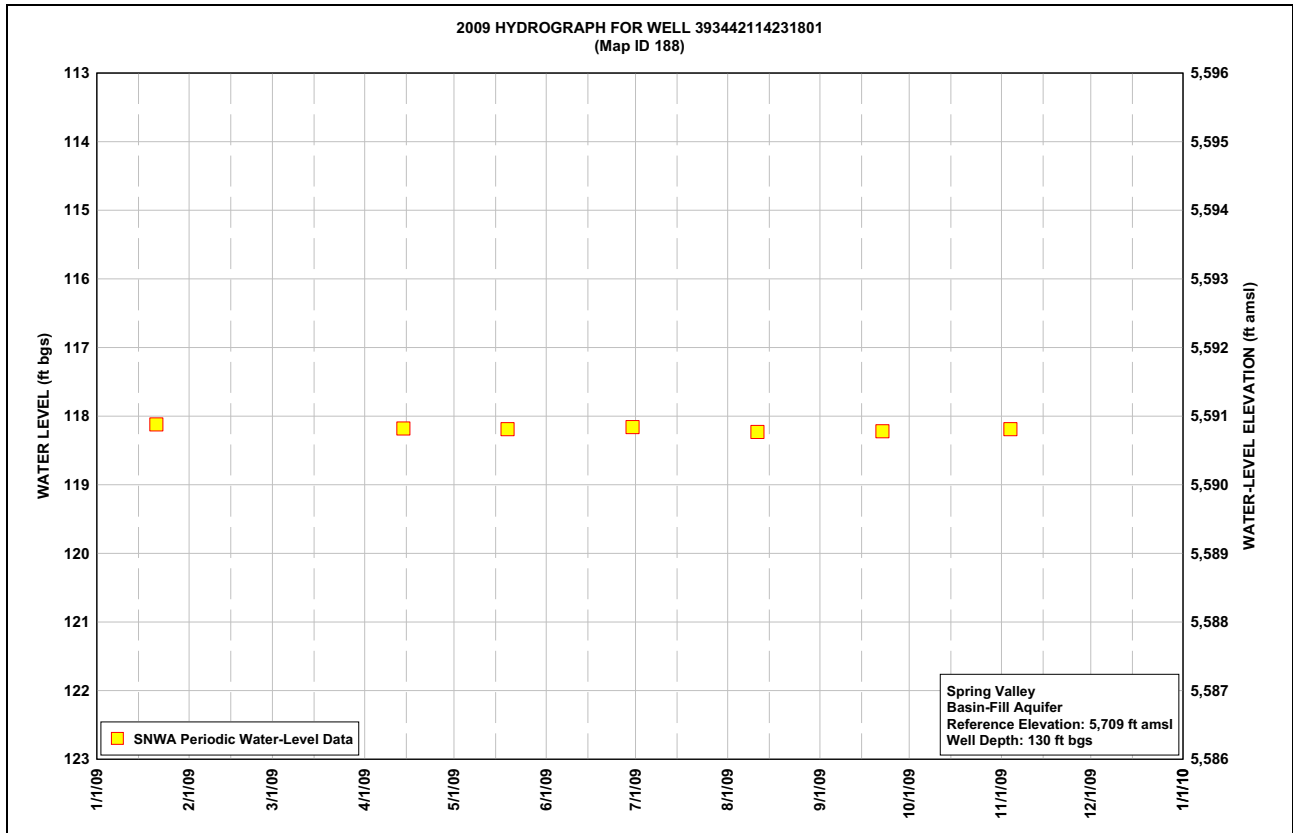
2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report



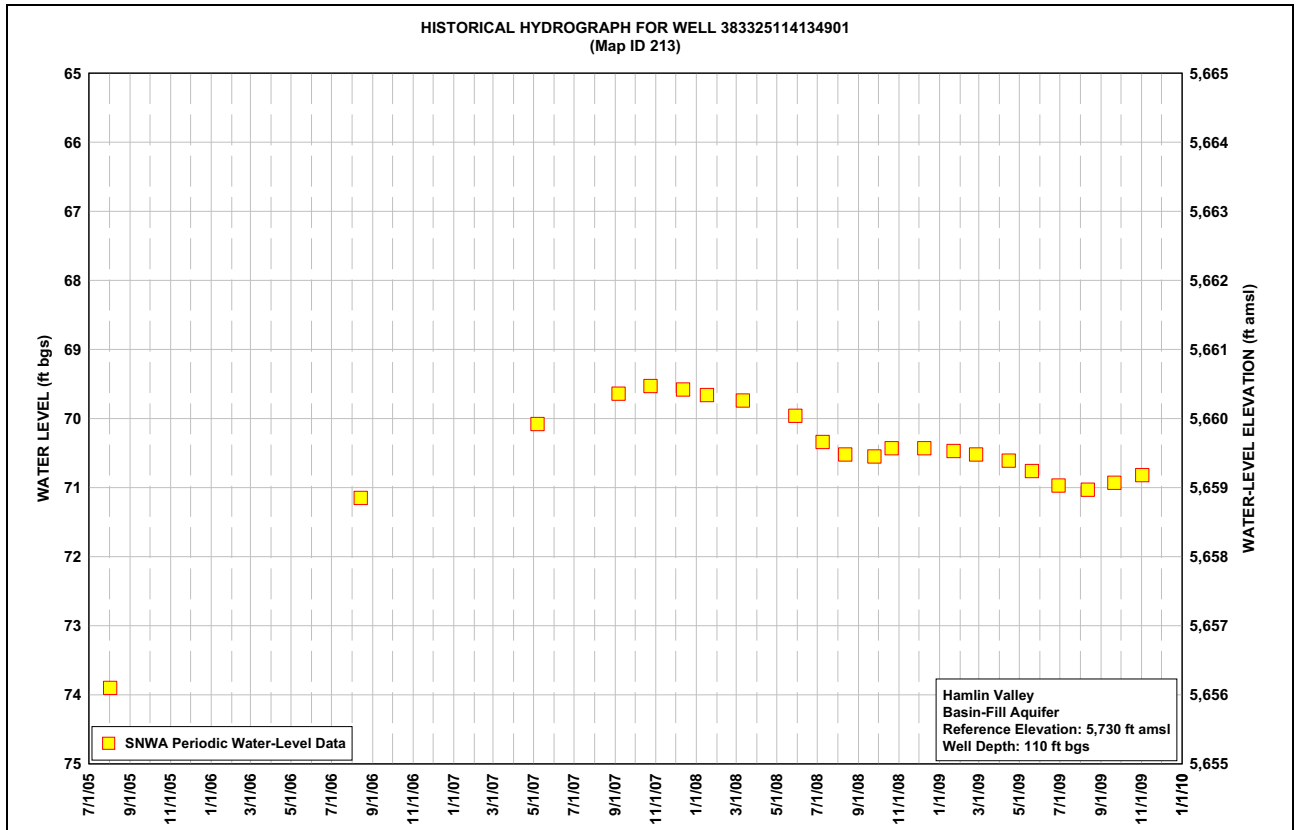
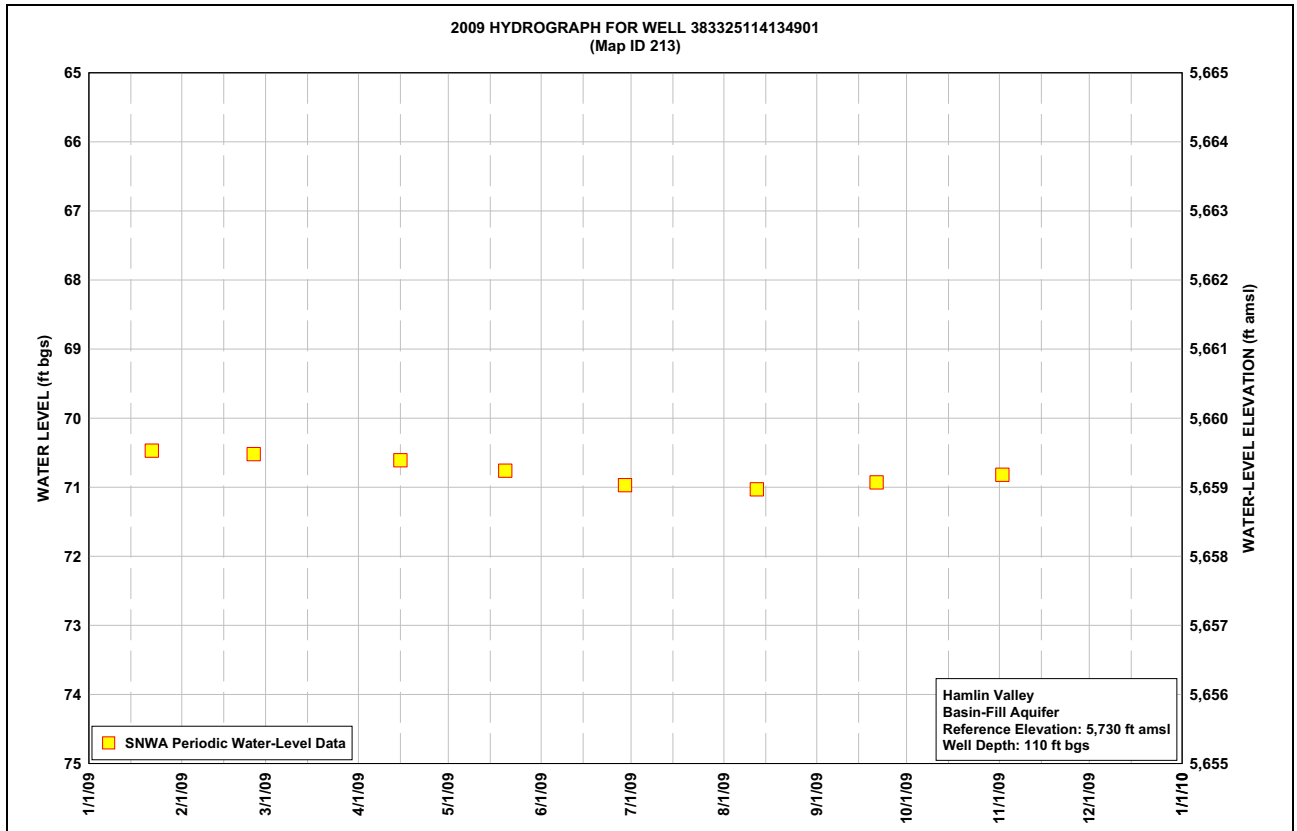


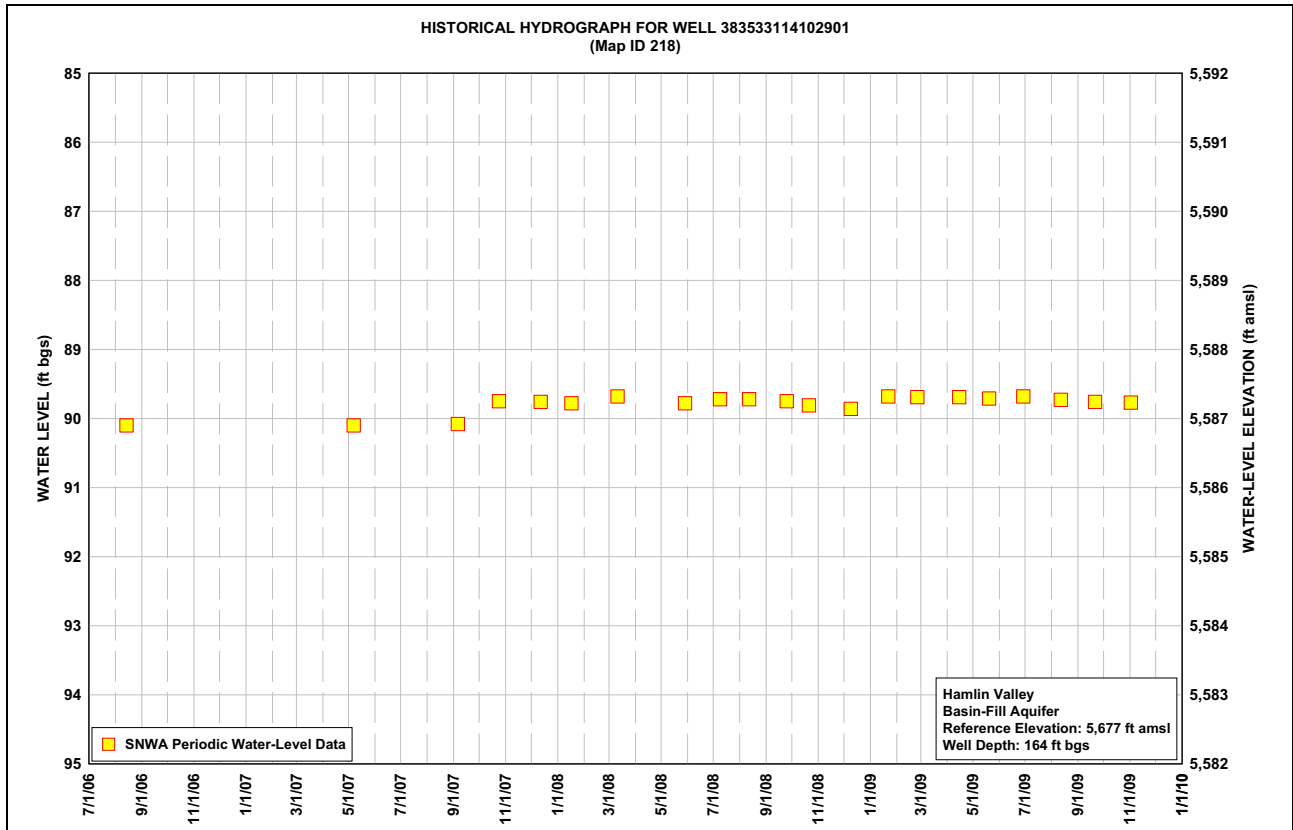
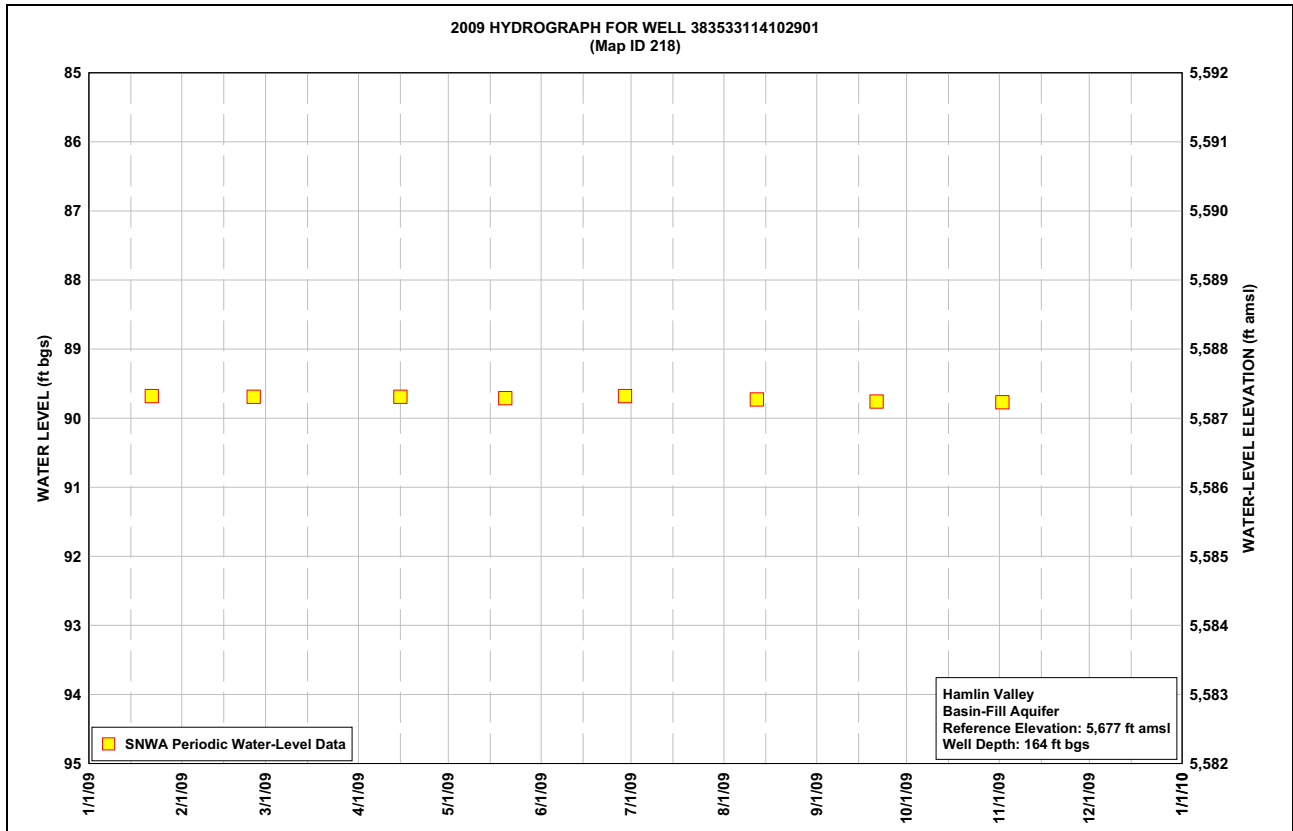
2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report





2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report





Appendix C

Continuous Water-Level Measurement Data from the Spring Valley Existing-Well Monitoring Network

C.1.0 MONITORING PROGRAM WELLS WITH CONTINUOUS TRANSDUCER DATA

Continuous data collection was performed in 2009 for the following monitor wells:

- 383704114225001
- 384039114232701
- 384831114314301
- 384745114224401
- 390352114305401
- 390803114251001
- 393211114320701
- 383023114115302
- 184W502M
- 184W504M
- 184W506M
- 184W508M
- SPR7007M
- SPR7005M
- SPR7008M

For these sites, the graphs are shown below and include historical data and data collected in 2009. Continuous data have been corrected for temperature and line stretch. Additional data processing, including barometric pressure corrections, may be applied in the future.



Table C-1
Well 383704114225001, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	---	---	---	---	225.01	225.03	225.02	225.04	225.07	225.01	224.90
2	---	---	---	---	---	225.04	225.06	224.98	225.02	224.90	225.06	224.98
3	---	---	---	---	---	225.07	225.02	225.01	224.99	224.81	225.00	225.07
4	---	---	---	---	---	224.98	225.02	225.03	224.98	224.92	224.99	224.96
5	---	---	---	---	---	224.94	224.99	224.96	224.97	225.13	224.96	224.81
6	---	---	---	---	---	225.01	224.97	224.89	224.99	225.07	224.95	224.91
7	---	---	---	---	---	225.04	224.97	225.01	224.95	224.96	224.95	224.84
8	---	---	---	---	---	225.02	225.00	225.06	225.00	225.04	225.05	225.10
9	---	---	---	---	---	225.02	225.04	225.03	225.05	225.02	225.05	225.08
10	---	---	---	---	---	225.02	225.06	225.03	225.04	224.95	225.02	225.02
11	---	---	---	---	---	225.03	225.05	225.02	224.99	224.92	224.92	225.00
12	---	---	---	---	---	225.03	225.01	224.97	224.88	224.97	224.85	224.94
13	---	---	---	---	---	225.02	224.99	224.94	224.95	225.01	224.97	224.97
14	---	---	---	---	225.03	225.02	225.03	224.95	225.01	225.09	225.06	225.13
15	---	---	---	---	225.10	225.02	225.04	225.01	225.08	225.11	225.15	225.09
16	---	---	---	---	225.12	225.05	225.04	225.01	225.02	225.06	225.03	225.03
17	---	---	---	---	225.07	225.01	225.02	225.00	224.98	224.98	224.92	225.02
18	---	---	---	---	225.00	225.03	225.03	225.00	225.00	224.93	224.94	225.01
19	---	---	---	---	225.00	224.95	224.99	224.99	224.98	224.88	225.07	225.02
20	---	---	---	---	225.03	224.97	225.00	225.01	225.00	225.05	224.90	224.96
21	---	---	---	---	225.05	225.00	225.00	224.99	225.09	225.05	224.98	224.90
22	---	---	---	---	225.03	225.07	224.99	224.99	225.02	225.02	224.99	224.83
23	---	---	---	---	225.04	225.04	225.01	224.99	224.98	225.01	225.14	225.15
24	---	---	---	---	225.04	225.06	225.02	225.02	224.96	224.96	225.06	225.08
25	---	---	---	---	225.04	225.03	225.04	225.02	225.01	225.09	225.03	224.97
26	---	---	---	---	225.06	225.02	225.02	225.03	225.01	224.95	224.96	225.01
27	---	---	---	---	225.06	225.09	224.97	225.03	224.94	224.82	224.86	225.03
28	---	---	---	---	225.06	225.01	224.96	225.00	224.92	224.96	224.94	225.00
29	---	---	---	---	225.07	224.98	224.99	224.94	224.89	225.09	225.10	224.92
30	---	---	---	---	225.02	225.00	225.03	224.94	225.09	225.10	225.01	225.01
31	---	---	---	---	224.99	---	225.03	225.00	---	225.05	---	225.13
Max	---	---	---	---	225.12	225.09	225.06	225.06	225.09	225.13	225.15	225.15
Min	---	---	---	---	224.99	224.94	224.96	224.89	224.88	224.81	224.85	224.81

Year 2009 Statistics: Year Max 225.15; Year Min 224.81
 Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

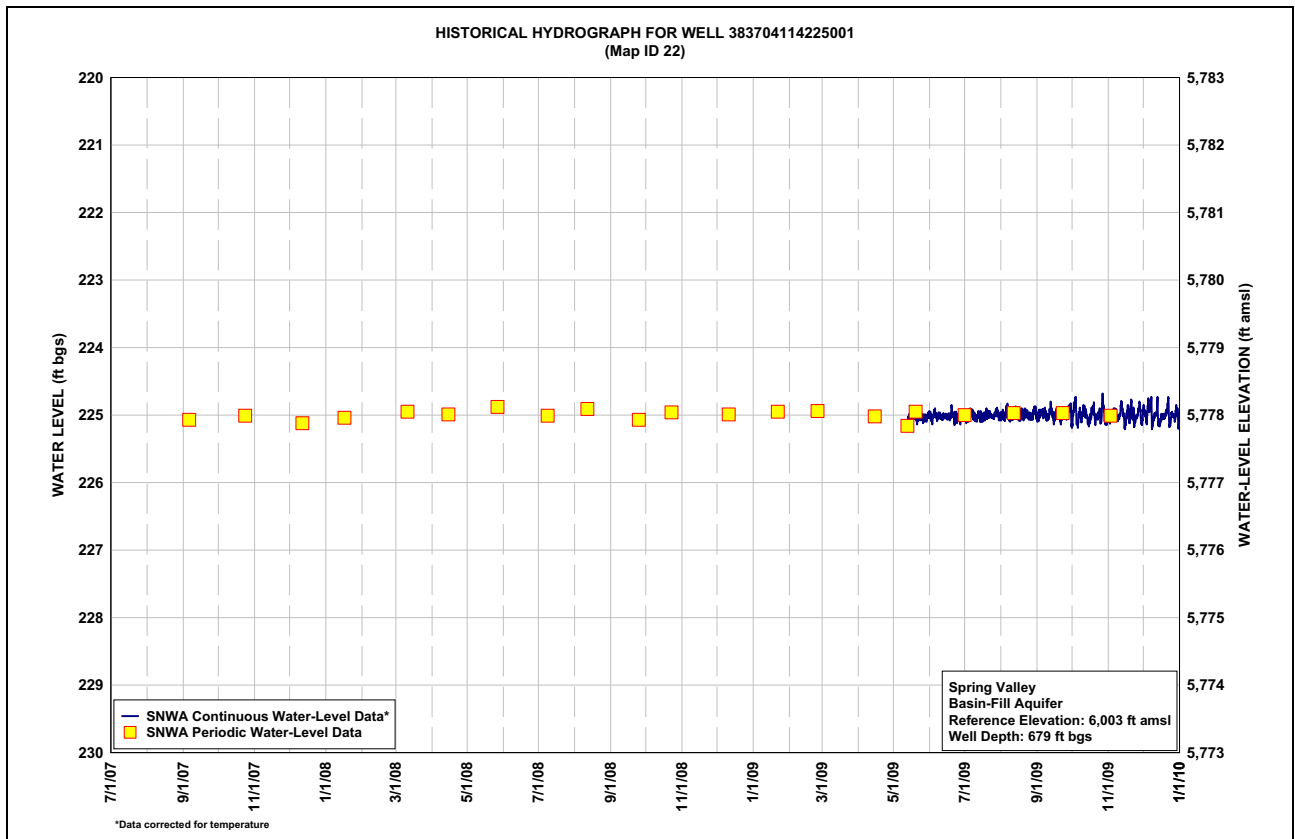
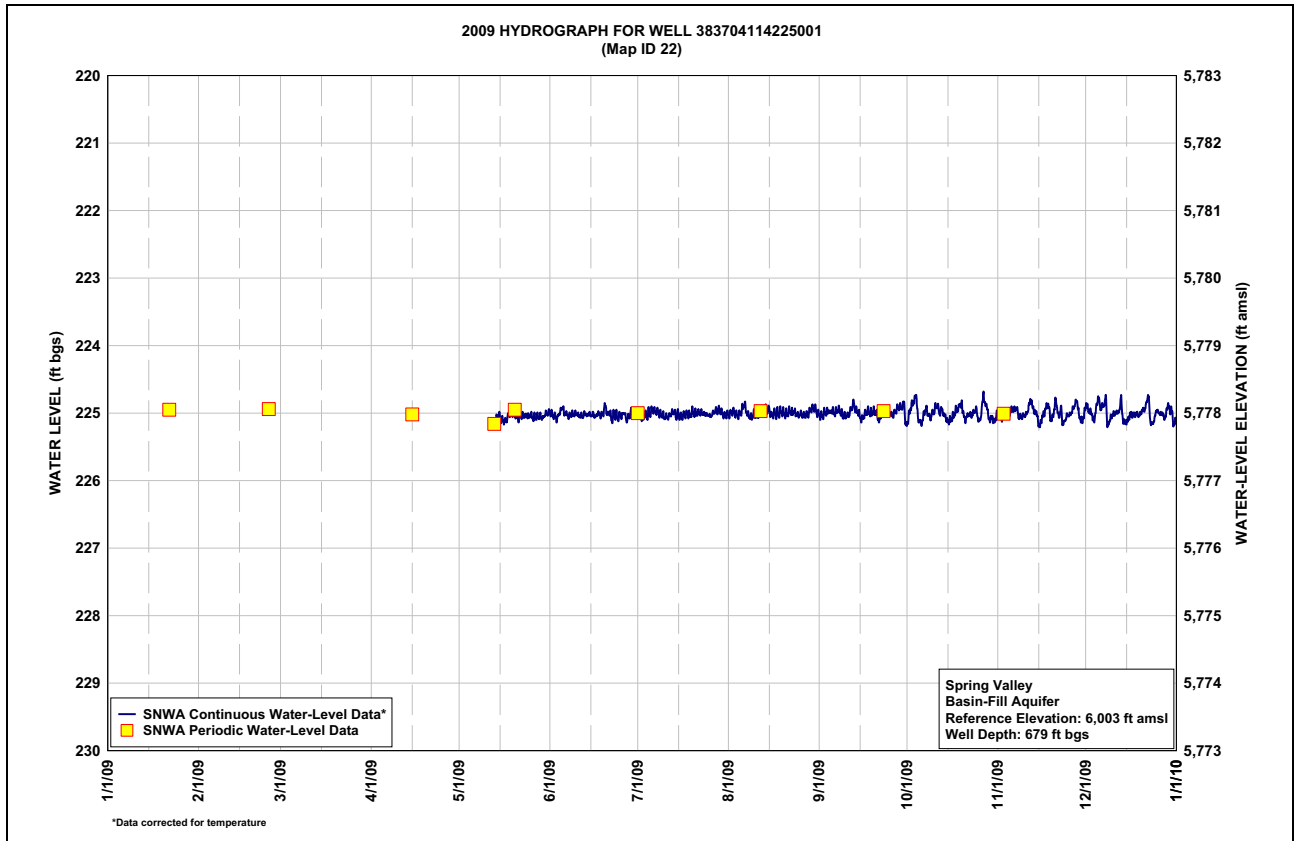




