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Groundwater Level Status Report for 2009
Los Alamos National Laboratory

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Progress Report
Issued: March 2010

Groundwater Level Status Report for 2009 Los Alamos National Laboratory

Richard J. Koch
Sarah Schmeer

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Contents

ABSTRACT **1**

1.0 INTRODUCTION **1**

2.0 DESCRIPTION OF GROUNDWATER LEVEL DATA **1**

3.0 GROUNDWATER LEVEL DATA FROM REGIONAL AQUIFER WELLS **3**

3.1 CDV-R-15-3 6
3.2 CDV-R-37-2 8
3.3 R-1 9
3.4 R-2 10
3.5 R-4 11
3.6 R-5 12
3.7 R-6 14
3.8 R-7 15
3.9 R-8 17
3.10 R-9 18
3.11 R-10 19
3.12 R-10A 20
3.13 R-11 21
3.14 R-12 (REGIONAL) 22
3.15 R-13 23
3.16 R-14 24
3.17 R-15 25
3.18 R-16 26
3.19 R-16R 28
3.20 R-17 29
3.21 R-18 30
3.22 R-19 31
3.23 R-20 33
3.24 R-21 35
3.25 R-22 36
3.26 R-23 38
3.27 R-24 39
3.28 R-25 40
3.29 R-26 44
3.30 R-27 46
3.31 R-28 47
3.32 R-31 48
3.33 R-32 49
3.34 R-33 51
3.35 R-34 52
3.36 R-35A 53
3.37 R-35B 54
3.38 R-36 55
3.39 R-37 56
3.40 R-38 58
3.41 R-39 59
3.42 R-40 60
3.43 R-41 62
3.44 R-42 63
3.45 R-43 64
3.46 R-44 65
3.47 R-45 66
3.48 R-46 67

3.49 R-48 68
3.50 R-49 69
3.51 TEST WELL 1 70
3.52 TEST WELL 2 71
3.53 TEST WELL 3 72
3.54 TEST WELL 4 73
3.55 TEST WELL 8 74
3.56 TEST WELL DT-5A 75
3.57 TEST WELL DT-9 76
3.58 TEST WELL DT-10 77

4.0 GROUNDWATER LEVEL DATA FROM INTERMEDIATE WELLS 78

4.1 03-B-9 83
4.2 03-B-10 84
4.3 03-B-13 85
4.4 16-26644 86
4.5 90LP-SE-16-02669 87
4.6 CDV-16-1(I) 88
4.7 CDV-16-2(I)R 89
4.8 CDV-16-3(I) 90
4.9 CDV-37-1(I) 91
4.10 LADP-3 92
4.11 LAOI(A)-1.1 93
4.12 LAOI-3.2 94
4.13 LAOI-3.2A 95
4.14 LAOI-7 96
4.15 MCOBT-4.4 97
4.16 MCOI-1 98
4.17 MCOI-4 99
4.18 MCOI-5 100
4.19 MCOI-6 101
4.20 MCOI-8 102
4.21 MSC-16-02665 103
4.22 PCI-2 104
4.23 POI-4 105
4.24 R-3I 106
4.25 R-6I 107
4.26 R-9I 108
4.27 R-12 (INTERMEDIATE) 109
4.28 R-23I 110
4.29 R-25B 112
4.30 R-25C 113
4.31 R-26 PZ-2 114
4.32 R-27I 115
4.33 SCI-1 116
4.34 SCI-2 117
4.35 TA-53I 118
4.36 TEST WELL 1A 119
4.37 TEST WELL 2A 120

5.0 GROUNDWATER LEVEL DATA FROM ALLUVIAL WELLS 121

5.1 18-BG-1 125
5.2 18-BG-4 126
5.3 18-MW-7 127
5.4 18-MW-8 128
5.5 18-MW-9 129

5.6 18-MW-11 130
5.7 18-MW-17 131
5.8 18-MW-18 132
5.9 3MAO-2 133
5.10 39-UM-3 134
5.11 39-DM-6 135
5.12 APCO-1 136
5.13 CDBO-1 137
5.14 CDBO-2 138
5.15 CDBO-3 139
5.16 CDBO-4 140
5.17 CDBO-5 141
5.18 CDBO-6 142
5.19 CDBO-7 143
5.20 CDBO-8 144
5.21 CDBO-9 145
5.22 CDV-16-02655 146
5.23 CDV-16-02656 147
5.24 CDV-16-02657 148
5.25 CDV-16-02658 149
5.26 CDV-16-02659 150
5.27 FCO-1 151
5.28 FLC-16-25278 152
5.29 FLC-16-25279 153
5.30 FLC-16-25280 154
5.31 LAO-B 155
5.32 LAO-0.3 156
5.33 LAO-0.6 157
5.34 LAO-0.91 158
5.35 LAO-1 159
5.36 LAO-1.6G 160
5.37 LAO-1.8 161
5.38 LAO-2 162
5.39 LAO-3A 163
5.40 LAO-4.5C 164
5.41 LAO-5 165
5.42 LAO-6 166
5.43 LAO-6A 167
5.44 LAUZ-1 168
5.45 LLAO-1B 169
5.46 LLAO-4 170
5.47 MCA-1 171
5.48 MCA-2 172
5.49 MCA-3AC & MCA-3B 173
5.50 MCA-3DEF 174
5.51 MCA-4 175
5.52 MCA-5 176
5.53 MCA-8 177
5.54 MCA-9 178
5.55 MCO-0.6 179
5.56 MCO-2 180
5.57 MCO-3 181
5.58 MCO-4B 182
5.59 MCO-5 183
5.60 MCO-6 184
5.61 MCO-7 185

5.62 MCO-7.5 186
5.63 MCWB-5 187
5.64 MCWB-5.5B 188
5.65 MCWB-6.2A 189
5.66 MCWB-6.5E 190
5.67 MCWB-7A 191
5.68 MCWB-7.4B 192
5.69 MCWB-7.7B 193
5.70 MSC-16-06293 194
5.71 MSC-16-06294 195
5.72 MSC-16-06295 196
5.73 MT-1 197
5.74 MT-2 198
5.75 MT-3 199
5.76 MT-4 200
5.77 PAO-1 201
5.78 PAO-2 202
5.79 PAO-4 203
5.80 PCAO-5 204
5.81 PCAO-6 205
5.82 PCAO-7A 206
5.83 PCAO-7B1 207
5.84 PCAO-7B2 208
5.85 PCAO-7C 209
5.86 PCAO-8 210
5.87 PCAO-9 211
5.88 PCO-1 212
5.89 PCO-2 213
5.90 PCO-3 214
5.91 SCA-1 AND SCA-1-DP 215
5.92 SCA-2 216
5.93 SCA-3 217
5.94 SCA-4 218
5.95 SCA-5 219
5.96 SCO-1 220
5.97 SCO-2 221
5.98 SCP-1ABC 222
5.99 SCP-2A 223
5.100 SCP-2B 224
5.101 TMO-1 225
5.102 TSCA-6 226
5.103 TSWB-6 227
5.104 WCO-1 228
5.105 WCO-2 229
5.106 WCO-3 230

6.0 GROUNDWATER LEVEL DATA FROM WATER SUPPLY WELLS 231

6.1 G-1A 232
6.2 G-2A 233
6.3 G-3 234
6.4 G-3A 235
6.5 G-4A 236
6.6 G-5A 237
6.7 O-1 238
6.8 O-4 239
6.9 PM-1 240

6.10 PM-2 241
6.11 PM-3 242
6.12 PM-4 243
6.13 PM-5 244

7.0 ACKNOWLEDGMENTS 245

8.0 REFERENCES AND BIBLIOGRAPHY 245

APPENDIX A. GEOLOGIC UNIT CODES 251

APPENDIX B. MEAN ANNUAL WATER LEVEL DATA 253

APPENDIX C. SUMMARY OF TRANSIENT RESPONSES 255

APPENDIX D. SUMMARY OF INTERMEDIATE GROUNDWATER LEVEL RESPONSES TO RUNOFF 257

D.1. INTERMEDIATE GROUNDWATER RESPONSES IN CERROS DEL RIO BASALT (TB4) 257
D.2. INTERMEDIATE GROUNDWATER IN GUAJE PUMICE BED (QBOG) 259
D.3. INTERMEDIATE GROUNDWATER IN THE PUYE FORMATION (TP) 260
D.4. INTERMEDIATE GROUNDWATER AT TA-16 260
D.5. SUMMARY OF RUNOFF IMPACTS TO INTERMEDIATE PERCHED GROUNDWATER 262

APPENDIX E. SUMMARY OF REGIONAL AND INTERMEDIATE GROUNDWATER TEMPERATURE 263

List of Figures

Figure 3-1. Regional aquifer monitoring wells and supply wells. 4
Figure 4-1. Intermediate monitoring wells. 80
Figure 5-1. Alluvial wells monitored for groundwater levels in 2009. 124
Figure D-1. Intermediate groundwater levels in Cerros del Rio basalt. 257
Figure D-2. Intermediate groundwater levels in Cerros del Rio basalt in Los Alamos and Pueblo canyons and mean daily flow at Gaging Station E042. 258
Figure D-3. Intermediate groundwater responses to snowmelt runoff in 2008 and 2009 in Cerros del Rio basalt and mean daily flow at Gaging Station E042. 258
Figure D-4. Intermediate groundwater levels at R-12 and R-23i and mean daily flow at Gaging Stations E042 and E250. 259
Figure D-5. Intermediate groundwater levels in the Guaje pumice bed at LAOI(A)-1.1, LADP-3, and LAOI-3.2 and mean daily flow at Gaging Station E042. 260
Figure D-6. Intermediate groundwater levels in TA-16 wells and mean daily flow at Gaging Station E252. 261
Figure E-1. Temperature of groundwater at the top of the regional aquifer. 264
Figure E-2. Temperature of intermediate groundwater. 265

List of Tables

Table 3-1. Location Information for Regional Aquifer Monitoring Wells 5
Table 4-1. General Information for Intermediate Wells at LANL 79
Table 4-2. Well Completion Information for Intermediate Wells and Screens 81
Table 5-1. Information and Location Data for Alluvial Aquifer Wells at LANL 121
Table 6-1. General Information for Los Alamos County Water Supply Wells 231
Table A-1. Geologic Unit Codes 251
Table B-1. Mean Annual Groundwater Levels at the Top of the Regional Aquifer in 2009 253
Table B-2. Mean Annual Groundwater Levels in Intermediate Wells in 2009 254
Table C-1. Summary of Transient Responses to Supply Well Pumping in LANL Monitoring Wells 255
Table E-1. Groundwater Temperature in Regional Aquifer and Intermediate Groundwater Wells 263

Groundwater Level Status Report for 2009
Los Alamos National Laboratory

by

Richard J. Koch and Sarah Schmeer

Abstract

The status of groundwater level monitoring at Los Alamos National Laboratory in 2009 is provided in this report. This report summarizes groundwater level data for 179 monitoring wells, including 55 regional aquifer wells (including 11 regional/intermediate wells), 26 intermediate wells, 98 alluvial wells, and 12 water supply wells. Pressure transducers were installed in 161 monitoring wells for continuous monitoring of groundwater levels. Time-series hydrographs of groundwater level data are presented along with pertinent construction and location information for each well. The report also summarizes the groundwater temperatures recorded in intermediate and regional aquifer monitoring wells.

1.0 Introduction

This report presents and describes groundwater level data obtained by Los Alamos National Laboratory (LANL) during Fiscal Year (FY) 2009 to provide regulatory compliance and to provide other programs at LANL with groundwater level data as a resource for groundwater modeling and data assessment. The Groundwater Level Monitoring (GWLM) Project was instituted in 2005 to meet New Mexico Environment Department Compliance Order on Consent (Consent Order) requirements to collect groundwater level data.

During 2009, 55 regional aquifer monitoring wells containing 85 regional aquifer screens, 26 intermediate wells and 11 intermediate/regional monitoring wells comprising 51 intermediate screens, 98 alluvial wells, and 12 Los Alamos County (LAC) water supply wells were monitored for groundwater levels. Seven of the multiple completion regional aquifer wells monitored one or more intermediate zones; however, at least one intermediate zone was dry in seven of these wells. Four of the multiple completion regional aquifer wells also monitored intermediate groundwater levels.

Pressure transducers were installed in 53 regional aquifer wells and 21 intermediate wells; periodic manual measurements were obtained from three intermediate wells, two of which are dry and are monitored quarterly or annually, and one of which has not yet had a transducer installed at one screen. Transducers were installed in 87 alluvial wells during 2009 and 11 alluvial wells were monitored with quarterly manual measurements. Transducers have been installed in all 12 LAC water supply wells through the cooperation and efforts of the LAC Utilities Department personnel.

This report includes groundwater level data obtained during FY 2009 (October 1, 2008, through September 30, 2009) and, where available, historical data. The groundwater level data are presented in time-series hydrographs to provide a comprehensive representation of the groundwater level characteristics, to the extent possible with available data. For the alluvial wells, the first hydrograph for each well represents the entire period of record, while the second hydrograph represents the most recent two or three years of data to provide better representation of recent and seasonal changes.

2.0 Description of Groundwater Level Data

The GWLM Project at LANL is conducted under the Quality Assurance Project Plan (QAPP) for Groundwater Level Monitoring (LANL 2006) to assure the quality of groundwater level data. The QAPP contains the work processes and the data quality objectives utilized in the GWLM Project.

Groundwater level data were collected during 2009 according to the criteria outlined in the 2009 Interim Facility-Wide Groundwater Monitoring Plan (LANL 2009). Two types of groundwater level data were collected:

- manual groundwater level measurements were obtained in monitoring wells and boreholes and
- pressure transducers were used to measure groundwater levels in monitoring wells.

Manual groundwater level measurements were obtained according to Environmental Program Directorate (EPD) standard operating procedure (SOP) 5223 (formerly ENV-SOP-202), *Manual Groundwater Level Measurements.* Transducer measurements were obtained according to EPD SOP 5227 (formerly ENV-SOP-201), *Pressure Transducer Installation, Removal, and Maintenance*, and EPD SOP 5226 (formerly ENV-WQH-SOP-064), *Westbay® Pressure Transducer Installation, Removal, and Maintenance*. Groundwater level data obtained both manually and with pressure transducers were reviewed and validated according to EPD SOP 5230 (formerly ENV-WQH-SOP-062), *Groundwater Level Data Processing, Review, and Validation*.

Wells installed with pressure transducers had measurements collected at least hourly. Where possible, manual groundwater level measurements were obtained at least semi-annually to provide quality control for the transducer measurements. In the following sections, both manual measurements and transducer measurements are shown on the time-series hydrographs. Because hourly transducer measurements are too voluminous to reproduce for most hydrographs, mean daily groundwater levels are shown on most hydrographs in this report. Some monitoring wells have significant drawdown when pumped during sampling events. Because pumping of the monitoring wells for sampling usually occurs over several hours, the mean daily water level value will not usually portray the full amount of drawdown experienced during pumping of a well. For this reason, mean daily water level data are not usually appropriate for determining well characteristics such as specific capacity, etc.

Transducers that measure pressure head in wells typically have a measurement precision of ±0.1% of the full-scale measurement capability. Thus, typical measurement accuracy for a 100-psi transducer is 0.23 ft, and for a 500-psi transducer is 1.2 ft. The higher-pressure-rated transducers are required in the deeper Westbay® installations where higher water pressures are encountered. Most shallow wells and deep wells not installed with the Westbay® sampling system are equipped with 30-psi transducers, with a measurement accuracy of 0.07 ft. A few of the shallow alluvial wells are equipped with 15-psi transducers. Manual groundwater level measurements typically have an accuracy of approximately 0.1 ft per 100 ft of measurement (0.1%).

From 2000 through 2004, groundwater level data obtained during groundwater sampling of Westbay® wells was from a 1000-psi-rated transducer that had an accuracy of about ±2.3 ft. In 2005 new sampling transducers with a 500-psi rating were obtained, which have an accuracy of about 1.2 ft. The higher accuracy of the new Westbay® sampling transducers is the cause for the apparent water level shift for sampling water levels in mid 2005, as observed on many of the accompanying hydrographs for Westbay® wells. Similarly, the apparent scatter of sampling water levels on hydrographs from Westbay® wells is the result of the higher-pressure-rated and less accurate transducers that are used for sampling.

In the following sections, acronyms used to describe groundwater level data include

GW	data obtained from transducers during groundwater sampling events
Trans	measurements from transducers installed in a well
MP	Measurement Port identification in multiple completion Westbay® wells
RT	Regional aquifer top screen
RD	Regional aquifer deeper screen
I	Intermediate perched groundwater

A Alluvial groundwater

Geologic unit codes used in the construction information tables are listed in Appendix A; Appendix B presents mean annual water level data; Appendix C summarizes transient responses to supply well pumping; Appendix D summarizes intermediate groundwater level responses to runoff; and groundwater temperature data are summarized for regional and intermediate wells in Appendix E.

Previous reports of groundwater level data at LANL were compiled for the regional aquifer test wells (TWs) by Koch et al. (2004) and for all wells in a submittal to the New Mexico Environment Department in January 2005 (LANL 2005). Groundwater levels in water supply wells at Los Alamos have been summarized in the series of water supply reports for Los Alamos, e.g., Koch and Rogers (2003). The previous reports in this series are as follows: *Groundwater Level Status Report for 2005,* issued in May 2006 (Allen and Koch 2006); *Groundwater Level Status Report for Fiscal Year 2006,* issued in March 2007 (Allen and Koch 2007); *Groundwater Level Status Report for Fiscal Year 2007,* issued in March 2008 (Allen and Koch 2008); and *Groundwater Level Status Report for 2008,* issued in March 2009 (Koch and Schmeer 2009).

3.0 Groundwater Level Data from Regional Aquifer Wells

Figure 3-1 shows the locations of the regional aquifer monitoring wells and water supply wells in the vicinity of LANL. Table 3-1 lists the regional aquifer monitoring wells that were monitored for groundwater levels in 2009. Screen intervals and port depths for each well are shown in subsequent sections.

The Appendix B table lists the mean annual water level for 2009 for each well screen located at the top of the regional aquifer. Figure 3-1 also shows the mean annual regional aquifer groundwater elevation for monitoring wells and the mean annual non-pumping water level for supply wells. Appendix C Table C-1 summarizes the transient responses observed in monitoring wells that result from supply well pumping at Los Alamos.

In the following sections reference is made to the barometric efficiency of some monitoring wells. Barometric efficiency is defined as the ratio of the water level change observed in a well divided by the concurrent atmospheric pressure change, expressed as a percentage. For a given change in atmospheric pressure, if the water in a well responds by an equal amount, the well is said to have 100% barometric efficiency; however, this type of response by the water in the well can occur only when the aquifer adjacent to the well does not experience the atmospheric pressure change. Thus, a well with a 100% barometric efficiency is installed into an aquifer that does not experience the atmospheric pressure fluctuations.

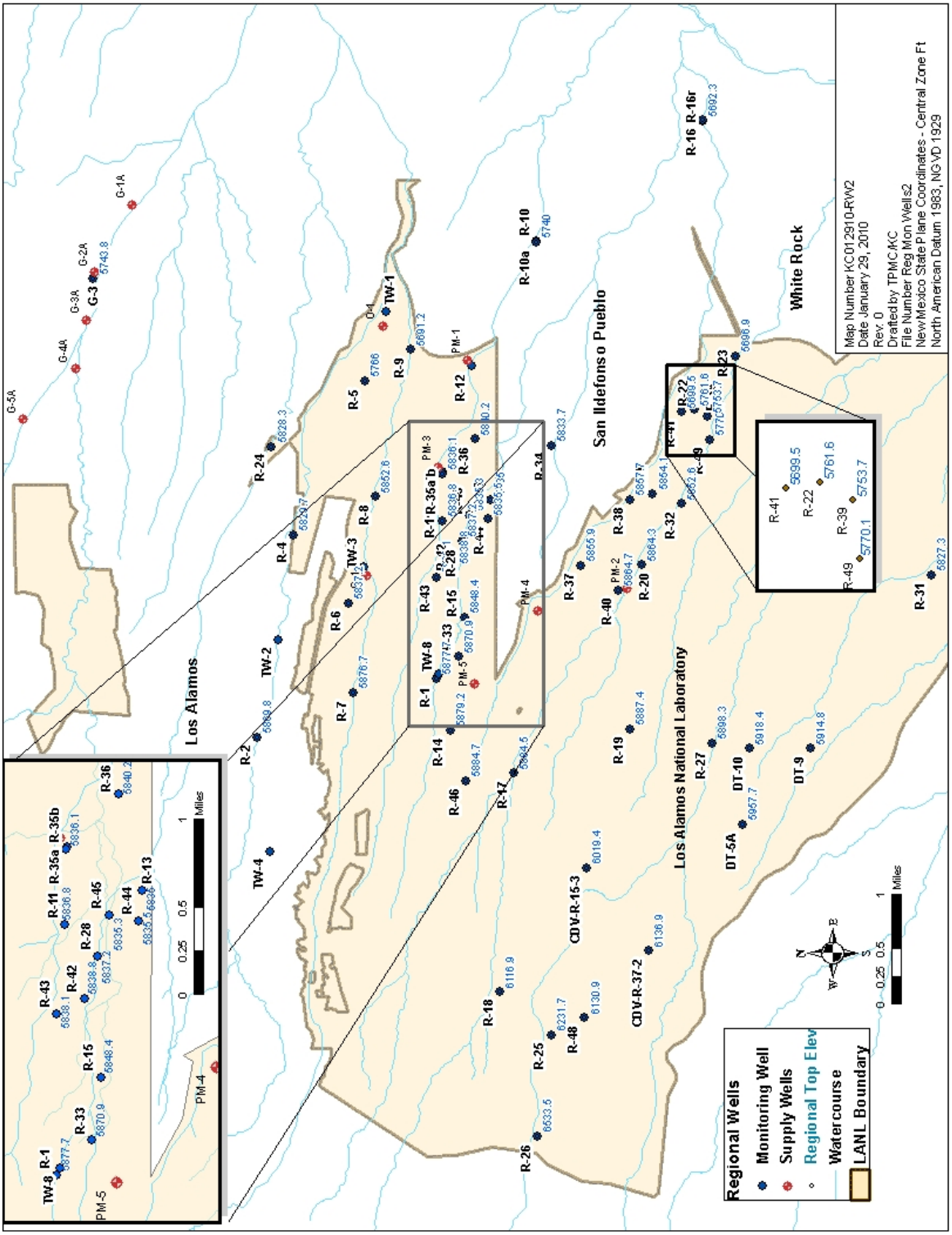


Figure 3-1. Regional aquifer monitoring wells and supply wells.