Table C-2
Well 384039114232701, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	118.38	118.37	118.36	118.33	118.34	118.34	118.33	118.33	118.32	118.31	118.31	118.31
2	118.37	118.38	118.35	118.32	118.34	118.34	118.33	118.33	118.32	118.31	118.31	118.31
3	118.37	118.38	118.35	118.31	118.34	118.34	118.33	118.33	118.32	118.30	118.32	118.31
4	118.37	118.38	118.34	118.33	118.34	118.34	118.34	118.33	118.32	118.29	118.32	118.31
5	118.37	118.36	118.34	118.35	118.34	118.34	118.33	118.33	118.32	118.30	118.32	118.30
6	118.37	118.35	118.34	118.36	118.34	118.34	118.33	118.33	118.32	118.30	118.31	118.29
7	118.37	118.34	118.34	118.35	118.34	118.33	118.33	118.32	118.32	118.30	118.31	118.28
8	118.37	118.33	118.34	118.33	118.34	118.33	118.33	118.33	118.32	118.30	118.31	118.27
9	118.38	118.32	118.33	118.33	118.34	118.32	118.33	118.33	118.32	118.31	118.32	118.28
10	118.39	118.33	118.34	118.33	118.34	118.32	118.33	118.33	118.32	118.30	118.32	118.29
11	118.39	118.35	118.34	118.33	118.34	118.32	118.33	118.33	118.32	118.30	118.31	118.29
12	118.39	118.34	118.35	118.34	118.33	118.32	118.33	118.33	118.32	118.30	118.31	118.29
13	118.39	118.34	118.35	118.34	118.34	118.32	118.33	118.33	118.31	118.30	118.31	118.28
14	118.39	118.34	118.34	118.33	118.34	118.32	118.33	118.33	118.31	118.30	118.31	118.29
15	118.39	118.35	118.34	118.31	118.34	118.32	118.33	118.33	118.31	118.31	118.31	118.30
16	118.40	118.34	118.35	118.34	118.34	118.32	118.34	118.33	118.32	118.31	118.31	118.30
17	118.40	118.34	118.35	118.35	118.35	118.32	118.34	118.33	118.31	118.31	118.31	118.31
18	118.40	118.36	118.36	118.36	118.34	118.32	118.34	118.32	118.32	118.31	118.31	118.31
19	118.40	118.38	118.35	118.37	118.34	118.32	118.34	118.32	118.31	118.31	118.31	118.31
20	118.40	118.37	118.35	118.37	118.34	118.32	118.34	118.32	118.31	118.31	118.31	118.31
21	118.39	118.37	118.34	118.37	118.34	118.32	118.34	118.32	118.32	118.31	118.30	118.31
22	118.38	118.37	118.33	118.36	118.34	118.32	118.33	118.32	118.32	118.31	118.31	118.30
23	118.37	118.37	118.34	118.35	118.34	118.32	118.33	118.32	118.32	118.31	118.31	118.30
24	118.37	118.36	118.35	118.34	118.34	118.32	118.33	118.32	118.32	118.31	118.31	118.31
25	118.35	118.35	118.34	118.34	118.34	118.33	118.34	118.32	118.32	118.31	118.32	118.31
26	118.34	118.35	118.34	118.34	118.34	118.33	118.34	118.32	118.32	118.31	118.31	118.31
27	118.36	118.35	118.34	118.34	118.34	118.34	118.34	118.32	118.32	118.30	118.31	118.31
28	118.37	118.36	118.34	118.33	118.34	118.34	118.33	118.33	118.31	118.30	118.30	118.31
29	118.38	---	118.32	118.34	118.34	118.34	118.33	118.32	118.31	118.30	118.31	118.31
30	118.38	---	118.33	118.34	118.34	118.34	118.33	118.32	118.31	118.31	118.31	118.31
31	118.37	---	118.34	---	118.34	---	118.33	118.32	---	118.31	---	118.32
Max	118.40	118.38	118.36	118.37	118.35	118.34	118.34	118.33	118.32	118.31	118.32	118.32
Min	118.34	118.32	118.32	118.31	118.33	118.32	118.33	118.32	118.31	118.29	118.30	118.27

Year 2009 Statistics:
 Note: Depth in ft bgs

Year Max 118.40; Year Min 118.27

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

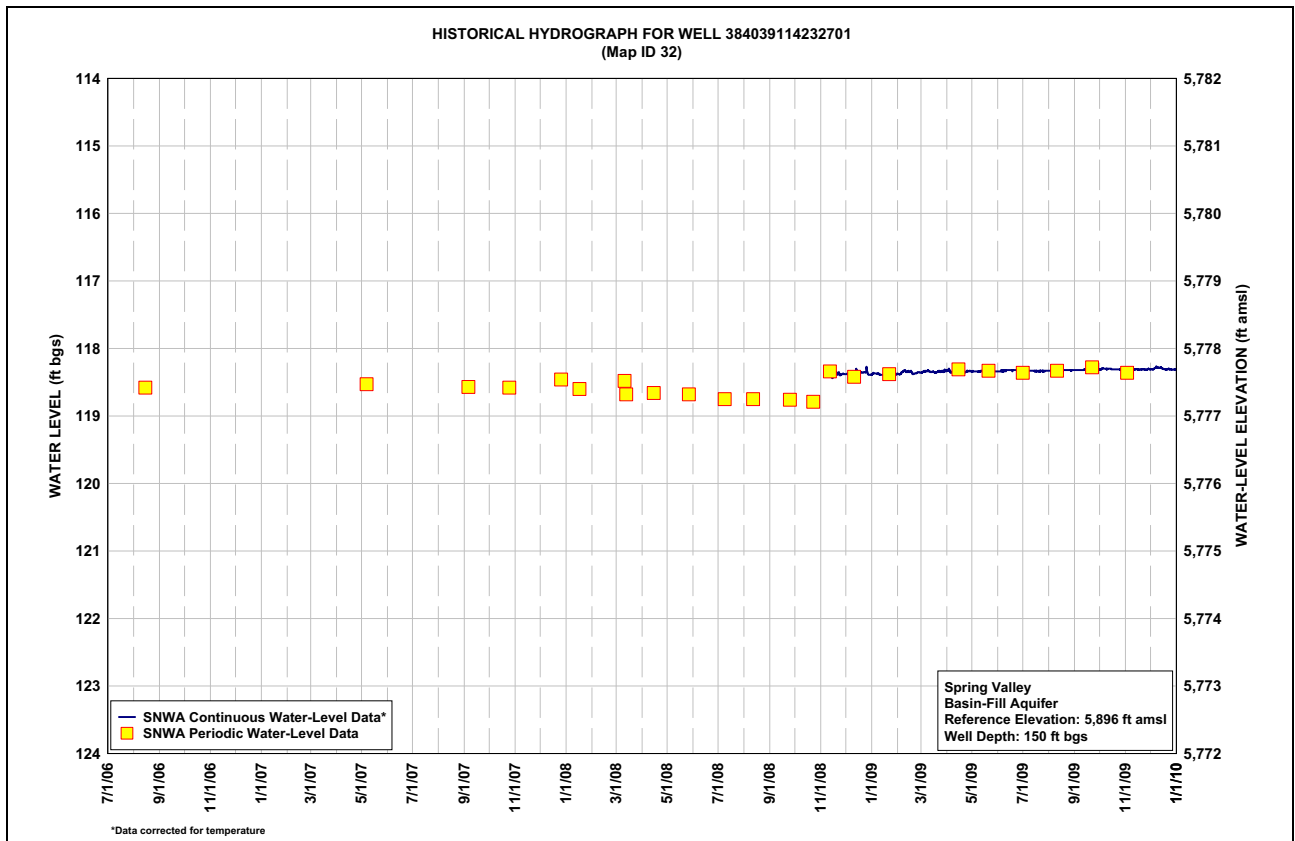
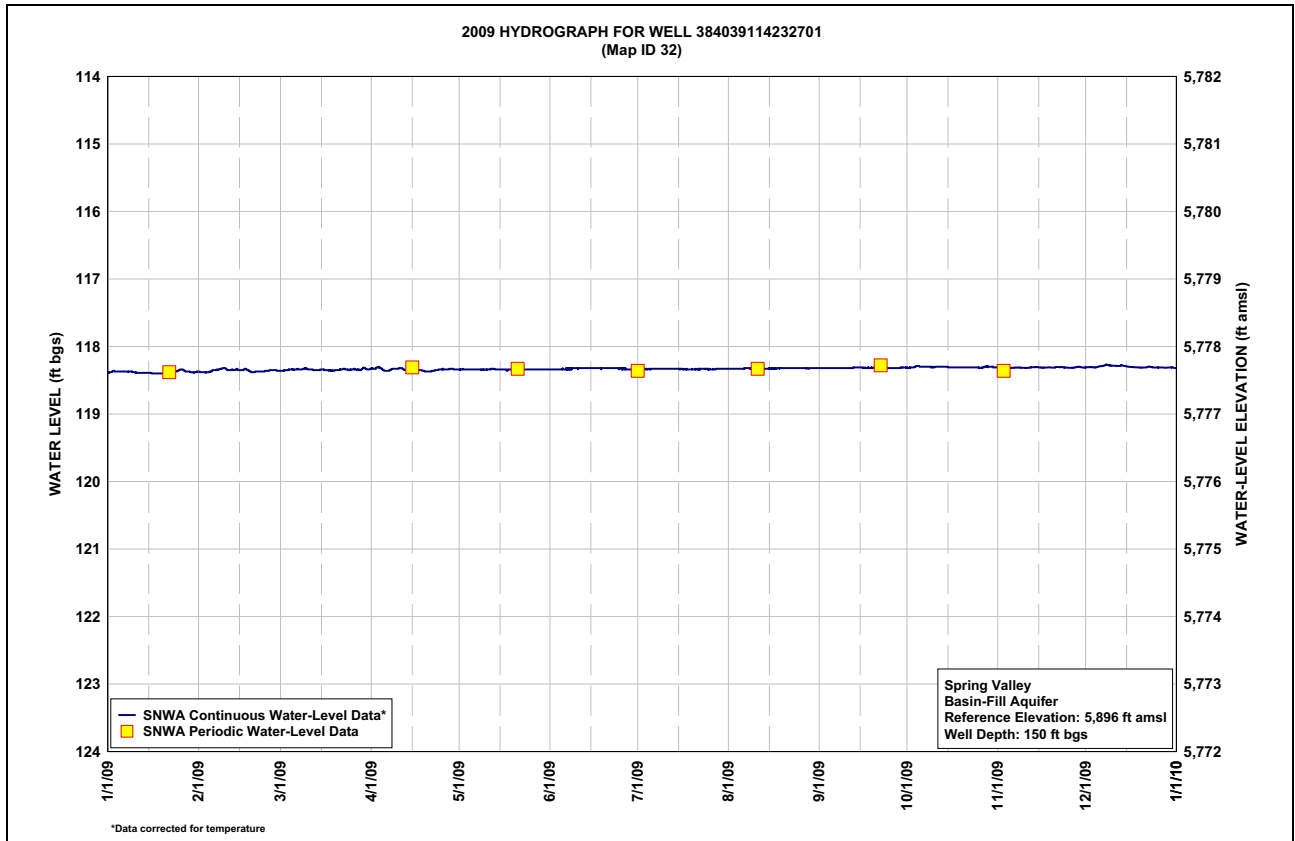




Table C-3
Well 384831114314301, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	---	---	---	---	47.17	47.20	47.24	47.29	47.34	47.36	47.35
2	---	---	---	---	---	47.17	47.21	47.24	47.29	47.30	47.37	47.36
3	---	---	---	---	---	47.18	47.20	47.24	47.29	47.27	47.36	47.38
4	---	---	---	---	---	47.16	47.20	47.25	47.29	47.29	47.36	47.36
5	---	---	---	---	---	47.15	47.20	47.24	47.28	47.34	47.35	47.32
6	---	---	---	---	---	47.16	47.19	47.22	47.29	47.34	47.34	47.33
7	---	---	---	---	---	47.17	47.18	47.24	47.28	47.32	47.34	47.31
8	---	---	---	---	---	47.17	47.19	47.26	47.29	47.34	47.36	47.37
9	---	---	---	---	---	47.17	47.21	47.26	47.31	47.34	47.37	47.38
10	---	---	---	---	---	47.17	47.22	47.26	47.31	47.32	47.37	47.37
11	---	---	---	---	---	47.18	47.22	47.26	47.30	47.31	47.34	47.37
12	---	---	---	---	---	47.18	47.21	47.25	47.27	47.31	47.31	47.35
13	---	---	---	---	---	47.18	47.21	47.24	47.28	47.32	47.33	47.36
14	---	---	---	---	47.16	47.18	47.22	47.24	47.29	47.35	47.36	47.40
15	---	---	---	---	47.18	47.18	47.22	47.26	47.32	47.37	47.39	47.40
16	---	---	---	---	47.19	47.19	47.23	47.26	47.31	47.36	47.38	47.39
17	---	---	---	---	47.19	47.18	47.22	47.26	47.31	47.35	47.35	47.39
18	---	---	---	---	47.17	47.18	47.23	47.26	47.31	47.32	47.35	47.39
19	---	---	---	---	47.16	47.16	47.22	47.26	47.31	47.31	47.38	47.39
20	---	---	---	---	47.17	47.17	47.22	47.27	47.31	47.34	47.34	47.38
21	---	---	---	---	47.17	47.17	47.22	47.27	47.33	47.35	47.35	47.35
22	---	---	---	---	47.17	47.19	47.22	47.27	47.33	47.35	47.36	47.33
23	---	---	---	---	47.17	47.19	47.23	47.27	47.32	47.35	47.40	47.40
24	---	---	---	---	47.17	47.20	47.23	47.28	47.32	47.34	47.39	47.40
25	---	---	---	---	47.17	47.19	47.24	47.28	47.33	47.37	47.39	47.38
26	---	---	---	---	47.17	47.19	47.24	47.29	47.33	47.34	47.37	47.39
27	---	---	---	---	47.18	47.21	47.23	47.29	47.31	47.30	47.33	47.40
28	---	---	---	---	47.18	47.20	47.22	47.28	47.30	47.32	47.34	47.39
29	---	---	---	---	47.18	47.19	47.23	47.27	47.29	47.35	47.38	47.37
30	---	---	---	---	47.17	47.19	47.24	47.26	47.34	47.37	47.37	47.38
31	---	---	---	---	47.17	---	47.24	47.28	---	47.37	---	47.41
Max	---	---	---	---	47.19	47.21	47.24	47.29	47.34	47.37	47.40	47.41
Min	---	---	---	---	47.16	47.15	47.18	47.22	47.27	47.27	47.31	47.31

Year 2009 Statistics:
 Note: Depth in ft bgs

Year Max 47.41; Year Min 47.15

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

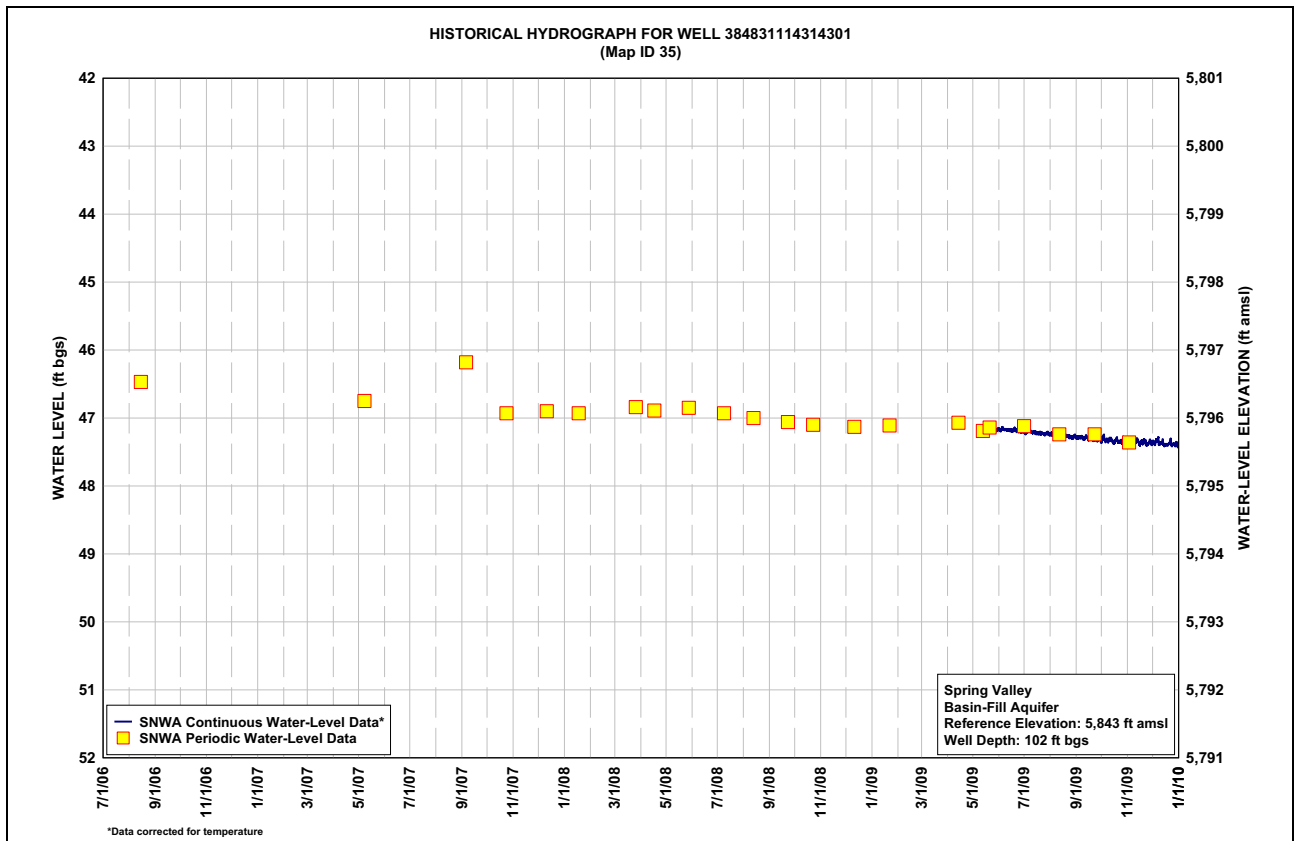
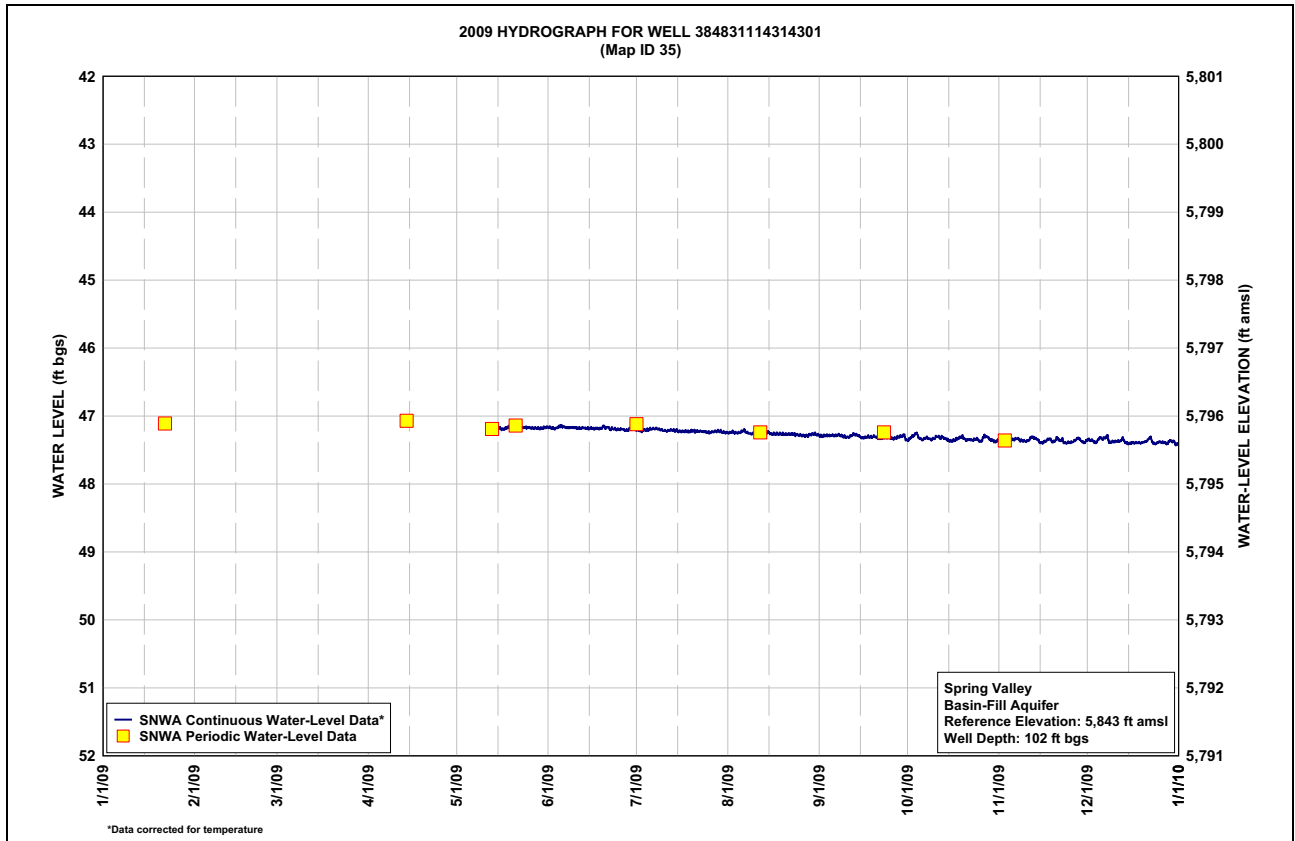




Table C-4
Well 384745114224401, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	98.57	98.75	98.87	98.98	99.08	99.18	99.25	99.34	99.41	99.48	99.55	99.62
2	98.58	98.76	98.88	98.99	99.08	99.18	99.25	99.34	99.41	99.48	99.56	99.62
3	98.58	98.76	98.88	98.99	99.09	99.18	99.25	99.34	99.41	99.48	99.56	99.62
4	98.59	98.77	98.88	98.99	99.09	99.18	99.27	99.34	99.41	99.48	99.56	99.63
5	98.60	98.77	98.88	99.00	99.09	99.18	99.27	99.34	99.42	99.48	99.56	99.62
6	98.60	98.77	98.89	99.00	99.09	99.18	99.27	99.34	99.42	99.49	99.56	99.62
7	98.61	98.77	98.89	99.01	99.10	99.18	99.27	99.34	99.42	99.49	99.57	99.62
8	98.62	98.78	98.90	99.01	99.10	99.18	99.27	99.34	99.42	99.50	99.57	99.63
9	98.62	98.78	98.90	99.01	99.10	99.20	99.27	99.34	99.43	99.50	99.57	99.63
10	98.63	98.78	98.90	99.01	99.11	99.20	99.27	99.36	99.43	99.50	99.58	99.63
11	98.64	98.79	98.91	99.01	99.11	99.20	99.27	99.36	99.43	99.50	99.58	99.64
12	98.65	98.79	98.91	99.02	99.11	99.20	99.27	99.36	99.43	99.51	99.58	99.64
13	98.65	98.80	98.92	99.02	99.12	99.20	99.29	99.36	99.43	99.51	99.58	99.64
14	98.66	98.80	98.92	99.02	99.12	99.20	99.30	99.36	99.43	99.51	99.58	99.64
15	98.66	98.81	98.92	99.02	99.12	99.20	99.30	99.37	99.44	99.52	99.59	99.65
16	98.67	98.81	98.93	99.03	99.13	99.20	99.30	99.37	99.44	99.52	99.59	99.65
17	98.68	98.82	98.93	99.04	99.13	99.22	99.30	99.37	99.44	99.52	99.59	99.65
18	98.68	98.82	98.94	99.04	99.13	99.23	99.30	99.37	99.45	99.52	99.59	99.66
19	98.69	98.83	98.94	99.05	99.13	99.23	99.30	99.38	99.45	99.52	99.59	99.66
20	98.69	98.83	98.94	99.05	99.13	99.23	99.30	99.38	99.45	99.52	99.59	99.66
21	98.70	98.84	98.94	99.05	99.13	99.23	99.30	99.38	99.46	99.53	99.60	99.66
22	98.70	98.84	98.95	99.05	99.14	99.23	99.31	99.38	99.46	99.53	99.60	99.66
23	98.70	98.85	98.95	99.05	99.16	99.23	99.32	99.39	99.46	99.53	99.60	99.66
24	98.71	98.85	98.96	99.05	99.16	99.23	99.32	99.39	99.46	99.54	99.61	99.67
25	98.71	98.85	98.96	99.06	99.16	99.23	99.32	99.39	99.47	99.54	99.61	99.67
26	98.71	98.86	98.96	99.06	99.16	99.25	99.32	99.39	99.47	99.54	99.61	99.67
27	98.72	98.86	98.97	99.06	99.16	99.25	99.32	99.40	99.47	99.54	99.61	99.67
28	98.73	98.87	98.97	99.07	99.16	99.25	99.32	99.40	99.47	99.54	99.61	99.68
29	98.74	---	98.97	99.07	99.16	99.25	99.32	99.40	99.47	99.54	99.61	99.68
30	98.74	---	98.98	99.08	99.17	99.25	99.32	99.40	99.48	99.55	99.62	99.68
31	98.75	---	98.98	---	99.18	---	99.33	99.40	---	99.55	---	99.68
Max	98.75	98.87	98.98	99.08	99.18	99.25	99.33	99.40	99.48	99.55	99.62	99.68
Min	98.57	98.75	98.87	98.98	99.08	99.18	99.25	99.34	99.41	99.48	99.55	99.62