Table 3-1. Location Information for Regional Aquifer Monitoring Wells

Well Name	Date Completed	Completed Depth (ft)	Easting (ft)	Northing (ft)	Surface Elevation (ft)
CdV-R-15-3	05/03/00	1722.0	1623222.30	1762347.50	7258.90
CdV-R-37-2	08/09/01	1664.0	1619216.70	1759320.80	7330.60
R-1	11/10/03	1080.1	1632354.13	1769600.84	6881.21
R-2	10/19/03	943.3	1629519.57	1778281.56	6770.38
R-4	09/28/03	840.0	1639287.98	1776530.28	6577.49
R-5	05/22/01	884.0	1646707.00	1773063.00	6472.60
R-6	11/16/04	1252.0	1636011.02	1773884.07	6995.80
R-7	01/20/01	977.0	1631666.00	1773653.00	6779.20
R-8	01/28/02	850.0	1641139.01	1772554.62	6544.74
R-9	10/04/99	758.0	1648236.50	1770847.10	6382.80
R-10	10/05/05	1079.0	1653465.92	1764766.46	6362.31
R-10a	08/18/05	706.0	1653411.63	1764782.29	6363.74
R-11	10/08/04	901.7	1639959.31	1769353.57	6673.72
R-13	10/06/01	1029.4	1640991.66	1766994.17	6673.05
R-14	07/04/02	1315.6	1629855.01	1768953.12	7062.08
R-15	09/21/99	1030.6	1635308.60	1768272.50	6820.00
R-16	08/31/02	1276.7	1659283.61	1756710.97	6256.87
R-16r	10/11/05	631.4	1659289.39	1756730.68	6256.97
R-17	01/04/06	1140.9	1627795.96	1765861.23	6921.51
R-18	12/14/04	1405.0	1617254.37	1766545.47	7404.83
R-19	03/30/00	1877.4	1629918.40	1760252.10	7066.30
R-20	09/08/02	1353.3	1637835.40	1759694.51	6694.35
R-21	11/20/02	941.4	1641284.17	1759143.06	6656.24
R-22	10/19/00	1472.9	1645324.40	1757111.10	6650.50
R-23	10/02/02	886.3	1647913.60	1755165.37	6527.75
R-24	09/02/05	861.0	1643554.46	1777591.35	6547.38
R-25	09/28/00	1934.7	1615178.42	1764060.50	7516.10
R-26	10/17/03	1479.0	1610267.23	1764721.12	7641.69
R-27	11/07/05	878.7	1629230.52	1756296.28	6713.72
R-28	12/17/03	980.3	1638988.73	1768358.57	6728.61
R-31	12/01/00	1077.7	1637353.80	1745648.40	6362.50
R-32	08/09/02	1002.0	1640797.67	1757730.25	6637.63
R-33	10/13/04	1126.0	1633401.71	1768532.65	6853.33
R-34	08/20/04	920.7	1643595.82	1764028.77	6629.99
R-35a	06/21/07	1086.2	1642326.53	1769310.85	6623.06
R-35b	07/11/07	872.2	1642234.75	1769322.98	6625.21
R-36	02/12/08	803.7	1643907.07	1767736.64	6591.37
R-37	6/6/2009	1068.8	1637828.13	1762616.71	6870.59
R-38	12/7/2008	853.4	1640998.66	1760235.07	6668.58
R-39	12/1/2008	875.6	1644995.98	1756488.99	6580.86
R-40	1/5/2009	895	1636628.23	1760801.14	6719.24
R-41	3/19/2009	997.1	1645217.12	1757745.55	6660.53
R-42	8/27/2008	973.5	1637709.96	1768775.73	6759.02
R-43	10/17/2008	990.4	1637236.21	1769614.7	6732.65
R-44	1/15/2009	1016.0	1640061.34	1767109.85	6714.91
R-45	1/24/2009	1016.0	1640249.62	1768017.72	6704.02
R-46	2/26/2009	1383.8	1627433.85	1768183.02	7213.33
R-48	9/26/2009	1540.0	1615980.5	1762434.9	7486.78
R-49	6/1/2009	949.3	1643900.9	1756401.85	6584.54
TW-1	01/03/50	642.0	1650041.50	1772076.87	6369.19
TW-2	12/15/90	834.0	1634231.12	1777267.87	6648.06
TW-3	11/20/49	815.0	1637727.50	1773138.12	6626.90
TW-4	03/08/50	1205.0	1624028.12	1777680.12	7244.56
TW-8	12/15/60	1065.0	1632573.87	1769506.62	6873.50
DT-10	03/13/60	1408.0	1628988.50	1754448.75	7019.90
DT-5A	01/25/60	1819.5	1625310.00	1754789.37	7143.86
DT-9	02/19/60	1501.0	1628993.62	1751492.62	6935.00

3.1 CdV-R-15-3

Location: CdV-R-15-3 is located on a mesa between upper Three-Mile Canyon and Cañon de Valle within the Cañon de Valle watershed.

Completion Type: Multiple completion, three screens in intermediate zones, three screens in regional zones.

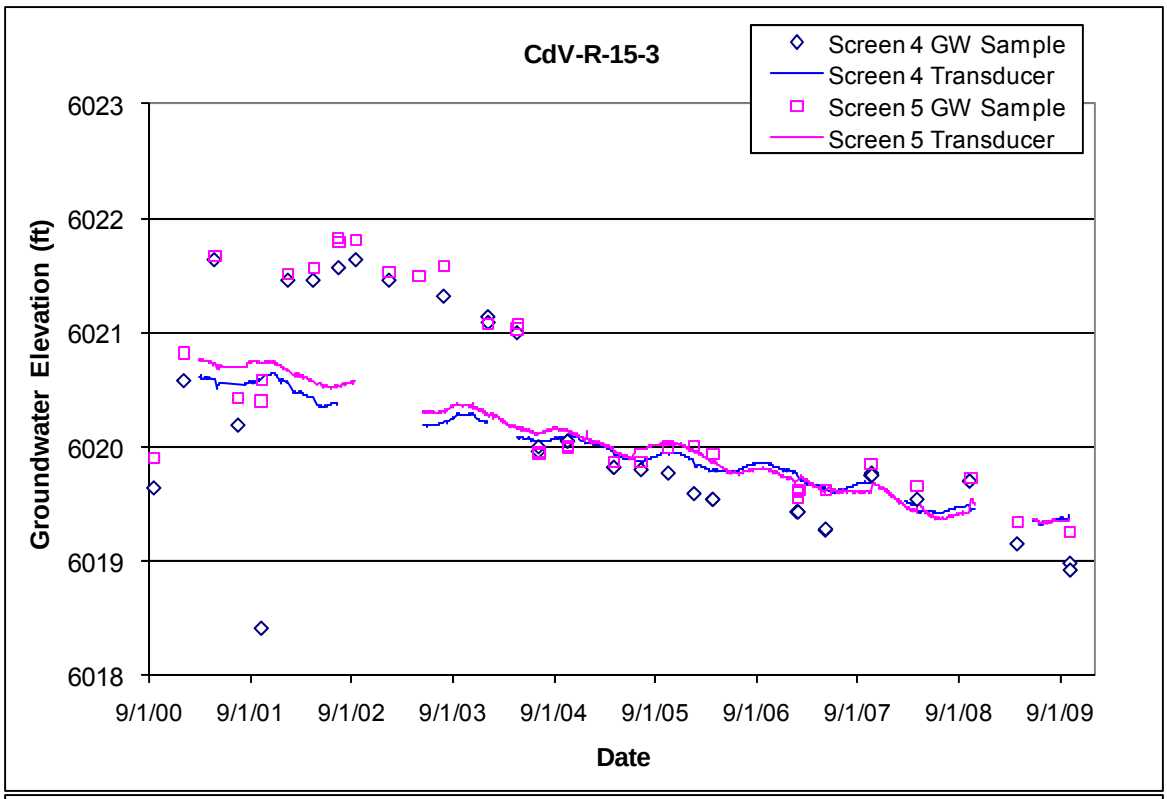
Period of Record: Westbay® installed September 17, 2000; transducers installed March 1, 2001; intermittent data through 2009. The transducers were removed for several months in 2009 to rebuild the cables.

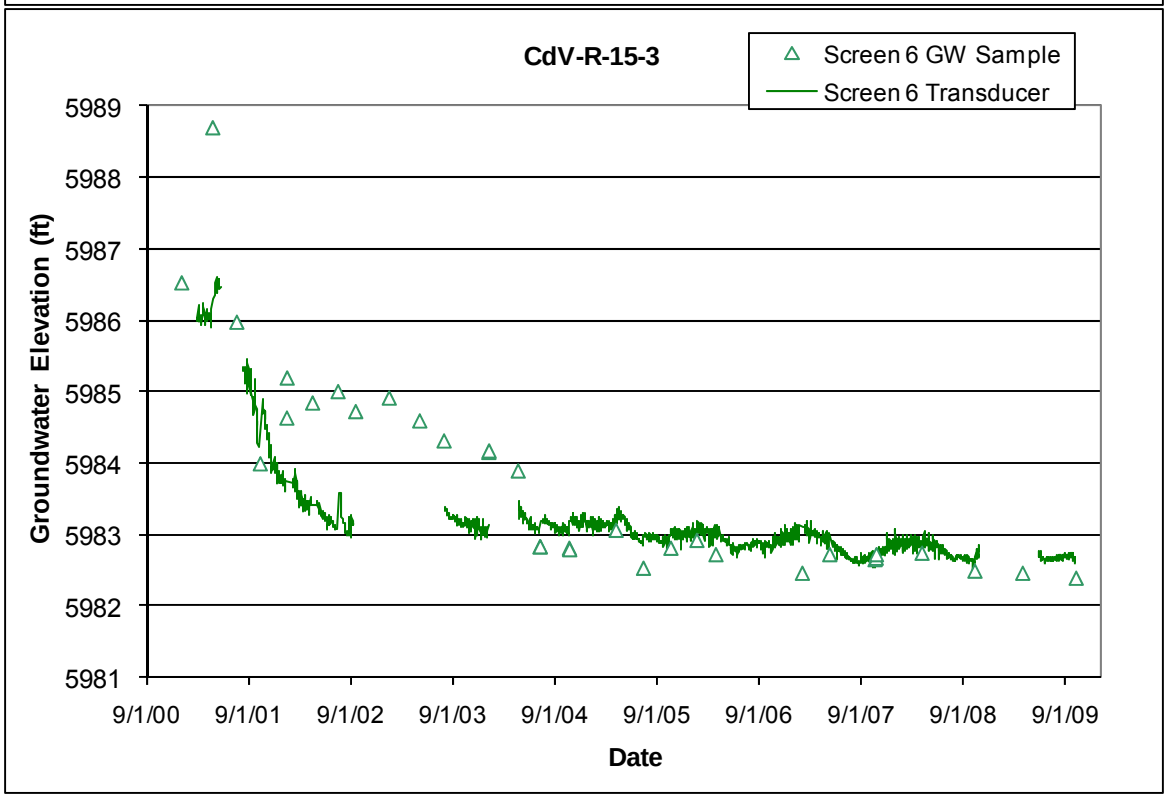
Remarks: The three intermediate screens have been dry since well installation. A transducer was never installed at screen 2. Transducers monitoring dry screens 1 and 3 were removed in January 2006. Regional screens 4 and 5 have similar heads; screen 6 head is 35 ft lower. Westbay monitoring port MP6B has not been operational since the system was installed (Kopp et al. 2002, p. 38). Six ft of water appeared in the screen 3 sump at port MP3C October 2006; sump water still present in October 2009. Screens 4 and 5 do not indicate a water level response to atmospheric pressure fluctuations; screen 6 indicates a 30% response to atmospheric pressure.

Measurement and Sampling Ports in CDV-R-15-3

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elev (ft)	Port Distance from Bottom of Screen (ft)	Comment
1	617.7	624.5	6641.2	6634.4	6.8	I	Qbo	MP1A	624.3	6634.6	0.2	Within Screen, port dry
								PP1	629.7	6629.2	-5.2	Below Screen
								MP1B	635.3	6623.6	-10.8	Below Screen, port dry
2	800.8	807.8	6458.1	6451.1	7.0	I	Tp	MP2A	807.3	6451.6	0.5	Within Screen, port dry
								PP2	812.6	6446.3	-4.8	Below Screen
								MP2B	818.3	6440.6	-10.5	Below Screen
3	964.8	980.9	6294.1	6278.0	16.1	I	Tb4	MP3A	969.0	6289.9	11.9	Within Screen, port dry
								MP3B	979.3	6279.6	1.6	Within Screen, port dry
								PP3	984.7	6274.2	-3.8	Below Screen
								MP3C	990.3	6268.6	-9.4	Below Screen, 6' water in sump
4	1235.1	1278.9	6023.8	5980.0	43.8	RT	Tp	**MP4A**	1254.4	6004.5	24.5	Within Screen, Regional Aquifer
								PP4A	1259.6	5999.3	19.3	Within Screen
								MP4B	1275.1	5983.8	3.8	Within Screen
								PP4B	1280.5	5978.4	-1.6	Below Screen
								MP4C	1286.1	5972.8	-7.2	Below Screen
5	1348.4	1355.3	5910.5	5903.6	6.9	RD	Tp	**MP5A**	1350.1	5908.8	5.2	Within Screen
								PP5	1355.4	5903.5	-0.1	Below Screen
								MP5B	1361.1	5897.8	-5.8	Below Screen
6	1637.9	1644.8	5621.0	5614.1	6.9	RD	Tp	**MP6A**	1640.1	5618.8	4.7	Within Screen
								PP6	1645.5	5613.4	-0.7	Below Screen
								MP6B	1651.1	5607.8	-6.3	Below Screen, Port inoperational

Note: CDV-R-15-3 Brass Cap Ground Elevation: 7258.9 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports


CdV-R-15-3
Screen 4 GW Sample
Screen 4 Transducer
Screen 5 GW Sample
Screen 5 Transducer
Groundwater Elevation (ft)
6023
6022
6021
6020
6019
6018
9/1/00
9/1/01
9/1/02
9/1/03
9/1/04
9/1/05
9/1/06
9/1/07
9/1/08
9/1/09
Date


CdV-R-15-3
Screen 6 GW Sample
Screen 6 Transducer
Groundwater Elevation (ft)
5989
5988
5987
5986
5985
5984
5983
5982
5981
9/1/00
9/1/01
9/1/02
9/1/03
9/1/04
9/1/05
9/1/06
9/1/07
9/1/08
9/1/09
Date

3.2 CdV-R-37-2

Location: CdV-R-37-2 is located on a mesa between Cañon de Valle and Water Canyon at Technical Area (TA) 37 in the Water Canyon watershed.

Completion Type: Multiple completion, one screen in an intermediate zone, three screens in regional zones.

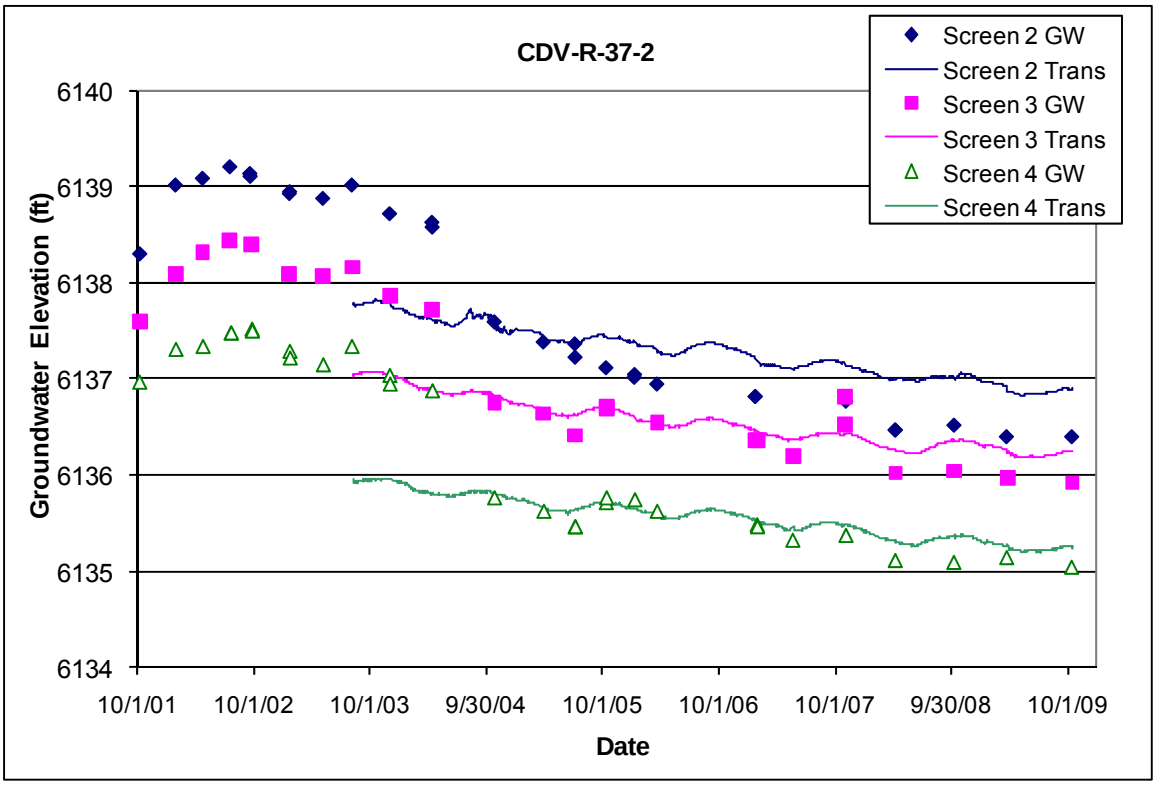
Period of Record: Westbay® installed October 8, 2001; transducers installed August 8, 2003; data through 2009.

Remarks: The intermediate screen has been dry since well installation; the transducer at this screen was removed in January 2006. The three regional screens have similar heads that show downward gradient of about 1 ft between each screen. The screens do not indicate a water level response to atmospheric pressure fluctuations.

Measurement and Sampling Ports in CDV-R-37-2

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elevation (ft)	Distance from Bottom of Screen (ft)	Comment
1	914.4	939.5	6416.2	6391.1	25.1	I	Tp	MP1A	934.9	6395.7	4.6	Within Screen (Dry)
								PP1	940.2	6390.4	-0.7	Below Screen
								MP1B	945.9	6384.7	-6.4	Below Screen
2	1188.7	1213.8	6141.9	6116.8	25.1	RT	Tt	**MP2A**	1200.3	6130.3	13.5	Within Screen
								PP2	1205.7	6124.9	8.1	Within Screen
								MP2B	1216.2	6114.4	-2.4	Below Screen
3	1353.7	1377.1	5976.9	5953.5	23.4	RD	Tt	**MP3A**	1359.3	5971.3	17.8	Within Screen
								PP3	1365.0	5965.6	12.1	Within Screen
								MP3B	1375.2	5955.4	1.9	Within Screen
4	1549.3	1556.0	5781.3	5774.6	6.7	RD	Tt	**MP4A**	1550.6	5780.0	5.4	Within Screen
								PP4	1556.0	5774.6	0	Base of Screen
								MP4B	1561.6	5769.0	-5.6	Below Screen

Note: CDV-R-37-2 Brass Cap Ground Elevation: 7330.6 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports



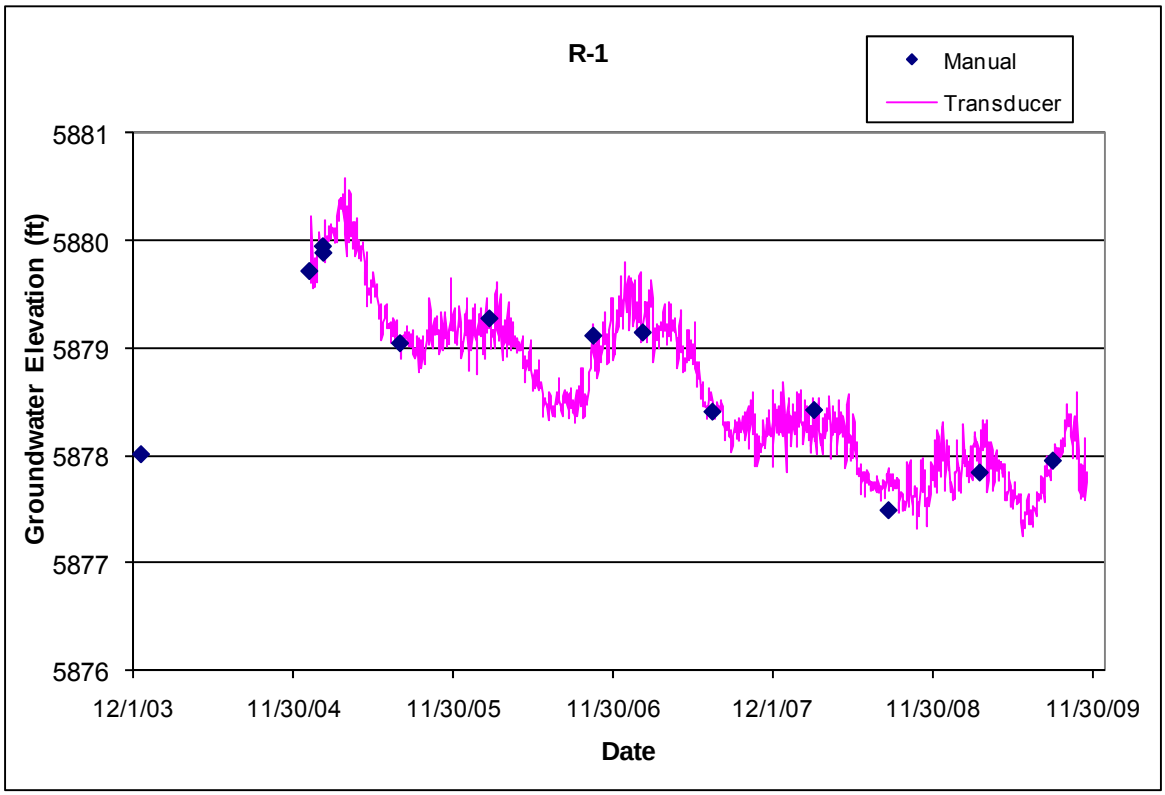
3.3 R-1

Location: R-1 is located in Mortandad Canyon about 220 ft west of former monitoring well TW-8.
Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 29 ft below the water table.
Period of Record: Well completed November 2003, transducer installed January 2005, transducer data through 2009.
Remarks: R-1 was completed to a depth of 1080.1 ft, about 80 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer has no immediate response to atmospheric pressure fluctuations. The aquifer indicates a seasonal response to supply well pumping and primarily responds to pumping at PM-5 and possibly to PM-4.

R-1 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1031.1	1057.4	5850.1	5823.8	26.3	1027.7	5853.5	1057.4	5823.8	1080.1	22.7	69.7	RT	Tp

Note: R-1 Brass Cap Ground Elevation: 6881.21 ft; all measurements are from this elevation



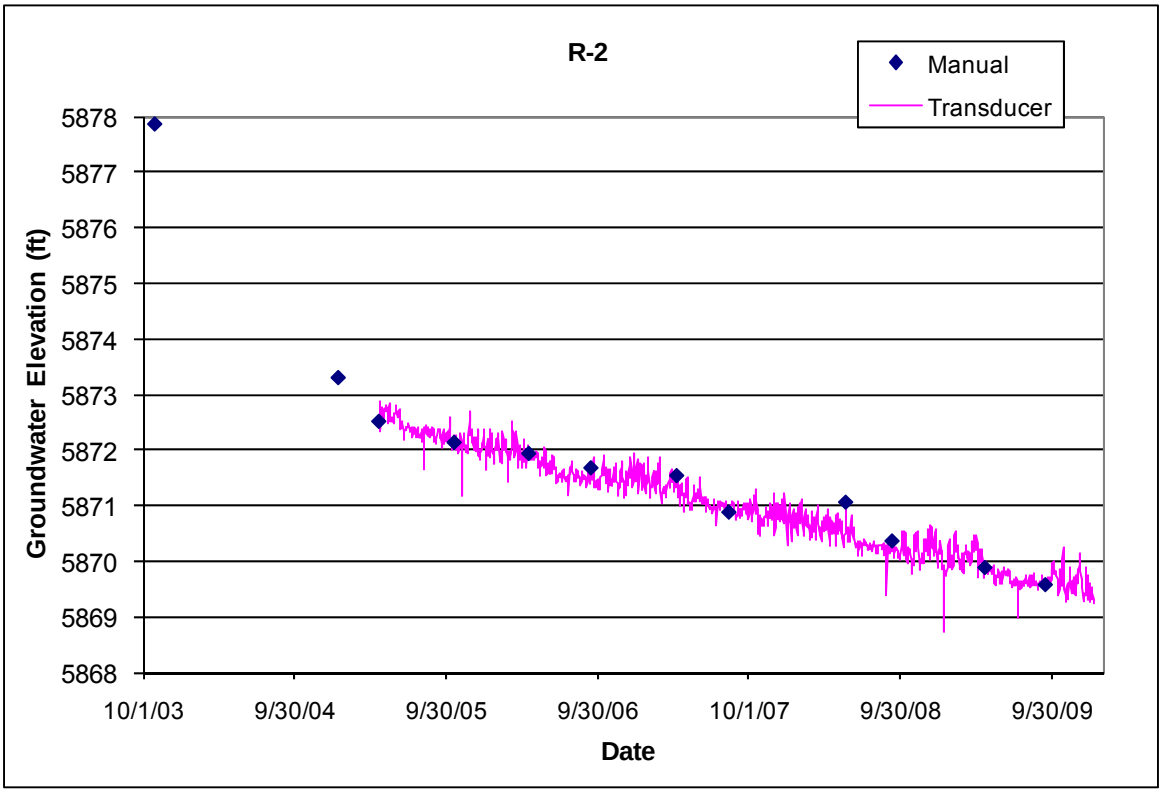
3.4 R-2

Location: R-2 is located in middle Pueblo Canyon between TW-4 and TW-2.
Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 8 ft below the water table.
Period of Record: Well completed October 2003, transducer installed January 2005, transducer data through 2009.
Remarks: R-2 was completed to a depth of 943.3 ft, about 50 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer has no immediate response to atmospheric pressure fluctuations. The well does not indicate a seasonal response to supply well pumping or an apparent response to pumping of any specific supply well.