Year 2009 Statistics:
 Note: Depth in ft bgs

Year Max 99.68; Year Min 98.57

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

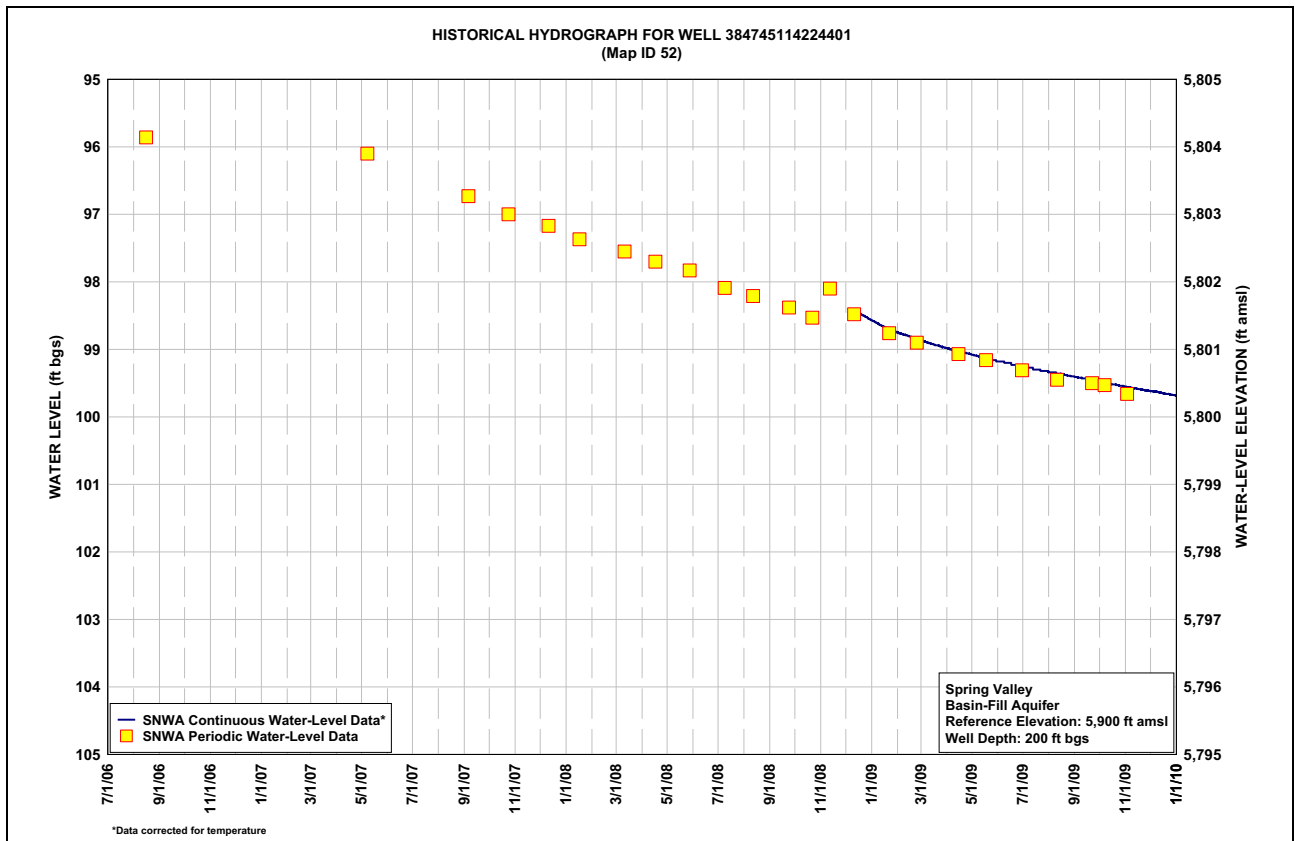
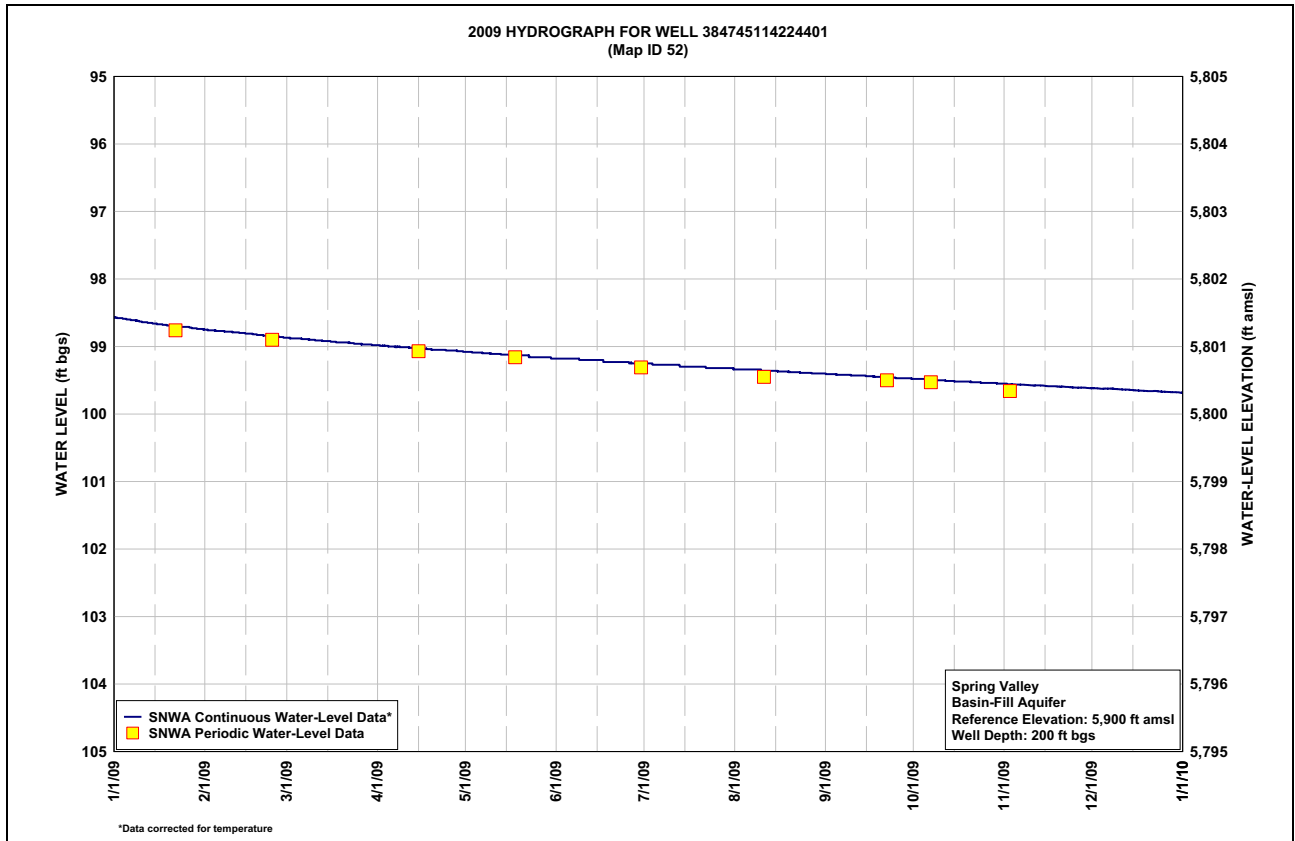




Table C-5
Well 390352114305401, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	---	---	---	---	38.66	38.67	38.69	38.74	38.77	38.78	38.76
2	---	---	---	---	---	38.66	38.67	38.69	38.74	38.77	38.78	38.76
3	---	---	---	---	---	38.66	38.67	38.69	38.74	38.77	38.78	38.76
4	---	---	---	---	---	38.66	38.67	38.70	38.74	38.77	38.78	38.76
5	---	---	---	---	---	38.66	38.67	38.70	38.74	38.77	38.78	38.75
6	---	---	---	---	---	38.66	38.67	38.70	38.74	38.77	38.78	38.75
7	---	---	---	---	---	38.66	38.67	38.70	38.74	38.77	38.78	38.75
8	---	---	---	---	---	38.66	38.67	38.70	38.75	38.77	38.78	38.75
9	---	---	---	---	---	38.66	38.67	38.70	38.75	38.78	38.78	38.75
10	---	---	---	---	---	38.66	38.67	38.71	38.75	38.78	38.78	38.75
11	---	---	---	---	---	38.66	38.67	38.71	38.75	38.78	38.78	38.75
12	---	---	---	---	---	38.66	38.68	38.71	38.75	38.77	38.77	38.75
13	---	---	---	---	38.38	38.66	38.68	38.71	38.75	38.77	38.77	38.74
14	---	---	---	---	38.44	38.66	38.68	38.71	38.75	38.78	38.77	38.75
15	---	---	---	---	38.49	38.66	38.68	38.71	38.76	38.78	38.77	38.75
16	---	---	---	---	38.52	38.66	38.68	38.71	38.76	38.78	38.77	38.75
17	---	---	---	---	38.55	38.66	38.68	38.72	38.76	38.78	38.77	38.75
18	---	---	---	---	38.57	38.66	38.68	38.72	38.76	38.78	38.77	38.75
19	---	---	---	---	38.59	38.66	38.68	38.72	38.76	38.78	38.77	38.75
20	---	---	---	---	38.60	38.66	38.68	38.72	38.76	38.78	38.77	38.75
21	---	---	---	---	38.61	38.66	38.68	38.72	38.77	38.78	38.77	38.75
22	---	---	---	---	38.62	38.66	38.68	38.72	38.77	38.78	38.77	38.74
23	---	---	---	---	38.62	38.67	38.68	38.72	38.77	38.78	38.77	38.74
24	---	---	---	---	38.63	38.67	38.68	38.73	38.77	38.78	38.77	38.74
25	---	---	---	---	38.63	38.67	38.69	38.73	38.77	38.78	38.77	38.74
26	---	---	---	---	38.64	38.67	38.69	38.73	38.77	38.78	38.77	38.74
27	---	---	---	---	38.64	38.67	38.69	38.73	38.77	38.78	38.77	38.74
28	---	---	---	---	38.65	38.67	38.69	38.74	38.77	38.77	38.76	38.74
29	---	---	---	---	38.65	38.67	38.69	38.74	38.77	38.78	38.76	38.74
30	---	---	---	---	38.65	38.67	38.69	38.73	38.77	38.78	38.76	38.74
31	---	---	---	---	38.65	---	38.69	38.74	---	38.78	---	38.74
Max	---	---	---	---	38.65	38.67	38.69	38.74	38.77	38.78	38.78	38.76
Min	---	---	---	---	38.38	38.66	38.67	38.69	38.74	38.77	38.76	38.74

Year 2009 Statistics: Year Max 38.78; Year Min 38.38
 Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

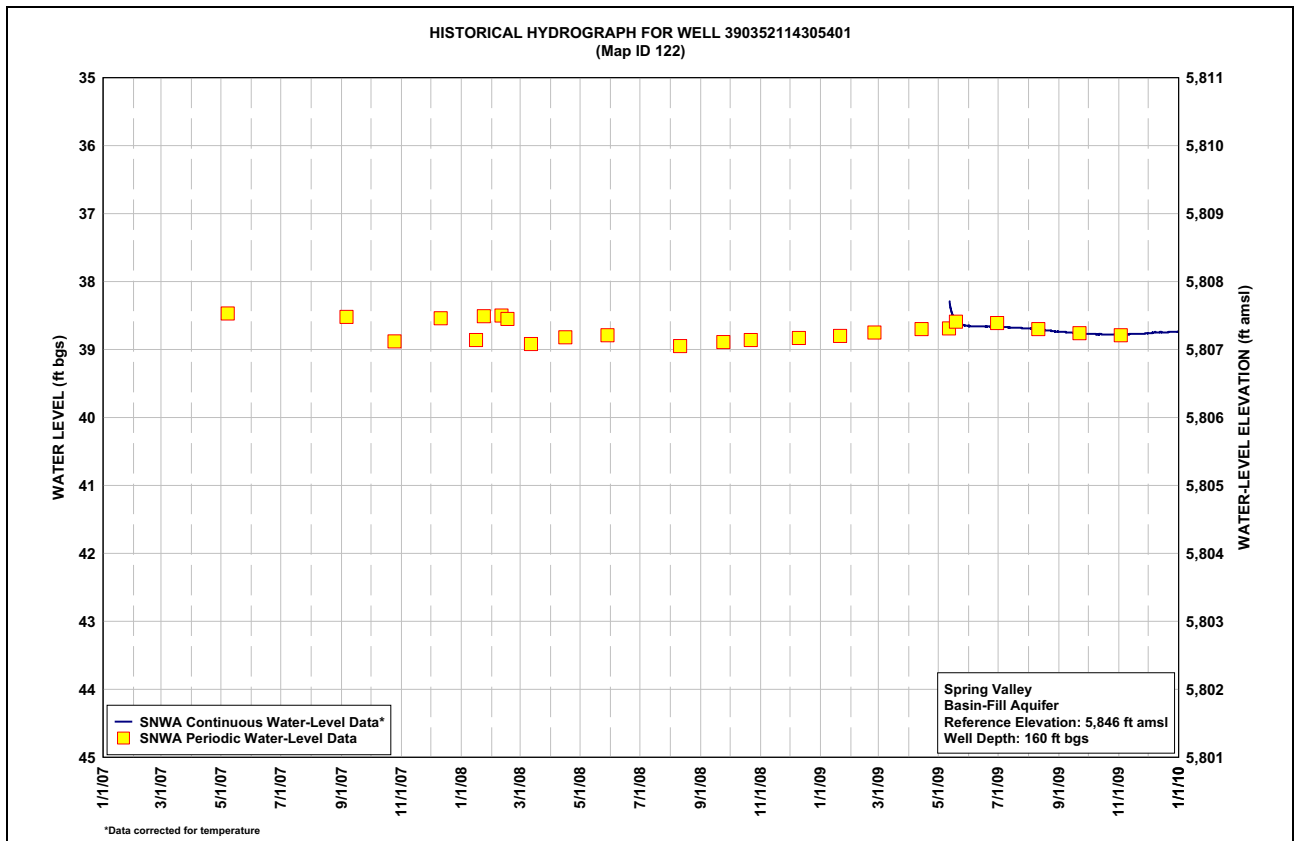
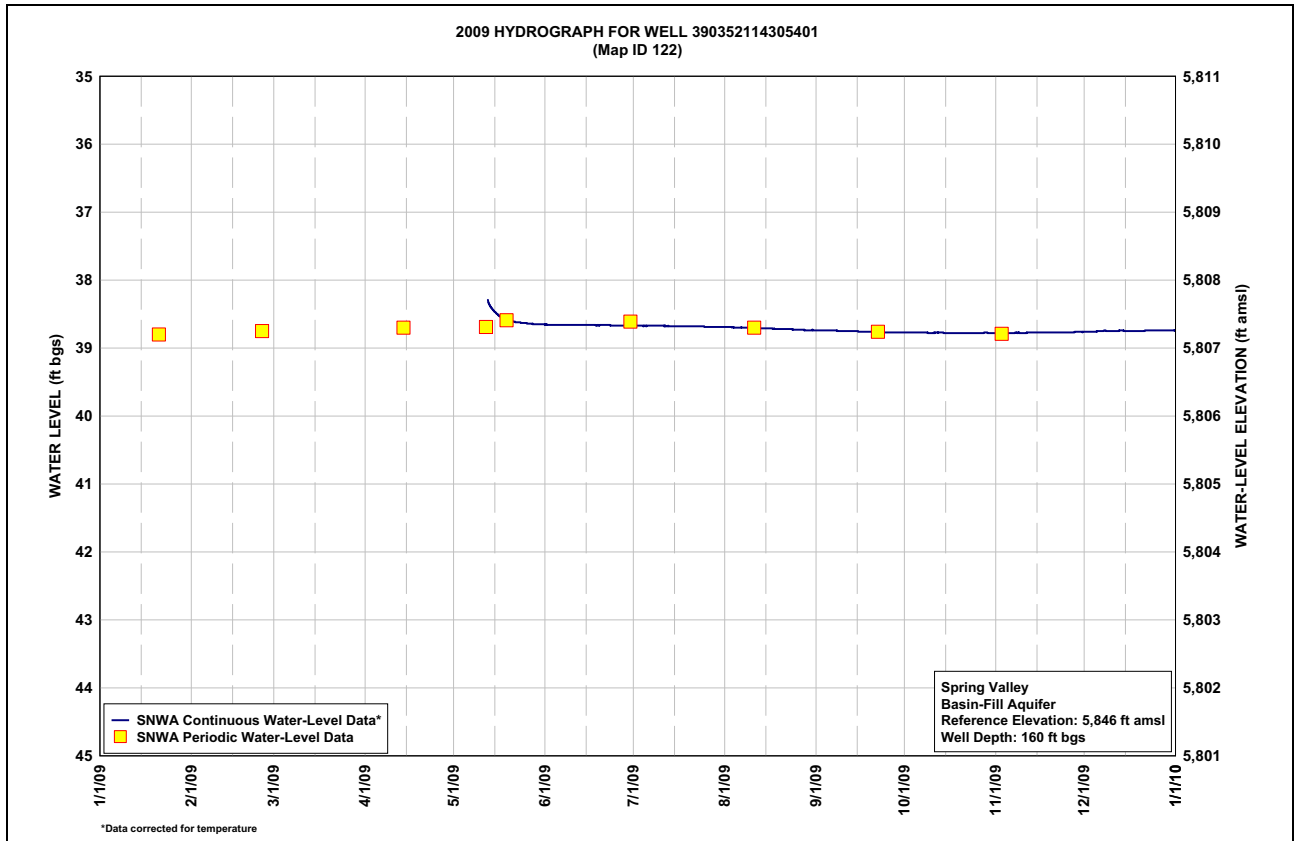




Table C-6
Well 390803114251001, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	----	----	----	----	----	39.76	39.85	39.93	39.99	40.06	40.12	40.16
2	----	----	----	----	----	39.76	39.85	39.93	40.00	40.06	40.12	40.16
3	----	----	----	----	----	39.76	39.85	39.93	40.00	40.06	40.12	40.17
4	----	----	----	----	----	39.77	39.86	39.93	40.00	40.06	40.12	40.17
5	----	----	----	----	----	39.77	39.86	39.94	40.00	40.06	40.12	40.17
6	----	----	----	----	----	39.77	39.86	39.94	40.01	40.07	40.12	40.17
7	----	----	----	----	----	39.78	39.86	39.94	40.01	40.07	40.13	40.17
8	----	----	----	----	----	39.78	39.87	39.95	40.01	40.07	40.13	40.17
9	----	----	----	----	----	39.78	39.87	39.95	40.01	40.07	40.13	40.17
10	----	----	----	----	----	39.79	39.87	39.95	40.01	40.07	40.13	40.18
11	----	----	----	----	----	39.79	39.87	39.95	40.02	40.08	40.13	40.18
12	----	----	----	----	----	39.80	39.88	39.95	40.02	40.08	40.13	40.18
13	----	----	----	----	39.68	39.80	39.88	39.95	40.02	40.08	40.13	40.18
14	----	----	----	----	39.69	39.80	39.88	39.96	40.02	40.08	40.14	40.18
15	----	----	----	----	39.69	39.80	39.88	39.96	40.02	40.09	40.14	40.18
16	----	----	----	----	39.70	39.81	39.89	39.96	40.03	40.09	40.14	40.18
17	----	----	----	----	39.70	39.81	39.89	39.96	40.03	40.09	40.14	40.19
18	----	----	----	----	39.70	39.81	39.89	39.97	40.03	40.09	40.14	40.19
19	----	----	----	----	39.71	39.82	39.89	39.97	40.03	40.09	40.15	40.19
20	----	----	----	----	39.71	39.82	39.90	39.97	40.03	40.10	40.15	40.19
21	----	----	----	----	39.72	39.82	39.90	39.97	40.04	40.10	40.15	40.19
22	----	----	----	----	39.72	39.82	39.90	39.97	40.04	40.10	40.15	40.19
23	----	----	----	----	39.72	39.83	39.90	39.97	40.04	40.10	40.15	40.19
24	----	----	----	----	39.73	39.83	39.91	39.98	40.04	40.10	40.15	40.19
25	----	----	----	----	39.73	39.83	39.91	39.98	40.04	40.11	40.16	40.19
26	----	----	----	----	39.73	39.84	39.91	39.98	40.05	40.11	40.16	40.20
27	----	----	----	----	39.74	39.84	39.91	39.98	40.05	40.11	40.16	40.20
28	----	----	----	----	39.74	39.84	39.92	39.99	40.05	40.11	40.16	40.20
29	----	----	----	----	39.75	39.85	39.92	39.99	40.05	40.11	40.16	40.20
30	----	----	----	----	39.75	39.85	39.92	39.99	40.05	40.11	40.16	40.20
31	---	---	---	---	39.75	---	39.92	39.99	---	40.12	---	40.20
Max	---	---	---	---	39.75	39.85	39.92	39.99	40.05	40.12	40.16	40.20
Min	---	---	---	---	39.68	39.76	39.85	39.93	39.99	40.06	40.12	40.16

Year 2009 Statistics: Year Max 40.20; Year Min 39.68
 Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

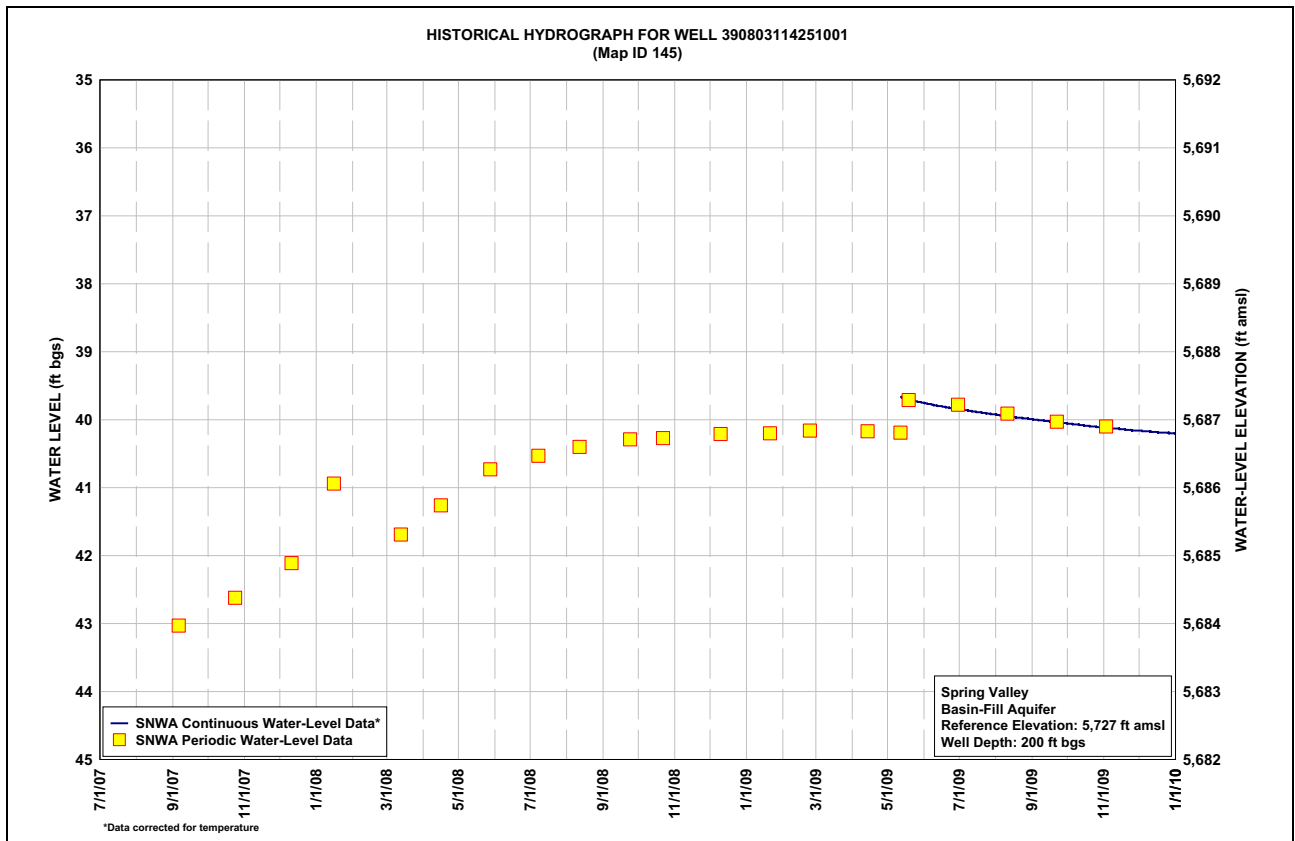
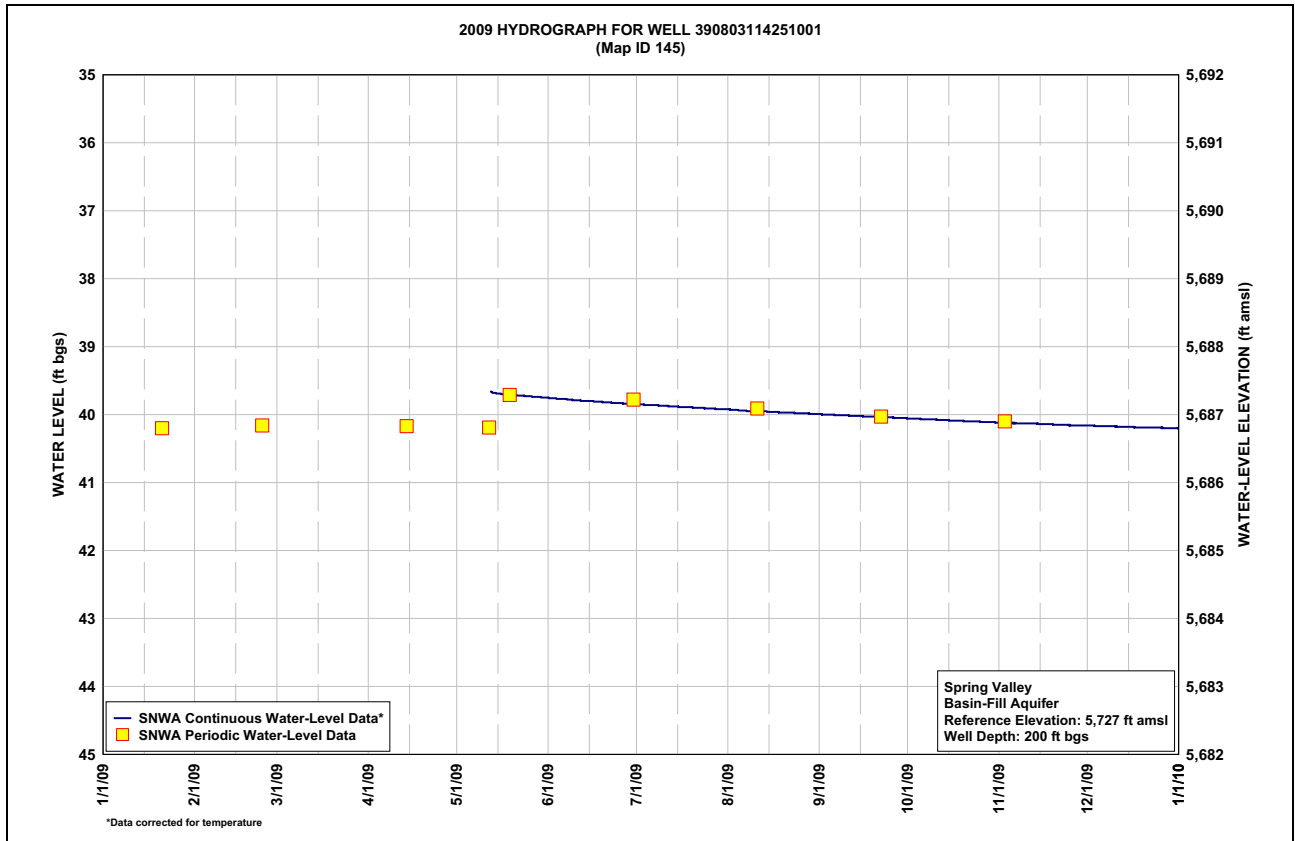