R-2 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	906.4	929.6	5864.0	5840.8	23.2	917.0	5853.4	929.6	5840.8	943.3	13.7	42.1	RT	Tp

Note: R-2 Brass Cap Ground Elevation: 6770.38 ft; all measurements are from this elevation



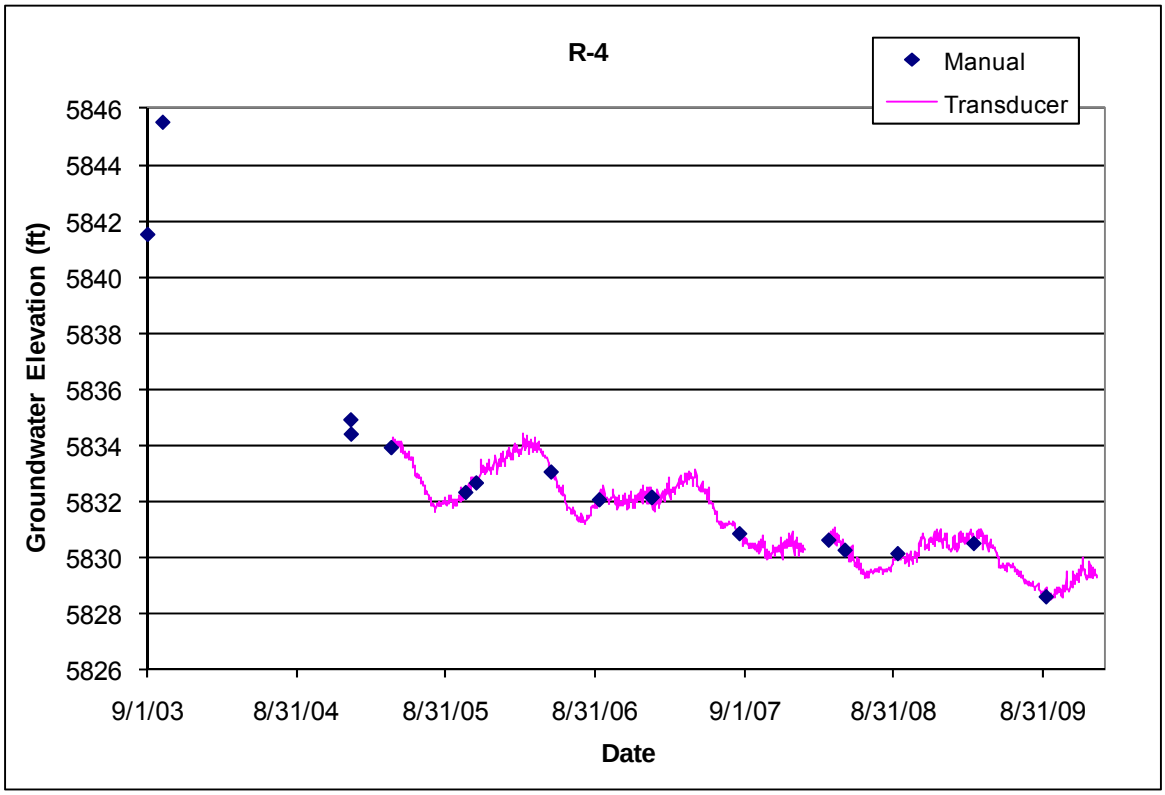
3.5 R-4

Location: R-4 is located in Pueblo Canyon near the new LAC Sewage Treatment Plant.
Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 49 ft below the piezometric water table in a confined zone.
Period of Record: Well completed September 2003, transducer installed January 2005, data through 2009. The transducer failed in January 2008 and was replaced in March 2008.
Remarks: R-4 was completed to a depth of 840 ft, about 90 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer has no immediate response to atmospheric pressure fluctuations. The aquifer indicates a seasonal response to supply well pumping and appears to respond primarily to pumping PM-3, and possibly to pumping at O-4 and the Guaje well field.

R-4 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	792.9	816	5784.6	5761.5	23.1	787.5	5790.0	816.0	5761.5	840.0	24.0	73.7	RT	Tp

Note: R-4 Brass Cap Ground Elevation: 6577.49 ft; all measurements are from this elevation



3.6 R-5

Location: R-5 is located in lower Pueblo Canyon upstream of supply well O-1.

Completion Type: Multiple completion, two screens in intermediate zones, two screens in regional zones.

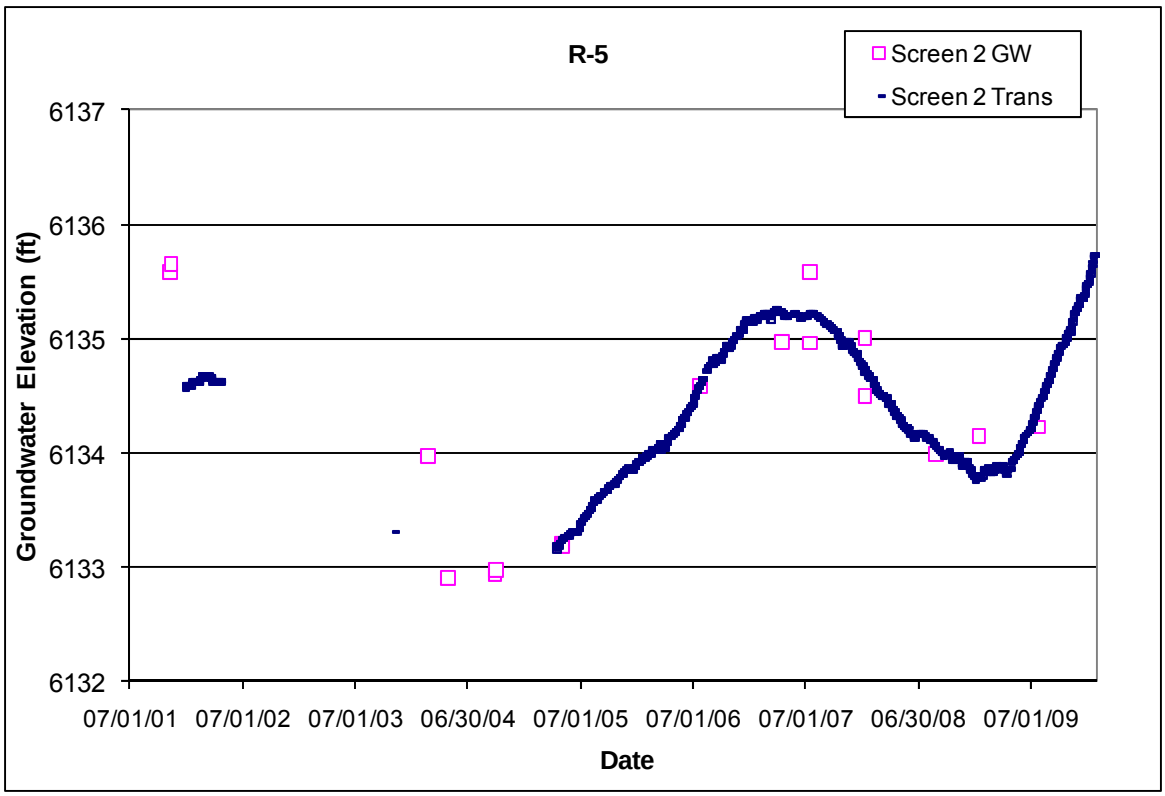
Period of Record: Westbay® installed July 17, 2001, transducers installed December 17, 2001, and April 4, 2005, intermittent data through 2009.

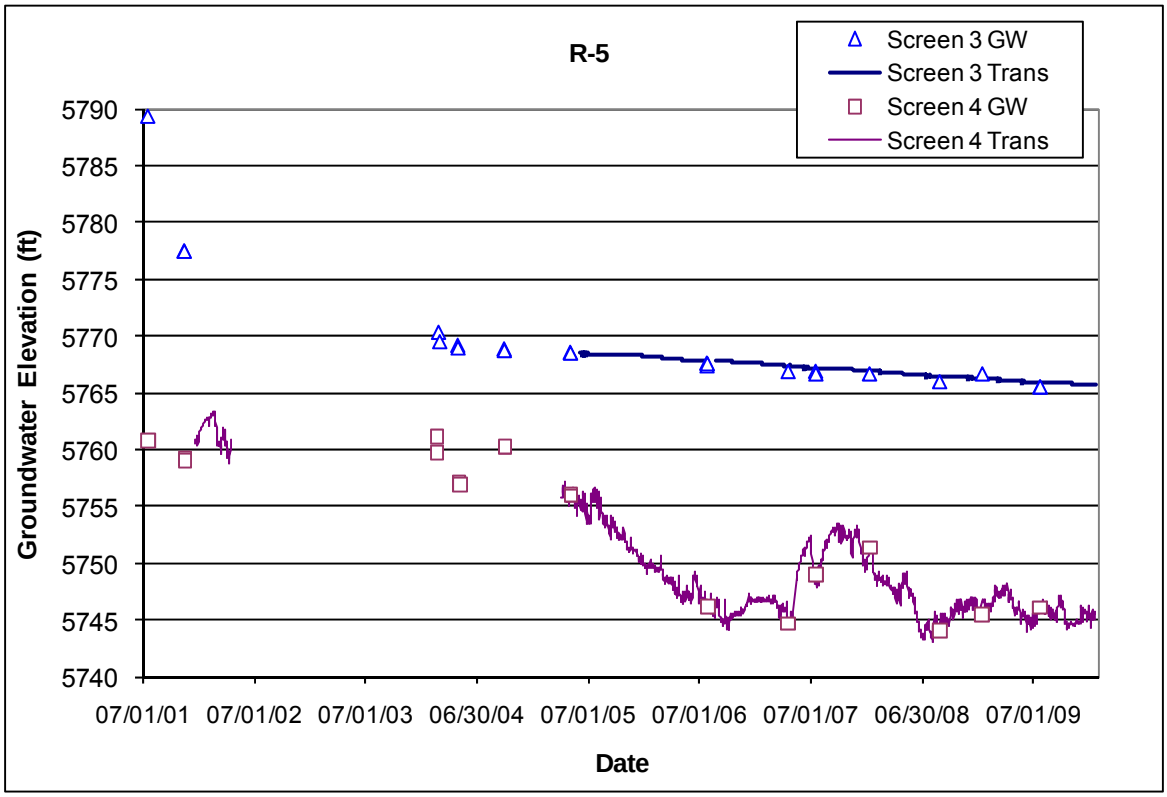
Remarks: Screen 1 has been dry since well installation, although there is about 3 ft of water above port MP1B in the sump below screen 1. The screen 2 intermediate groundwater level is about 6 ft below the bottom of screen 1. The two regional screens have heads about 10 to 15 ft apart. The water level at the top of the regional aquifer at screen 3 declined below port MP3A in 2001; samples are collected and groundwater level is monitored from port MP3B. The water level at screen 4 responds primarily to supply well pumping at PM-1, but screen 3 apparently shows little or no response. The R-5 regional aquifer screens do not indicate a response to atmospheric pressure fluctuations.

R-5 Construction and Port Data

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elevation (ft)	Distance from Bottom of Screen (ft)	Sump Volume (L)	Comment
1	326.4	331.5	6146.2	6141.1	5.1	I	Tp	**MP1A**	329.5	6143.1	2.0		Within Screen, Screen Dry
								PP1	334.9	6137.7	-3.4	9.8	Below Screen
								MP1B	350.4	6122.2	-18.9	54.7	Below Screen, 3 ft of water
2	372.8	388.8	6099.8	6083.8	16.0	I	Tp	**MP2A**	383.9	6088.7	4.9		Within Screen
								PP2	388.8	6083.8	0.0	0.0	At Bottom of Screen
								MP2B	394.4	6078.2	-5.6	16.2	Below Screen
3	676.9	720.3	5795.7	5752.3	43.4	RT	Tsf	MP3A	695.1	5777.5	25.2		Within Screen, Port Dry
								MP3B	718.6	5754.0	1.7		Within Screen, Port sampled
								PP3	724.0	5748.6	-3.7	10.7	Below Screen
4	858.7	863.7	5613.9	5608.9	5.0	RD	Tsfb	**MP4A**	860.9	5611.7	2.8		Within Screen
								PP4	866.3	5606.3	-2.6	7.5	Below Screen
								MP4B	871.9	5600.7	-8.2	23.7	Below Screen

Note: R-5 Brass Cap Ground Elevation: 6472.6 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports


R-5
Screen 2 GW
Screen 2 Trans
Groundwater Elevation (ft)
6137
6136
6135
6134
6133
6132
07/01/01
07/01/02
07/01/03
06/30/04
07/01/05
07/01/06
07/01/07
06/30/08
07/01/09
Date


R-5
Screen 3 GW
Screen 3 Trans
Screen 4 GW
Screen 4 Trans
Groundwater Elevation (ft)
5790
5785
5780
5775
5770
5765
5760
5755
5750
5745
5740
07/01/01
07/01/02
07/01/03
06/30/04
07/01/05
07/01/06
07/01/07
06/30/08
07/01/09
Date

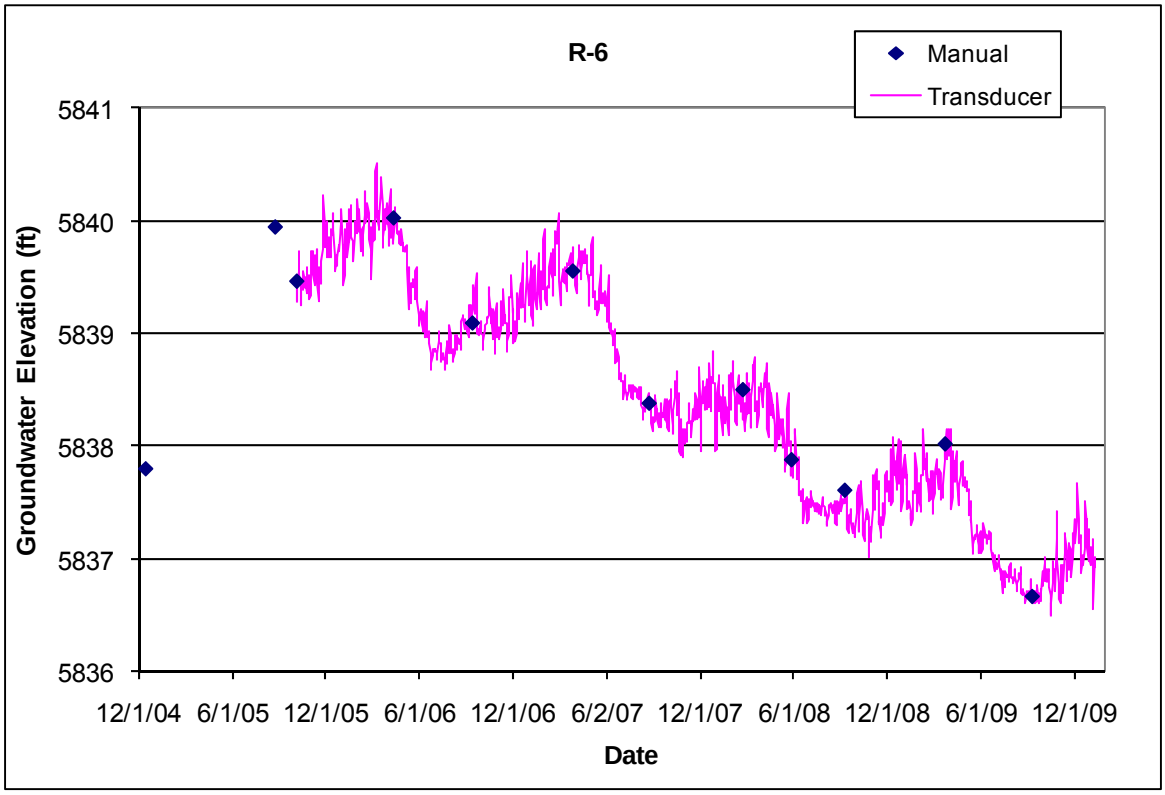
3.7 R-6

Location: R-6 is located at the east end of DP Mesa between DP Canyon and Los Alamos Canyon.
Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 49 ft below the water table.
Period of Record: Well completed November 2004, transducer installed December 2004, data through 2009.
Remarks: R-6 was completed to a depth of 1252 ft, about 100 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer has no immediate response to atmospheric pressure fluctuations.

R-6 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1205.0	1228.0	5790.8	5767.8	23.0		6995.8	1228.0	5767.8	1252.0	24.0	73.7	RT	Tf

Note: Brass Cap Ground Elevation: 6995.8 ft; all measurements are from this elevation



3.8 R-7

Location: R-7 is located in middle Los Alamos Canyon about 1 mile upstream of supply well O-4.

Completion Type: Multiple completion, two screens in intermediate zones, one screen at the top of the regional aquifer.

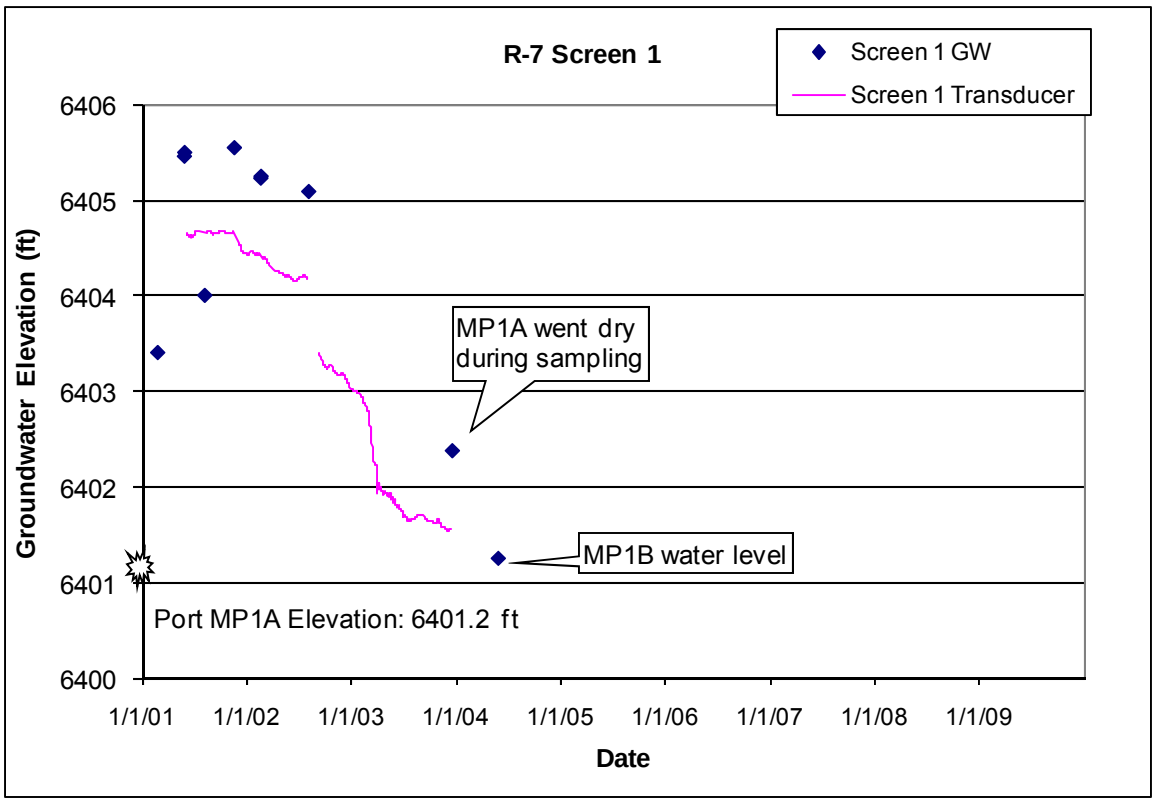
Period of Record: Westbay® installed February 25, 2001, transducers installed February 28, 2001, intermittent data to July 20, 2009. Equipment problems caused data loss from July 2009 to January 2010.

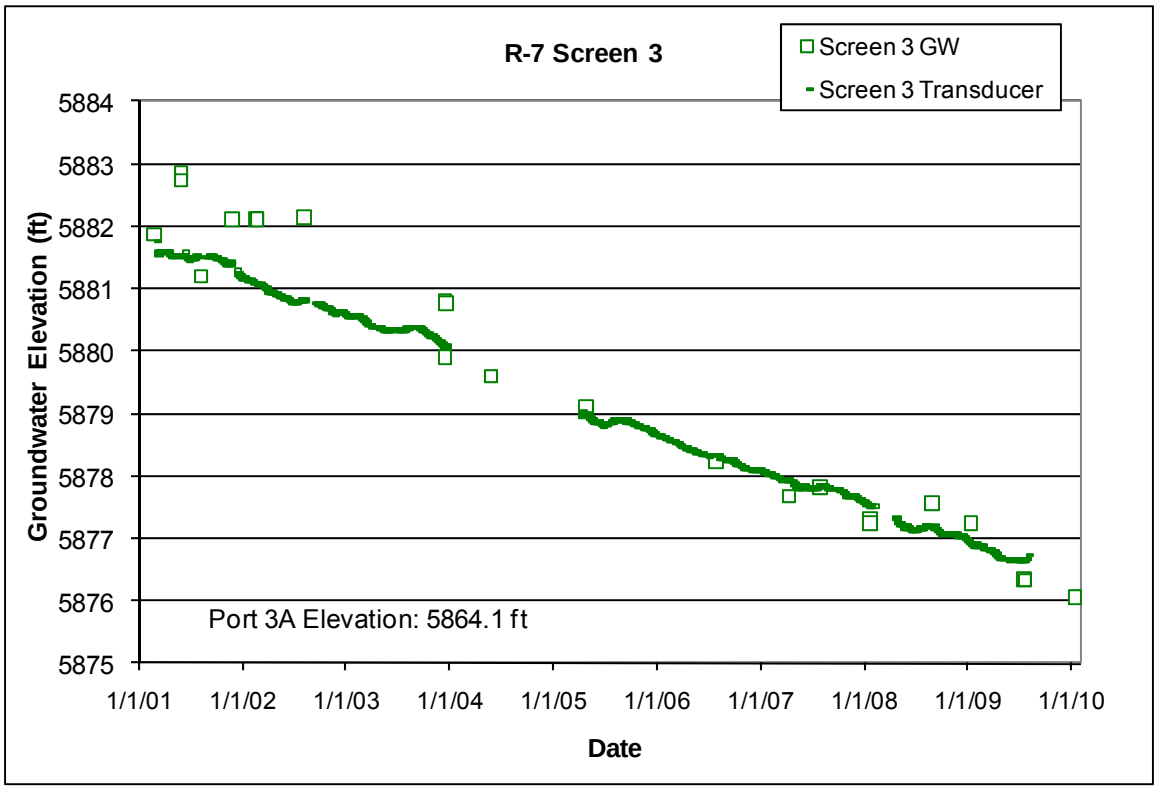
Remarks: Initial transducer data from MP1A are not valid because transducer apparently did not connect properly to port. Port MP1A at intermediate screen 1 went dry during sampling on December 18, 2003. Pressure data from port MP1B located in the sump have indicated 3 to 4 ft of water present above the port but below the screen since 2005. The screen 2 intermediate screen has been dry since well installation but port MP2B indicates about 1 ft of water in the sump above the port since mid 2008. The regional aquifer at R-7 screen 3 does not indicate a response to atmospheric pressure fluctuations and does not show a seasonal water level response to supply well pumping or a response to pumping any of the water supply wells.

R-7 Construction and Port Data

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elevation (ft)	Distance from Bottom of Screen (ft)	Comment
1	363.2	379.2	6416.0	6400.0	16.0	I	Tp	**MP1A**	378.0	6401.2	1.2	Within screen - Screen dry
								PP1	383.3	6395.9	-4.1	Below screen
								MP1B	389.0	6390.2	-9.8	Below screen
2	730.4	746.4	6048.8	6032.8	16.0	I	Tp	**MP2A**	744.8	6034.4	1.6	Within screen - Screen dry
								PP2	750.1	6029.1	-3.7	Below screen
								MP2B	755.8	6023.4	-9.4	Below screen
3	895.5	937.4	5883.7	5841.8	41.9	RT	Tp	**MP3A**	915.1	5864.1	22.3	Within screen
								MP3B	935.3	5843.9	2.1	Within screen
								PP3	940.6	5838.6	-3.2	Below screen
								MP3C	946.3	5832.9	-8.9	Below screen

Note: R-7 Brass Cap Ground Elevation: 6779.2 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports


R-7 Screen 1
Screen 1 GW
Screen 1 Transducer
Groundwater Elevation (ft)
6406
6405
6404
6403
6402
6401
6400
MP1A went dry during sampling
MP1B water level
Port MP1A Elevation: 6401.2 ft
1/1/01
1/1/02
1/1/03
1/1/04
1/1/05
1/1/06
1/1/07
1/1/08
1/1/09
Date


R-7 Screen 3
Screen 3 GW
Screen 3 Transducer
Groundwater Elevation (ft)
5884
5883
5882
5881
5880
5879
5878
5877
5876
5875
Port 3A Elevation: 5864.1 ft
1/1/01
1/1/02
1/1/03
1/1/04
1/1/05
1/1/06
1/1/07
1/1/08
1/1/09
1/1/10
Date

3.9 R-8

Location: R-8 is located in middle Los Alamos Canyon about 0.75 miles downstream of the confluence with DP Canyon and supply well O-4.