Table C-7
Well 393211114320701, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	----	----	----	----	----	----	----	43.03	43.47	43.88	44.11	44.12
2	----	----	----	----	----	----	----	43.03	43.49	43.89	44.12	44.12
3	----	----	----	----	----	----	----	43.05	43.51	43.90	44.12	44.13
4	----	----	----	----	----	----	----	43.06	43.52	43.91	44.12	44.12
5	----	----	----	----	----	----	----	43.07	43.54	43.93	44.12	44.12
6	----	----	----	----	----	----	----	43.07	43.56	43.94	44.12	44.11
7	----	----	----	----	----	----	----	43.09	43.57	43.94	44.13	44.10
8	----	----	----	----	----	----	----	43.11	43.59	43.96	44.13	44.10
9	----	----	----	----	----	----	----	43.13	43.61	43.96	44.13	44.10
10	----	----	----	----	----	----	----	43.14	43.62	43.97	44.13	44.09
11	----	----	----	----	----	----	----	43.16	43.64	43.98	44.13	44.08
12	----	----	----	----	----	----	----	43.17	43.65	43.99	44.13	44.07
13	----	----	----	----	----	----	----	43.17	43.66	44.00	44.13	44.07
14	----	----	----	----	----	----	----	43.19	43.68	44.01	44.13	44.07
15	----	----	----	----	----	----	42.96	43.20	43.70	44.02	44.14	44.07
16	----	----	----	----	----	----	42.96	43.22	43.71	44.03	44.14	44.07
17	----	----	----	----	----	----	42.96	43.24	43.72	44.03	44.13	44.08
18	----	----	----	----	----	----	42.96	43.25	43.73	44.04	44.13	44.08
19	----	----	----	----	----	----	42.96	43.27	43.75	44.04	44.13	44.08
20	----	----	----	----	----	----	42.96	43.28	43.76	44.05	44.12	44.08
21	----	----	----	----	----	----	42.96	43.30	43.78	44.06	44.13	44.08
22	----	----	----	----	----	----	42.96	43.31	43.79	44.07	44.13	44.08
23	----	----	----	----	----	----	42.96	43.33	43.80	44.07	44.13	44.09
24	----	----	----	----	----	----	42.97	43.35	43.81	44.08	44.13	44.10
25	----	----	----	----	----	----	42.97	43.36	43.82	44.08	44.13	44.10
26	----	----	----	----	----	----	42.98	43.38	43.83	44.08	44.13	44.10
27	----	----	----	----	----	----	42.98	43.40	43.84	44.09	44.12	44.10
28	----	----	----	----	----	----	42.98	43.41	43.85	44.10	44.13	44.10
29	----	----	----	----	----	----	42.99	43.42	43.86	44.10	44.13	44.09
30	----	----	----	----	----	----	43.00	43.44	43.87	44.11	44.13	44.09
31	---	---	---	---	---	---	43.02	43.45	---	44.11	---	44.10
Max	---	---	---	---	---	---	43.02	43.45	43.87	44.11	44.14	44.13
Min	---	---	---	---	---	---	42.96	43.03	43.47	43.88	44.11	44.07

Year 2009 Statistics: Year Max 44.14; Year Min 42.96
 Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

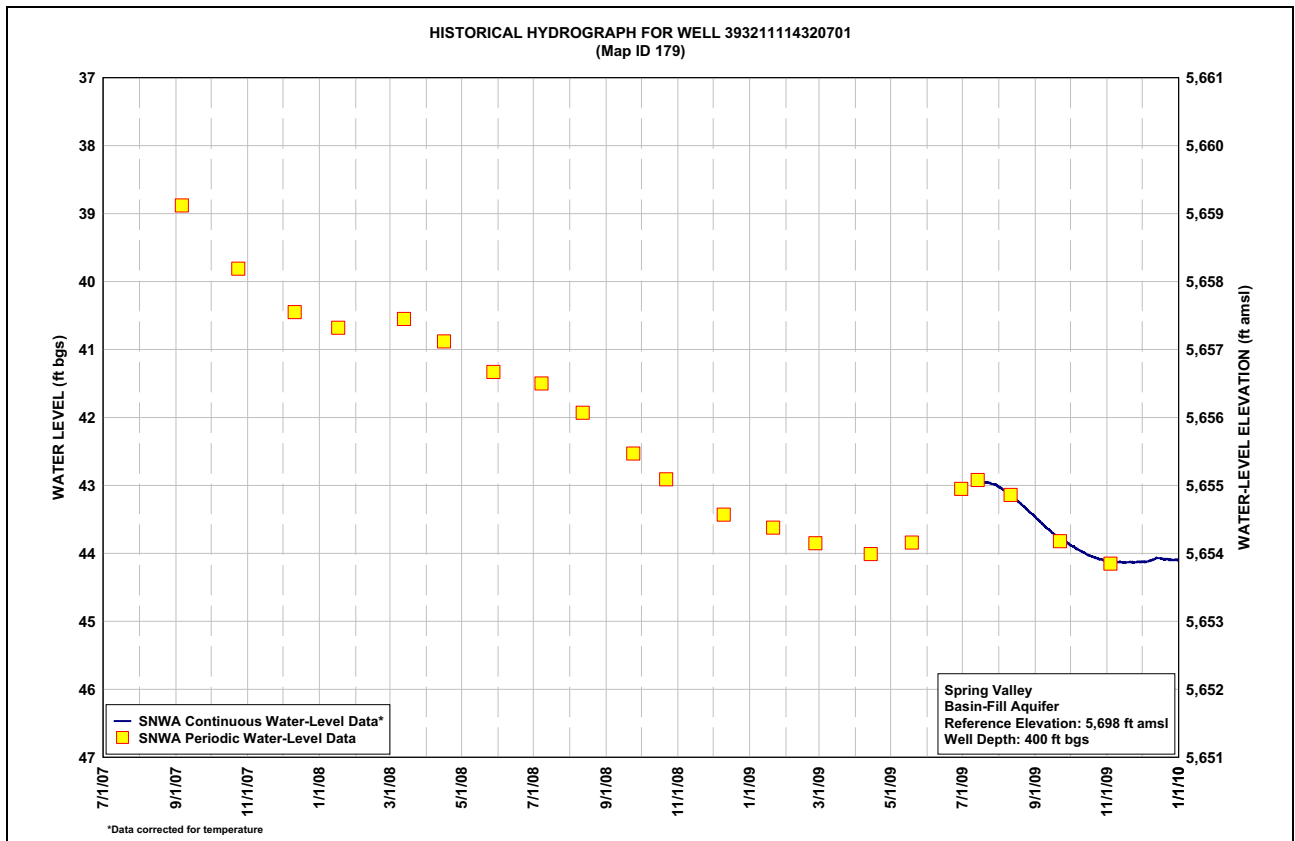
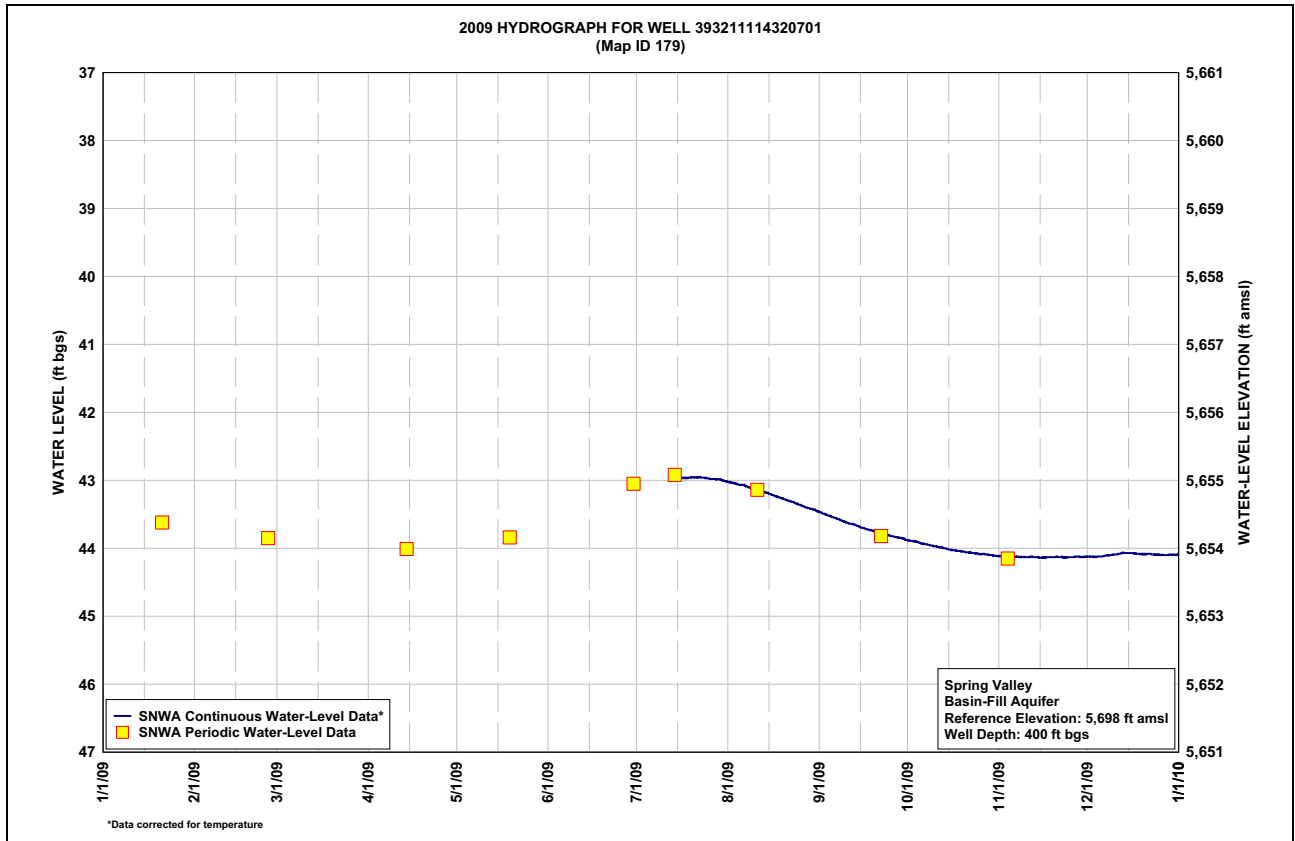




Table C-8
Well 383023114115302, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	173.96	174.19	174.37	174.47	174.62	174.68	174.56	174.41	174.33	174.34	174.40	174.47
2	173.89	174.19	174.39	174.49	174.63	174.69	174.57	174.39	174.33	174.27	174.43	174.49
3	174.00	174.18	174.38	174.46	174.64	174.71	174.55	174.40	174.32	174.21	174.41	174.55
4	174.01	174.15	174.37	174.60	174.65	174.66	174.55	174.40	174.30	174.26	174.41	174.50
5	173.95	174.20	174.44	174.57	174.64	174.64	174.52	174.37	174.30	174.34	174.39	174.44
6	174.02	174.20	174.39	174.52	174.66	174.65	174.51	174.33	174.30	174.33	174.38	174.45
7	174.03	174.21	174.42	174.54	174.66	174.66	174.49	174.37	174.28	174.30	174.38	---
8	173.98	174.12	174.31	174.47	174.68	174.65	174.50	174.40	174.31	174.33	174.43	---
9	174.09	174.09	174.45	174.50	174.66	174.65	174.51	174.39	174.33	174.32	174.44	---
10	174.08	174.29	174.46	174.48	174.68	174.65	174.52	174.39	174.33	174.30	174.44	---
11	174.05	174.26	174.48	174.54	174.65	174.65	174.52	174.39	174.31	174.28	174.38	---
12	174.08	174.20	174.50	174.58	174.65	174.64	174.50	174.36	174.25	174.29	174.35	174.50
13	174.05	174.17	174.41	174.50	174.71	174.64	174.48	174.33	174.28	174.31	174.39	174.53
14	174.06	174.23	174.34	174.47	174.68	174.63	174.50	174.33	174.29	174.36	174.44	174.61
15	174.09	174.21	174.52	174.53	174.72	174.63	174.50	174.35	174.34	174.39	174.50	174.61
16	174.09	174.15	174.45	174.62	174.73	174.64	174.49	174.35	174.32	174.38	174.47	174.60
17	174.10	174.24	174.43	174.59	174.71	174.62	174.48	174.35	174.31	174.35	174.42	174.61
18	174.12	174.35	174.42	174.61	174.68	174.62	174.48	174.34	174.31	174.31	174.43	174.61
19	174.09	174.33	174.50	174.61	174.68	174.58	174.46	174.33	174.30	174.29	174.48	174.62
20	174.08	174.25	174.44	174.60	174.69	174.58	174.46	174.34	174.31	174.36	174.40	174.59
21	174.10	174.27	174.39	174.57	174.70	174.58	174.45	174.33	174.36	174.36	174.45	174.55
22	174.10	174.26	174.38	174.55	174.70	174.61	174.44	174.33	174.34	174.37	174.45	174.52
23	174.11	174.27	174.53	174.53	174.70	174.60	174.44	174.32	174.32	174.36	174.54	174.65
24	174.06	174.26	174.54	174.55	174.70	174.61	174.44	174.34	174.31	174.35	174.52	174.64
25	174.00	174.29	174.40	174.59	174.71	174.60	174.45	174.34	174.33	174.41	174.52	174.62
26	174.10	174.27	174.46	174.61	174.72	174.59	174.44	174.35	174.33	174.34	174.49	174.64
27	174.18	174.36	174.48	174.58	174.72	174.62	174.41	174.35	174.30	174.28	174.42	174.66
28	174.14	174.40	174.54	174.60	174.72	174.58	174.40	174.33	174.28	174.33	174.47	174.64
29	174.18	---	174.45	174.64	174.73	174.56	174.40	174.30	174.24	174.39	174.54	174.61
30	174.19	---	174.52	174.64	174.70	174.55	174.42	174.29	174.35	174.42	174.51	174.65
31	174.15	---	174.43	---	174.68	---	174.41	174.31	---	174.41	---	174.71
Max	174.19	174.40	174.54	174.64	174.73	174.71	174.57	174.41	174.36	174.42	174.54	174.71
Min	173.89	174.09	174.31	174.46	174.62	174.55	174.40	174.29	174.24	174.21	174.35	174.44

Year 2009 Statistics:
 Note: Depth in ft bgs

Year Max 174.73; Year Min 173.89

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

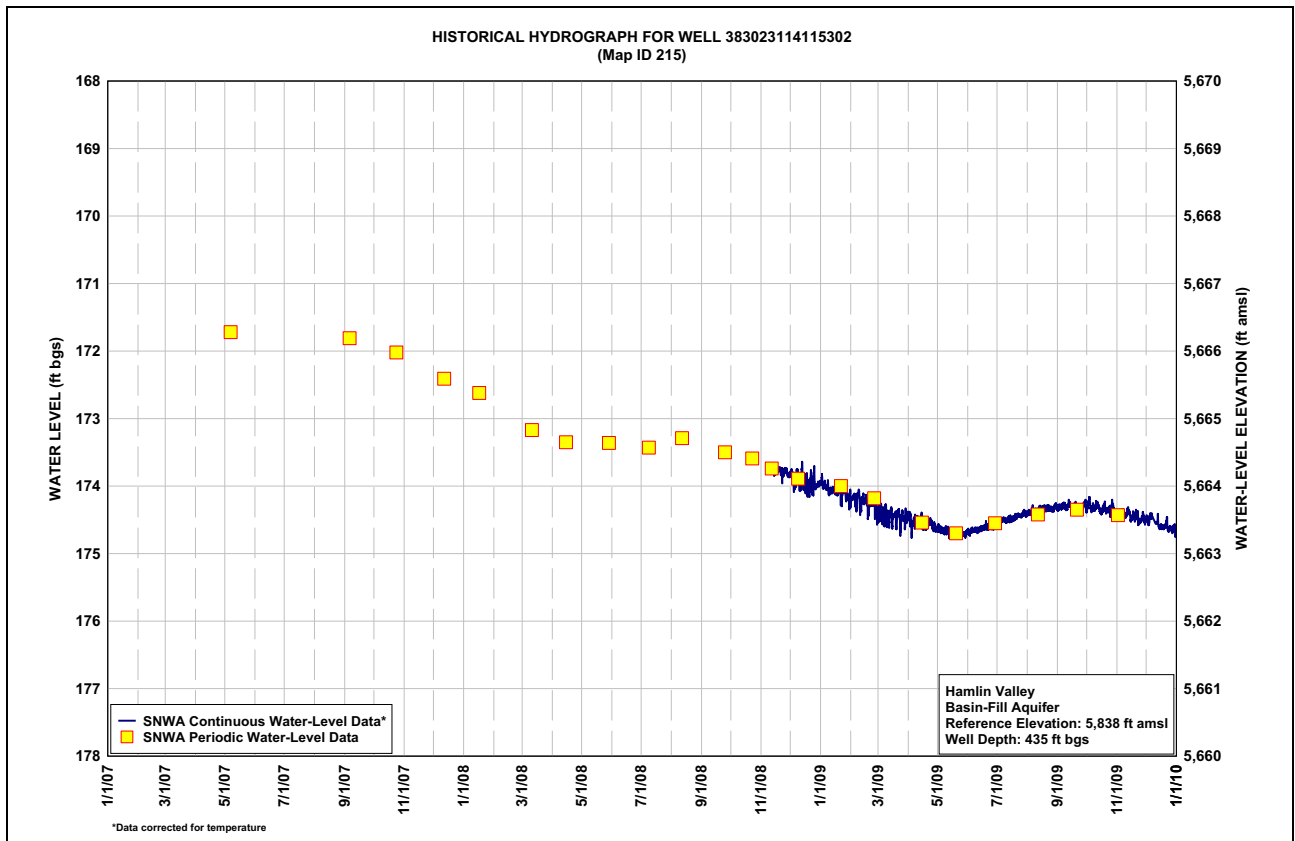
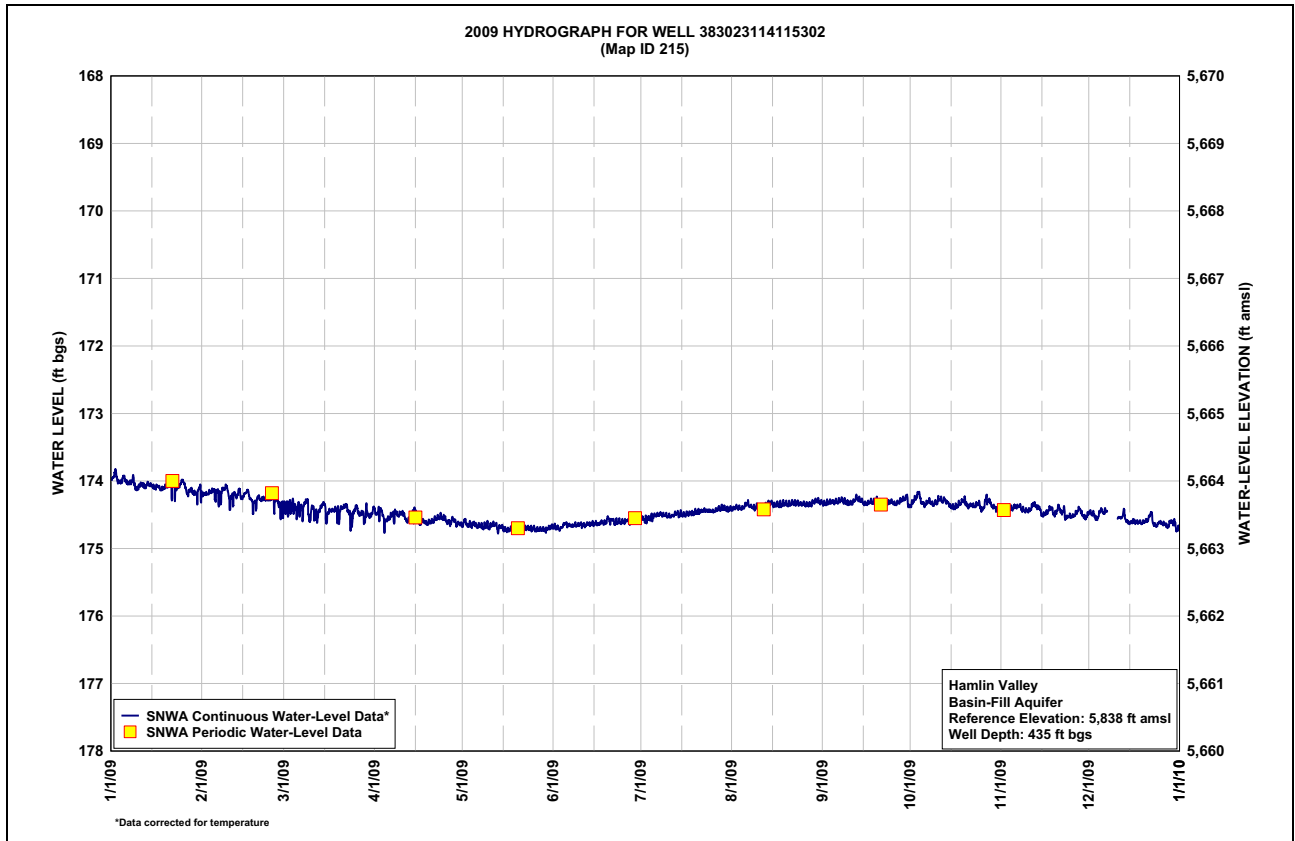




Table C-9
Well 184W502M, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	---	---	---	---	---	---	482.29	482.36	482.50	482.55	482.46
2	---	---	---	---	---	---	---	482.24	482.38	482.31	482.60	482.49
3	---	---	---	---	---	---	---	482.25	482.35	482.09	482.54	482.62
4	---	---	---	---	---	---	---	482.28	482.32	482.07	482.51	482.59
5	---	---	---	---	---	---	---	482.22	482.31	482.39	482.46	482.33
6	---	---	---	---	---	---	---	482.09	482.32	482.48	482.41	482.35
7	---	---	---	---	---	---	---	482.18	482.27	482.36	482.37	482.26
8	---	---	---	---	---	---	---	482.29	482.31	482.42	482.50	482.50
9	---	---	---	---	---	---	---	482.32	482.40	482.44	482.56	482.66
10	---	---	---	---	---	---	---	482.35	482.44	482.35	482.57	482.65
11	---	---	---	---	---	---	---	482.35	482.39	482.26	482.45	482.62
12	---	---	---	---	---	---	---	482.29	482.23	482.30	482.26	482.54
13	---	---	---	---	---	---	---	482.22	482.22	482.34	482.33	482.49
14	---	---	---	---	---	---	482.35	482.20	482.30	482.49	482.48	482.75
15	---	---	---	---	---	---	482.36	482.25	482.44	482.60	482.72	482.82
16	---	---	---	---	---	---	482.37	482.30	482.44	482.59	482.67	482.76
17	---	---	---	---	---	---	482.34	482.31	482.38	482.49	482.51	482.74
18	---	---	---	---	---	---	482.33	482.31	482.38	482.37	482.43	482.72
19	---	---	---	---	---	---	482.29	482.29	482.36	482.24	482.59	482.71
20	---	---	---	---	---	---	482.27	482.32	482.37	482.37	482.45	482.63
21	---	---	---	---	---	---	482.25	482.31	482.50	482.48	482.44	482.52
22	---	---	---	---	---	---	482.23	482.30	482.48	482.48	482.49	482.33
23	---	---	---	---	---	---	482.24	482.29	482.41	482.47	482.71	482.69
24	---	---	---	---	---	---	482.27	482.33	482.36	482.41	482.72	482.79
25	---	---	---	---	---	---	482.29	482.36	482.40	482.54	482.68	482.68
26	---	---	---	---	---	---	482.30	482.39	482.43	482.46	482.59	482.69
27	---	---	---	---	---	---	482.24	482.41	482.35	482.17	482.40	482.73
28	---	---	---	---	---	---	482.19	482.37	482.26	482.25	482.38	482.73
29	---	---	---	---	---	---	482.19	482.28	482.19	482.48	482.62	482.59
30	---	---	---	---	---	---	482.25	482.22	482.36	482.59	482.63	482.65
31	---	---	---	---	---	---	482.28	482.28	---	482.61	---	482.86
Max	---	---	---	---	---	---	482.37	482.41	482.50	482.61	482.72	482.86
Min	---	---	---	---	---	---	482.19	482.09	482.19	482.07	482.26	482.26

Year 2009 Statistics: Year Max 482.86; Year Min 482.07
 Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

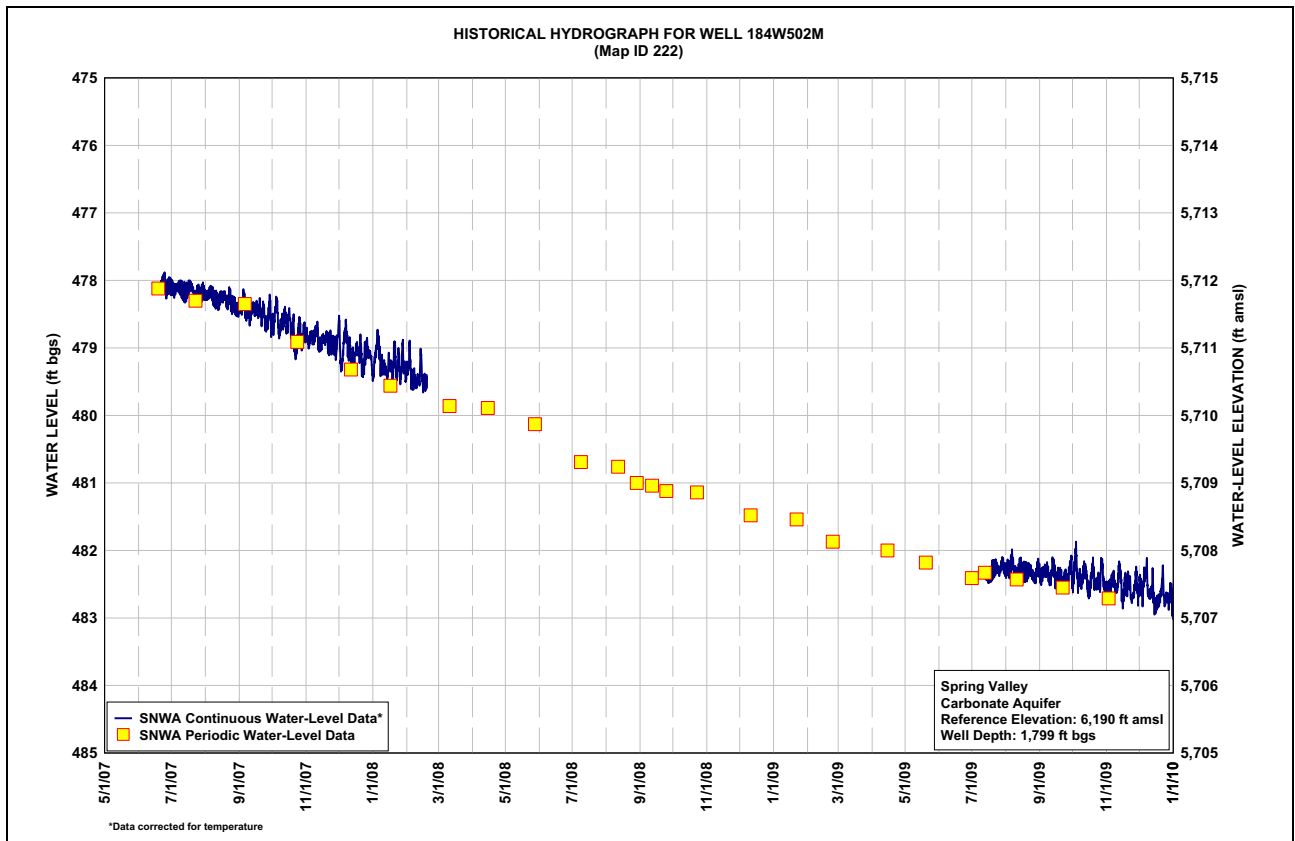
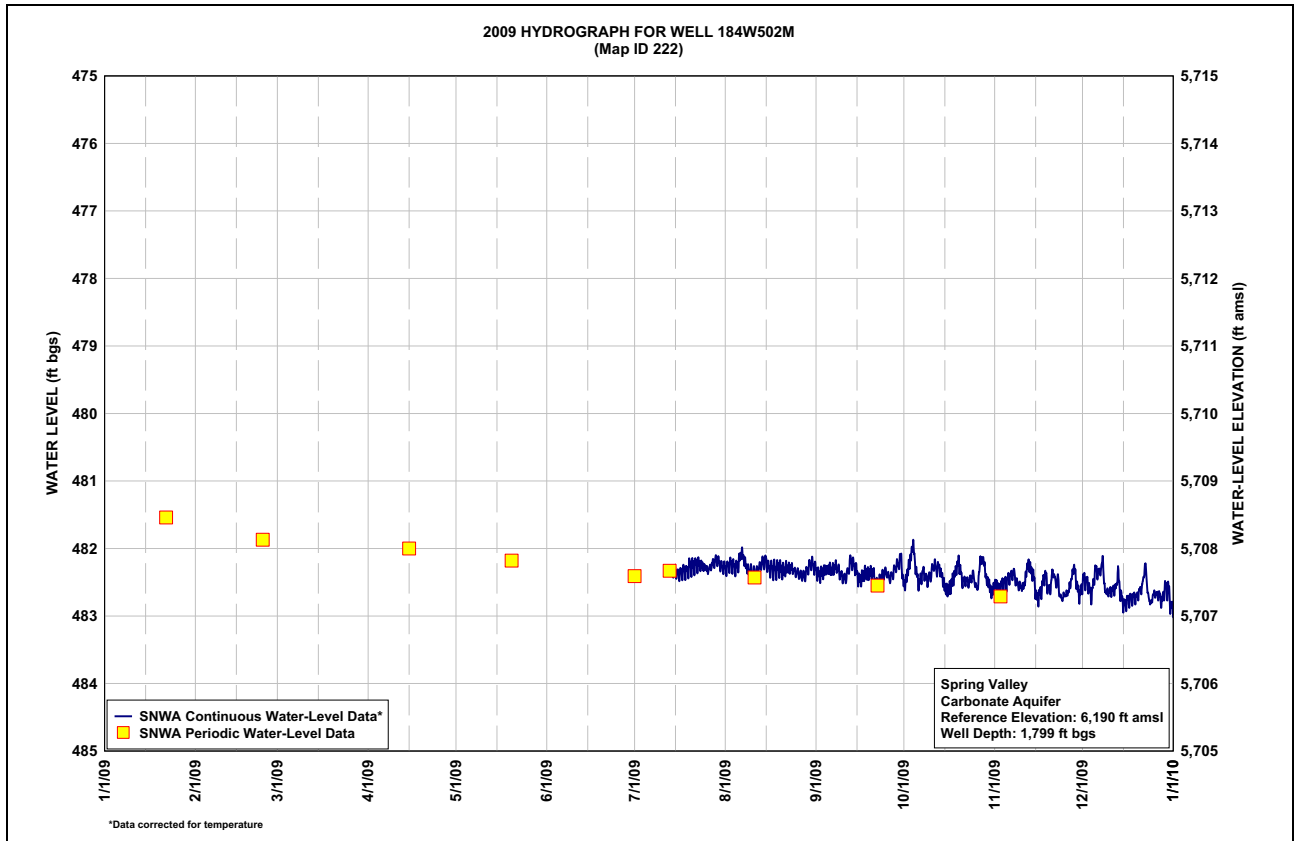