Completion Type: Multiple completion, two screens in the regional aquifer. The top of screen 1 is about 16 ft below the water table.

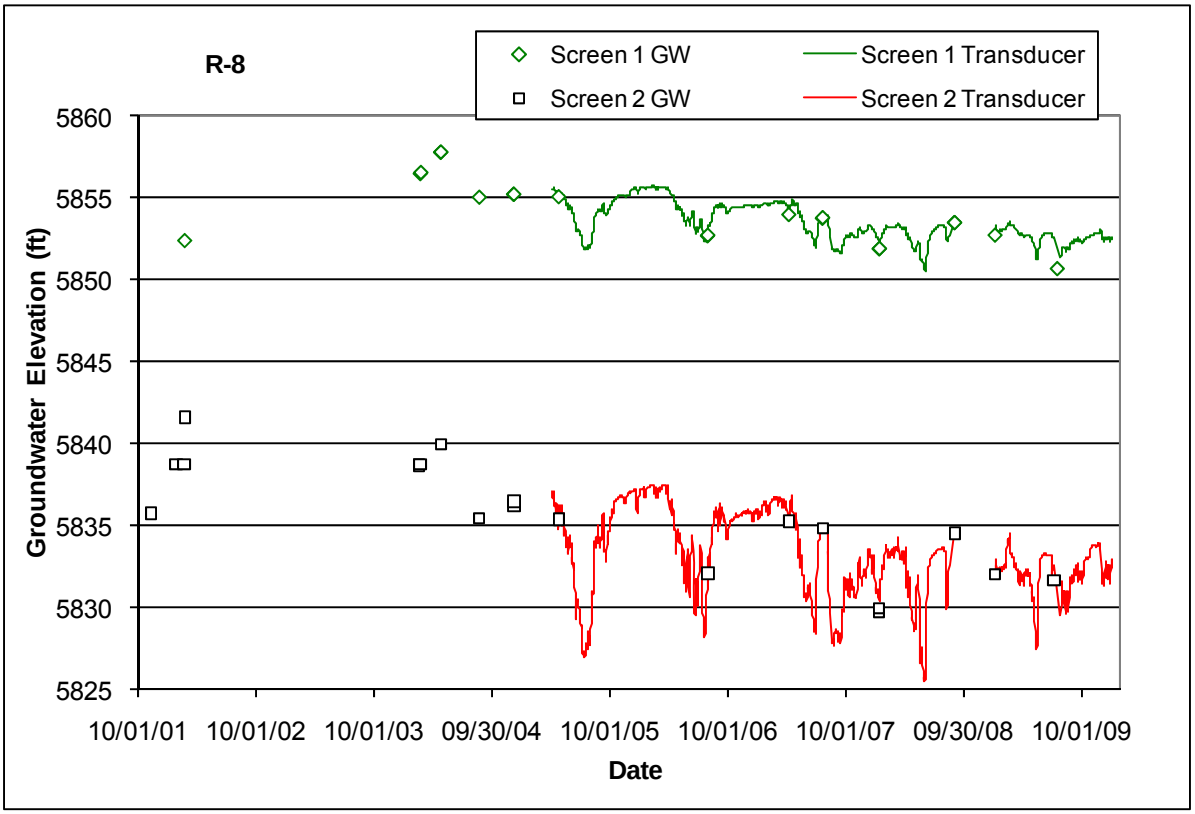
Period of Record: Westbay® installed February 23, 2002, transducers installed April 7, 2005, data through 2009.

Remarks: Screens are 66 ft apart, head in screen 2 about 20 ft lower than screen 1. The groundwater does not indicate a response to atmospheric pressure fluctuations, but the groundwater at both screens responds to pumping supply well PM-3.

R-8 Construction and Port Data

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elevation (ft)	Distance from Bottom of Screen (ft)	Comment
1	705.3	755.7	5839.4	5789.04	50.4	RT	Tp	MP1A	711.1	5833.64	44.6	Within Screen
								MP1B	721.4	5823.34	34.3	Within Screen
								MP1C	751.3	5793.44	4.4	Within Screen
								PP1	756.7	5788.04	-1.0	Below Screen
								MP1D	762.3	5782.44	-6.6	Below Screen
2	821.3	828.0	5723.4	5716.74	6.7	RD	Tp	MP2A	825.0	5719.74	3.0	Within Screen
								PP2	830.4	5714.34	-2.4	Below Screen
								MP2B	836.0	5708.7	-8.0	Below Screen

Note: R-8 Brass Cap Ground Elevation: 6544.74 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports



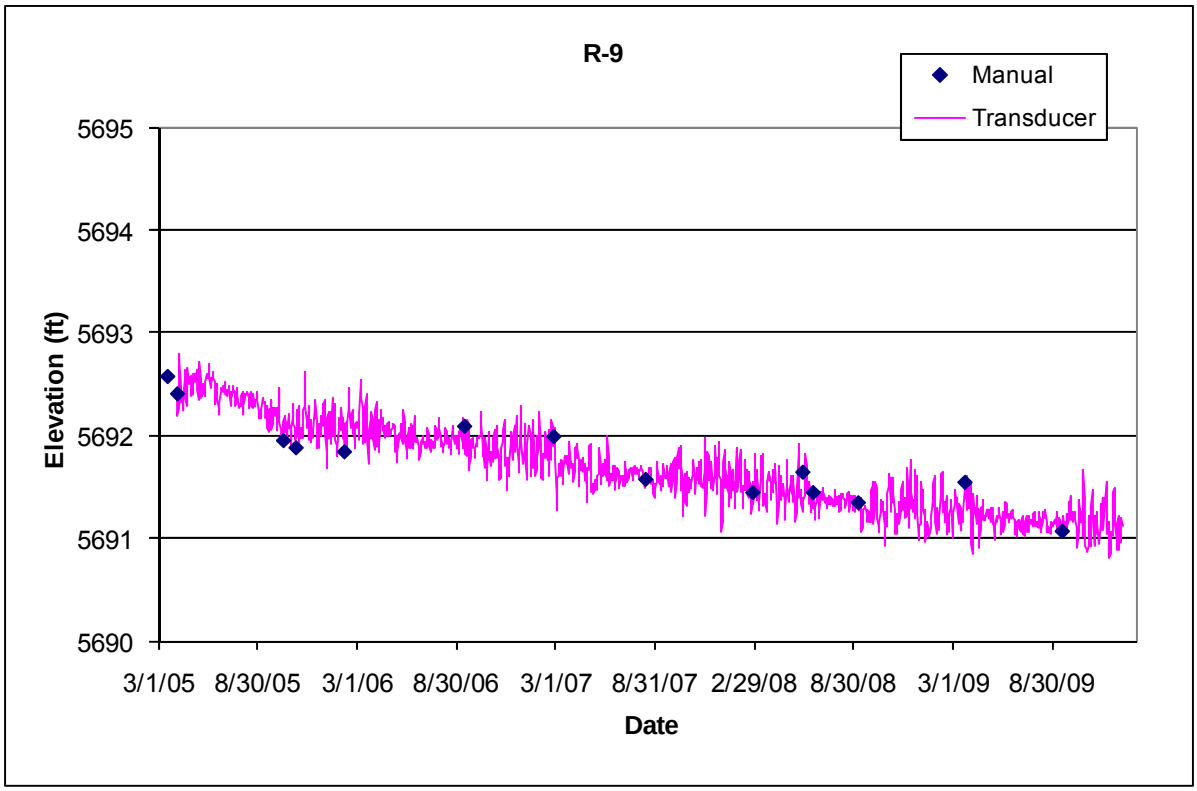
3.10 R-9

Location: R-9 is located in Los Alamos Canyon near the eastern LANL boundary.
Completion Type: Single completion at the top of the regional aquifer. The screen straddles the water table.
Period of Record: March 2, 1998, to August 12, 1998, in temporary well. Final well completed October 1999. Transducer installed April 5, 2005, data through 2009.
Remarks: R-9 was completed to a depth of 758 ft, about 70 ft into the regional aquifer. The well is 100% barometrically efficient; the groundwater has no immediate response to atmospheric pressure fluctuations. However, the aquifer indicates a delayed 65% response to atmospheric pressure.

R-9 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	683.0	748.5	5699.8	5634.3	65.5	741.4	5641.4	748.5	5634.3	758	9.5	29.7	RT	Tsfb

Note: R-9 Brass Cap Ground Elevation: 6382.8; all depths are from this elevation



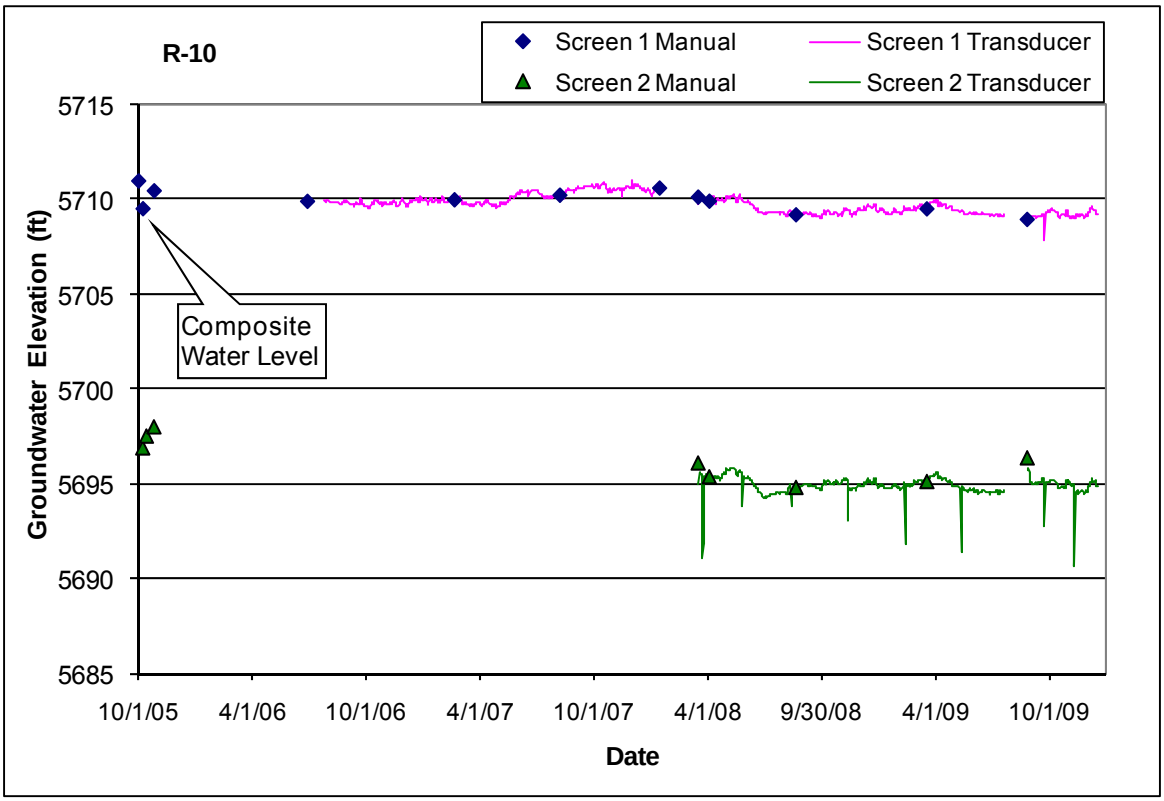
3.11 R-10

Location: R-10 is located in lower Sandia Canyon on San Ildefonso land east of the LANL boundary.
Completion Type: Dual completion in two deeper zones within the regional aquifer. Baski packer and dual valve sampling system with single submersible pump installed in May 2006.
Period of Record: Well completed October 2005, transducers installed July 26, 2006, data through 2009. The transducers were removed during repair of the Baski system in 2008 and 2009.
Remarks: R-10 screen 1 is 174 ft deeper than the screen at R-10a; due to relatively low hydraulic conductivity of the formation between these screens, the head at R-10 screen 1 is 30 ft lower than at R-10a. The screen 2 water level gage tube was inoperable until repaired in February 2008; water level data for R-10 screen 2 in 2006 and 2007 are not available. The groundwater at R-10 screens exhibit a barometric efficiency of about 45%. The regional aquifer at both screens responds to pumping at supply well PM-1.

R-10 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Packer/ Sump (ft)	Top of Packer/ Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	874.0	897.0	5488.3	5465.3	23.0	884.3	5478.0	905.2	5457.2	905.2	8.2	25.5	RD	Tsf
2	1042.0	1065.0	5320.3	5297.3	23.0	1053.1	5309.2	1065.0	5297.3	1081.6	16.6	5.8	RD	Tsf

Note: R-10 Brass Cap Ground Elevation: 6362.31 ft; all measurements are from this elevation



3.12 R-10a

Location: R-10a is located in lower Sandia Canyon on San Ildefonso land east of the LANL boundary adjacent to R-10.

Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 67 ft below the water table.

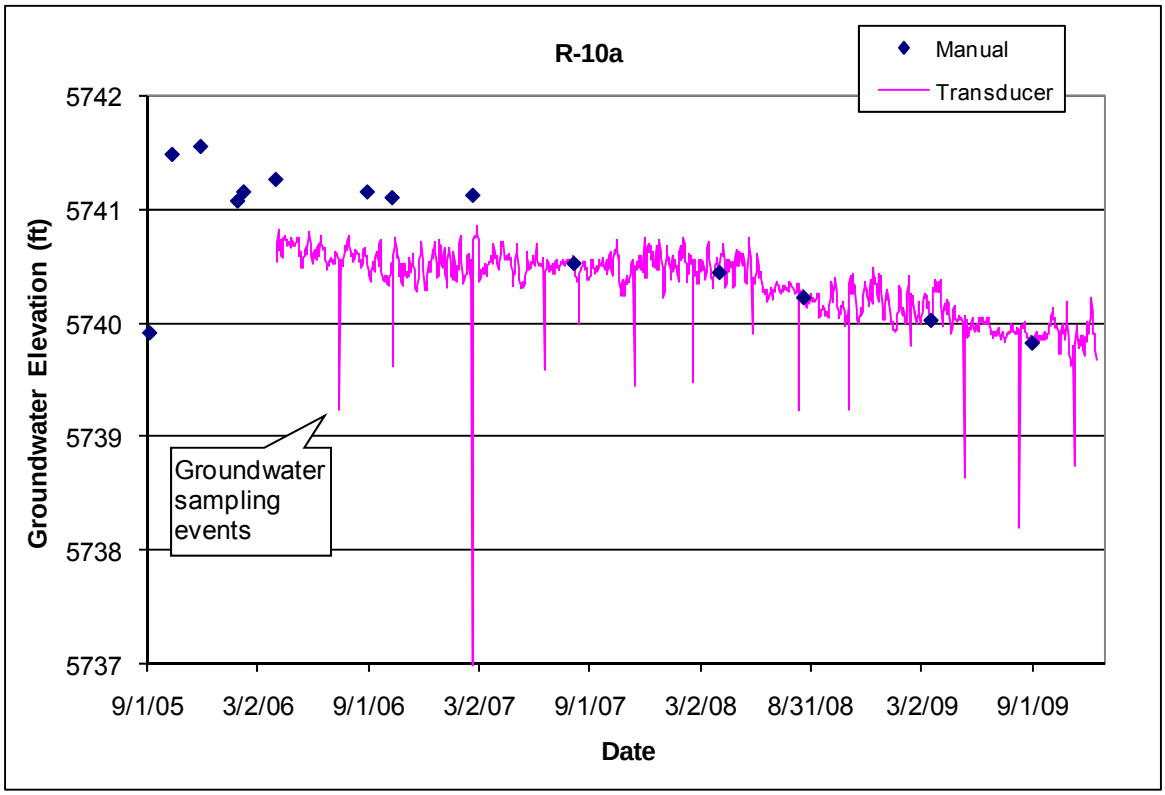
Period of Record: Well completed August 2005, transducer installed April 3, 2006, data through 2009.

Remarks: The R-10a water level is about 30 ft higher than at R-10 screen 1. The groundwater at R-10a shows an immediate 58% response to atmospheric pressure fluctuations for a well barometric efficiency of 42%. There is no apparent response to supply well pumping at R-10a.

R-10a Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	690.0	700.0	5673.7	5663.7	10.0	685.6	5678.1	700.0	5663.7	709.1	9.1	27.9	RT	Tsf

Note: Brass Cap Ground Elevation: 6363.74 ft; all measurements are from this elevation



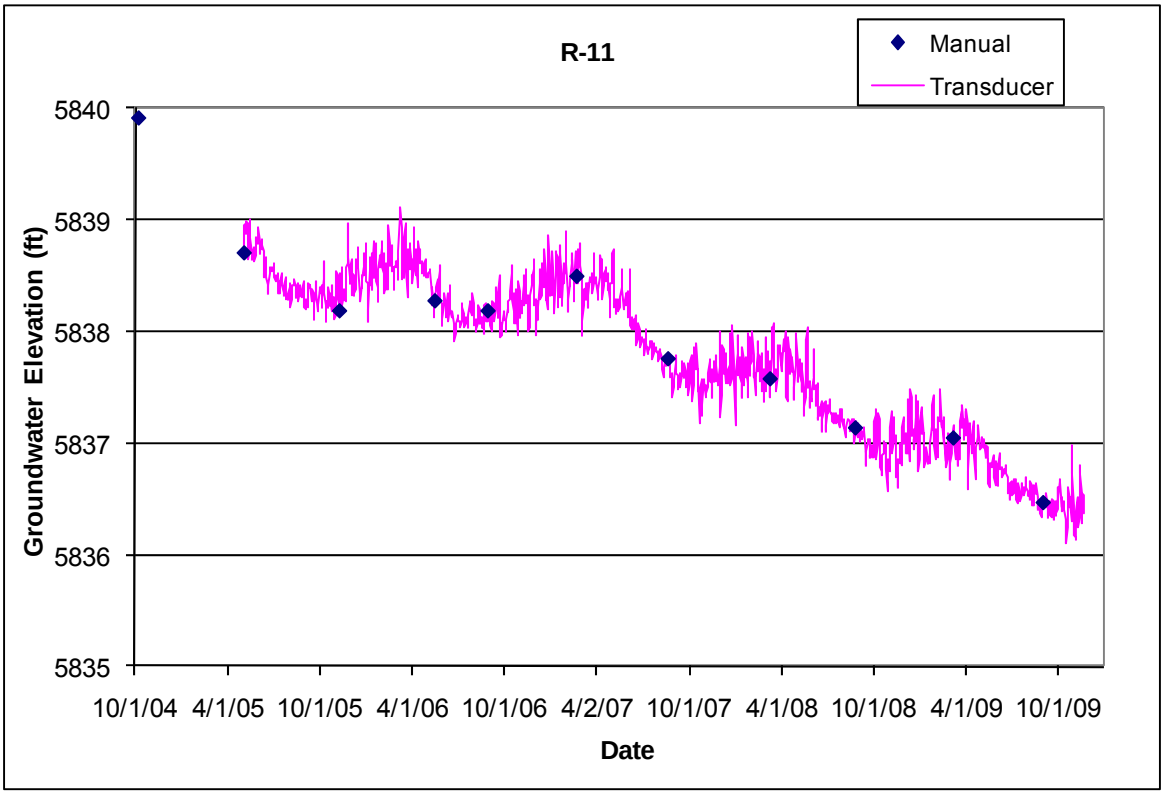
3.13 R-11

Location: R-11 is located in middle Sandia Canyon about 0.5 miles upstream of supply well PM-3.
Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 20 ft below the water table.
Period of Record: Transducer installed May 4, 2005; data through 2009.
Remarks: R-11 was completed in 2004 to a depth of 901.7 ft, about 66 ft into the regional aquifer. The well is 100% barometrically efficient; the groundwater has no immediate response to atmospheric pressure fluctuations. The aquifer at R-11 exhibits a seasonal response to supply well pumping but does not indicate a direct response to any specific supply well.

R-11 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	855.0	877.9	5818.7	5795.8	22.9	850	5823.7	877.9	5795.8	901.7	23.8	73.1	RT	Tp

Note: R-11 Brass Cap Ground Elevation: 6673.72 ft; all measurements are from this elevation



3.14 R-12 (Regional)

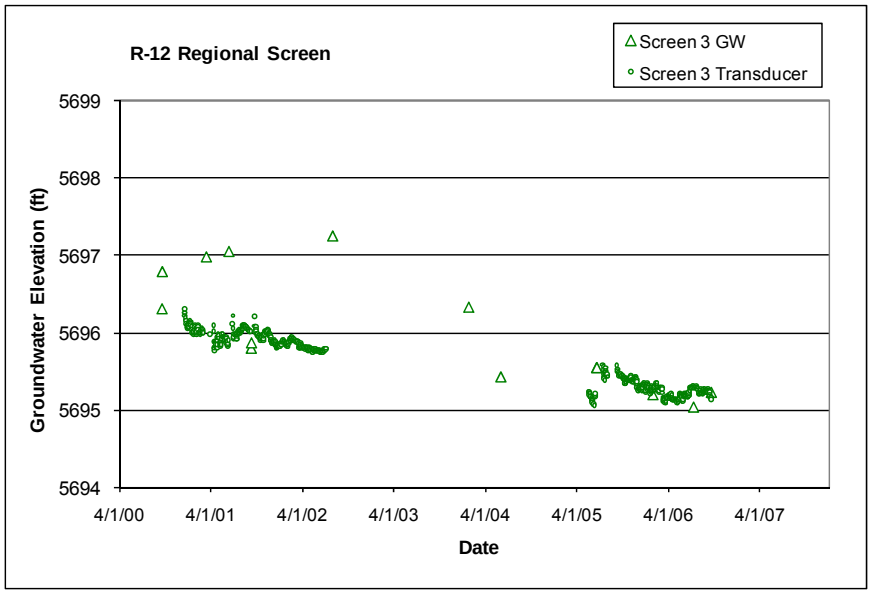
Monitoring well R-12 was recompleted as a dual screen intermediate monitoring well in December 2007. Refer to Section 4 for recent R-12 intermediate groundwater level status.

Location: R-12 is located in lower Sandia Canyon near State Route (SR) 4 and supply well PM-1.
Completion Type: Multiple completion, two screens in intermediate zones, one screen at the top of the regional aquifer until September 2006. Well recompleted as two intermediate screens on December 13, 2007, when screen 3 was plugged and abandoned.
Period of Record: Westbay® installed March 21, 2000, transducers installed December 14, 2000, intermittent data to September 21, 2006, when transducers were removed for removal of the Westbay® system for well rehabilitation. No regional aquifer water level data after 2006. Transducers were reinstalled at intermediate screens 1 and 2 on December 13, 2007; data through 2009.
Remarks: In December 2007, screen 3 was abandoned and a Baski packer with dual pump sampling system was installed at the two intermediate screens. The regional aquifer at screen 3 did not exhibit a seasonal response to supply well pumping, or a response to pumping of any specific supply well, including nearby supply well PM-1. There is no immediate response to atmospheric pressure fluctuations at any screen.

R-12 Former Westbay Port Data

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elev (ft)	Distance from Bottom of Screen (ft)	Sump Volume (L)	Comment
1	459.0	467.5	6040.6	6032.1	8.5	I	Tb4	MP1A	468.1	6031.5	-0.6	1.1	Below screen
								PP1	473.5	6026.1	-6.0	11.3	Below screen
								MP1B	479.1	6020.5	-11.6	21.9	Below screen
2	504.5	508.0	5995.1	5991.6	3.5	I	Tb4	MP2A	507.0	5992.6	1.0		Within screen
								PP2	512.4	5987.2	-4.4	8.3	Below screen
								MP2B	518.0	5981.6	-10.0	18.9	Below screen
3	801.0	839.0	5698.6	5660.6	38	RT	Tsfb	MP3A	810.8	5688.8	28.2		Within screen
								PP3A	816.2	5683.4	22.8		Within screen
								MP3B	821.8	5677.8	17.2		Within screen
								PP3B	827.2	5672.4	11.8		Within screen
								MP3C	832.9	5666.7	6.1		Within screen

Brass Cap Elevation: 6499.6 ft; all measurements are from this elevation;
MP = measurement port; PP = pumping port



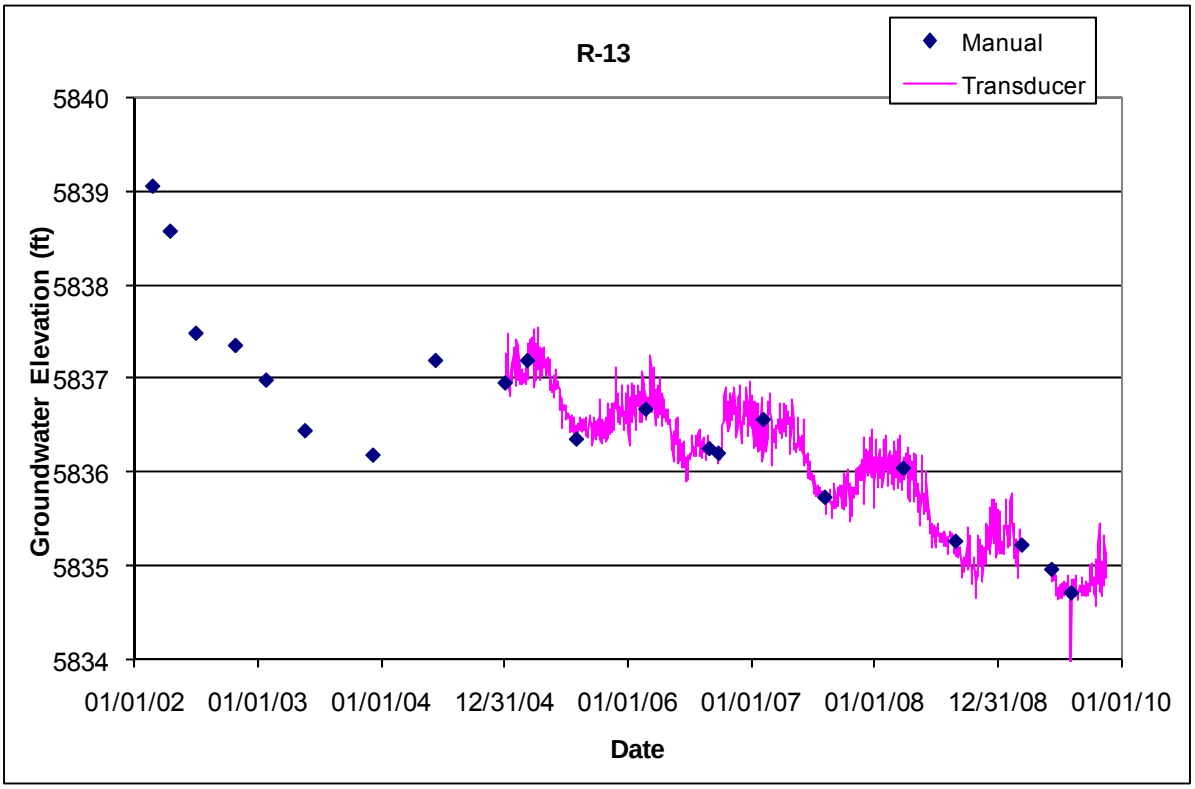
3.15 R-13

Location: R-13 is located in lower Mortandad Canyon near the LANL boundary.
Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 122 ft below the water table.
Period of Record: Well completed October 2001, transducer installed January 3, 2005, data through 2009. The transducer failed and was replaced in June 2009.
Remarks: R-13 was completed to a depth of 1029.4 ft, about 200 ft into the regional aquifer. The well is 100% barometrically efficient; the groundwater has no immediate response to atmospheric pressure fluctuations. However, the aquifer indicates a delayed 30% response to atmospheric pressure. R-13 exhibits a seasonal response to supply well pumping and responds primarily to pumping at PM-4 (McLin 2006) and possibly to PM-2 and PM-5, but apparently does not respond significantly to pumping at nearby supply well PM-3.

R-13 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	958.3	1018.7	5714.8	5654.4	60.4	933.0	5740.1	1018.7	5654.4	1029.4	10.7	33.5	RT	Tp

Note: R-13 Brass Cap Ground Elevation: 6673.05 ft; all measurements are from this elevation



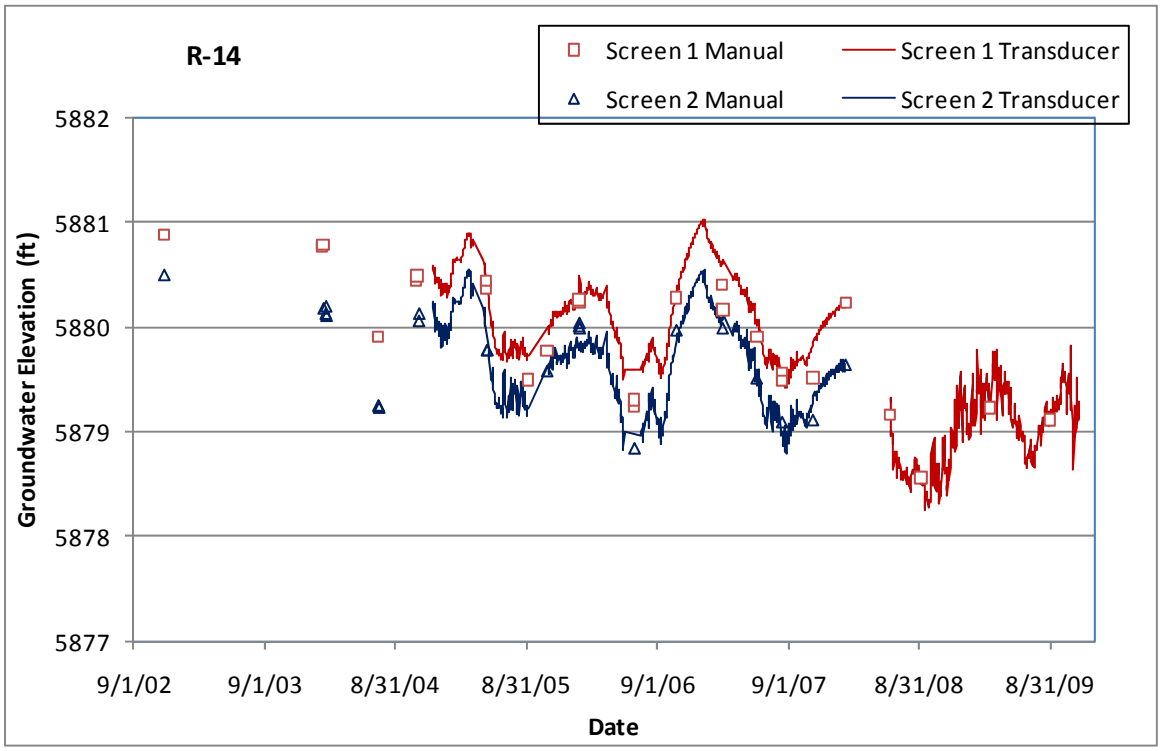
3.16 R-14

Location: R-14 is located in upper Ten Site Canyon about 0.5 miles upgradient of supply well PM-5.
Completion Type: Formerly multiple completion, two screens in the regional aquifer; recompleted in February 2008 to single screen at the top of the regional aquifer when screen 2 was plugged and abandoned. The top of screen 1 is about 20 ft below the water table.
Period of Record: Westbay® system installed November 23, 2002, transducers installed December 14, 2004, water level data from Westbay® system to February 25, 2008. Transducer installed in recompleted single screen well June 10, 2008; data through 2009.
Remarks: Screens were formerly 53 ft apart; heads between screens were within 0.5 ft of each other. The aquifer shows no response to atmospheric pressure fluctuations. The aquifer at R-14 responds primarily to pumping supply well PM-5. After removal of the Westbay® system, an error in the Westbay® pipe tally resulted in correction of all Westbay® derived water level data downward by 3.3 ft.

R-14 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Depth (ft)	Pump Elev (ft)	Top of Packer/ Plug (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1200.6	1233.2	5861.48	5828.88	32.6	1198.0	5864.1	1244.7	11.5	36.0	RT	Tp
2	1286.5	1293.1	5775.58	5768.98	6.6	Screen 2 Plugged and Abandoned 2/08					RD	Tp

Note: R-14 brass cap elevation 7062.08 ft; all measurements from this elevation.



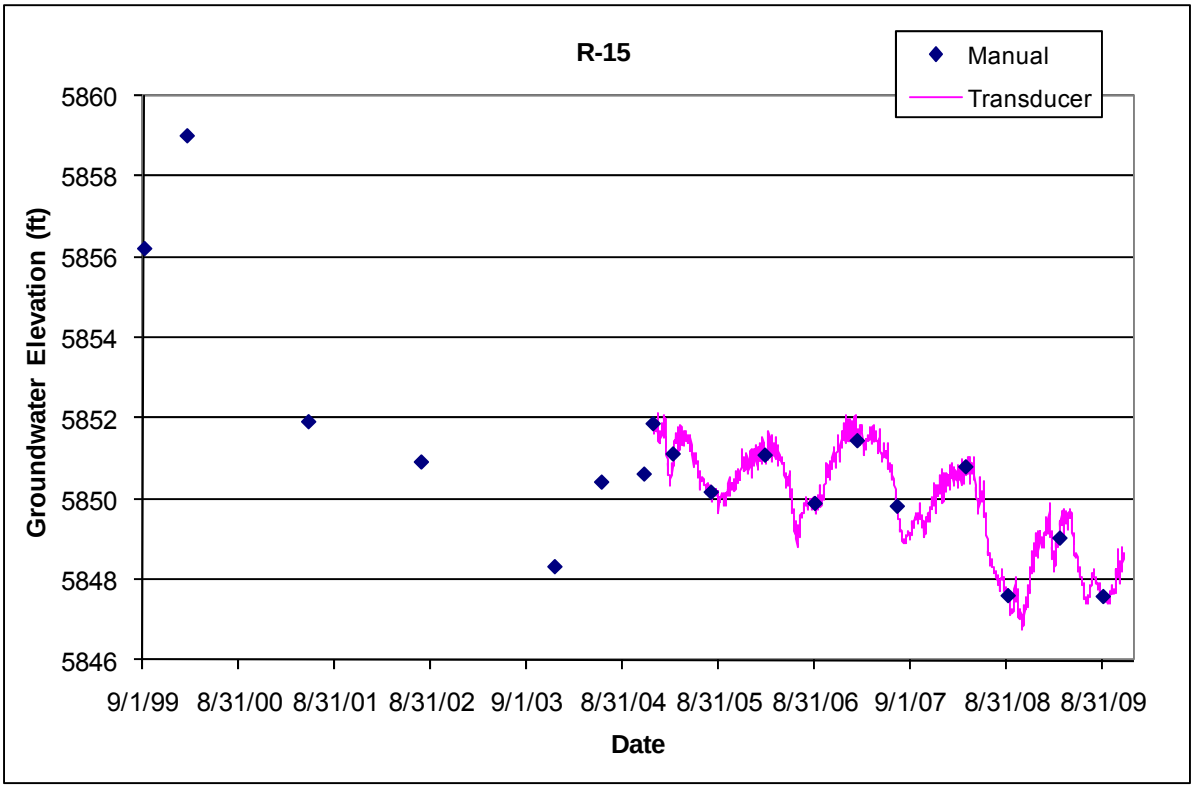
3.17 R-15

Location: R-15 is located in lower Mortandad Canyon downstream of the sediment traps.
Completion Type: Single completion at the top of the regional aquifer. The screen straddles the water table.
Period of Record: Well completed September 1999, transducer installed December 23, 2004, transducer data through 2009.
Remarks: R-15 was completed in 1999 to a depth of 1030.6 ft, about 140 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. The aquifer at R-15 responds to pumping supply wells PM-4 and PM-5.

R-15 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	958.6	1020.3	5861.4	5799.7	61.7	1015.6	5804.4	1020.3	5799.7	1030.6	10.3	39.8	RT	Tp

Note: R-15 Brass Cap Ground Elevation: 6820.0 ft; all measurements are from this elevation



3.18 R-16

Location: R-16 is located northeast of White Rock in lower Cañada del Buey near the confluence with lower Mortandad Canyon.

Completion Type: Multiple completion, four screens in the regional aquifer, screen 1 is blocked by casing and is not useable.

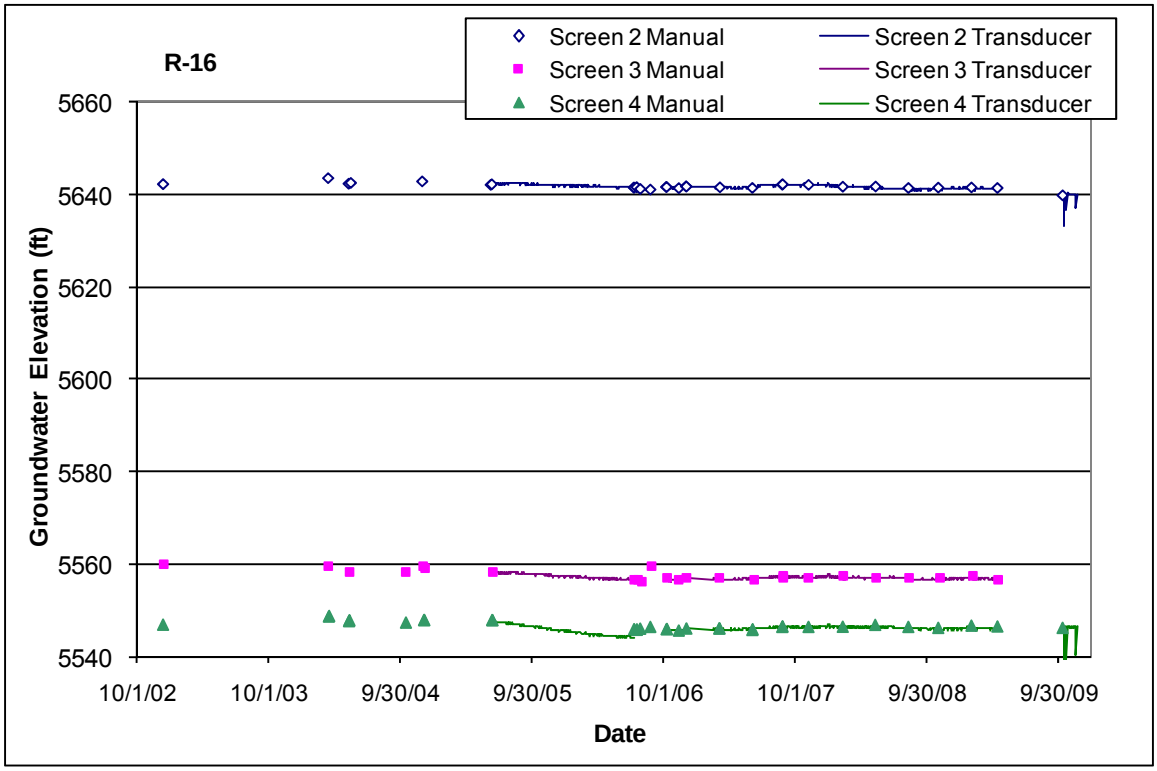
Period of Record: Westbay® installed December 14, 2002, transducers installed June 16, 2005, transducer data to July 12, 2006, when the Westbay® system was removed for additional screen development. The Westbay® system was reinstalled and transducers were reinstalled October 18, 2006. Westbay® transducer data extend to April 15, 2009, when the Westbay® system was removed for well rehabilitation and conversion. A single submersible pump with dual valve Baski sampling system was installed on October 14, 2009, to monitor screens 2 and 4; screen 3 not monitored after April 15, 2009 (LANL 2009). Groundwater level data from the dual screen sampling system are available from October 14, 2009, through 2009.

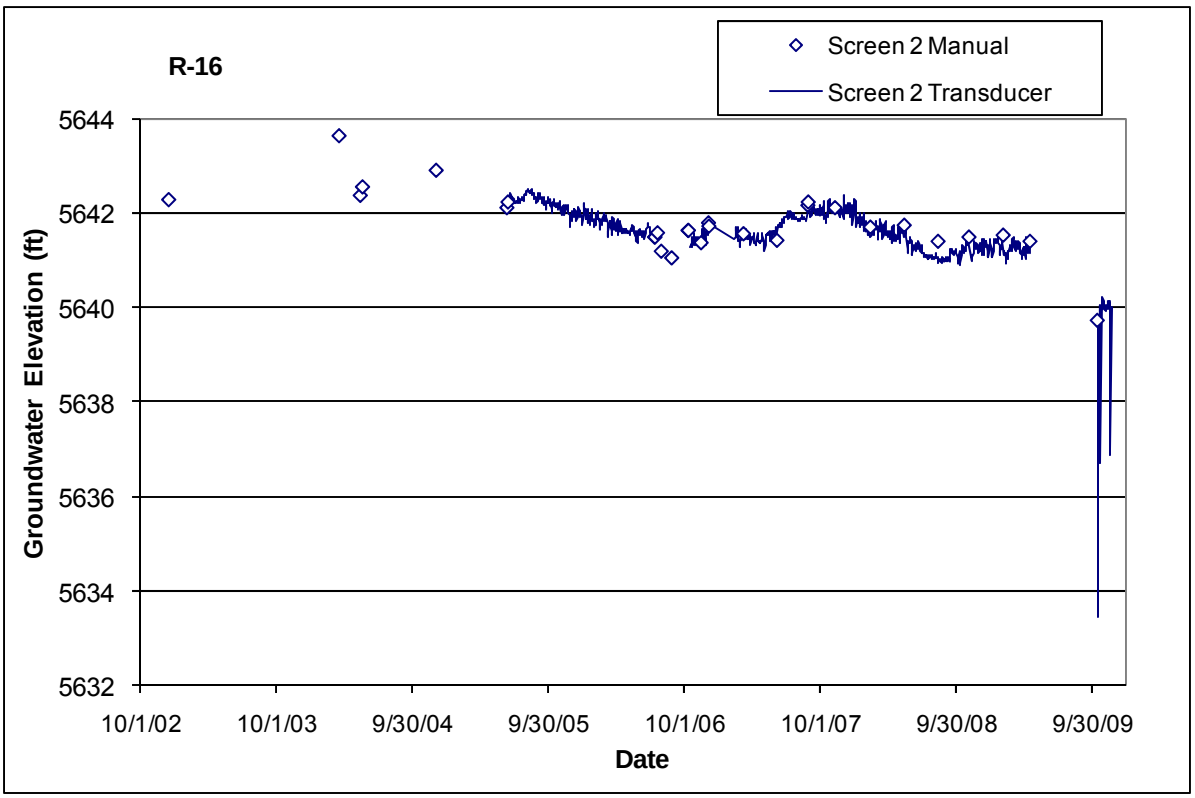
Remarks: Screens 2 and 3 are about 144 ft apart with a head difference of over 80 ft. Screens 3 and 4 show similar water level trends. The aquifer response to atmospheric pressure declines downward from screen 2 to screen 4, from 68% at screen 2 to 57% at screen 4.

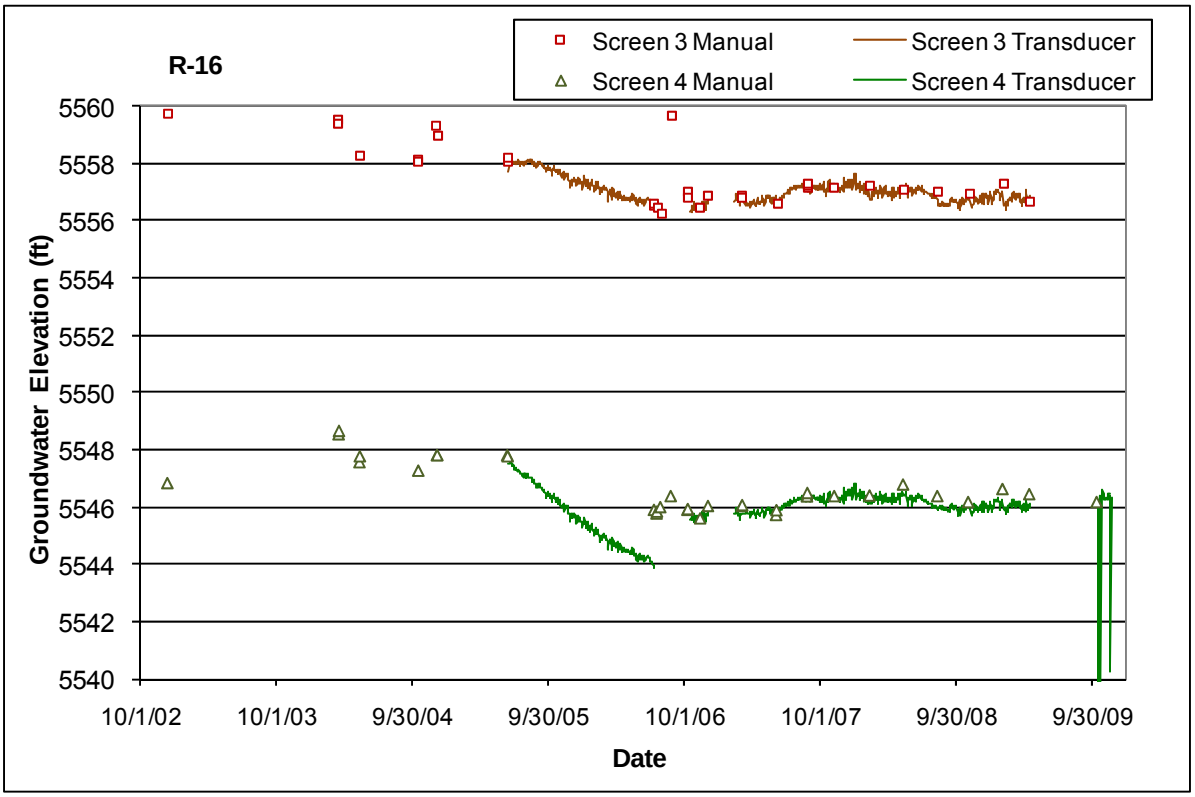
R-16 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	APV Intake Depth (ft)	APV Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Packer/ Sump Bottom (ft)	Packer Bottom Depth (ft)	Bottom of Sump Elev (ft)	Sump Length (ft)	Hydro Zone Code	Geo Unit Code	Comment
1	641.0	648.6	5615.9	5608.3	7.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RT	Tp	Screen unusable
2	863.4	870.9	5393.5	5386.0	7.5	872.8	5384.1	870.9	5386.0	881.2	885.6	5375.6	10.3	RD	Tsf	Upper zone
3	1014.8	1022.4	5242.1	5234.5	7.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	RD	Tsf	Screen sealed off
4	1237.0	1244.6	5019.9	5012.3	7.6	1234.6	5022.3	1244.6	5012.3	1276.7	1223.0	4980.2	32.1	RD	Tsf	Lower zone

Brass Cap Elevation: 6256.87 ft; all measurements are from this elevation




R-16
Screen 2 Manual
Screen 2 Transducer
Groundwater Elevation (ft)
5644
5642
5640
5638
5636
5634
5632
10/1/02
10/1/03
9/30/04
9/30/05
10/1/06
10/1/07
9/30/08
9/30/09
Date


R-16
Screen 3 Manual
Screen 3 Transducer
Screen 4 Manual
Screen 4 Transducer
Groundwater Elevation (ft)
5560
5558
5556
5554
5552
5550
5548
5546
5544
5542
5540
10/1/02
10/1/03
9/30/04
9/30/05
10/1/06
10/1/07
9/30/08
9/30/09
Date

3.19 R-16r

Location: R-16r is located northeast of White Rock adjacent to R-16 in lower Cañada del Buey near the confluence with lower Mortandad Canyon.

Completion Type: Single completion at the top of the regional aquifer. R-16r provides data for the top of the regional aquifer in place of R-16 screen 1, which is blocked by casing and is not useable. The top of the screen is about 36 ft below the water table.