Table C-10
Well 184W504M, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	99.72	99.80	99.75	99.74	99.77	99.82	99.87	100.08	100.26	100.31	100.31	100.25
2	99.65	99.80	99.74	99.67	99.76	99.83	99.89	100.06	100.25	100.24	100.33	100.28
3	99.75	99.79	99.70	99.70	99.77	99.85	99.88	100.15	100.24	100.18	100.31	100.32
4	99.77	99.77	99.71	99.81	99.75	99.81	99.88	100.22	100.24	100.23	100.30	100.27
5	99.71	99.70	99.75	99.83	99.74	99.79	99.87	100.19	100.23	100.31	100.28	100.21
6	99.76	99.71	99.71	99.79	99.77	99.81	99.85	100.16	100.24	100.30	100.26	100.23
7	99.78	99.70	99.76	99.72	99.75	99.83	99.85	100.21	100.22	100.26	100.26	100.18
8	99.73	99.66	99.70	99.71	99.75	99.82	99.86	100.23	100.24	100.30	100.31	100.31
9	99.82	99.63	99.71	99.74	99.75	99.82	99.88	100.23	100.27	100.29	100.32	100.31
10	99.82	99.76	99.78	99.71	99.77	99.83	99.90	100.24	100.27	100.26	100.31	100.30
11	99.78	99.74	99.75	99.77	99.73	99.84	99.90	100.23	100.25	100.24	100.26	100.29
12	99.79	99.72	99.78	99.80	99.73	99.84	99.89	100.21	100.20	100.25	100.22	100.25
13	99.76	99.69	99.76	99.72	99.77	99.84	---	100.19	100.22	100.28	100.25	100.27
14	99.76	99.75	99.70	99.64	99.73	99.84	---	100.19	100.25	100.33	100.31	100.34
15	99.80	99.73	99.76	99.73	99.74	99.84	---	100.22	100.29	100.34	100.36	100.34
16	99.81	99.68	99.79	99.82	99.73	99.86	100.07	100.22	100.27	100.33	100.32	100.32
17	99.81	99.75	99.79	99.79	---	99.84	100.06	100.23	100.25	100.29	100.27	100.32
18	99.82	99.82	99.77	99.82	---	99.85	100.07	100.22	100.26	100.26	100.27	100.32
19	99.79	99.80	99.74	99.82	---	99.81	100.05	100.22	100.25	100.23	100.32	100.32
20	99.77	99.75	99.72	99.80	99.83	99.82	100.06	100.23	100.27	100.30	100.24	100.29
21	99.75	99.77	99.71	99.76	99.83	99.83	100.05	100.22	100.30	100.30	100.28	100.25
22	99.75	99.76	99.70	99.73	99.82	99.86	100.05	100.23	100.28	100.30	100.28	100.21
23	99.77	99.75	99.78	99.69	99.83	99.86	100.06	100.23	100.27	100.29	100.36	100.34
24	99.72	99.74	99.76	99.71	99.82	99.88	100.07	100.24	100.26	100.28	100.34	100.33
25	99.67	99.72	99.69	99.76	99.83	99.87	100.08	100.24	100.28	100.33	100.33	100.30
26	99.75	99.73	99.76	99.76	99.84	99.87	100.07	100.26	100.28	100.26	100.29	100.31
27	99.83	99.81	99.77	99.72	99.84	99.90	100.05	100.26	100.25	100.21	100.23	100.33
28	99.79	99.80	99.72	99.73	99.85	99.87	100.04	100.24	100.23	100.26	100.26	100.31
29	99.83	---	99.69	99.78	99.85	99.85	100.05	100.22	100.21	100.31	100.33	100.27
30	99.80	---	99.78	99.78	99.83	99.86	100.08	100.21	100.33	100.34	100.30	100.31
31	99.72	---	99.70	---	99.81	---	100.08	100.23	---	100.32	---	100.36
Max	99.83	99.82	99.79	99.83	99.85	99.90	100.08	100.26	100.33	100.34	100.36	100.36
Min	99.65	99.63	99.69	99.64	99.73	99.79	99.85	100.06	100.20	100.18	100.22	100.18

Year 2009 Statistics:

Year Max 100.36; Year Min 99.63

Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

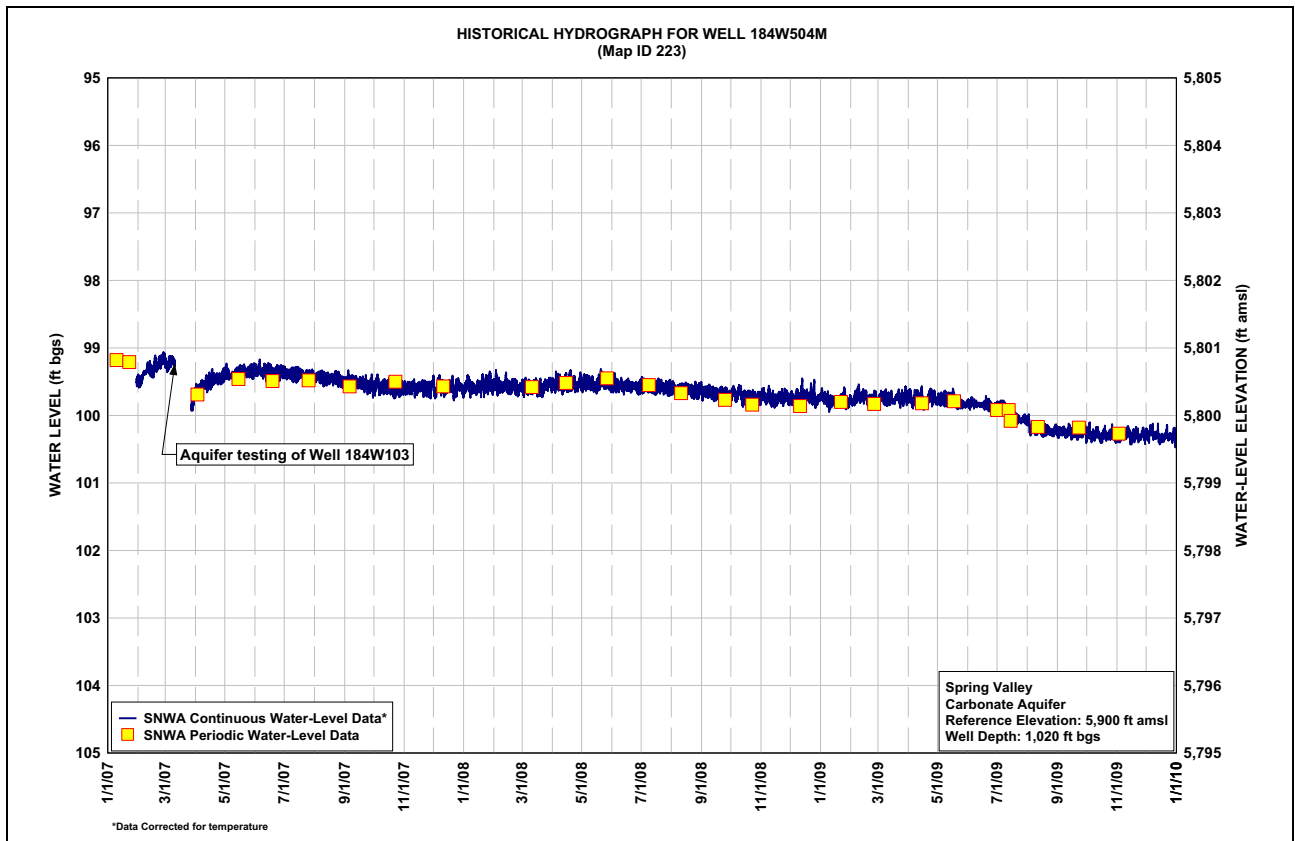
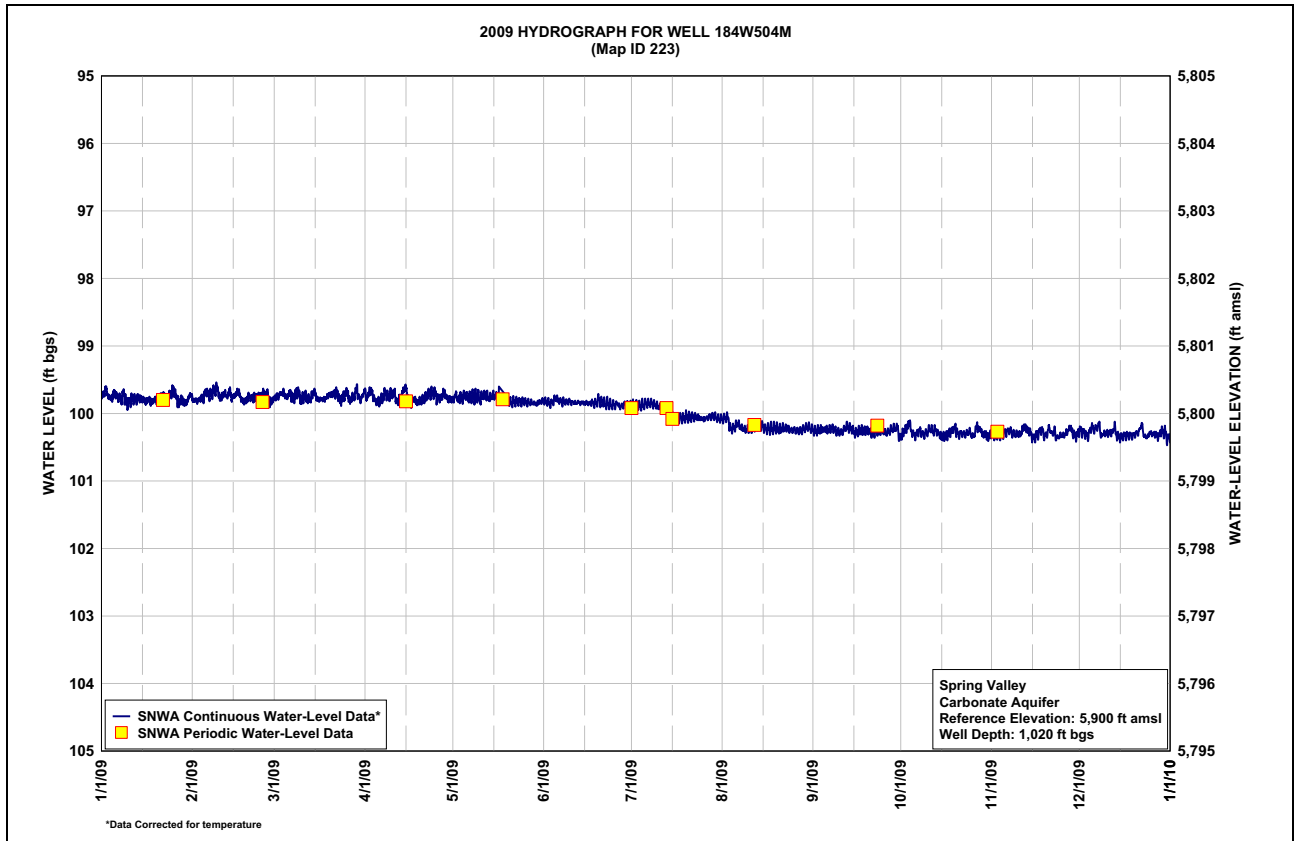




Table C-11
Well 184W506M, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	215.34	215.40	215.40	215.40	215.42	215.52	215.52	215.69	215.76	215.81	215.85	215.86
2	215.31	215.41	215.38	215.36	215.42	215.53	215.53	215.69	215.76	215.78	215.86	215.86
3	215.35	215.40	215.36	215.37	215.42	215.53	215.53	215.70	215.76	215.74	215.85	215.89
4	215.36	215.39	215.37	215.42	215.42	215.51	215.53	215.71	215.76	215.76	215.85	215.87
5	215.34	215.36	215.39	215.44	215.42	215.50	215.52	215.70	215.76	215.80	215.84	215.83
6	215.36	215.36	215.37	215.42	215.43	215.50	215.51	215.68	215.76	215.80	215.84	215.83
7	215.36	215.35	215.39	215.39	215.44	215.51	215.51	215.70	215.75	215.79	215.83	215.81
8	215.35	215.34	215.36	215.38	215.44	215.51	215.51	215.72	215.76	215.80	215.85	215.86
9	215.40	215.31	215.36	215.39	215.43	215.50	215.51	215.72	215.78	215.80	215.86	215.87
10	215.41	215.37	215.40	215.38	215.44	215.50	215.53	215.73	215.78	215.79	215.86	215.87
11	215.39	215.36	215.39	215.40	215.42	215.51	215.53	215.73	215.78	215.78	215.84	215.86
12	215.40	215.36	215.40	215.43	215.41	215.51	215.53	215.72	215.75	215.78	215.82	215.85
13	215.39	215.34	215.40	215.40	215.44	215.51	---	215.71	215.75	215.79	215.83	215.86
14	215.39	215.37	215.38	215.35	215.43	215.50	---	215.71	215.77	215.82	215.85	215.89
15	215.40	215.36	215.39	215.39	215.45	215.51	---	215.72	215.79	215.83	215.88	215.90
16	215.40	215.33	215.41	215.43	215.46	215.51	215.67	215.73	215.79	215.84	215.87	215.90
17	215.41	215.37	215.41	215.43	215.46	215.51	215.67	215.73	215.78	215.82	215.85	215.90
18	215.42	215.40	215.41	215.44	215.44	215.51	215.68	215.73	215.78	215.81	215.85	215.90
19	215.41	215.40	215.40	215.45	215.51	215.49	215.68	215.73	215.78	215.79	215.87	215.91
20	215.39	215.39	215.39	215.45	215.56	215.50	215.68	215.74	215.79	215.82	215.84	215.89
21	215.38	215.39	215.37	215.44	215.56	215.50	215.68	215.73	215.81	215.83	215.85	215.87
22	215.36	215.39	215.37	215.42	215.54	215.51	215.68	215.74	215.81	215.83	215.86	215.85
23	215.37	215.39	215.42	215.39	215.55	215.51	215.68	215.74	215.80	215.83	215.89	215.90
24	215.35	215.38	215.41	215.40	215.55	215.52	215.69	215.75	215.79	215.82	215.89	215.91
25	215.32	215.37	215.39	215.41	215.54	215.51	215.69	215.75	215.80	215.85	215.89	215.89
26	215.36	215.38	215.41	215.42	215.55	215.52	215.69	215.76	215.81	215.82	215.88	215.90
27	215.40	215.41	215.41	215.41	215.56	215.53	215.68	215.76	215.79	215.79	215.84	215.91
28	215.39	215.41	215.39	215.41	215.55	215.52	215.68	215.76	215.78	215.81	215.85	215.90
29	215.41	---	215.37	215.43	215.56	215.51	215.68	215.75	215.76	215.83	215.88	215.89
30	215.40	---	215.42	215.43	215.54	215.51	215.69	215.74	215.81	215.85	215.88	215.90
31	215.37	---	215.39	---	215.53	---	215.69	215.75	---	215.85	---	215.92
Max	215.42	215.41	215.42	215.45	215.56	215.53	215.69	215.76	215.81	215.85	215.89	215.92
Min	215.31	215.31	215.36	215.35	215.41	215.49	215.51	215.68	215.75	215.74	215.82	215.81

Year 2009 Statistics:

Year Max 215.92; Year Min 215.31

Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

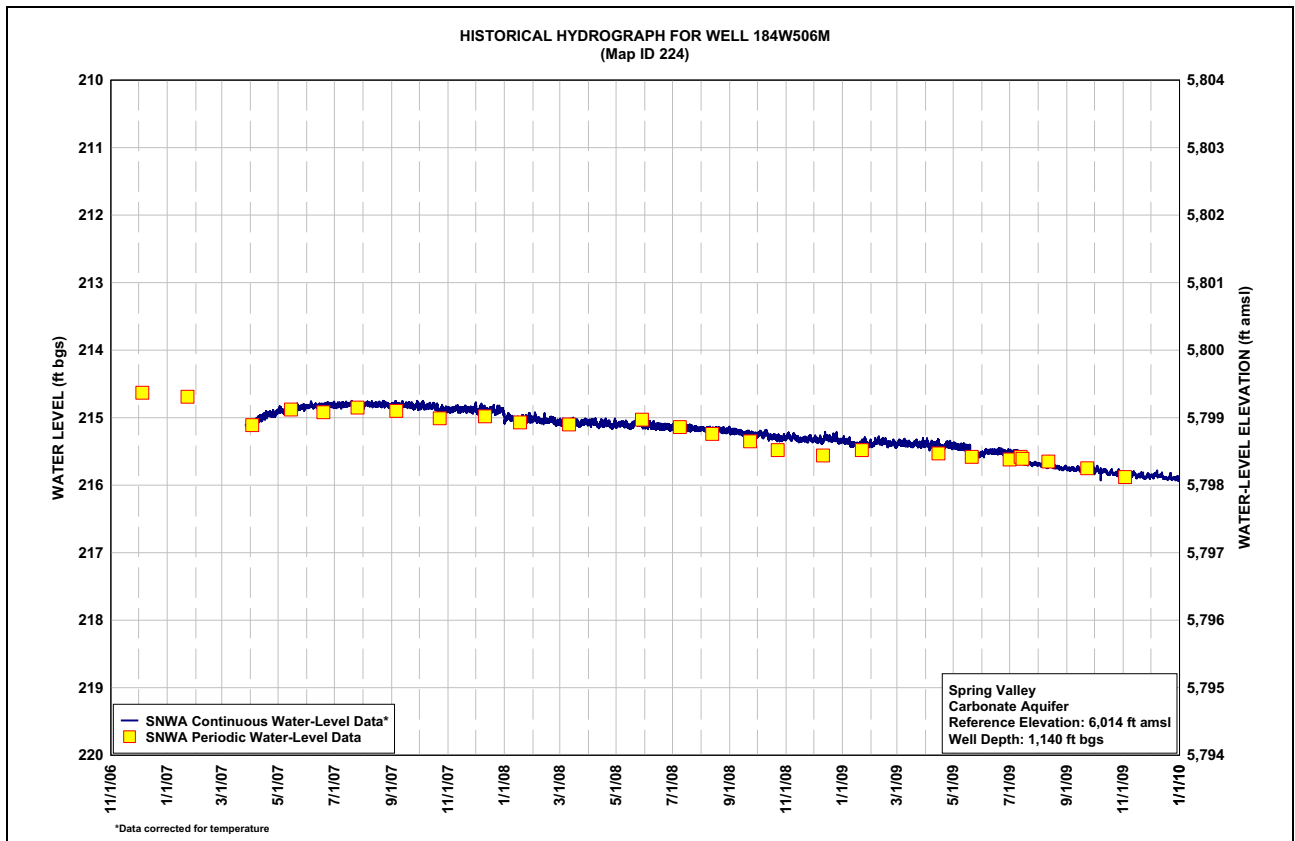
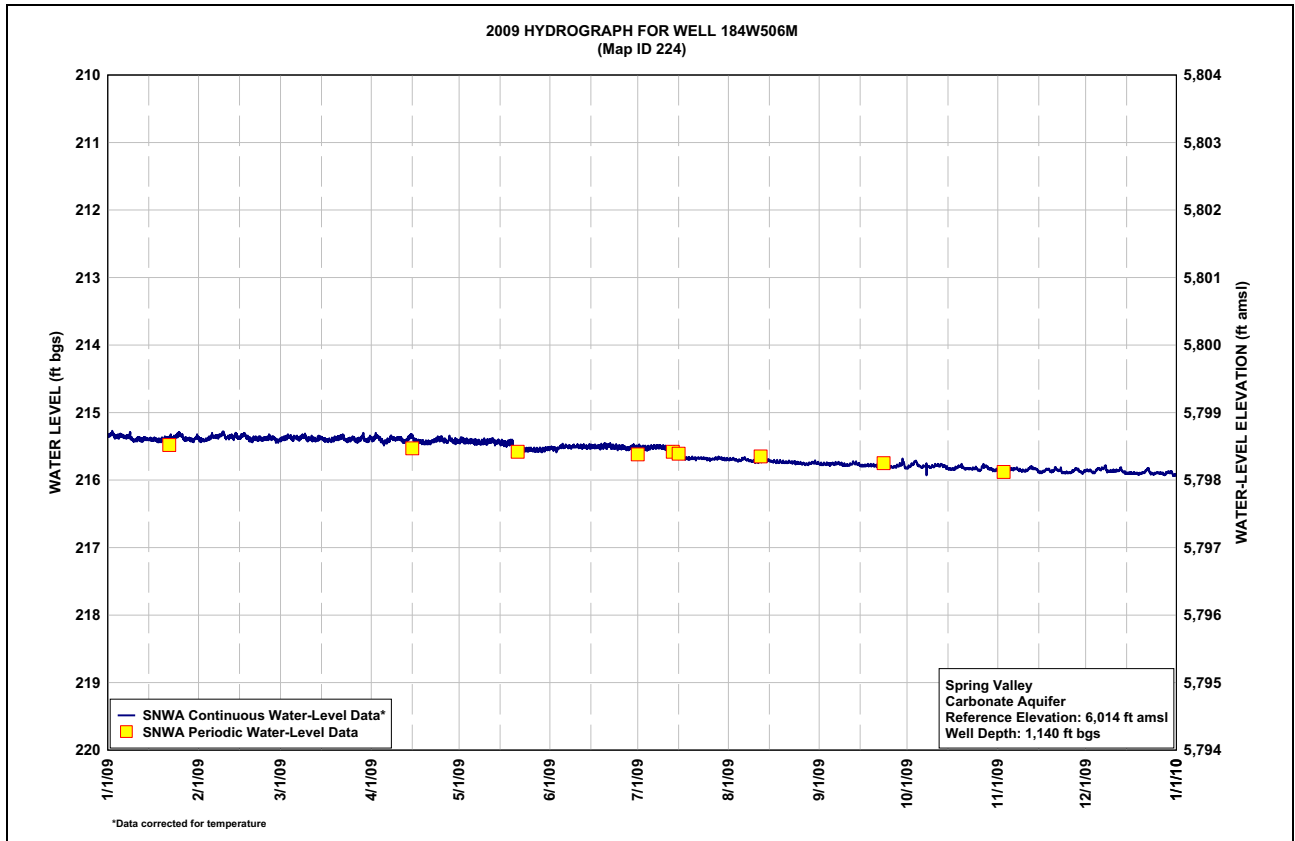




Table C-12
Well 184W508M, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	276.38	276.47	276.45	276.35	276.44	276.64	276.67	276.78	276.80	276.85	276.83	276.68
2	276.23	276.50	276.38	276.29	276.39	276.66	276.73	276.74	276.81	276.70	276.87	276.71
3	276.38	276.47	276.30	276.26	276.44	276.71	276.71	276.77	276.78	276.53	276.83	276.81
4	276.48	276.40	276.28	276.51	276.44	276.63	276.70	276.80	276.76	276.55	276.80	276.77
5	276.35	276.28	276.39	276.64	276.40	276.56	276.66	276.75	276.75	276.78	276.76	276.56
6	276.44	276.27	276.33	276.56	276.45	276.60	276.61	276.66	276.75	276.83	276.71	276.58
7	276.49	276.30	276.41	276.37	276.44	276.64	276.59	276.73	276.72	276.74	276.69	276.49
8	276.38	276.21	276.33	276.26	276.46	276.64	276.61	276.81	276.75	276.78	276.79	276.71
9	276.56	276.16	276.29	276.34	276.42	276.63	276.66	276.82	276.81	276.79	276.83	276.82
10	276.64	276.40	276.48	276.31	276.44	276.64	276.72	276.83	276.84	276.72	276.83	276.80
11	276.55	276.44	276.44	276.40	276.37	276.66	276.73	276.82	276.80	276.65	276.72	276.77
12	276.53	276.37	276.47	276.56	276.35	276.67	276.69	276.77	276.67	276.68	276.58	276.70
13	276.49	276.33	276.46	276.42	276.47	276.66	---	276.72	276.67	276.72	276.65	276.67
14	276.45	276.37	276.32	276.18	276.43	276.66	---	276.70	276.73	276.83	276.77	276.88
15	276.48	276.40	276.39	276.25	276.48	276.65	276.79	276.75	276.84	276.91	276.94	276.93
16	276.52	276.27	276.51	276.53	276.53	276.69	276.81	276.77	276.83	276.90	276.89	276.88
17	276.49	276.37	276.51	276.57	276.51	276.66	276.79	276.78	276.78	276.82	276.75	276.85
18	276.54	276.56	276.47	276.57	276.51	276.66	276.79	276.78	276.78	276.72	276.70	276.83
19	276.49	276.56	276.40	276.60	276.67	276.60	276.76	276.76	276.76	276.63	276.83	276.83
20	276.42	276.43	276.35	276.54	276.66	276.56	276.75	276.78	276.78	276.75	276.69	276.76
21	276.35	276.46	276.31	276.45	276.70	276.60	276.75	276.77	276.87	276.81	276.70	276.67
22	276.32	276.42	276.27	276.35	276.68	276.69	276.74	276.76	276.84	276.81	276.74	276.52
23	276.38	276.42	276.46	276.28	276.68	276.70	276.75	276.76	276.80	276.80	276.91	276.82
24	276.31	276.39	276.48	276.28	276.68	276.73	276.76	276.78	276.76	276.75	276.91	276.89
25	276.18	276.33	276.35	276.35	276.68	276.71	276.79	276.80	276.79	276.85	276.87	276.79
26	276.32	276.36	276.38	276.43	276.71	276.69	276.79	276.83	276.80	276.76	276.79	276.80
27	276.56	276.50	276.49	276.41	276.72	276.77	276.73	276.83	276.74	276.57	276.63	276.82
28	276.52	276.56	276.38	276.35	276.73	276.72	276.70	276.81	276.67	276.64	276.64	276.81
29	276.57	---	276.24	276.45	276.74	276.65	276.70	276.73	276.62	276.80	276.82	276.70
30	276.53	---	276.47	276.46	276.69	276.64	276.75	276.70	276.78	276.88	276.82	276.75
31	276.35	---	276.38	---	276.64	---	276.78	276.74	---	276.88	---	276.92
Max	276.64	276.56	276.51	276.64	276.74	276.77	276.81	276.83	276.87	276.91	276.94	276.93
Min	276.18	276.16	276.24	276.18	276.35	276.56	276.59	276.66	276.62	276.53	276.58	276.49