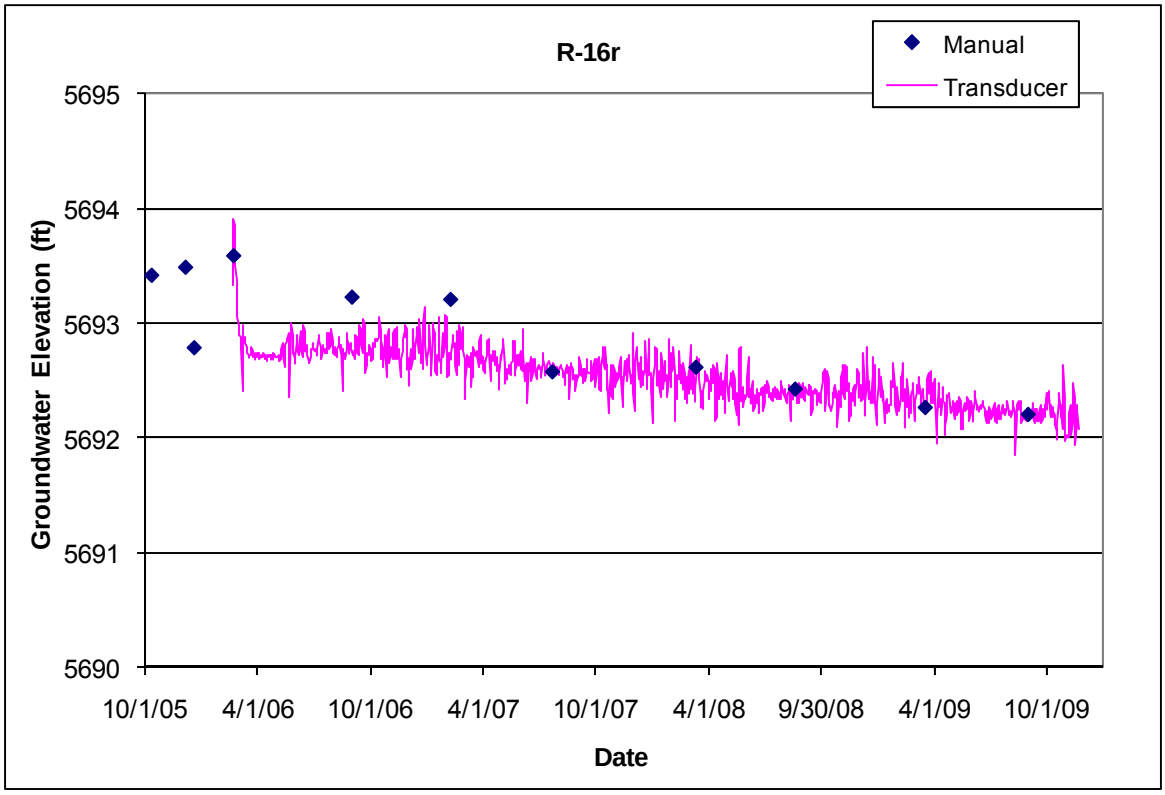
Period of Record: Well completed October 11, 2005, transducers installed February 21, 2006, data through 2009.

Remarks: R-16r water level at the top of the regional aquifer about 50 ft higher than the water level at R-16 screen 2, which is located about 250 ft lower than the R-16r screen. The well is 90% barometrically efficient; the aquifer indicates a 10% response to atmospheric pressure; however, the aquifer shows a delayed response to atmospheric pressure fluctuations.

R-16r Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	600.0	617.6	5657.0	5639.4	17.6	596.6	5660.4	617.6	5639.4	631.4	13.8	42.4	RT	Tpt

Note: Brass Cap Ground Elevation: 6256.97 ft; all measurements are from this elevation



3.20 R-17

Location: R-17 is located in middle Pajarito Canyon below the confluence with Two-Mile Canyon and about 1 mile southwest of supply well PM-5.

Completion Type: Dual completion within the regional aquifer with a Baski packer and dual valve system and single submersible pump. The top of screen 1 is located about 20 ft below the water table. The screens are 44 ft apart.

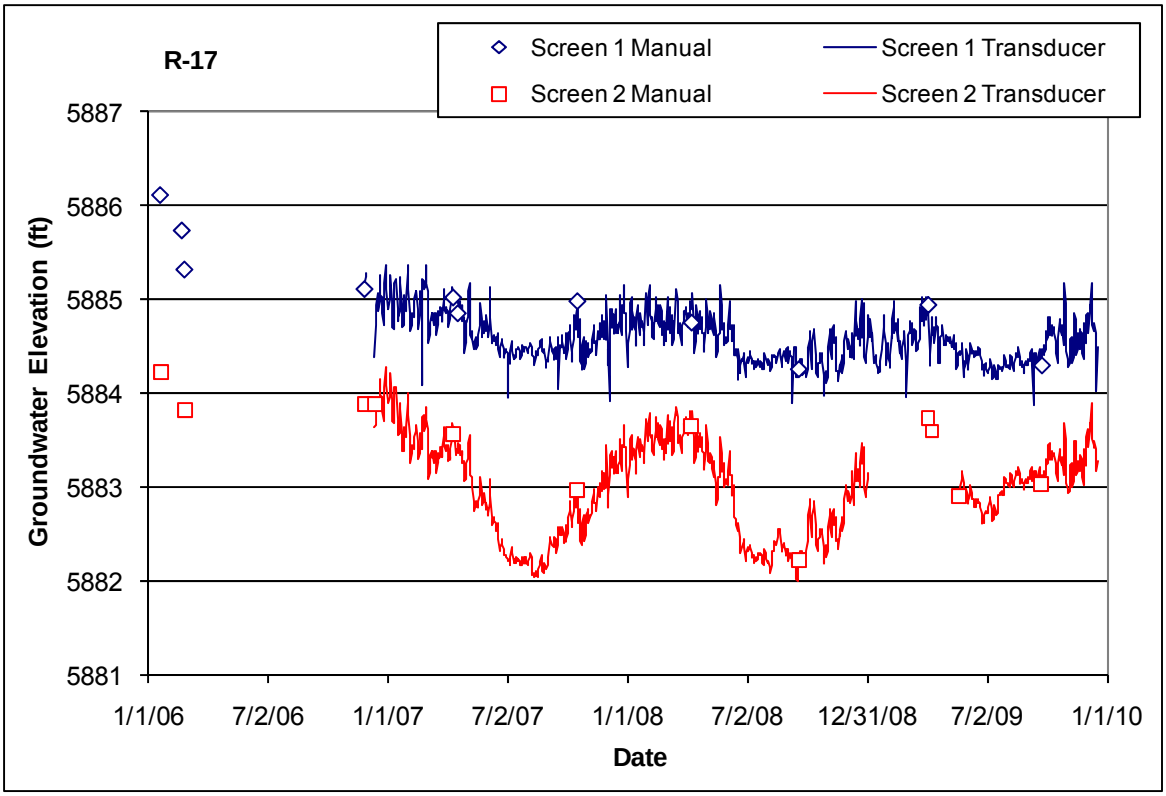
Period of Record: Completed January 4, 2006, transducers installed December 12, 2006, transducer data through 2009.

Remarks: R-17 was completed to a depth of 1140.9 ft, about 100 ft into the regional aquifer. Screen 1 is 100% barometrically efficient; the aquifer does not show a response to atmospheric pressure fluctuations. Screen 2 is 90% barometrically efficient. Both screens show a seasonal response to supply well pumping; screen 2 shows a response to pumping supply wells PM-2, PM-4, and PM-5.

R-17 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Packer/ Sump (ft)	Top of Packer/ Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1057.0	1080.0	5864.5	5841.5	23.0	1089.6	5831.9	1101.2	5820.4	1101.2	21.1	66.1	RT	Tpf
2	1124.0	1134.0	5797.5	5787.5	10.0	1128.6	5792.9	1134.0	5787.5	1140.9	6.9	21.6	RD	Tpf

Note: Brass Cap Ground Elevation: 6921.51 ft; all measurements are from this elevation



3.21 R-18

Location: R-18 is located on a mesa at TA-14 between Pajarito Canyon and Cañon de Valle, about 3000 ft northeast of R-25.

Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 70 ft bellow the water table.

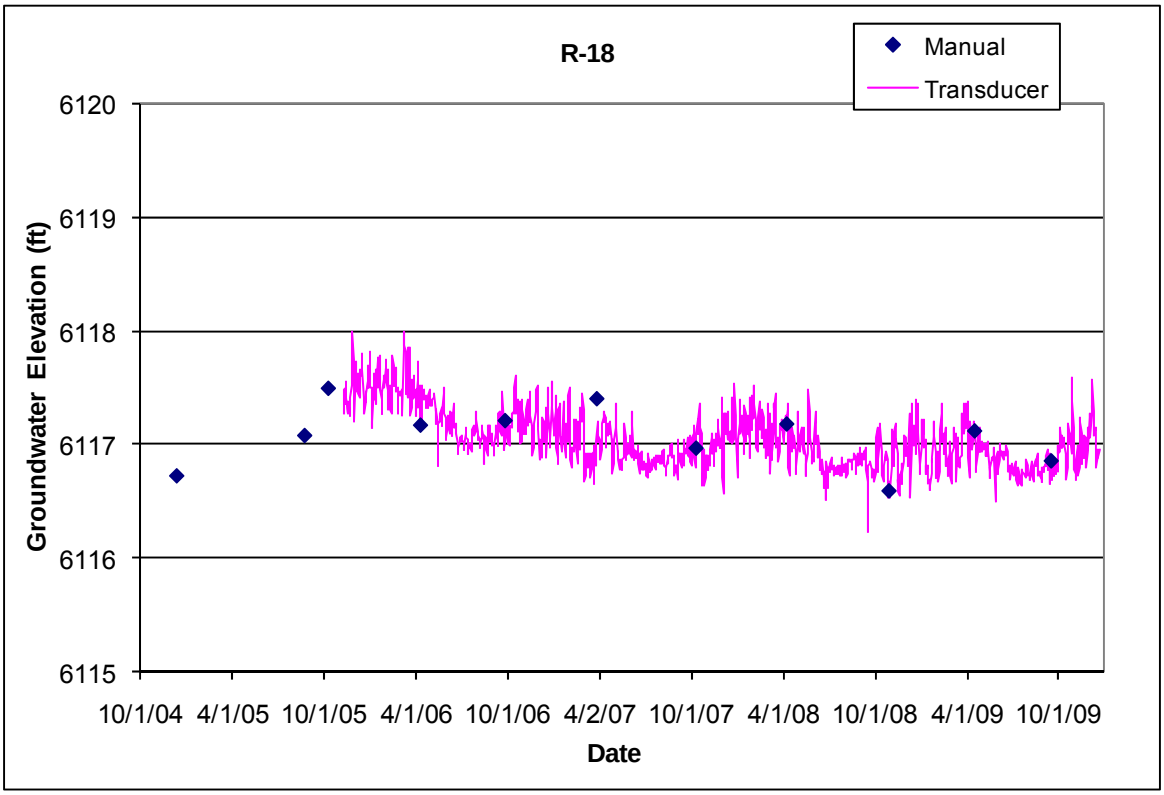
Period of Record: Completed December 12, 2004, transducer installed October 11, 2005, transducer data through 2009.

Remarks: R-18 was completed to a depth of 1405 ft, about 118 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer does not indicate a response to atmospheric pressure fluctuations. There is no apparent response to supply well pumping.

R-18 Construction Information

Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1358.0	1381	6046.8	6023.8	23.0	1353	6051.8	1381.0	6023.8	1405	24.0	75.1	RT	Tpf

Note: Brass Cap Ground Elevation: 7404.83 ft; all measurements are from this elevation



3.22 R-19

Location: R-19 is located on a mesa south of Three-Mile Canyon about 1.2 miles west of supply well PM-2.

Completion Type: Multiple completion, two screens in intermediate zones, and five screens in the regional aquifer. Screen 3 straddles the regional water table.

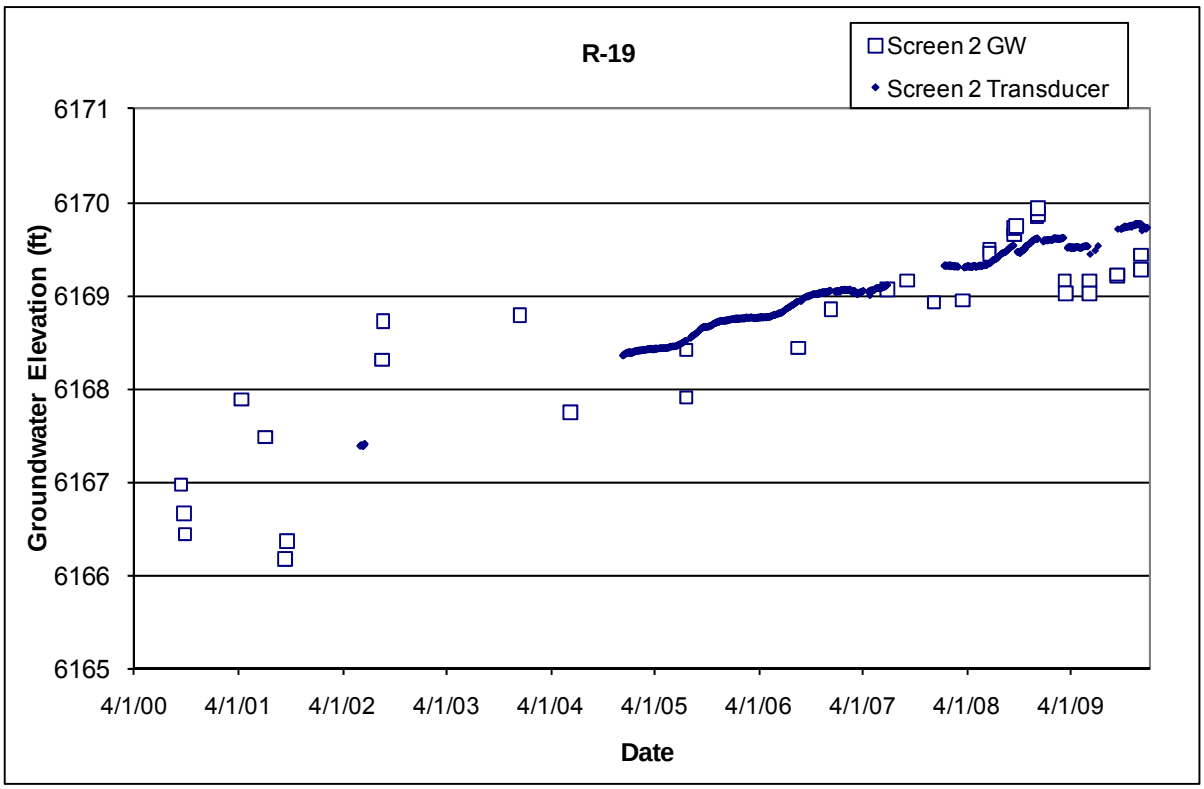
Period of Record: Westbay® installed September 11, 2000, transducers installed June 04, 2002, equipment problems occurred within two weeks. Transducers reinstalled December 10, 2004; transducer data to June 25, 2007, when the transducer string cable failed. Cable rebuilt and transducers reinstalled January 10, 2008; data are available intermittently through 2009.

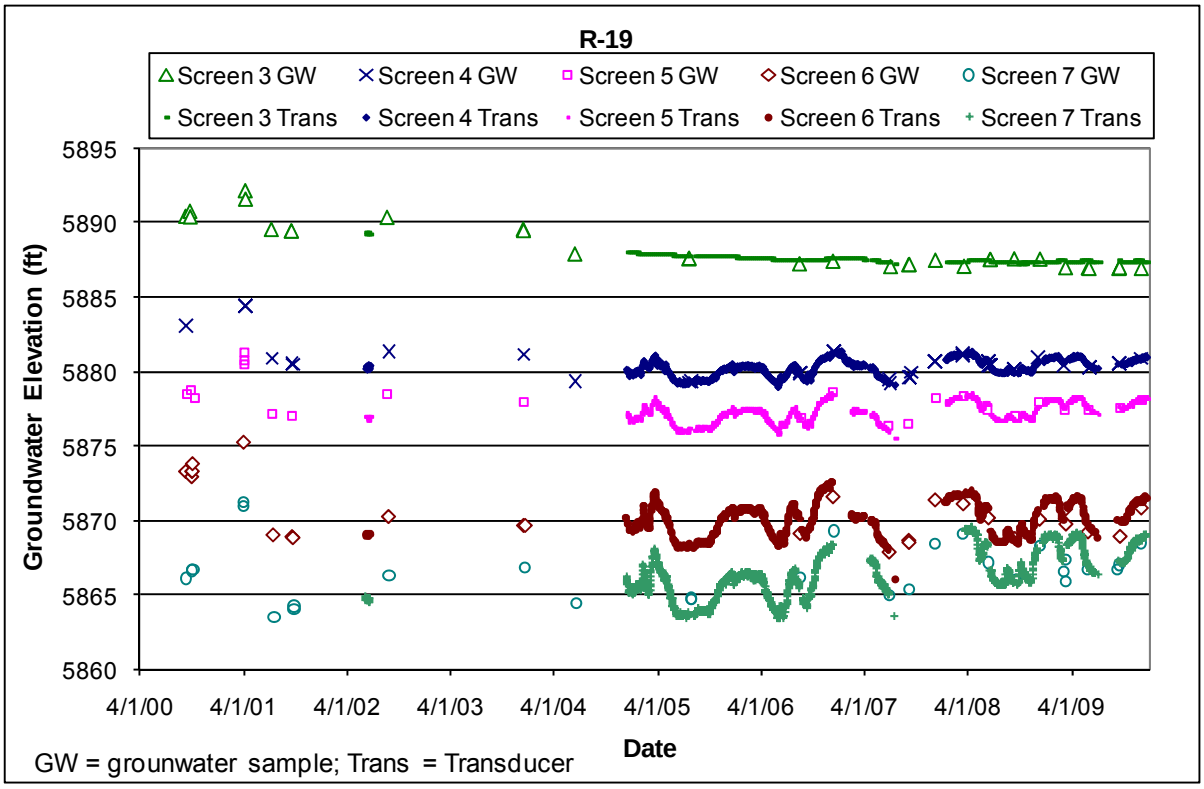
Remarks: Screen 1 has been dry since Westbay® installation. Screen 3 at the top of the regional aquifer does not show a response to atmospheric pressure fluctuations, but the deeper screens 4 through 7 indicate 40% to 50% response. The deeper screens (4 through 7) in the regional aquifer respond to supply well pumping at PM-2 and PM-4, and possibly to PM-5.

R-19 Construction Information and Port Data

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elevation (ft)	Distance from Bottom of Screen (ft)	Sump Volume (L)	Comment
1	827.2	843.6	6239.1	6222.7	16.4	I	Qbog	MP1A	844.2	6222.1	-0.6	1.3	Below Screen
								PP1	849.6	6216.7	-6	13.0	Below Screen
								MP1B	855.2	6211.1	-11.6	25.1	Below Screen
2	893.3	909.6	6173.0	6156.7	16.3	I	Tp	**MP2A**	909.3	6157.0	0.3		Within Screen
								PP2	914.7	6151.6	-5.1	11.0	Below Screen
								MP2B	920.3	6146.0	-10.7	23.1	Below Screen
3	1171.4	1215.4	5894.9	5850.9	44.0	RT	Tpf	MP3A	1190.7	5875.6	24.7		Within Screen
								PP3	1196.1	5870.2	19.3		Within Screen
								MP3B	1201.7	5864.6	13.7		Within Screen
								MP3C	1212.8	5853.5	2.6		Within Screen
4	1410.2	1417.4	5656.1	5648.9	7.2	RD	Tpf	**MP4A**	1412.9	5653.4	4.5		Within Screen
								PP4	1418.3	5648.0	-0.9	1.9	Below Screen
								MP4B	1423.9	5642.4	-6.5	14.1	Below Screen
5	1582.6	1589.8	5483.7	5476.5	7.2	RD	Tpf	**MP5A**	1586.1	5480.2	3.7		Within Screen
								PP5	1591.5	5474.8	-1.7	3.7	Below Screen
								MP5B	1597.1	5469.2	-7.3	15.8	Below Screen
6	1726.8	1733.9	5339.5	5332.4	7.1	RD	Tpf	**MP6A**	1730.1	5336.2	3.8		Within Screen
								PP6	1735.4	5330.9	-1.5	3.2	Below Screen
								MP6B	1741.1	5325.2	-7.2	15.6	Below Screen
7	1832.4	1839.5	5233.9	5226.8	7.1	RD	Tpf	**MP7A**	1834.7	5231.6	4.8		Within Screen
								PP7	1840.0	5226.3	-0.5	1.1	Below Screen
								MP7B	1845.7	5220.6	-6.2	13.4	Below Screen

Note: R-19 Brass Cap Ground Elevation: 7066.3 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports


R-19
Screen 2 GW
Screen 2 Transducer
Groundwater Elevation (ft)
6171
6170
6169
6168
6167
6166
6165
4/1/00
4/1/01
4/1/02
4/1/03
4/1/04
4/1/05
4/1/06
4/1/07
4/1/08
4/1/09
Date


R-19
Screen 3 GW
Screen 4 GW
Screen 5 GW
Screen 6 GW
Screen 7 GW
Screen 3 Trans
Screen 4 Trans
Screen 5 Trans
Screen 6 Trans
Screen 7 Trans
Groundwater Elevation (ft)
5895
5890
5885
5880
5875
5870
5865
5860
4/1/00
4/1/01
4/1/02
4/1/03
4/1/04
4/1/05
4/1/06
4/1/07
4/1/08
4/1/09
Date
GW = grounwater sample; Trans = Transducer

3.23 R-20

Location: R-20 is located in lower Pajarito Canyon about 1300 ft east of supply well PM-2.

Completion Type: Multiple completion, originally three screens in the regional aquifer. Screen 3 was plugged and abandoned November 2007, leaving two screens in the regional aquifer. The top of screen 1 is about 76 ft below the regional water table.

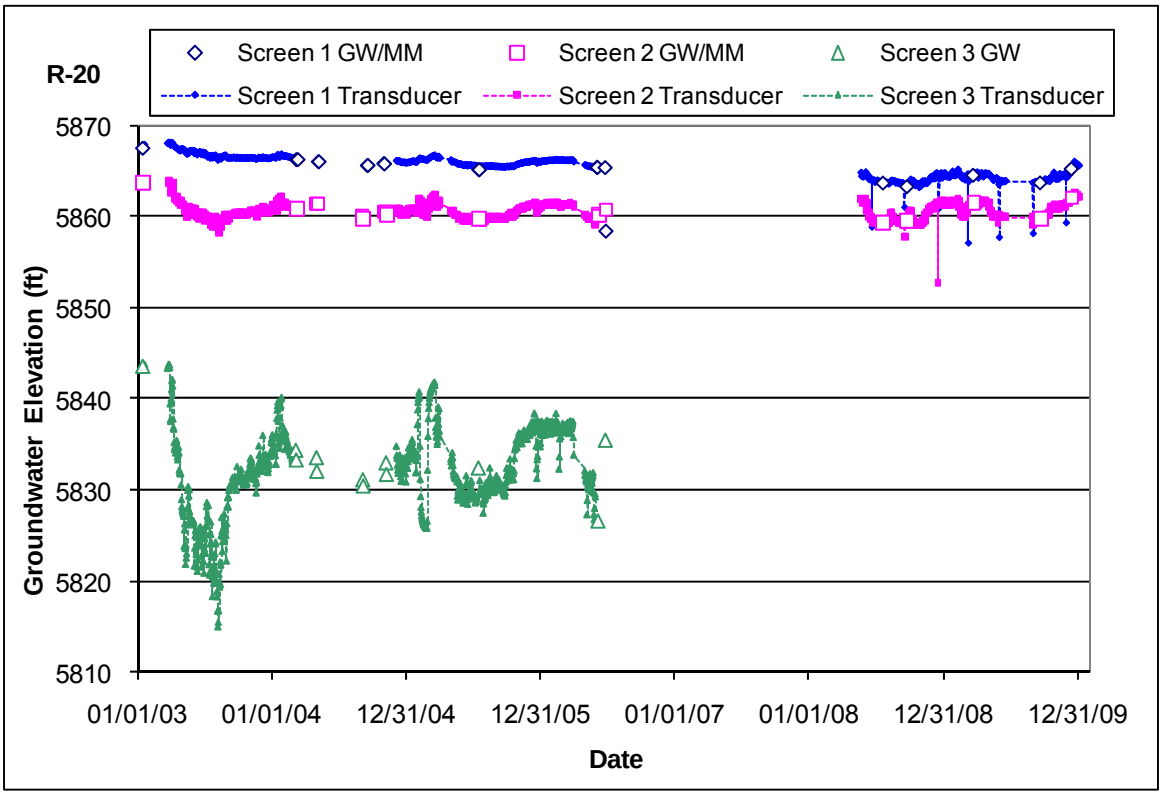
Period of Record: Westbay® installed January 18, 2003, transducers installed March 26, 2003, intermittent transducer data to June 1, 2006, when the Westbay® system was removed. No water level data in the last half of 2006 and in 2007 during well rehabilitation. Transducers installed at screens 1 and 2 in May 2008; data through 2009.

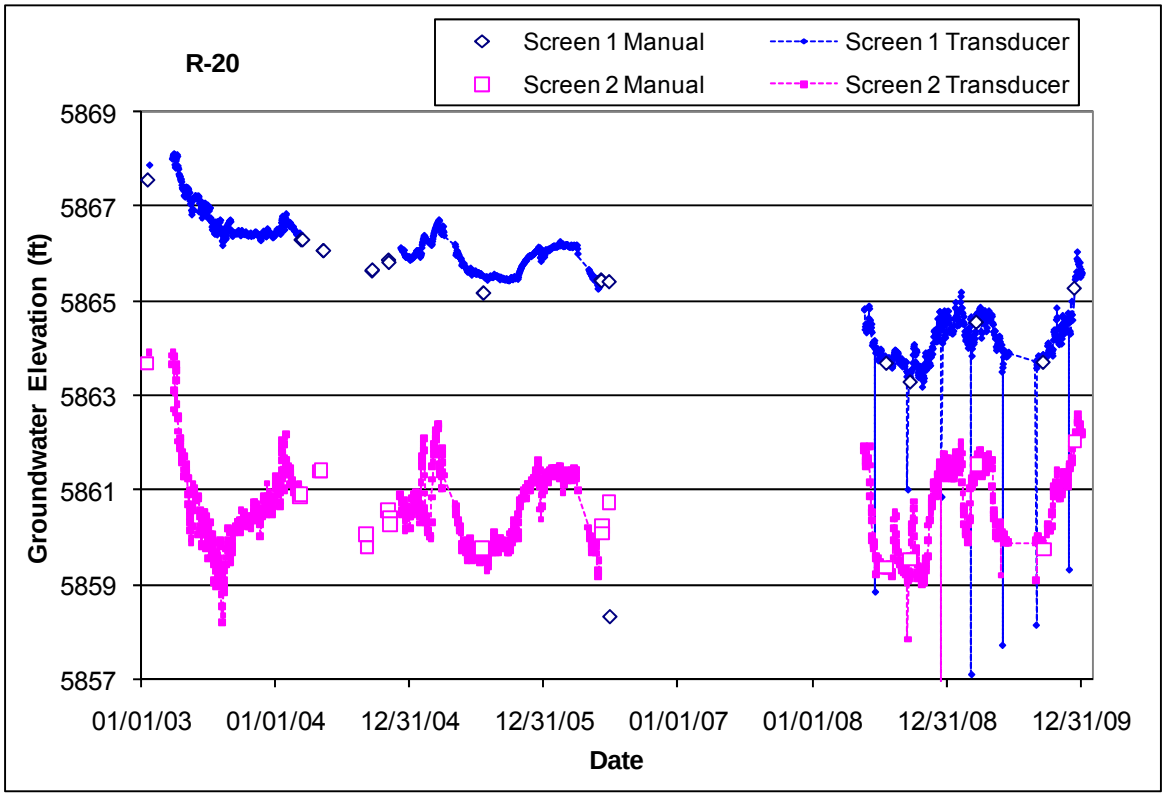
Remarks: Two packers installed between screens 1 and 2 and a dual pump Baski sampling system installed May 2008 (LANL January 2008). Screen 1 shows no response to atmospheric pressure fluctuations. Screen 3 responded to supply well pumping at PM-2 and PM-4. The shallower screens 1 and 2 show a muted response to supply well pumping.

R-20 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Second Packer Bottom Depth (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Packer/ Sump Bottom (ft)	Sump Length (ft)	Sump Vol (gal)	Hydro Zone Code	Geo Unit Code
1	904.6	912.2	5789.8	5782.2	7.6	908.43	5785.9		912.2	5782.2	918.7	6.5	5.3	RT	Tb4
2	1147.1	1154.7	5547.3	5539.7	7.6	1141.7	5552.6	1133.8	1154.7	5539.7	1183.5	28.8	23.8	RD	Tpp
3	1328.8	1336.5	5365.6	5357.9	7.7	**Screen 3 plugged and abandoned November 2007**								RD	Tsf

Note: R-20 Brass Cap Ground Elevation: 6694.35 ft; all measurements are from this elevation


R-20
Screen 1 GW/MM
Screen 2 GW/MM
Screen 3 GW
Screen 1 Transducer
Screen 2 Transducer
Screen 3 Transducer
Groundwater Elevation (ft)
5870
5860
5850
5840
5830
5820
5810
01/01/03
01/01/04
12/31/04
12/31/05
01/01/07
01/01/08
12/31/08
12/31/09
Date


R-20
Screen 1 Manual
Screen 1 Transducer
Screen 2 Manual
Screen 2 Transducer
Groundwater Elevation (ft)
5869
5867
5865
5863
5861
5859
5857
01/01/03
01/01/04
12/31/04
12/31/05
01/01/07
01/01/08
12/31/08
12/31/09
Date

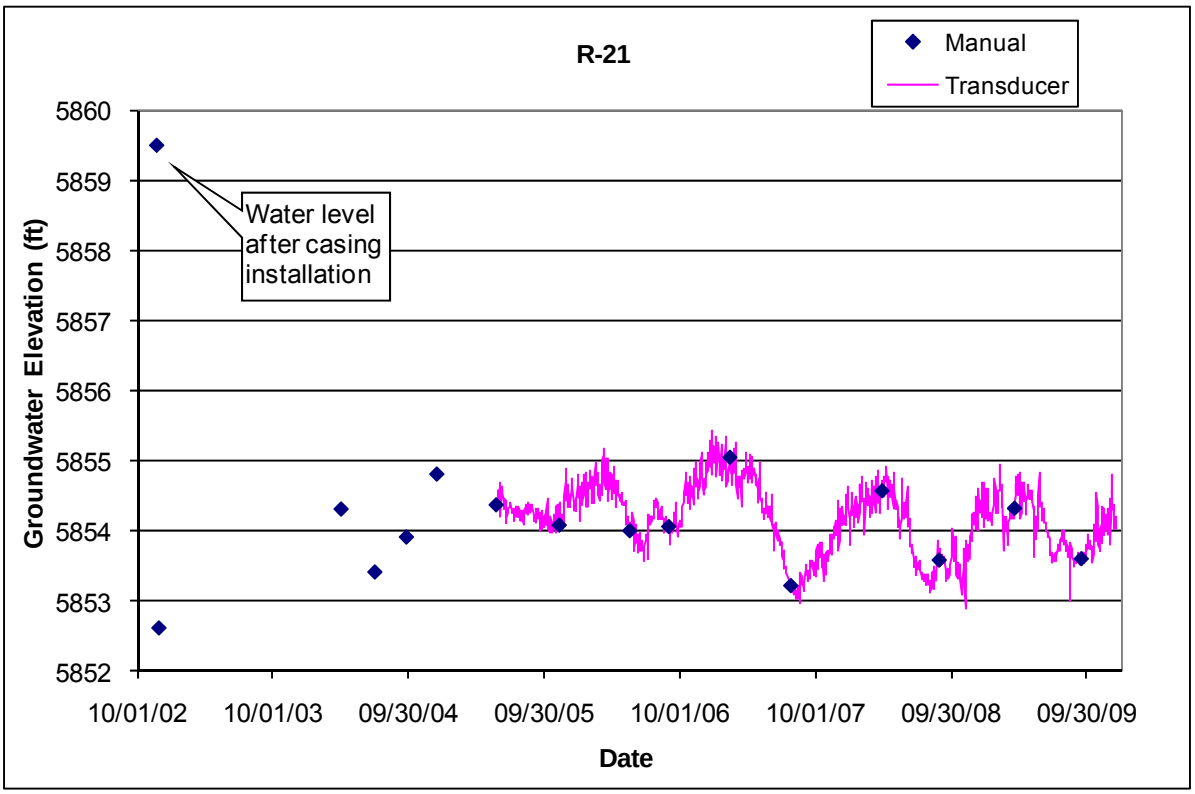
3.24 R-21

Location: R-21 is located in Cañada del Buey north of TA-54.
Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 87 ft below the water table.
Period of Record: Well completed November 2002, transducer installed May 23, 2005, transducer data through 2009.
Remarks: R-21 installed to a depth of 941.4 ft, about 140 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. The well responds to pumping of PM-2, PM-4, and possibly another well or combination of wells.

R-21 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	888.8	906.8	5767.4	5749.4	18.0	861	5795.2	906.8	5749.4	941.4	34.6	192.4	RT	Tpf

Note: R-21 Brass Cap Ground Elevation: 6656.24 ft; all measurements are from this elevation



3.25 R-22

Location: R-22 is located at the east end of Mesita del Buey, east of TA-54.

Completion Type: Multiple completion, five screens in the regional aquifer. Screen 1 straddles the regional water table.

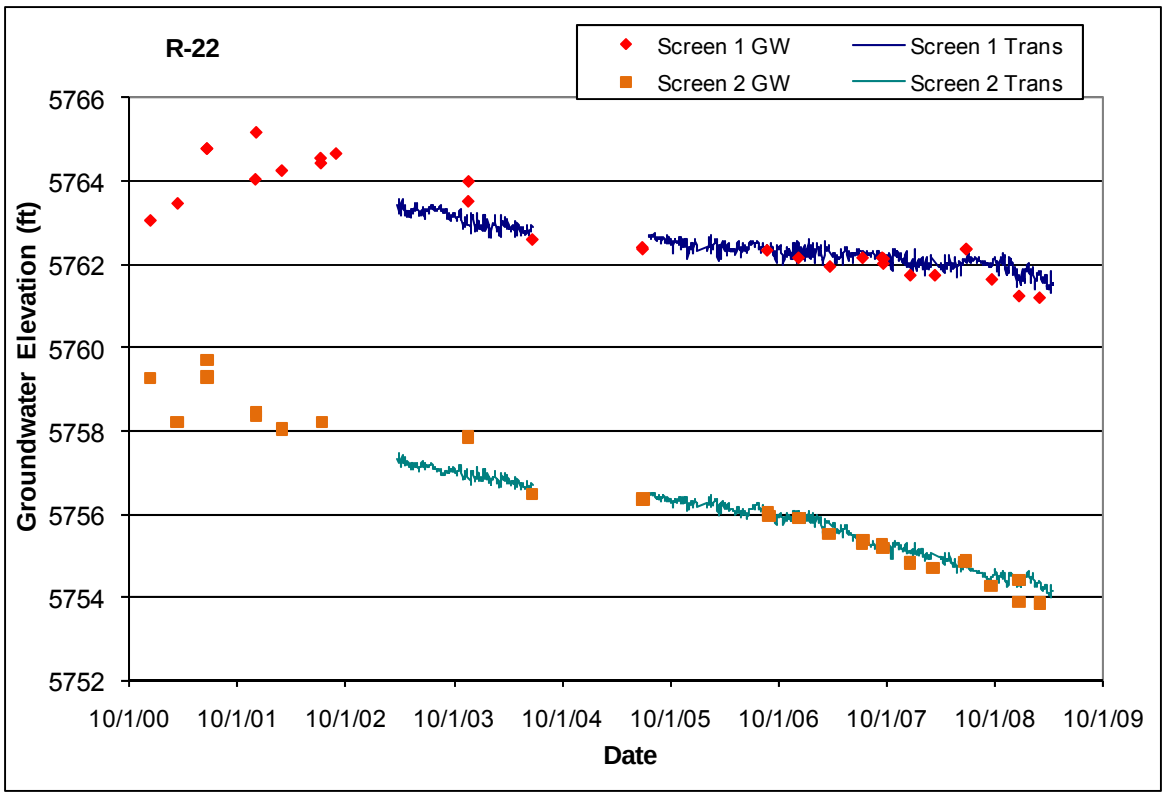
Period of Record: Westbay® installed December 11, 2000, transducers installed March 26, 2003, intermittent transducer data to April 13, 2009, when the transducers were removed in preparation for removing the Westbay® system.

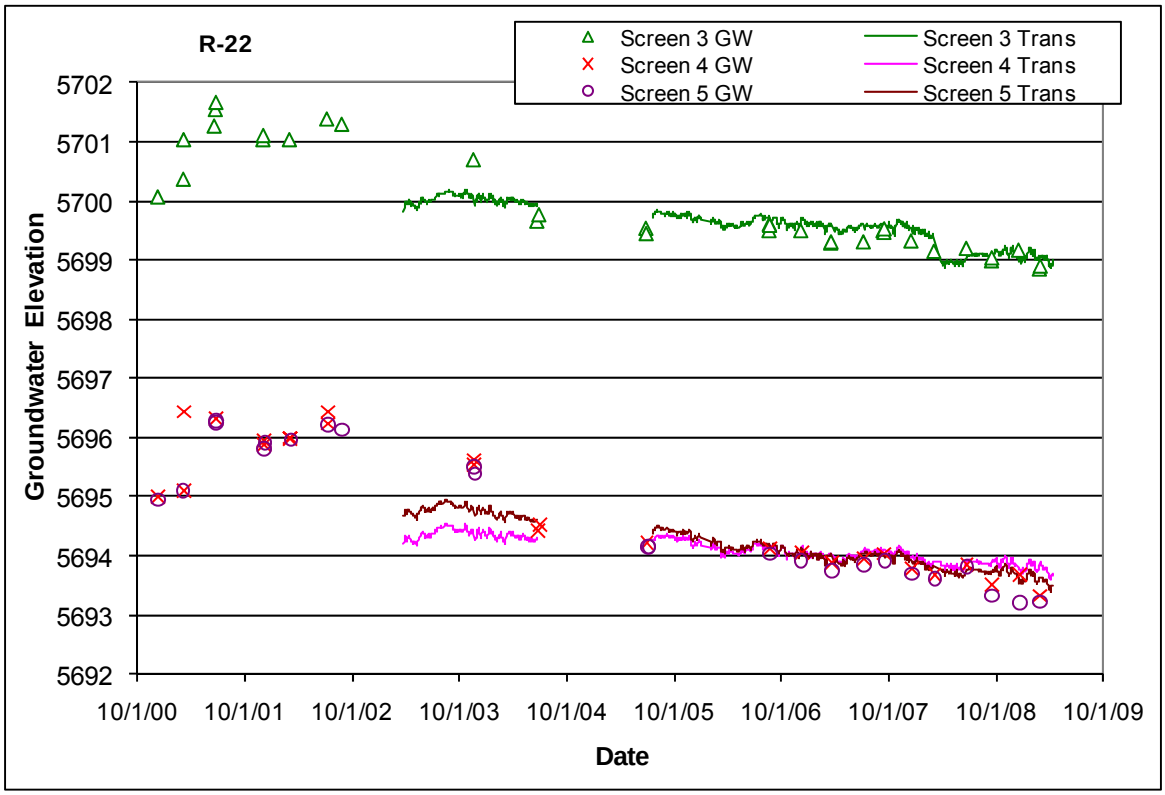
Remarks: Screens 1 and 2 have similar head values about 6 ft apart. Screens 3, 4, and 5 have similar heads within 6 ft of each other, but about 60 ft lower than screens 1 and 2. Screens 4 and 5 have nearly identical head values. The R-22 screens do not show an immediate response to atmospheric pressure fluctuations, but show a delayed response ranging from 20% to 95%. The deeper aquifer at R-22 screens 3, 4, and 5 shows an apparent small seasonal response to supply well pumping. The Westbay® system was removed on May 3, 2009, for well rehabilitation (LANL 2009).

R-22 Construction and Port Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elevation (ft)	Distance from Bottom of Screen (ft)	Sump Volume (L)	Comment
1	872.3	914.2	5778.2	5736.3	41.9	RT	Tb4	**MP1A**	907.1	5743.4	7.1		Within Screen
								PP1	912.4	5738.1	1.8		Within Screen
								MP1B	918.1	5732.4	-3.9	9.1	Below Screen
2	947.0	988.9	5703.5	5661.6	41.9	RD	Tb4	**MP2A**	962.8	5687.7	26.1		Within Screen
								PP2	967.7	5682.8	21.2		Within Screen
								MP2B	973.4	5677.1	15.5		Within Screen
3	1272.2	1278.9	5378.3	5371.6	6.7	RD	Tpf	**MP3A**	1273.5	5377.0	5.4		Within Screen
								PP3	1278.9	5371.6	0		Within Screen
								MP3B	1284.5	5366.0	-5.6	13.1	Below Screen
4	1378.2	1384.9	5272.3	5265.6	6.7	RD	Tb	**MP4A**	1378.0	5272.5	6.9		Above Screen
								PP4	1383.4	5267.1	1.5		Within Screen
								MP4B	1389.1	5261.4	-4.2	9.9	Below Screen
5	1447.3	1452.3	5203.2	5198.2	5.0	RD	Tpf	**MP5A**	1448.2	5202.3	4.1		Within Screen
								PP5	1453.6	5196.9	-1.3	3.0	Below Screen
								MP5B	1459.2	5191.3	-6.9	16.2	Below Screen

Note: R-22 Brass Cap Ground Elevation: 6650.5 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports


R-22
Screen 1 GW
Screen 1 Trans
Screen 2 GW
Screen 2 Trans
Groundwater Elevation (ft)
5766
5764
5762
5760
5758
5756
5754
5752
10/1/00
10/1/01
10/1/02
10/1/03
10/1/04
10/1/05
10/1/06
10/1/07
10/1/08
10/1/09
Date


R-22
Screen 3 GW
Screen 3 Trans
Screen 4 GW
Screen 4 Trans
Screen 5 GW
Screen 5 Trans
Groundwater Elevation
5702
5701
5700
5699
5698
5697
5696
5695
5694
5693
5692
10/1/00
10/1/01
10/1/02
10/1/03
10/1/04
10/1/05
10/1/06
10/1/07
10/1/08
10/1/09
Date

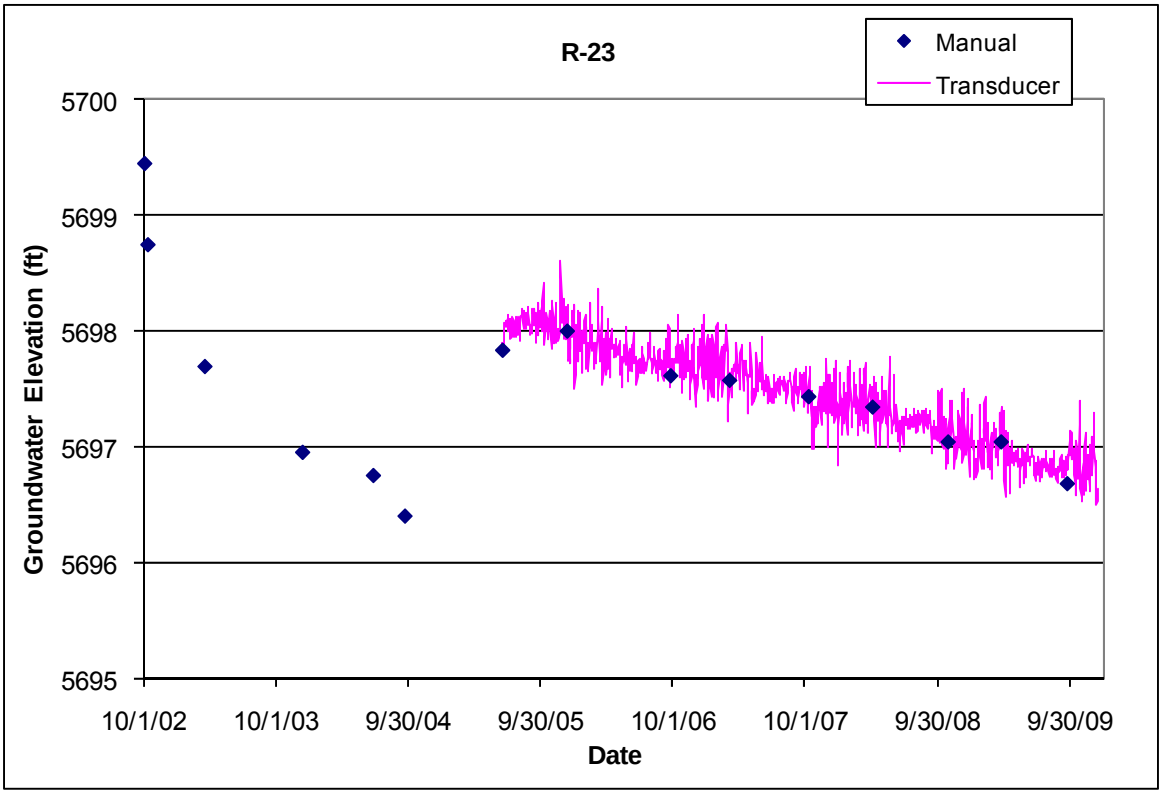
3.26 R-23

Location: R-23 is located in lower Pajarito Canyon near SR-4 and the eastern LANL boundary.
Completion Type: Single completion at the top of the regional aquifer. The screen straddles the water table.
Period of Record: Well completed October 2002, transducer installed June 20, 2005, transducer data through 2009.
Remarks: R-23 was installed to a depth of 886.3 ft, about 60 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer has no immediate response to atmospheric pressure fluctuations, however, the aquifer has a delayed response to atmospheric pressure. The aquifer at R-23 shows no apparent response to pumping the PM well field or the Buckman well field.

R-23 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	816.0	873.2	5711.8	5654.6	57.2	870.7	5657.1	873.2	5654.6	886.3	13.1	41.0	RT	Tsf

Note: R-23 Brass Cap Ground Elevation: 6527.75 ft; all measurements are from this elevation



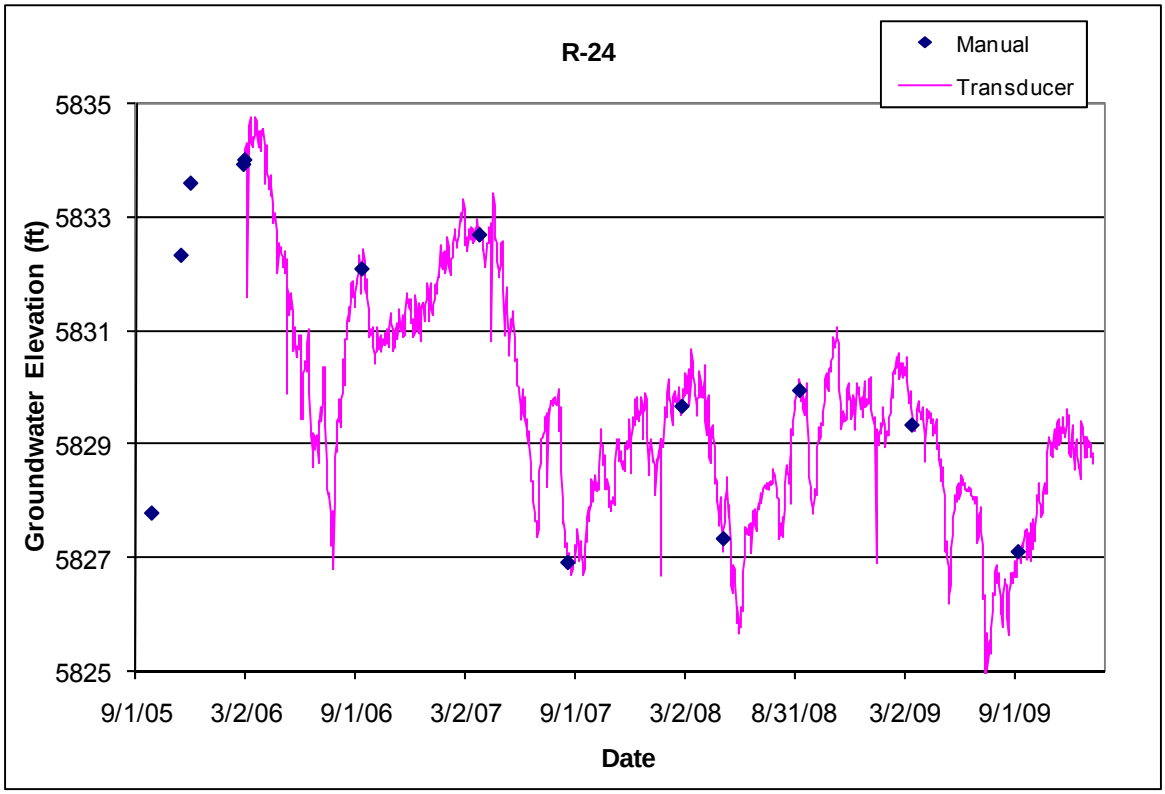
3.27 R-24

Location: R-24 is located in Bayo Canyon north of the former Bayo Sewage Treatment Plant.
Completion Type: Single completion at the top of the regional aquifer. The top of the screen is in a confined zone about 110 ft below the water table.
Period of Record: Well completed September 2005, transducer installed March 1, 2006, data through 2009.
Remarks: R-24 installed to a depth of 861 ft, about 150 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. The aquifer at R-24 responds primarily to pumping at supply well PM-3 but may also respond to pumping the Guaje well field and supply well O-4.