Year 2009 Statistics:
 Note: Depth in ft bgs

Year Max 276.94; Year Min 276.16

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

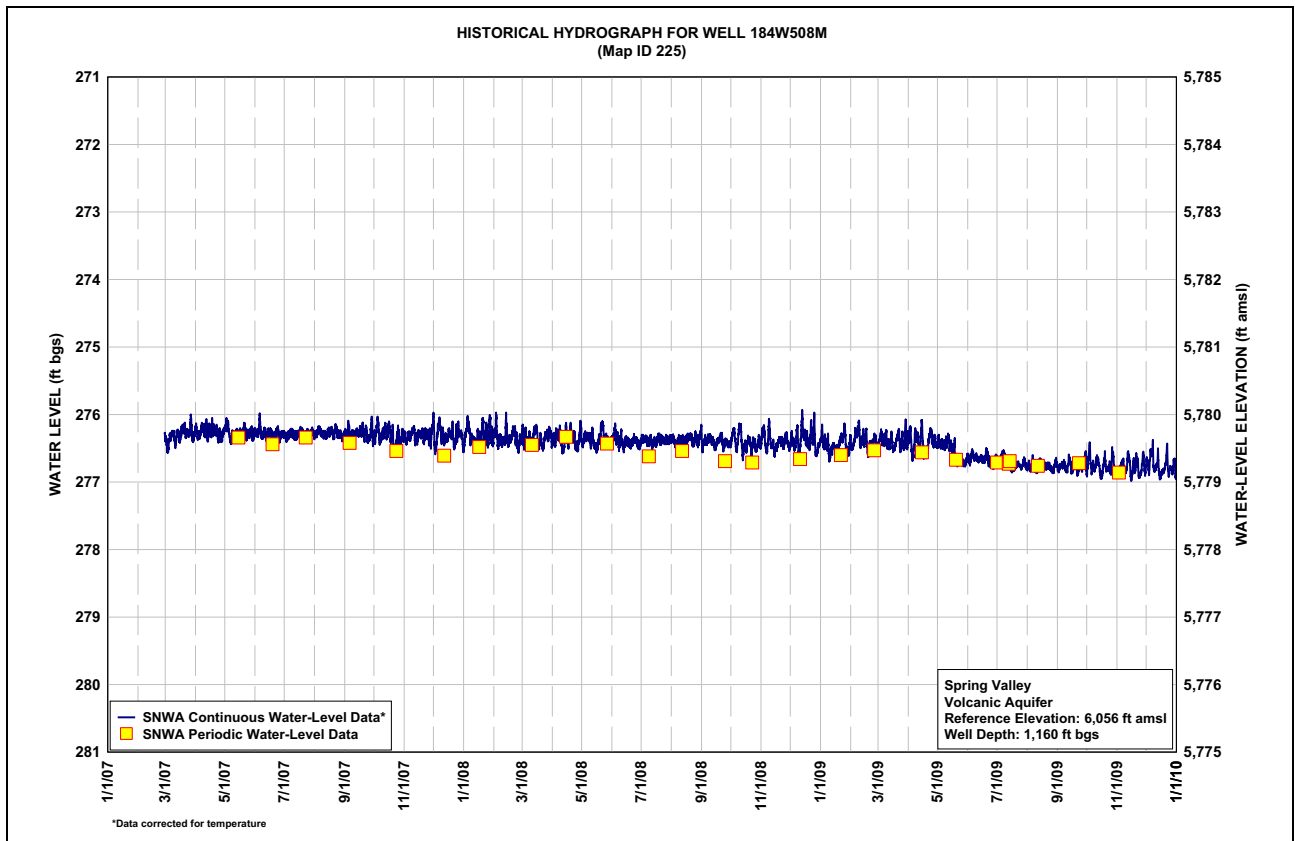
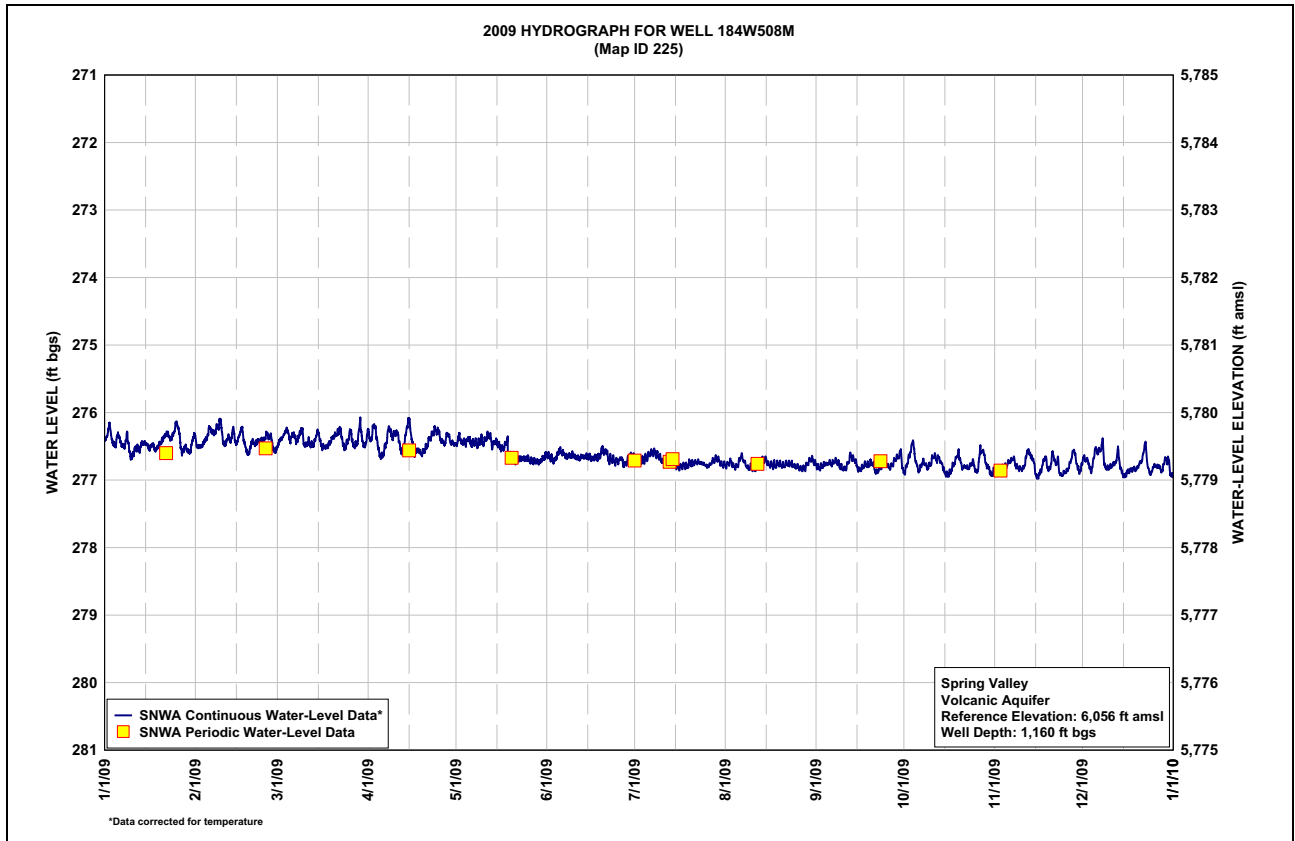




Table C-13
Well SPR7007M, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	---	---	---	---	151.56	146.97	147.39	147.78	148.77	150.15	151.54
2	---	---	---	---	---	151.17	147.00	147.37	147.80	148.68	150.23	151.63
3	---	---	---	---	---	150.81	146.99	147.39	147.80	148.60	150.24	151.75
4	---	---	---	---	---	150.37	147.00	147.42	147.81	148.68	150.27	151.74
5	---	---	---	---	---	149.97	146.97	147.38	147.82	148.91	150.29	151.67
6	---	---	---	---	---	149.68	146.95	147.30	147.86	148.96	150.32	151.76
7	---	---	---	---	---	149.39	146.95	147.39	147.85	148.93	150.36	151.75
8	---	---	---	---	---	149.09	146.98	147.46	147.90	149.02	150.48	151.99
9	---	---	---	---	---	148.82	147.03	147.47	147.99	149.06	150.55	152.05
10	---	---	---	---	---	148.58	147.09	147.49	148.03	149.05	150.59	152.08
11	---	---	---	---	---	148.37	147.11	147.49	148.01	149.05	150.55	152.12
12	---	---	---	---	---	148.18	147.10	147.46	147.95	149.12	150.52	152.12
13	---	---	---	---	---	148.00	147.10	147.43	147.99	149.20	150.64	152.18
14	---	---	---	---	---	147.85	147.14	147.43	148.07	149.33	150.77	152.35
15	---	---	---	---	---	147.72	147.18	147.48	148.19	149.42	150.92	152.40
16	---	---	---	---	---	147.63	147.20	147.50	148.20	149.45	150.91	152.41
17	---	---	---	---	---	147.50	147.21	147.52	148.19	149.44	150.87	152.46
18	---	---	---	---	---	147.42	147.23	147.53	148.23	149.41	150.91	152.50
19	---	---	---	---	---	147.28	147.22	147.53	148.25	149.40	151.05	152.55
20	---	---	---	---	156.34	147.20	147.23	147.56	148.30	149.55	150.98	152.55
21	---	---	---	---	156.10	147.16	147.24	147.56	148.41	149.63	151.07	152.54
22	---	---	---	---	155.78	147.17	147.24	147.57	148.42	149.67	151.13	152.52
23	---	---	---	---	155.44	147.13	147.27	147.58	148.42	149.71	151.31	152.79
24	---	---	---	---	155.07	147.11	147.30	147.62	148.43	149.72	151.33	152.83
25	---	---	---	---	154.67	147.06	147.33	147.65	148.50	149.86	151.36	152.81
26	---	---	---	---	154.27	147.02	147.33	147.69	148.54	149.81	151.35	152.88
27	---	---	---	---	153.83	147.07	147.30	147.71	148.52	149.72	151.31	152.94
28	---	---	---	---	153.38	147.00	147.29	147.70	148.52	149.84	151.39	152.96
29	---	---	---	---	152.94	146.95	147.31	147.66	148.51	150.01	151.57	152.96
30	---	---	---	---	152.45	146.95	147.36	147.65	148.71	150.11	151.58	153.05
31	---	---	---	---	151.99	---	147.38	147.72	---	150.13	---	153.19
Max	---	---	---	---	156.34	151.56	147.38	147.72	148.71	150.13	151.58	153.19
Min	---	---	---	---	151.99	146.95	146.95	147.30	147.78	148.60	150.15	151.54

Year 2009 Statistics:

Year Max 156.34; Year Min 146.95

Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

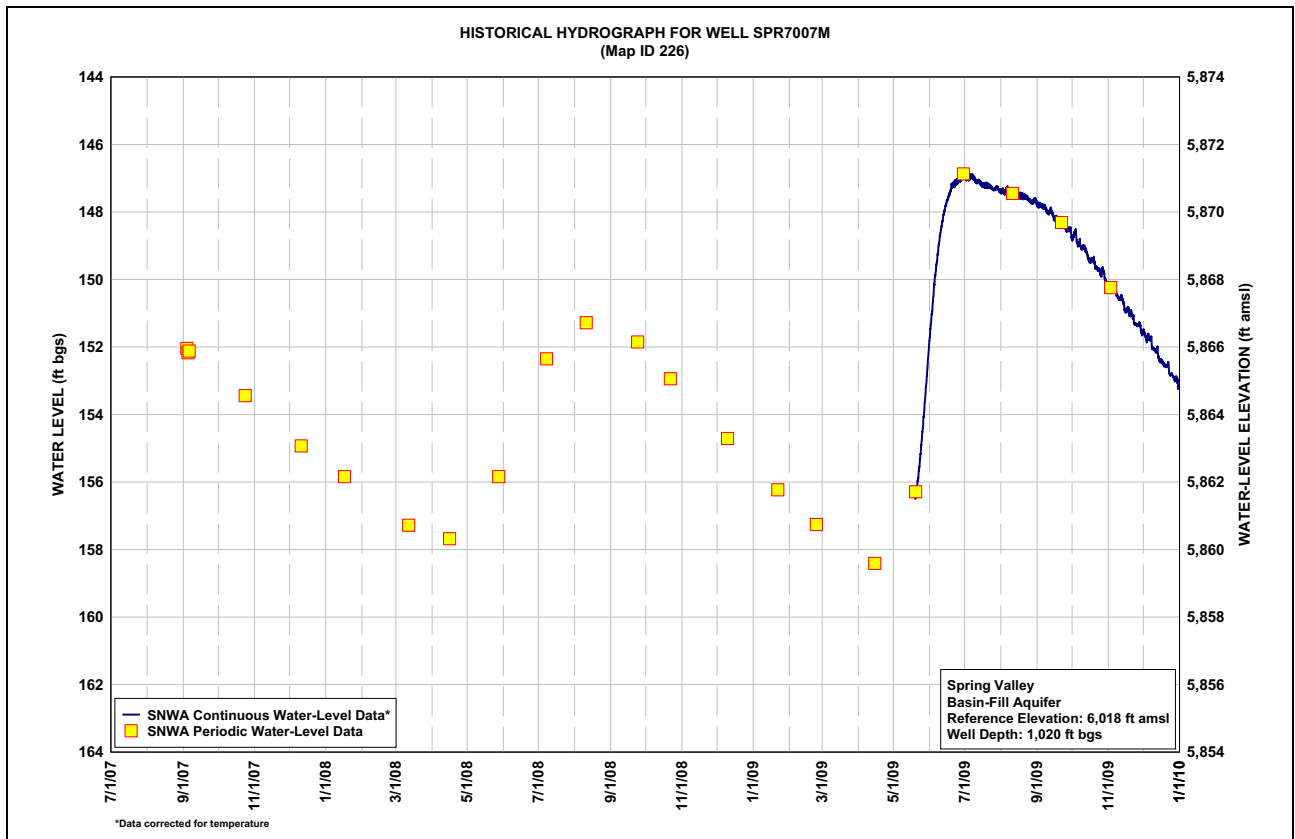
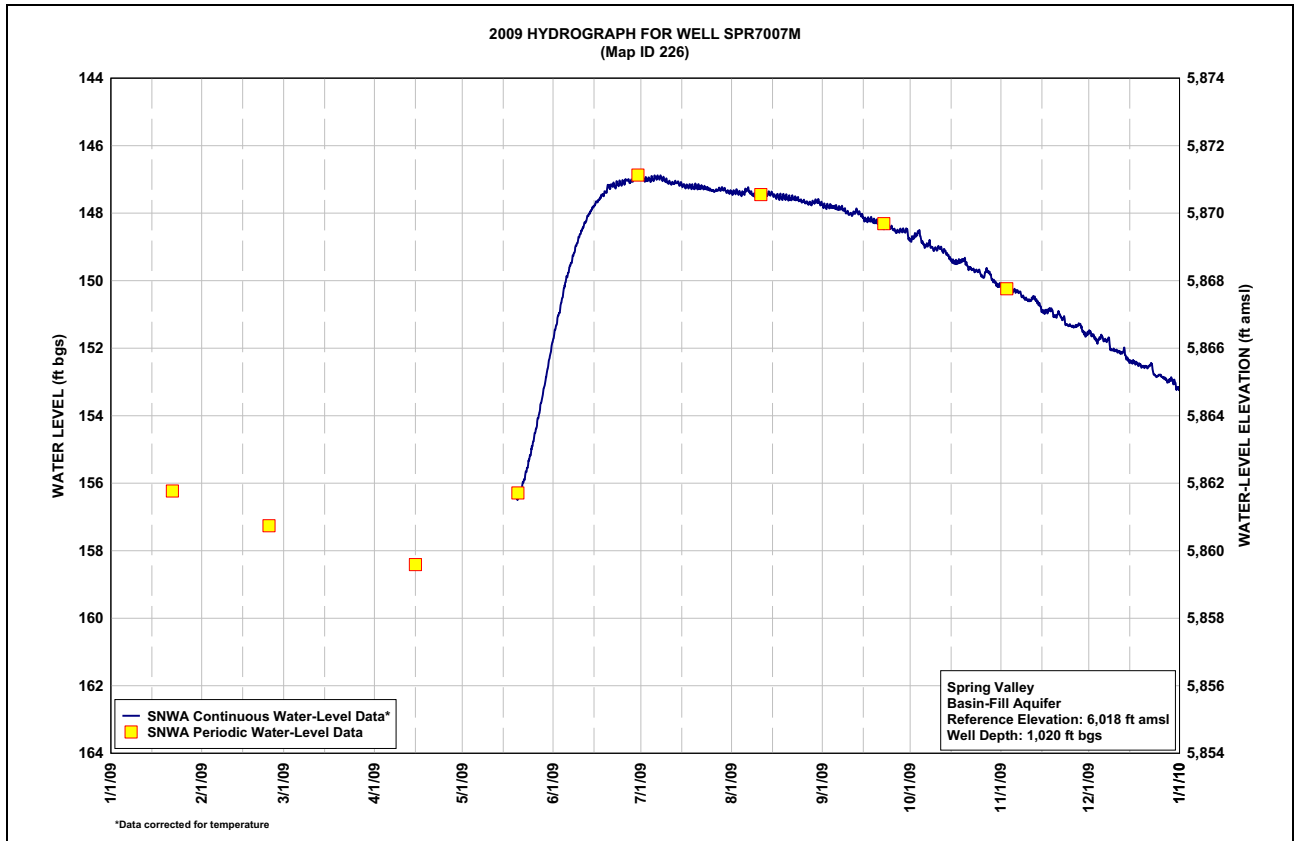




Table C-14
Well SPR7005M, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	494.34	494.41	494.43	494.32	494.14	493.84	493.32	493.25	493.32	493.57	493.79	---
2	494.23	494.43	494.39	494.20	494.10	493.83	493.34	493.22	493.33	493.45	493.83	---
3	494.37	494.41	494.33	494.16	494.13	493.85	493.31	493.23	493.31	493.32	493.80	---
4	494.39	494.36	494.33	494.43	494.12	493.77	493.30	493.25	493.30	493.36	493.79	---
5	494.33	494.26	494.41	494.49	494.09	493.70	493.25	493.20	493.29	493.56	493.77	---
6	494.42	494.27	494.36	494.41	494.12	493.72	493.22	493.13	493.31	493.59	493.75	---
7	494.47	494.30	494.41	494.27	494.10	493.73	493.20	493.20	493.28	493.52	493.75	---
8	494.39	494.23	494.33	494.20	494.10	493.71	493.21	493.27	493.32	493.57	493.83	---
9	494.54	494.20	494.32	494.27	494.06	493.68	493.24	493.27	493.37	493.58	493.86	---
10	494.59	494.39	494.46	494.24	494.07	493.67	493.26	493.28	493.39	493.53	493.87	---
11	494.52	494.40	494.42	494.31	493.99	493.65	493.26	493.27	493.36	493.49	493.79	---
12	494.52	494.35	494.44	494.41	493.97	493.64	493.21	493.23	493.27	493.52	493.70	---
13	494.50	494.32	494.42	494.28	494.05	493.61	---	493.19	493.28	493.56	493.77	---
14	494.48	494.37	494.31	494.10	494.00	493.59	---	493.18	493.35	493.66	493.87	---
15	494.52	494.38	494.38	494.13	494.03	493.58	493.35	493.23	493.43	493.73	494.00	---
16	494.55	494.28	494.46	494.35	494.05	493.58	493.34	493.25	493.42	493.71	493.95	---
17	494.54	494.38	494.45	494.35	494.01	493.54	493.32	493.25	493.39	493.65	493.86	---
18	494.59	494.52	494.43	494.34	493.94	493.53	493.32	493.25	493.40	493.59	493.85	---
19	494.54	494.50	494.37	494.34	493.96	493.45	493.28	493.24	493.39	493.54	493.96	---
20	494.50	494.41	494.34	494.30	494.02	493.44	493.27	493.26	493.42	493.65	493.85	---
21	494.39	494.44	494.31	494.23	494.02	493.44	493.26	493.25	493.51	493.69	493.89	---
22	494.28	494.41	494.28	494.15	494.00	493.49	493.26	493.24	493.48	493.69	493.92	---
23	494.34	494.42	494.44	494.10	493.98	493.46	493.26	493.24	493.45	493.69	494.06	---
24	494.28	494.40	494.42	494.12	493.97	493.46	493.26	493.28	493.43	493.67	494.05	---
25	494.18	494.35	494.31	494.14	493.96	493.43	493.28	493.29	493.48	493.76	494.03	---
26	494.31	494.38	494.36	494.19	493.96	493.41	493.27	493.31	493.49	493.67	493.98	---
27	494.47	494.49	494.42	494.14	493.96	493.45	493.23	493.32	493.44	493.55	493.88	---
28	494.43	494.51	494.32	494.12	493.95	493.39	493.20	493.30	493.40	493.63	493.92	---
29	494.47	---	494.23	494.19	493.94	493.34	493.21	493.25	493.37	493.75	---	---
30	494.42	---	494.41	494.18	493.90	493.32	493.25	493.22	493.53	493.82	---	---
31	494.30	---	494.30	---	493.85	---	493.26	493.27	---	493.81	---	---
Max	494.59	494.52	494.46	494.49	494.14	493.85	493.35	493.32	493.53	493.82	494.06	---
Min	494.18	494.20	494.23	494.10	493.85	493.32	493.20	493.13	493.27	493.32	493.70	---

Year 2009 Statistics:
 Note: Depth in ft bgs

Year Max 494.59; Year Min 493.13

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

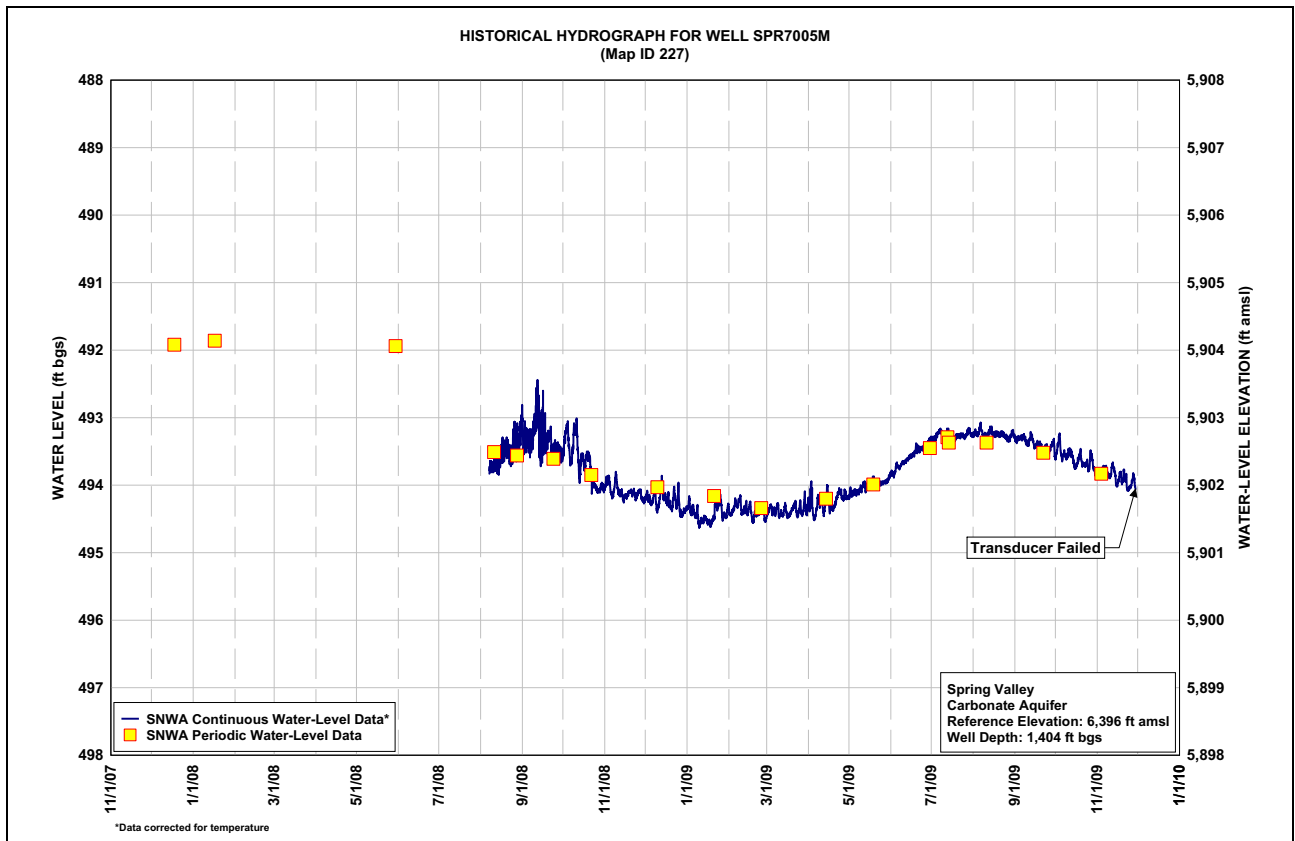
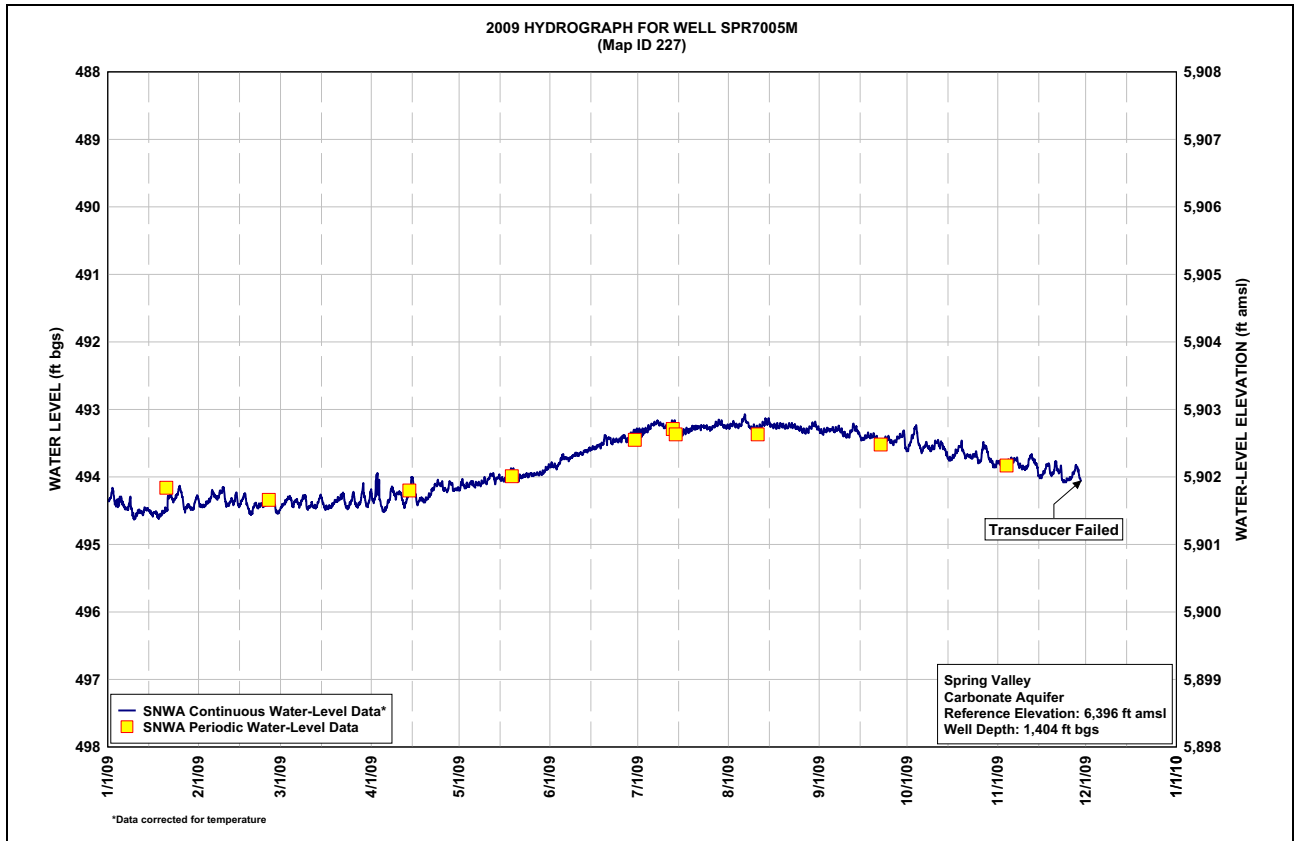


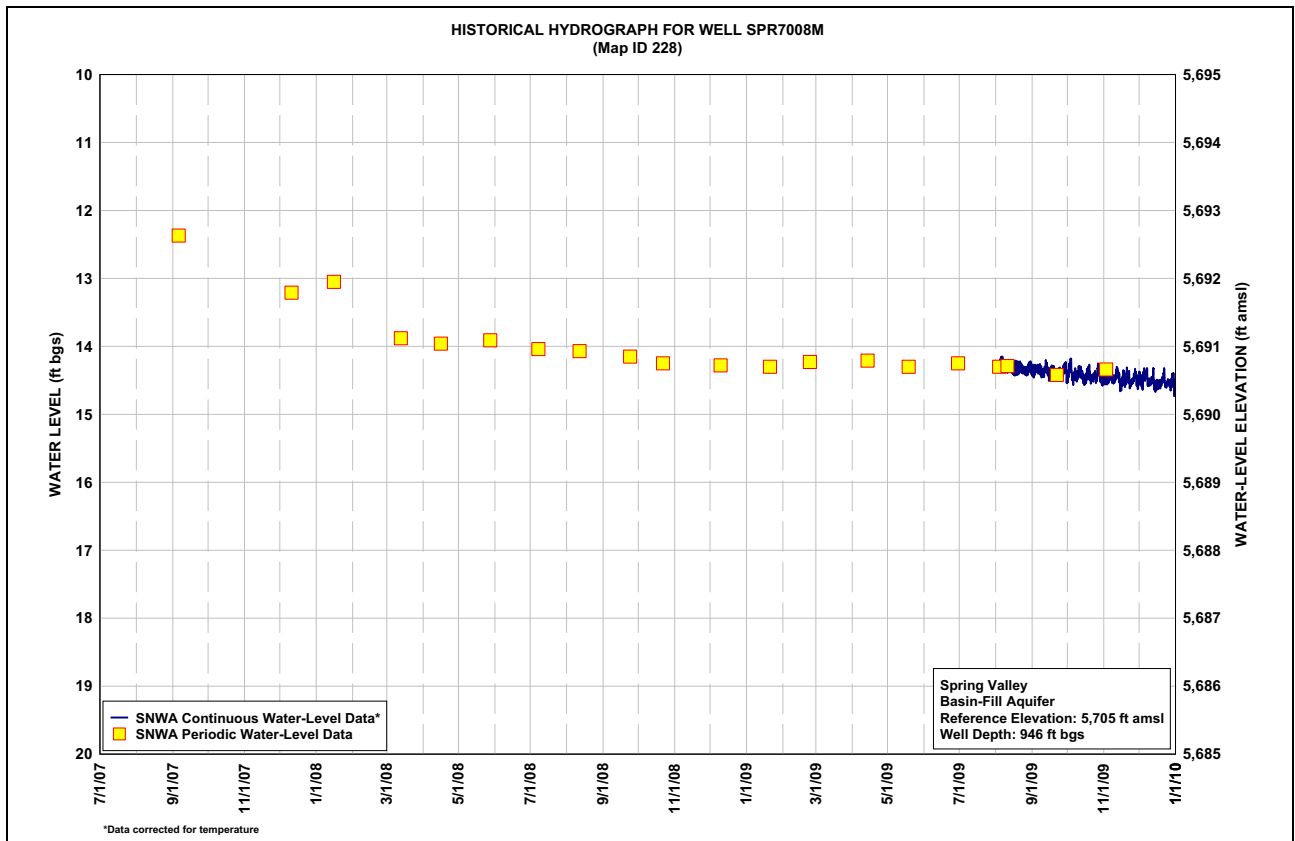
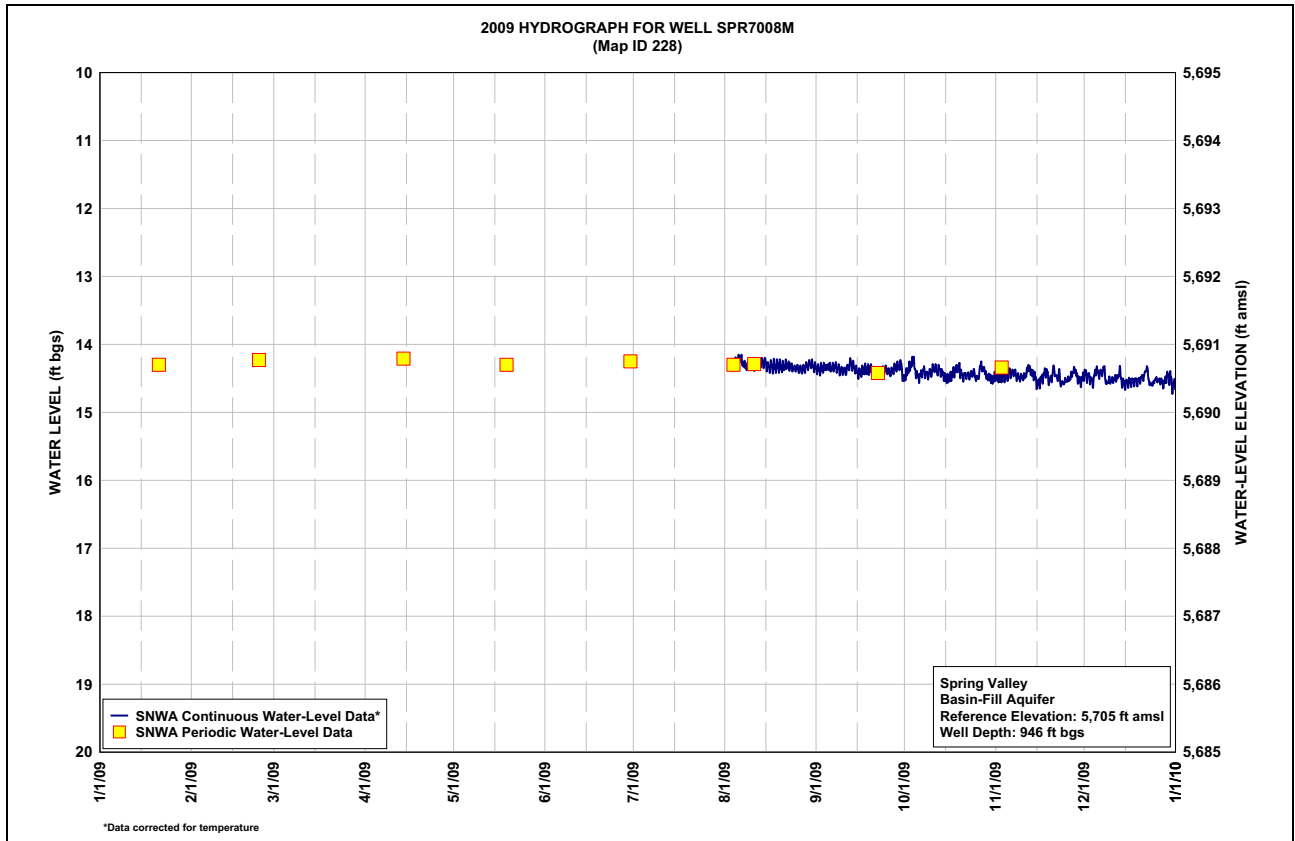


Table C-15
Well SPR7008M, Calendar Year 2009
Water-Level Data, Daily Mean Values

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	---	---	---	---	---	---	---	14.37	14.45	14.47	14.44
2	---	---	---	---	---	---	---	---	14.36	14.35	14.49	14.47
3	---	---	---	---	---	---	---	---	14.35	14.27	14.46	14.54
4	---	---	---	---	---	---	---	---	14.34	14.33	14.45	14.47
5	---	---	---	---	---	---	---	14.25	14.33	14.46	14.42	14.39
6	---	---	---	---	---	---	---	14.22	14.34	14.45	14.42	14.43
7	---	---	---	---	---	---	---	14.29	14.32	14.39	14.42	14.38
8	---	---	---	---	---	---	---	14.33	14.36	14.43	14.49	14.54
9	---	---	---	---	---	---	---	14.32	14.39	14.42	14.49	14.54
10	---	---	---	---	---	---	---	14.33	14.39	14.38	14.48	14.53
11	---	---	---	---	---	---	---	14.32	14.36	14.36	14.41	14.50
12	---	---	---	---	---	---	---	14.29	14.30	14.38	14.37	14.46
13	---	---	---	---	---	---	---	14.27	14.32	14.41	14.43	14.48
14	---	---	---	---	---	---	---	14.27	14.37	14.47	14.51	14.58
15	---	---	---	---	---	---	---	14.32	14.42	14.51	14.57	14.57
16	---	---	---	---	---	---	---	14.33	14.40	14.48	14.52	14.55
17	---	---	---	---	---	---	---	14.33	14.37	14.43	14.44	14.55
18	---	---	---	---	---	---	---	14.32	14.38	14.37	14.44	14.54
19	---	---	---	---	---	---	---	14.32	14.36	14.36	14.52	14.54
20	---	---	---	---	---	---	---	14.33	14.39	14.45	14.40	14.49
21	---	---	---	---	---	---	---	14.32	14.45	14.45	14.47	14.44
22	---	---	---	---	---	---	---	14.31	14.41	14.45	14.47	14.41
23	---	---	---	---	---	---	---	14.33	14.39	14.44	14.58	14.58
24	---	---	---	---	---	---	---	14.35	14.37	14.42	14.54	14.57
25	---	---	---	---	---	---	---	14.35	14.40	14.50	14.52	14.52
26	---	---	---	---	---	---	---	14.36	14.40	14.40	14.47	14.54
27	---	---	---	---	---	---	---	14.37	14.36	14.35	14.39	14.56
28	---	---	---	---	---	---	---	14.34	14.33	14.42	14.46	14.54
29	---	---	---	---	---	---	---	14.30	14.31	14.48	14.54	14.48
30	---	---	---	---	---	---	---	14.29	14.46	14.51	14.50	14.52
31	---	---	---	---	---	---	---	14.34	---	14.49	---	14.59
Max	---	---	---	---	---	---	---	14.37	14.46	14.51	14.58	14.59
Min	---	---	---	---	---	---	---	14.22	14.30	14.27	14.37	14.38

Year 2009 Statistics: Year Max 14.59; Year Min 14.22
 Note: Depth in ft bgs

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report





This Page Left Intentionally Blank

Appendix D

Spring-Monitoring Program Hydrologic and Field-Chemistry Data

Table D-1
Spring Valley Miscellaneous Discharge Data
 (Page 1 of 2)

Spring Number	Spring Name	Date	Time	Discharge ^a (gpm)	Discharge ^a (cfs)	Measurement Rated as: (E, G, F, P) ^b	Method ^c	Water Temp. (°C)	Electrical Conductivity	pH	Remarks	Data Source
1845501	Willow Spring	2/4/2009	9:45:00	---	0.01	E	F	9.0	454	7.46	---	SNWA
		4/14/2009	12:27:00	---	0.01	G	F	10.4	378	8.02	---	SNWA
		5/26/2009	17:00:00	---	0.01	E	F	12.3	467	7.71	---	SNWA
		7/8/2009	18:02:00	---	0.01	F	F	16.2	444	6.63	---	SNWA
		8/18/2009	9:37:00	1.80	<0.01	G	F	---	---	---	---	SNWA
		11/17/2009	9:15:00	---	0.01	E	F	9.6	446	6.96	---	SNWA
		2/4/2009	14:15:00	---	1.1	P	C	12.9	471	7.83	---	SNWA
1845702	South Millick Spring	4/15/2009	18:34:00	---	1.1	F	C	10.3	454	7.83	---	SNWA
		5/28/2009	17:45:00	---	0.91	P	C	16.9	484	7.50	---	SNWA
		7/7/2009	16:02:00	---	1.0	P	C	16.6	472	7.50	---	SNWA
		8/19/2009	11:18:00	---	0.73	P	C	15.4	471	6.09	---	SNWA
		11/18/2009	13:28:00	---	0.79	P	C	13.0	318	7.49	---	SNWA
		2/2/2009	15:45:00	0.23	<0.01	G	V	---	---	---	---	SNWA
		4/16/2009	8:32:00	0.29	<0.01	E	V	6.3	360	7.46	---	SNWA
1845901	Layton Spring	5/26/2009	19:05:00	0.12	<0.01	F	V	---	---	---	---	SNWA
		8/17/2009	17:42:00	0	0	E	---	---	---	---	Dry	SNWA
		11/18/2009	9:34:00	0.05	<0.01	E	V	8.2	234	7.44	---	SNWA
		2/2/2009	15:32:00	---	0.69	P	---	10.5	335	7.98	---	SNWA
		4/14/2009	12:36:00	---	0.97	F	C	10.3	371	7.95	---	SNWA
		5/26/2009	18:10:00	---	1.0	F	F	8.7	334	7.76	---	SNWA
		7/8/2009	10:10:00	---	0.96	P	C	9.3	323	---	---	SNWA
1846201	Swallow Springs	8/17/2009	14:21:00	---	1.0	P	---	10.9	377	7.81	---	SNWA
		9/15/2009	11:40:00	---	0.97	F	---	12.6	242	7.26	---	SNWA
		11/17/2009	8:34:00	---	0.70	P	---	9.9	332	7.62	---	SNWA
		4/14/2009	9:30:00	---	---	---	---	8.8	599	7.20	Outside Gage Height = 8.00	SNWA
		7/6/2009	15:32:00	---	---	---	---	26.3	542	7.00	Outside Gage Height = 8.22	SNWA
		7/8/2009	8:54:00	---	---	---	---	---	---	---	Outside Gage Height = 8.20	SNWA
		8/17/2009	12:56:00	---	---	---	---	---	---	---	Outside Gage Height = 7.93	SNWA
1846401	Blind Spring ^d	11/16/2009	13:35:00	---	---	---	---	---	---	---	Outside Gage Height = 8.08	SNWA



**Table D-1
Spring Valley Miscellaneous Discharge Data
(Page 2 of 2)**

Spring Number	Spring Name	Date	Time	Discharge ^a (gpm)	Discharge ^a (cfs)	Measurement Rated as: (E, G, F, P) ^b	Method ^c	Water Temp. (°C)	Electrical Conductivity	pH	Remarks	Data Source
1847101	Keegan Spring	2/5/2009	14:24:00	---	0.49	P	C	11.1	79	7.44	---	SNWA
		5/26/2009	15:00:00	---	0.66	P	C	15.4	74	6.73	---	SNWA
		7/9/2009	8:47:00	---	1.2	P	C	13.9	81	6.70	---	SNWA
		8/19/2009	11:39:00	---	0.64	P	C	14.1	84	6.60	---	SNWA
		11/19/2009	9:00:00	---	0.51	P	C	10.6	73	6.85	---	SNWA
1847201	Minerva Spring	2/2/2009	13:40:00	---	0.58	P	---	6.1	360	7.68	---	SNWA
		4/14/2009	10:43:00	---	0.54	P	C	5.5	349	7.42	---	SNWA
		7/6/2009	17:45:00	---	2.2	P	C	16.3	323	7.33	---	SNWA
		8/19/2009	15:21:00	---	3.2	P	---	18.7	175	7.74	---	SNWA
		2/5/2009	12:30:00	---	0.035	E	F	12.5	670	7.93	---	SNWA
1847301	Rock Spring	4/13/2009	17:06:00	---	0.036	G	F	13.6	651	---	---	SNWA
		6/1/2009	17:57:00	---	0.031	E	F	---	---	---	---	SNWA
		7/6/2009	14:36:00	---	0.031	G	F	24.1	584	7.81	---	SNWA
		9/16/2009	11:00:00	---	0.022	G	F	18.4	545	7.42	---	SNWA
		11/18/2009	13:17:00	---	0.031	E	F	---	---	---	---	SNWA
1848001	Turnley Spring	11/23/2009	8:00:00	---	0.031	E	F	---	---	---	---	SNWA
		2/5/2009	12:25:00	---	0.16	E	F	---	---	---	---	SNWA
		4/13/2009	14:07:00	---	0.13	G	F	11.8	565	6.03	---	SNWA
		6/3/2009	10:50:00	---	0.13	G	F	---	---	---	---	SNWA
		7/7/2009	9:29:00	---	0.13	E	F	11.5	557	6.97	---	SNWA
		8/24/2009	15:12:00	---	0.095	E	F	12.2	511	6.91	---	SNWA
		10/6/2009	8:36:00	---	0.075	G	F	11.6	612	6.84	---	SNWA
		11/18/2009	9:00:00	---	0.095	E	F	11.2	600	7.16	---	SNWA

^aDischarge is reported in cfs for values >0.01 and in gpm for values <0.01 cfs.

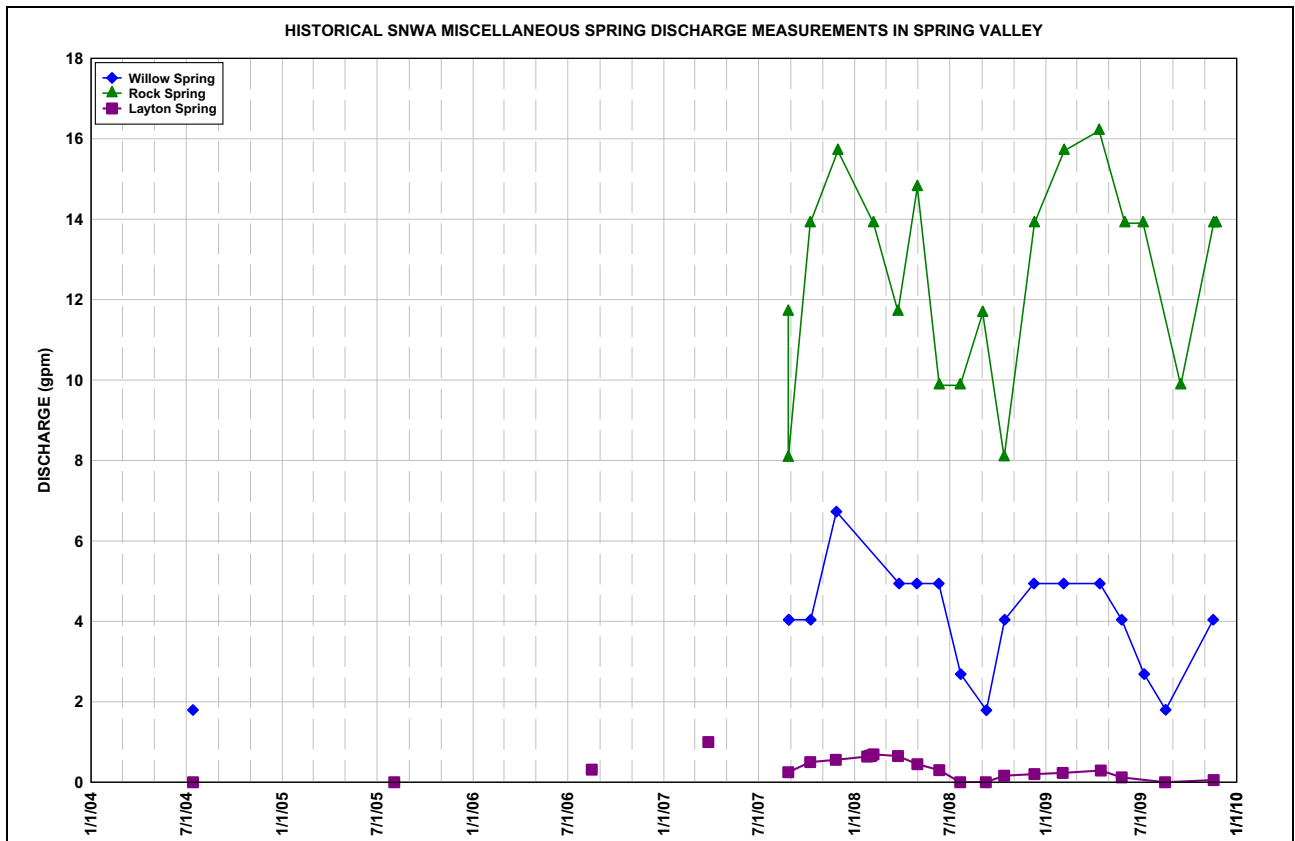
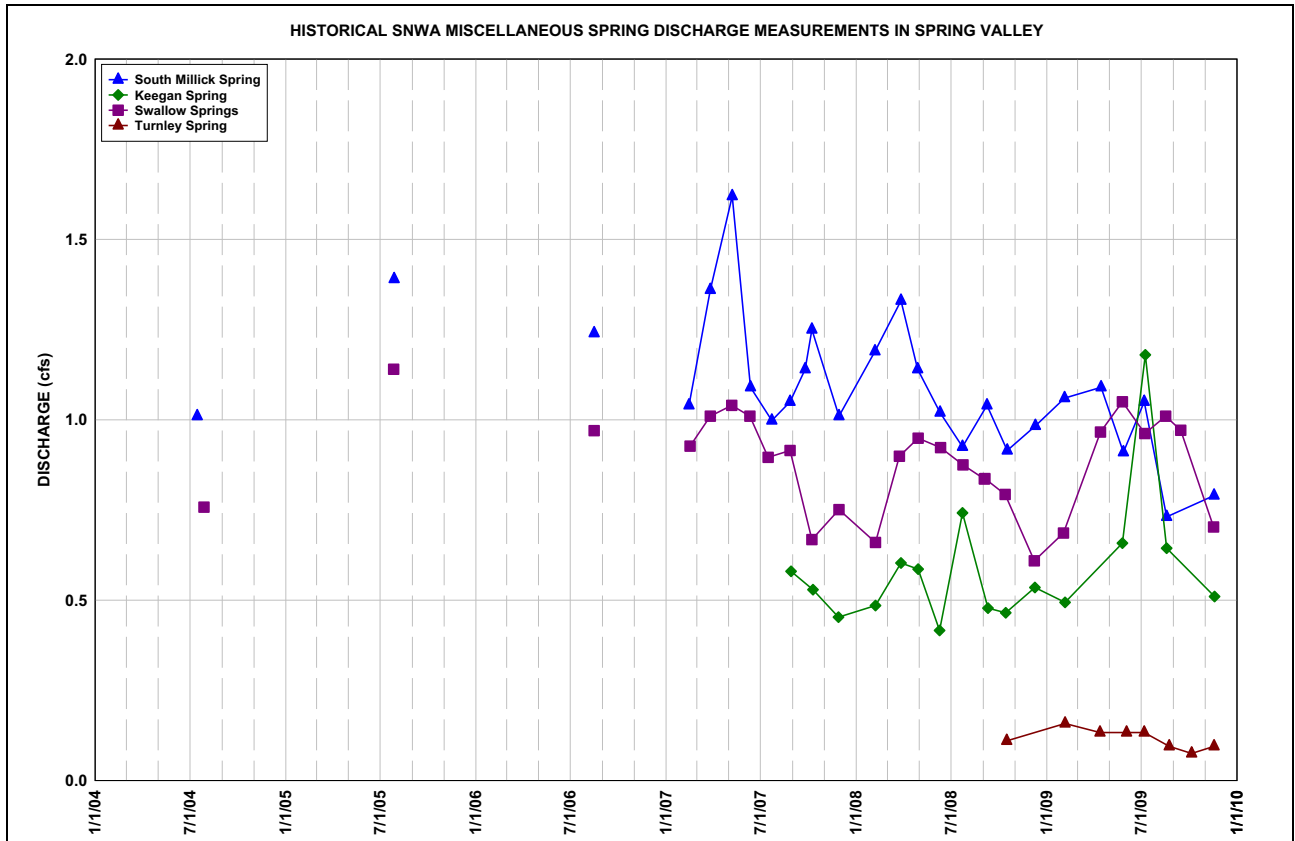
^bMeasurement Rating: E = Excellent; G = Good; F = Fair; P = Poor

^cMeasurement Method: C = Current meter; O = Other; V = Volumetric; F = Flume

^dNo discharge flows away from the Blind Spring pool.

Note: Minerva Spring Discharge is controlled by reservoir level and irrigation practices. Discharge is total of all channels. The Seep was observed to be dry in September, 2009.

2009 Spring Valley Hydrologic Monitoring and Mitigation Plan Status and Data Report

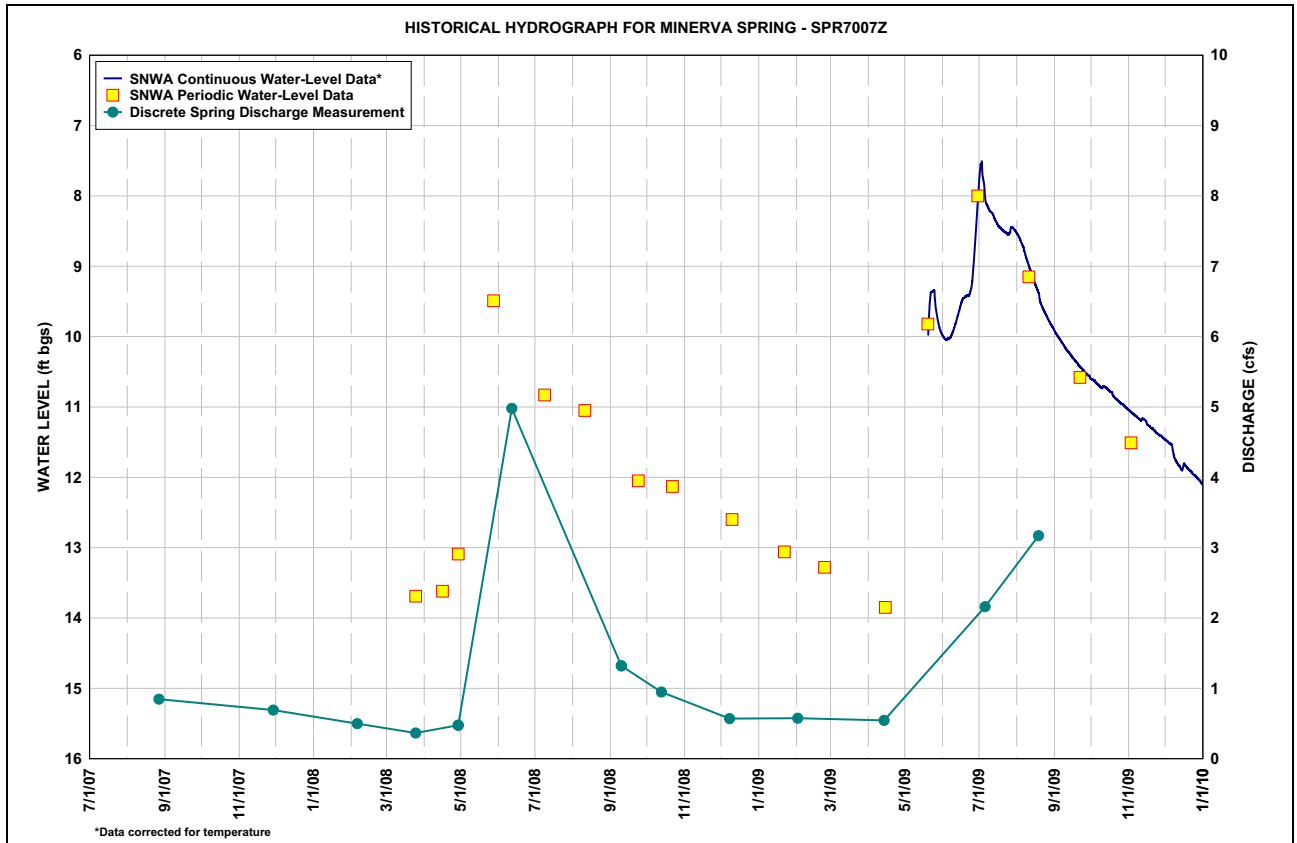




**Table D-2
Well SPR7007Z, Calendar Year 2009
Water-Level Data, Daily Mean Values**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	---	---	---	---	---	9.99	7.71	8.54	9.93	10.60	11.05	11.47
2	---	---	---	---	---	10.02	7.56	8.57	9.96	10.61	11.07	11.48
3	---	---	---	---	---	10.04	7.59	8.61	9.99	10.62	11.08	11.50
4	---	---	---	---	---	10.04	7.76	8.65	10.01	10.64	11.10	11.51
5	---	---	---	---	---	10.03	7.90	8.69	10.04	10.66	11.11	11.52
6	---	---	---	---	---	10.03	8.07	8.73	10.06	10.68	11.12	11.54
7	---	---	---	---	---	10.01	8.12	8.80	10.09	10.69	11.14	11.63
8	---	---	---	---	---	9.98	8.16	8.86	10.12	10.71	11.15	11.71
9	---	---	---	---	---	9.93	8.20	8.91	10.15	10.72	11.17	11.75
10	---	---	---	---	---	9.88	8.22	8.97	10.17	10.72	11.18	11.78
11	---	---	---	---	---	9.83	8.24	9.02	10.20	10.71	11.19	11.81
12	---	---	---	---	---	9.77	8.26	9.06	10.22	10.72	11.17	11.84
13	---	---	---	---	---	9.71	8.31	9.11	10.24	10.73	11.17	11.86
14	---	---	---	---	---	9.65	8.35	9.16	10.26	10.75	11.19	11.89
15	---	---	---	---	---	9.58	8.38	9.22	10.29	10.76	11.21	11.88
16	---	---	---	---	---	9.52	8.41	9.27	10.31	10.78	11.25	11.81
17	---	---	---	---	---	9.47	8.44	9.31	10.33	10.79	11.27	11.83
18	---	---	---	---	---	9.45	8.45	9.36	10.35	10.81	11.28	11.85
19	---	---	---	---	---	9.44	8.47	9.42	10.37	10.85	11.30	11.87
20	---	---	---	---	---	9.42	8.49	9.51	10.39	10.87	11.31	11.89
21	---	---	---	---	9.54	9.42	8.50	9.56	10.42	10.88	11.32	11.91
22	---	---	---	---	9.38	9.42	8.51	9.60	10.44	10.90	11.34	11.92
23	---	---	---	---	9.36	9.38	8.53	9.63	10.46	10.91	11.36	11.95
24	---	---	---	---	9.35	9.32	8.54	9.67	10.47	10.93	11.37	11.96
25	---	---	---	---	9.40	9.20	8.54	9.70	10.49	10.95	11.39	11.97
26	---	---	---	---	9.59	8.99	8.51	9.74	10.51	10.96	11.40	11.99
27	---	---	---	---	9.70	8.75	8.45	9.77	10.53	10.97	11.41	12.01
28	---	---	---	---	9.79	8.50	8.45	9.81	10.55	10.98	11.43	12.03
29	---	---	---	---	9.87	8.22	8.47	9.84	10.56	11.00	11.44	12.05
30	---	---	---	---	9.92	7.95	8.49	9.86	10.59	11.02	11.46	12.07
31	---	---	---	---	9.96	---	8.51	9.90	---	11.03	---	12.09
Max	---	---	---	---	9.96	10.04	8.54	9.90	10.59	11.03	11.46	12.09
Min	---	---	---	---	9.35	7.95	7.56	8.54	9.93	10.60	11.05	11.47

Year 2009 Statistics: Year Max 12.09; Year Min 7.56
Note: Depth in ft bgs





This Page Left Intentionally Blank

Appendix E

SNWA and USGS Discharge Measurements and Hydrographs for Cleve Creek and Big Springs Creek

**Table E-1
Big Springs Creek near Baker, Nevada (Combined Discharge)**

SNWA Station Number	USGS Station Number	Station Name	Date	Time	Discharge (cfs)	Measurement Rated as: (E, G, F, P) ^a	Method ^b	Remarks	Data Source ^c
USGS Discharge Measurements at Big Springs Creek South Channel									
1951903	10243224	Big Springs Creek South Channel	1/8/2009	14:30	6.1	G	R	---	USGS-NWIS
			1/8/2009	14:40	6.1	G	R	---	USGS-NWIS
			2/5/2009	11:18	5.8	F	R	---	USGS-NWIS
			3/19/2009	11:31	6.1	F	R	---	USGS-NWIS
			5/13/2009	11:54	5.6	G	R	---	USGS-NWIS
			7/7/2009	9:15	5.2	F	R	---	USGS-NWIS
			8/26/2009	9:47	6.1	F	R	---	USGS-NWIS
			10/20/2009	9:56	6.1	F	R	---	USGS-NWIS
			12/1/2009	10:52	5.8	G	R	---	USGS-NWIS
			12/3/2009	10:07	5.5	F	R	---	USGS-NWIS
USGS Discharge Measurements at Big Springs Creek North Channel									
1951904	10243224	Big Springs Creek North Channel	1/8/2009	15:45	4.0	F	R	---	USGS-NWIS
			2/5/2009	12:25	3.6	F	R	---	USGS-NWIS
			2/5/2009	13:00	3.8	F	R	---	USGS-NWIS
			3/19/2009	12:14	3.4	G	R	---	USGS-NWIS
			3/19/2009	12:54	3.2	F	R	---	USGS-NWIS
			5/13/2009	12:40	4.0	F	R	---	USGS-NWIS
			5/13/2009	13:20	3.8	F	R	---	USGS-NWIS
			7/7/2009	10:05	4.1	P	R	---	USGS-NWIS
			7/28/2009	9:10	3.6	F	R	---	USGS-NWIS
			8/26/2009	11:01	3.4	F	R	---	USGS-NWIS
			10/20/2009	10:45	3.6	F	R	---	USGS-NWIS
			12/1/2009	11:42	3.3	F	R	---	USGS-NWIS
SNWA Discharge Measurements at Big Springs Creek (Combined Discharge of North and South Channels)									
1951901	---	Big Springs Creek near Baker, NV (Combined Discharge)	4/20/2009	13:48	8.8	F	C	South channel discharge = 5.37 cfs North channel discharge = 3.47 cfs	SNWA
			6/1/2009	14:07	9.0	P	C	South channel discharge = 5.75 cfs North channel discharge = 3.29 cfs	SNWA
			7/15/2009	12:44	9.0	P	C	South channel discharge = 5.59 cfs North channel discharge = 3.44 cfs	SNWA
			8/26/2009	12:56	9.1	F	C	South channel discharge = 5.72 cfs North channel discharge = 3.39 cfs	SNWA

^aMeasurement Rating: E = Excellent; G = Good; F = Fair; P = Poor

^bMeasurement Method: R = Reported; C = Current meter

^cUSGS-NWIS data are provisional.

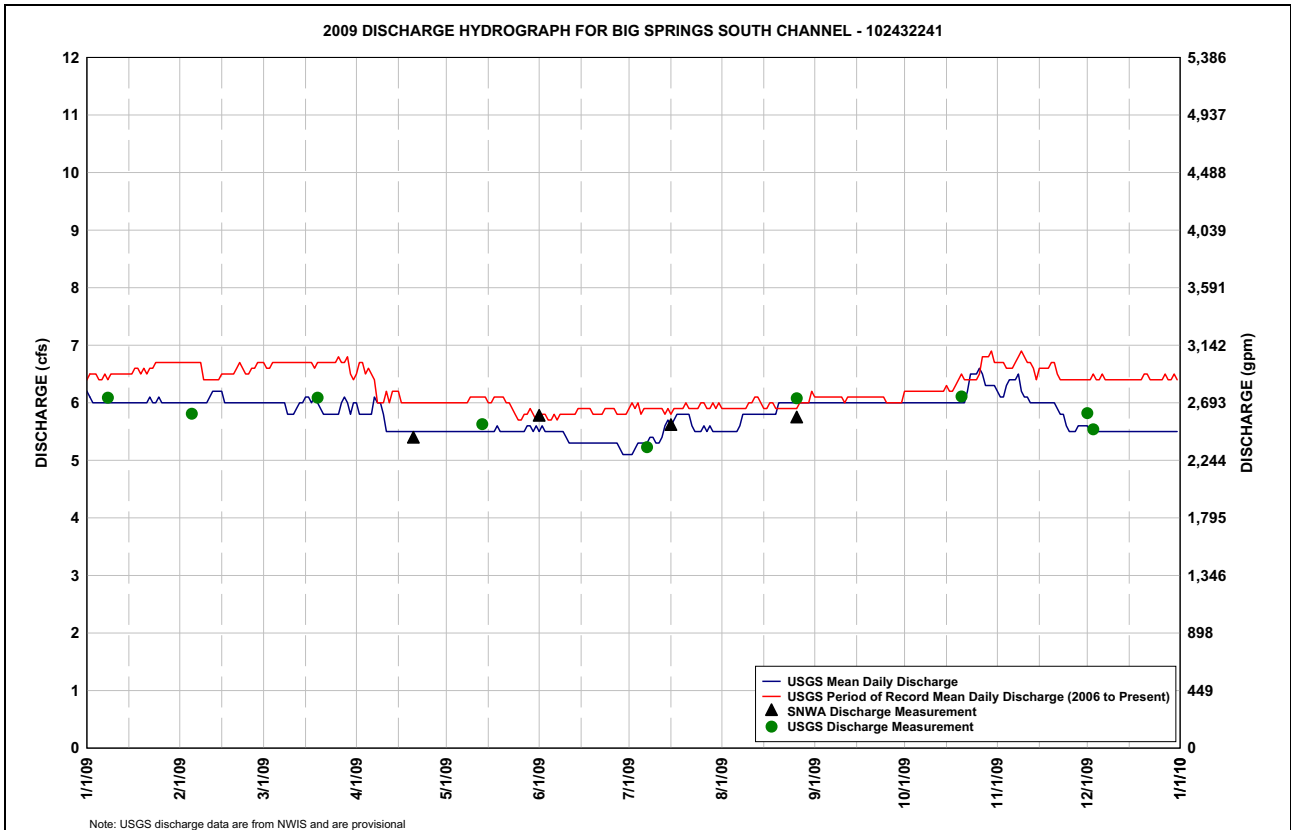
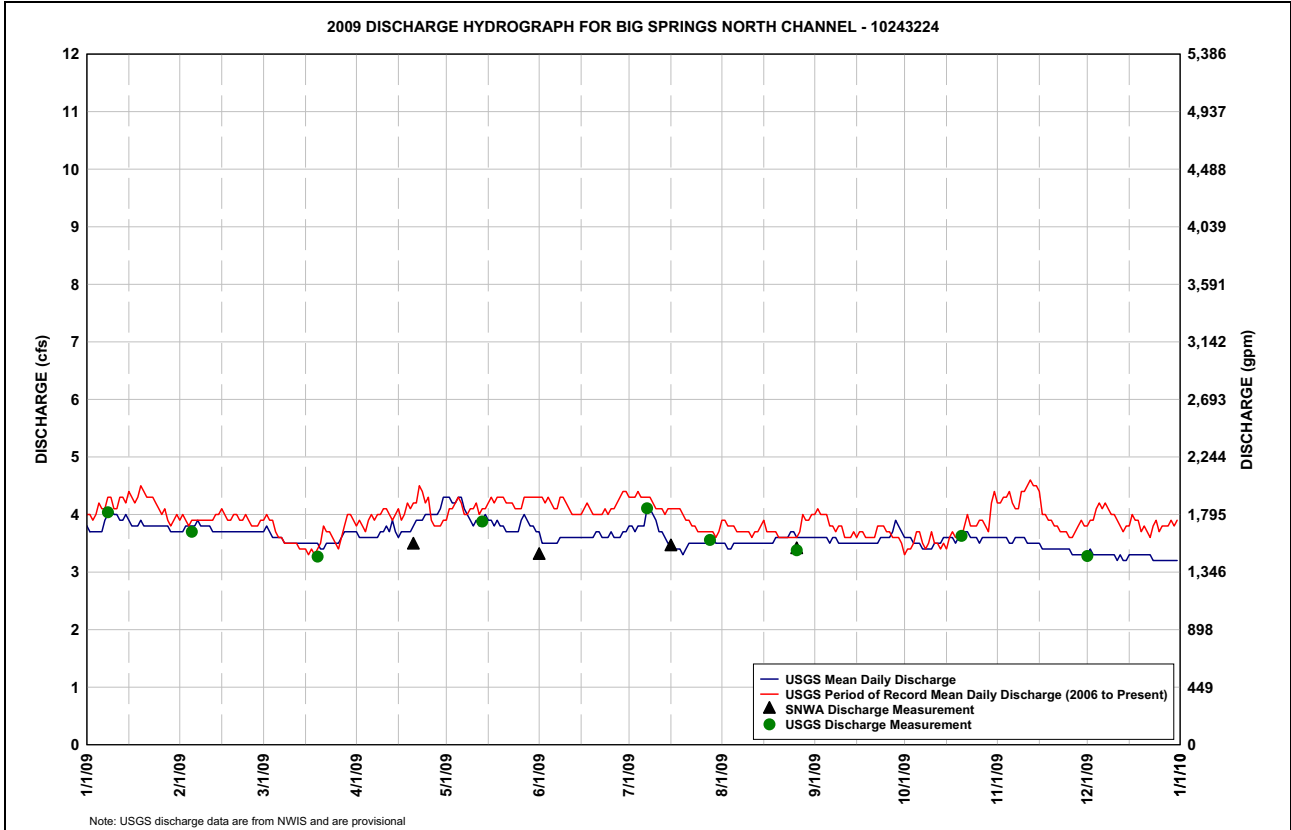


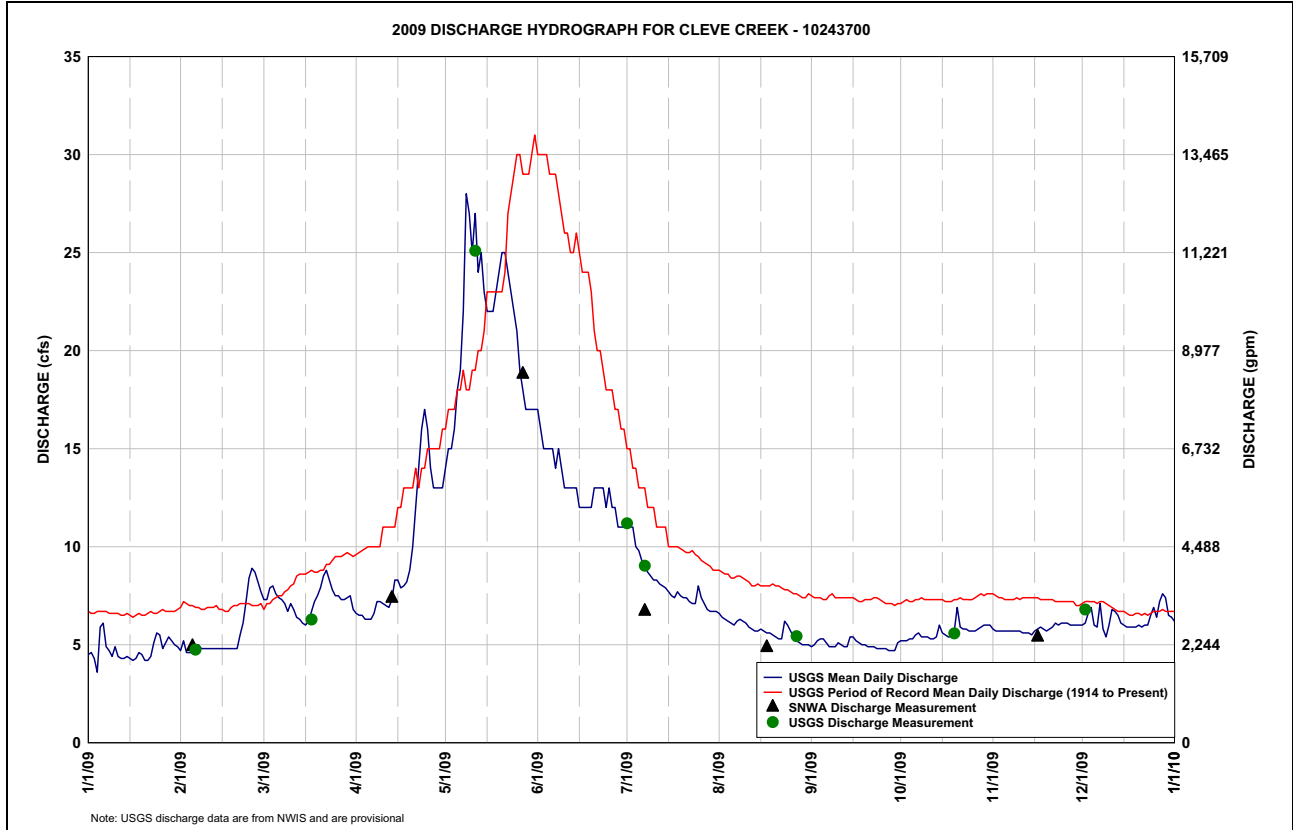
Table E-2
10243700-Cleve Creek near Ely, Nevada (Discharge Measurements)

SNWA Station Number	USGS Station Number	Station Name	Date	Time	Discharge (cfs)	Measurement Rated as: (E, G, F, P) ^a	Method ^b	Remarks	Data Source ^c
1841611	10243700	Cleve Creek near Ely, NV	2/5/2009	8:34	4.9	G	C	---	SNWA
			2/6/2009	11:27	4.8	F	R	---	USGS-NWIS
			3/17/2009	12:43	6.5	---	R	---	USGS-NWIS
			3/17/2009	13:35	6.1	F	R	---	USGS-NWIS
			4/13/2009	15:55	7.4	F	C	---	SNWA
			5/11/2009	14:21	25	F	R	---	USGS-NWIS
			5/11/2009	15:15	26	F	R	---	USGS-NWIS
			5/27/2009	11:12	19	F	C	---	SNWA
			7/1/2009	14:25	10	F	R	---	USGS-NWIS
			7/1/2009	15:00	12	F	R	---	USGS-NWIS
			7/7/2009	13:11	9.2	F	R	---	USGS-NWIS
			7/7/2009	13:53	8.9	P	R	---	USGS-NWIS
			7/7/2009	18:22	6.7	P	C	---	SNWA
			8/17/2009	17:11	4.9	F	C	---	SNWA
			8/27/2009	10:55	5.7	G	R	---	USGS-NWIS
			8/27/2009	12:08	5.2	P	R	---	USGS-NWIS
			10/19/2009	14:04	5.6	G	R	---	USGS-NWIS
			11/16/2009	15:43	5.4	P	C	---	SNWA
12/2/2009	11:52	6.8	F	R	---	USGS-NWIS			

^aMeasurement Rating: E = Excellent; G = Good; F = Fair; P = Poor

^bMeasurement Method: C = Current meter; R = Reported

^cUSGS-NWIS data are provisional (USGS, 2010).



References

U.S. Geological Survey, 2010, National Water Information System (NWIS-Web) [Internet]: [accessed January, 2010], available at <http://waterdata.usgs.gov/nwis/>.

USGS, see U.S. Geological Survey.



This Page Left Intentionally Blank

Appendix F

Regional and High-Altitude Precipitation Data

**Table F-1
2009 Regional Precipitation Data**

Data Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ely WBO, NV													
2009 Data	1.49	0.54	0.65	1.18	0.33	1.78	0.92	0.33	0.37	1.45	0.98	0.43	10.02
Period of Record Statistics (1893 to Present)													
Mean	0.77	0.78	1.02	1.02	1.09	0.66	0.62	0.81	0.75	0.81	0.69	0.65	9.54
S.D.	0.56	0.64	0.75	0.82	0.90	0.75	0.55	0.73	0.83	0.66	0.53	0.56	2.88
Skew	0.95	1.77	1.38	2.27	1.03	1.71	1.02	1.09	2.35	1.48	0.92	1.59	0.34
Max	2.50	3.75	4.30	5.52	3.55	3.53	2.30	3.00	4.99	3.67	2.40	3.15	16.16
Min	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.22
No. Yrs	87	87	87	87	87	85	86	88	87	86	85	84	77
McGill, NV													
2009 Data	1.70	0.63	0.93	1.56	0.65	1.98	1.74	0.56	0.68	1.32	0.01	4.70	11.76
Period of Record Statistics (1892 to Present)													
Mean	0.63	0.65	0.75	0.94	1.01	0.77	0.69	0.77	0.67	0.79	0.55	0.56	8.81
S.D.	0.62	0.50	0.54	0.64	0.83	0.88	0.63	0.66	0.78	0.64	0.46	0.49	2.51
Skew	3.09	1.21	1.18	0.81	1.06	1.71	1.16	1.24	2.88	0.97	1.09	1.16	0.53
Max	4.58	2.38	2.54	3.19	3.33	4.30	3.03	3.25	5.57	3.38	1.90	2.10	16.21
Min	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.76
No. Yrs	100	101	102	103	101	102	101	100	100	98	101	101	88
Great Basin National Park, NV													
2009 Data	1.75	2.90	0.88	1.96	1.31	1.51	1.78	1.43	0.84	1.34	0.03	0.60	13.95
Period of Record Statistics (1948 to Present)													
Mean	1.05	1.15	1.40	1.18	1.24	0.91	0.95	1.20	1.08	1.23	0.96	0.91	13.21
S.D.	0.90	0.83	1.00	0.85	0.98	0.89	0.78	0.91	1.02	0.97	0.85	0.81	3.10
Skew	1.20	0.86	1.17	0.61	1.18	1.40	1.15	1.54	2.20	1.49	0.90	1.45	0.08
Max	3.78	3.59	4.96	3.02	4.74	3.73	3.90	5.10	6.02	5.22	3.40	3.45	21.20
Min	0.03	0.09	0.00	0.03	0.00	0.00	0.01	0.02	0.00	0.00	0.00	0.00	7.37
No. Yrs	58	58	58	60	60	58	60	60	61	61	60	58	53
Eskdale													
2009 Data	0.52	0.70	0.10	1.67	0.07	1.86	0.21	0.00z	0.41	0.00	0.00z	0.00z	5.54
Period of Record Statistics (1966 to Present)													
Mean	0.27	0.42	0.63	0.67	0.64	0.64	0.52	0.55	0.65	0.63	0.37	0.29	6.34
S.D.	0.32	0.47	0.53	0.60	0.70	0.67	0.63	0.53	0.65	0.61	0.34	0.43	2.32
Skew	2.87	2.30	0.88	0.99	2.09	1.04	2.25	1.74	2.32	1.06	1.00	3.89	0.62
Max	1.77	2.38	2.03	2.21	3.35	2.32	3.26	2.40	3.57	2.24	1.40	2.57	12.57
Min	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.18
No. Yrs	41	42	40	43	43	44	43	43	42	44	41	40	29

Precipitation data in inches.

Notes: Provisional Data: z = 26 or more days missing.

Long-term means based on columns; thus, the monthly row may not sum (or average) to the long-term annual value.

Individual Months not used for annual or monthly statistics if more than 5 days are missing.

Individual Years not used for annual statistics if any month in that year has more than 5 days missing.



**Table F-2
Recent (2005 – 2008) High-Altitude Precipitation Data**

Station Name	USGS Site ID	Date	Precipitation (in.)	Comments
Mt. Washington	385409114185401	7/12/2005	46	Took samples from gage and bucket.
		11/2/2005	6	Replaced isotope collection bucket.
		7/5/2006	17.5	---
		7/6/2006	0	Sampled tube - added 2 gal antifreeze to precipitation drained and filled bucket and tube.
		10/19/2006	7	Drained, add 1 gal antifreeze.
		6/5/2007	13.0	Drained, no antifreeze added, will add antifreeze next visit.
		10/24/2007	2.75	Added 1 gal of antifreeze and 3/4 gal oil.
		6/5/2008	12.5	Drained and added one gal antifreeze.
		10/15/2008	4.50	2 samples taken.
Unnamed Peak NW of Mt. Moriah	391913114143101	7/20/2005	22	---
		11/7/2005	6.5	Drained, added 1 gal antifreeze.
		6/23/2006	11.75	---
		10/19/2006	3.5	Drained added antifreeze.
		6/13/2007	10.75	Drained added 1 gal antifreeze.
		10/23/2007	1.25	Did not drain. Added 1gal antifreeze.
		6/5/2008	9.5	Drained. Added 1 gal antifreeze.
Cave Mountain	39094611364901	7/20/2005	15.25	---
		11/7/2005	3.25	Drained, added 1 gal antifreeze.
		6/23/2006	18.75	---
		10/19/2006	4.25	Raised wind baffle to just above top of collector, tightened guide wires. Drained - added antifreeze.
		6/13/2007	12	Drained and added 1 gal of antifreeze.
		10/23/2007	3.75	Did not drain. Added 1gal antifreeze.
		6/5/2008	8.5	Drain. Added 1 gal antifreeze.
10/14/2008	4.25	Added 1 gal antifreeze.		

Note: 2009 USGS data not released at the time of the printing of this report.