R-24 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	825.0	848.0	5722.4	5699.4	23.0	818.7	5728.7	848.0	5699.4	861	13.0	40.7	RT	Tsf

Note: R-24 Brass Cap Ground Elevation: 6547.38 ft; all measurements are from this elevation



3.28 R-25

Location: R-25 is located at TA-16 within the Cañon de Valle watershed.

Completion Type: Multiple completion, four screens in intermediate zones, and five screens in the regional aquifer. Screens 3 and 9 were damaged during installation and are not reliable for water level monitoring. Screen 5 straddles the regional water table.

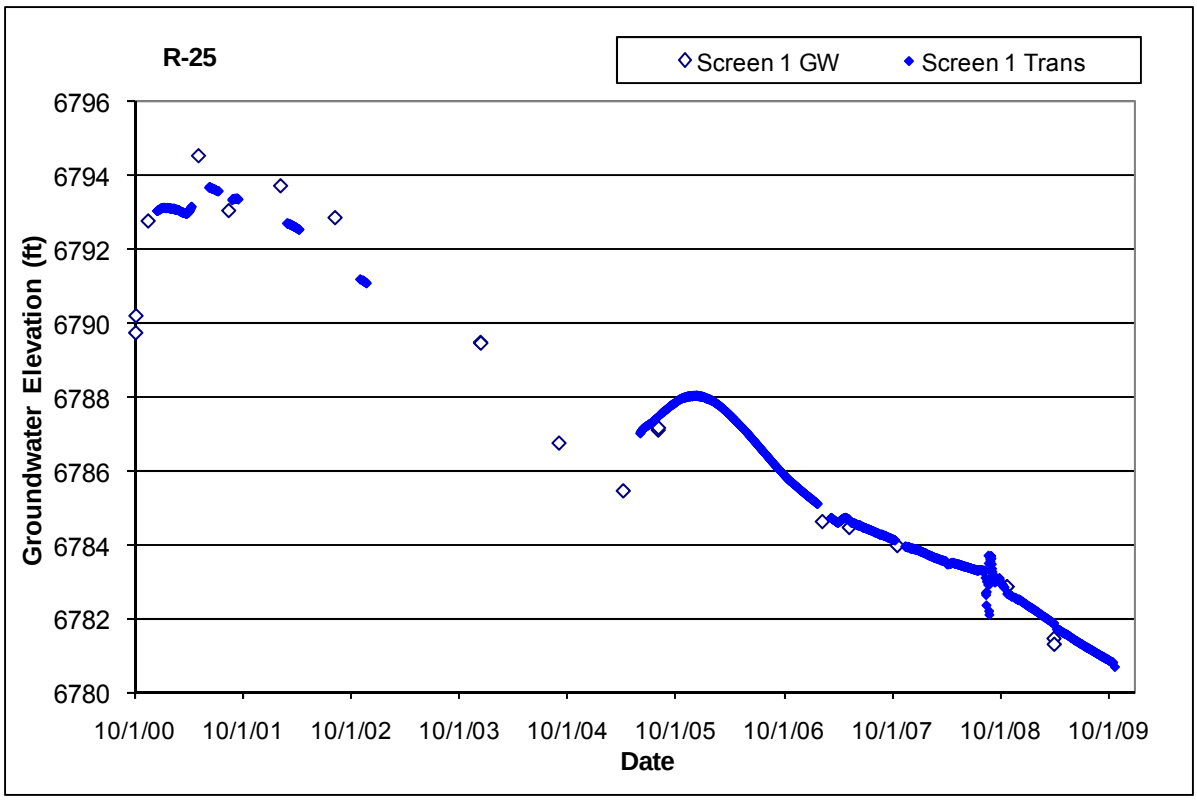
Period of Record: Westbay® installed October 3, 2000, transducers installed February 26, 2001, and between sampling events through 2002. Transducers installed again June 2, 2005; data through 2009.

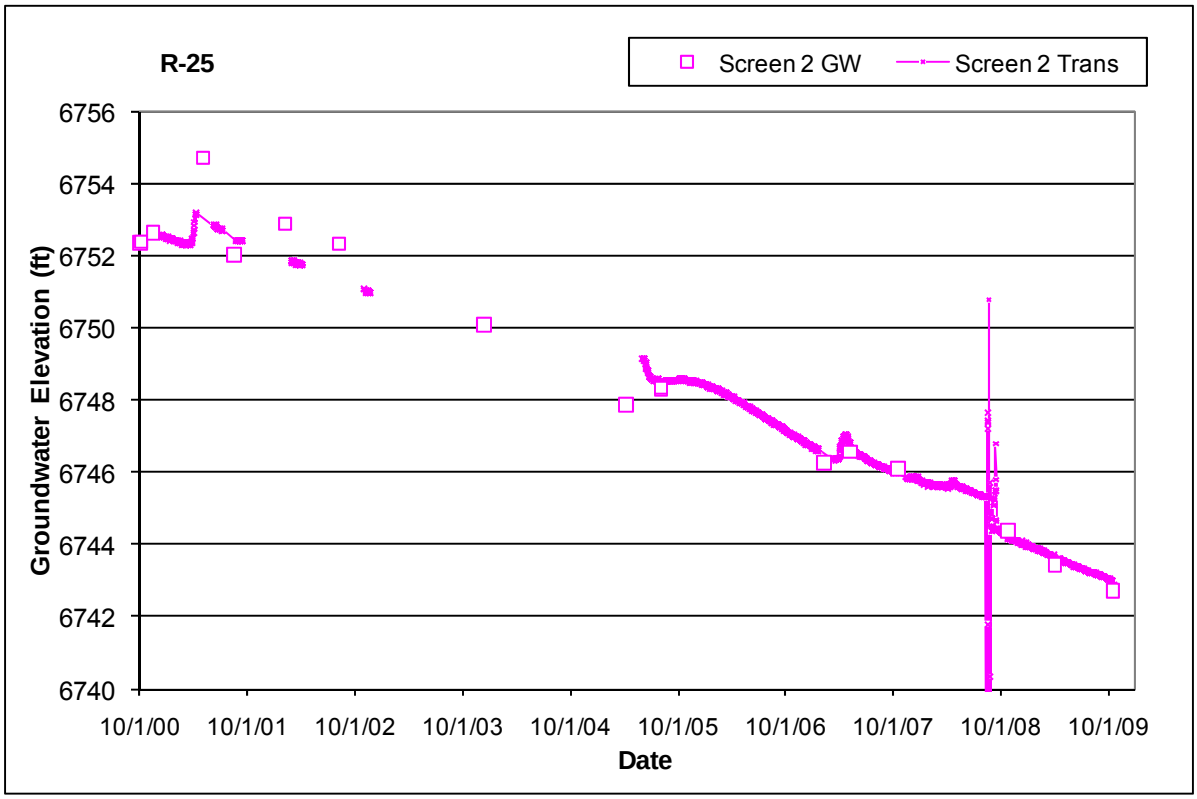
Remarks: Recurring problems with the transducer cables from 2001 to 2005 caused loss of data. The transducer cables were rebuilt in 2005. Screens 1 and 2 appear to be in the same intermediate zone. Screen 4 appears to be in a separate intermediate zone. The water level at screen 5, the top of the regional aquifer, declines significantly during low flow sampling and recovers slowly. There is no significant response to atmospheric pressure at any of the screens. Intermediate screens 1, 2, and 4 responded to snowmelt runoff in 2005, 2007, and 2008. The regional aquifer screens do not indicate an apparent response to supply well pumping. The intermediate groundwater at screens 1, 2, and 4 and the sump water at screen 3 responded to drilling and installation of adjacent well R-25c (replacement for R-25 screen 3) in August 2008 (LANL September 2008).

R-25 Construction and Port Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elev (ft)	Distance from Bottom of Screen (ft)	Sump Vol above Port (L)	Sump Vol Total (L)	Comment
1	737.6	758.4	6778.5	6757.7	20.8	I	Qbo	**MP1A**	754.8	6761.3	3.6			Within Screen
								PP1	760.1	6756.0	-1.7	4.9		Below Screen
								MP1B	765.8	6750.3	-7.4	21.4	31.9	Below Screen
2	882.6	893.4	6633.5	6622.7	10.8	I	Tpf	**MP2A**	891.8	6624.3	1.6			Within Screen
								PP2	897.2	6618.9	-3.8	11.0		Below Screen
								MP2B	902.8	6613.3	-9.4	27.2	37.9	Below Screen
3	1054.6	1064.6	6461.5	6451.5	10.0	I	Tpf	**MP3A**	1063.4	6452.7	1.2			Within Screen, screen damaged
								PP3	1068.8	6447.3	-4.2	12.2		Below Screen
								MP3B	1084.2	6431.9	-19.6	56.8	72.4	Below Screen, sump water
4	1184.6	1194.6	6331.5	6321.5	10.0	I	Tpf	**MP4A**	1192.4	6323.7	2.2			Within Screen
								PP4	1197.8	6318.3	-3.2	9.3		Below Screen
								MP4B	1203.4	6312.7	-8.8	25.5	36.5	Below Screen
5	1294.7	1304.7	6221.4	6211.4	10.0	RT	Tpf	**MP5A**	1303.4	6212.7	1.3			Within Screen
								PP5	1308.8	6207.3	-4.1	11.9		Below Screen
								MP5B	1314.4	6201.7	-9.7	28.1	39.1	Below Screen
6	1404.7	1414.7	6111.4	6101.4	10.0	RD	Tpf	**MP6A**	1406.3	6109.8	8.4			Within Screen
								PP6	1411.7	6104.4	3			Within Screen
								MP6B	1417.3	6098.8	-2.6	7.5	18.5	Below Screen
7	1604.7	1614.7	5911.4	5901.4	10.0	RD	Tpf	**MP7A**	1606.0	5910.1	8.7			Within Screen
								PP7	1611.4	5904.7	3.3			Within Screen
								MP7B	1617.1	5899.0	-2.4	7.0	17.7	Below Screen
8	1794.7	1804.7	5721.4	5711.4	10.0	RD	Tpf	**MP8A**	1796.0	5720.1	8.7			Within Screen
								PP8	1801.4	5714.7	3.3			Within Screen
								MP8B	1807.0	5709.1	-2.3	6.7	17.4	Below Screen
9	1894.7	1904.7	5621.4	5611.4	10.0	RD	Tpf	**MP9**	1825.1	5691.0	79.6			Screen 9 blocked by sediment

Note: R-25 Brass Cap Ground Elevation: 7516.1 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports


R-25
Screen 1 GW
Screen 1 Trans
Groundwater Elevation (ft)
6796
6794
6792
6790
6788
6786
6784
6782
6780
10/1/00
10/1/01
10/1/02
10/1/03
10/1/04
10/1/05
10/1/06
10/1/07
10/1/08
10/1/09
Date


R-25
Screen 2 GW
Screen 2 Trans
Groundwater Elevation (ft)
6756
6754
6752
6750
6748
6746
6744
6742
6740
10/1/00
10/1/01
10/1/02
10/1/03
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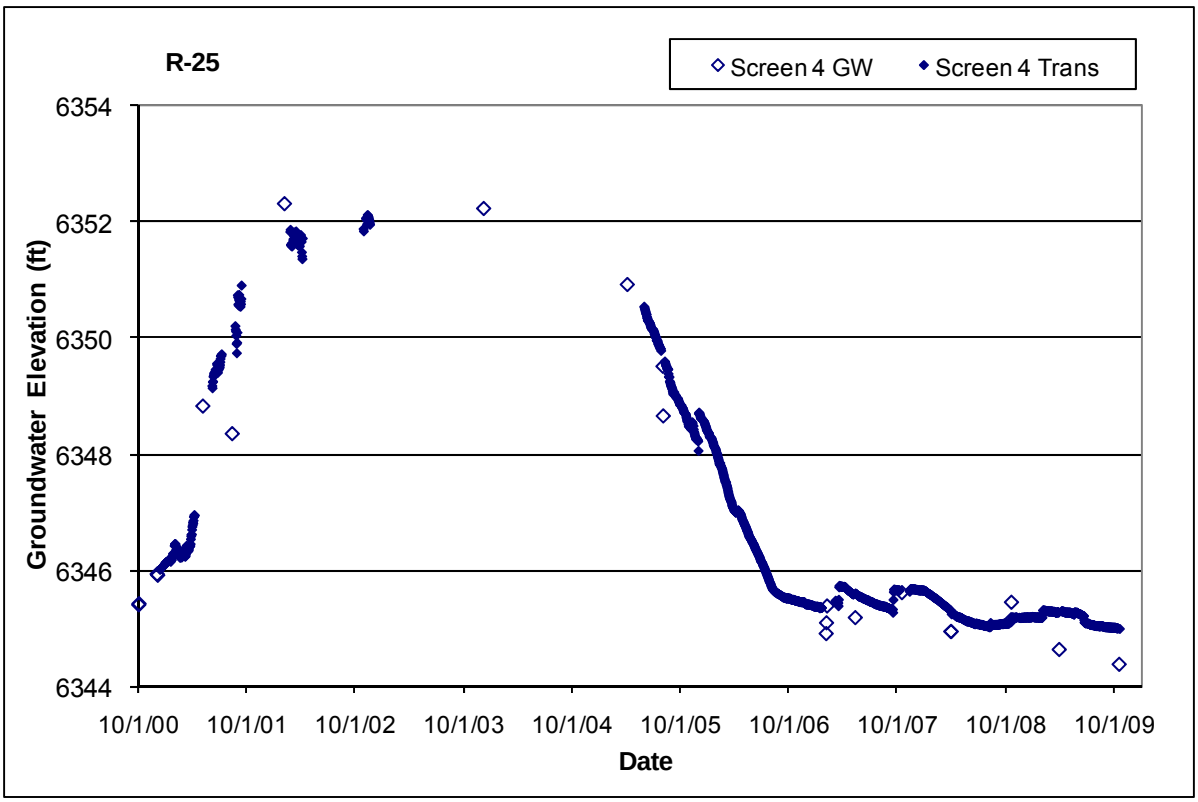
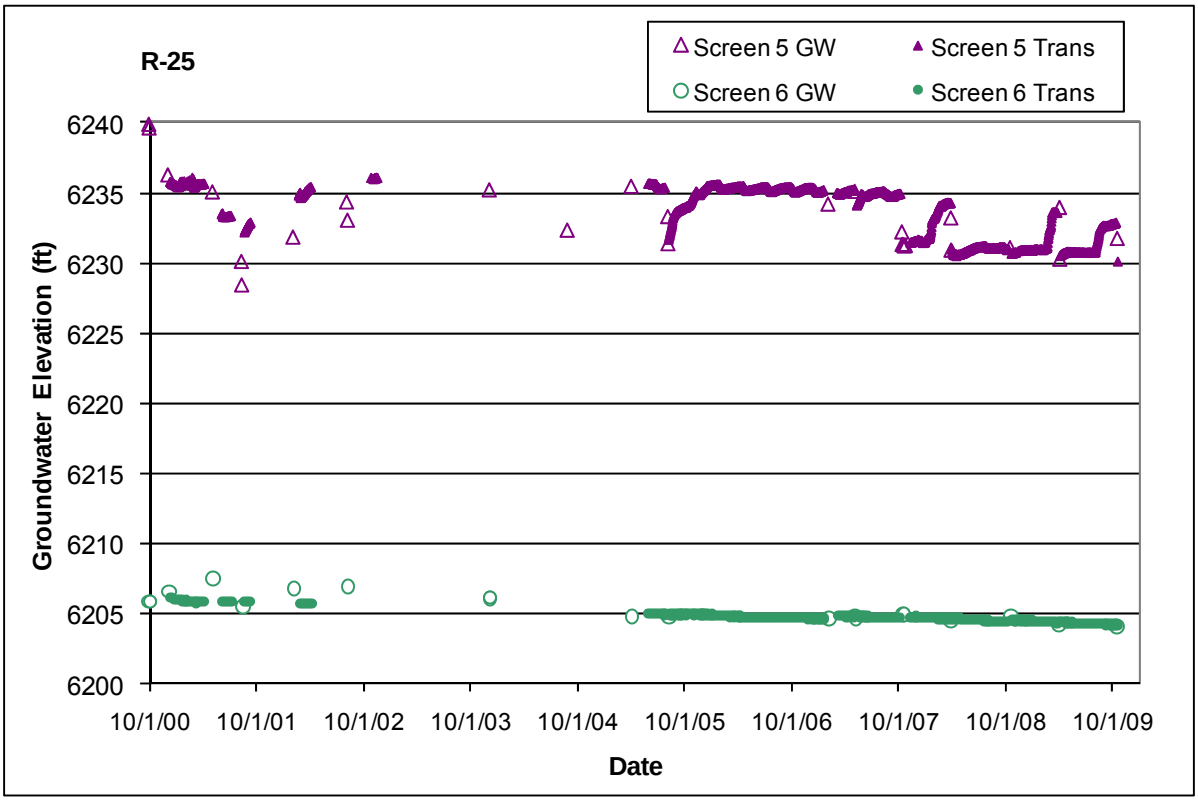
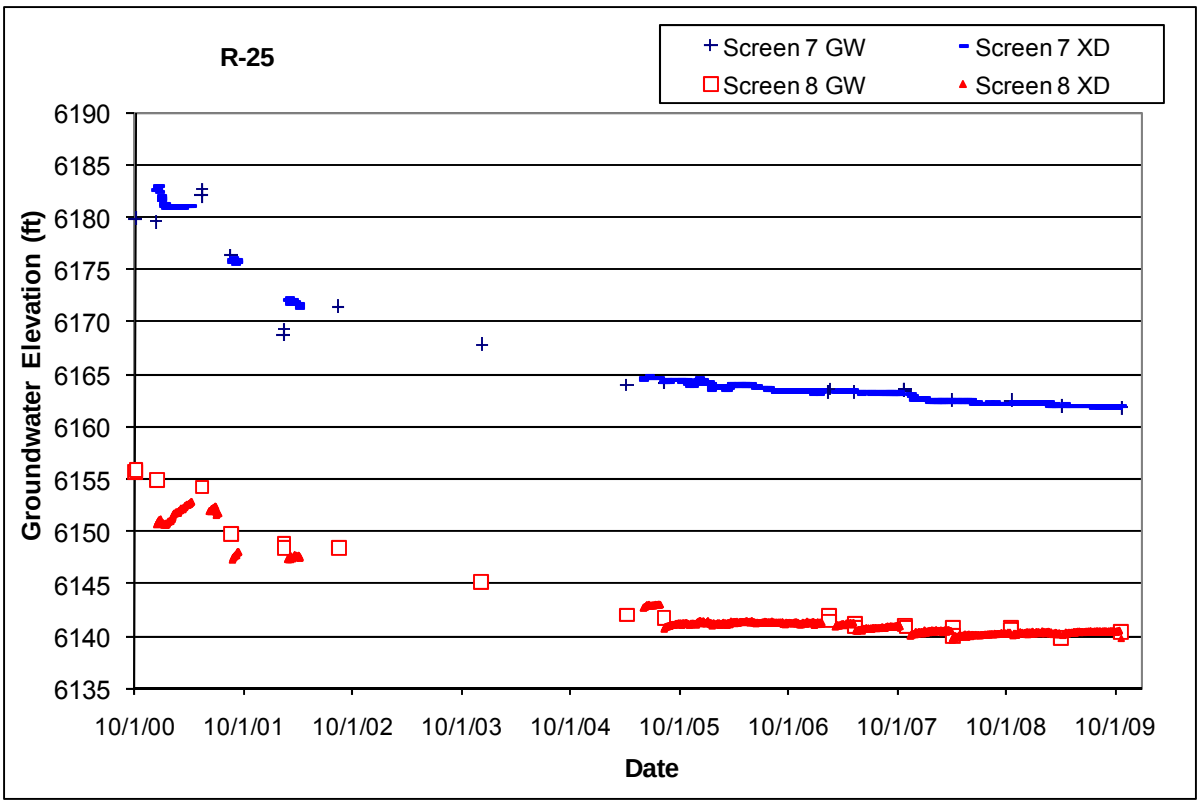
10/1/07
10/1/08
10/1/09
Date


R-25
Screen 4 GW
Screen 4 Trans
Groundwater Elevation (ft)
6354
6352
6350
6348
6346
6344
10/1/00
10/1/01
10/1/02
10/1/03
10/1/04
10/1/05
10/1/06
10/1/07
10/1/08
10/1/09
Date


R-25
Screen 5 GW
Screen 5 Trans
Screen 6 GW
Screen 6 Trans
Groundwater Elevation (ft)
6240
6235
6230
6225
6220
6215
6210
6205
6200
10/1/00
10/1/01
10/1/02
10/1/03
10/1/04
10/1/05
10/1/06
10/1/07
10/1/08
10/1/09
Date


R-25
Screen 7 GW
Screen 7 XD
Screen 8 GW
Screen 8 XD
Groundwater Elevation (ft)
6190
6185
6180
6175
6170
6165
6160
6155
6150
6145
6140
6135
10/1/00
10/1/01
10/1/02
10/1/03
10/1/04
10/1/05
10/1/06
10/1/07
10/1/08
10/1/09
Date

3.29 R-26

Location: R-26 is located at the western LANL boundary near Cañon de Valle.

Completion Type: Multiple completion, screen 1 is in an intermediate zone, and screen 2 is within the regional aquifer. The top of screen 2 is about 319 ft below the regional water table.

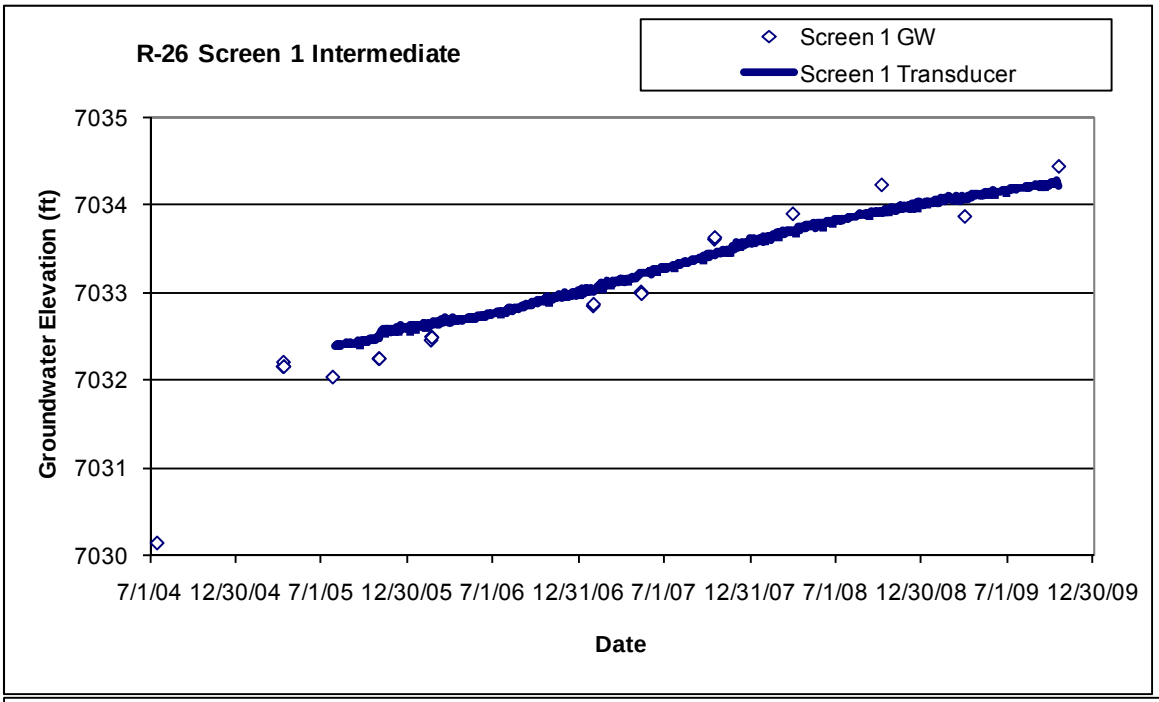
Period of Record: Westbay® installed July 18, 2004, transducers installed July 29, 2005, transducer data through 2009.

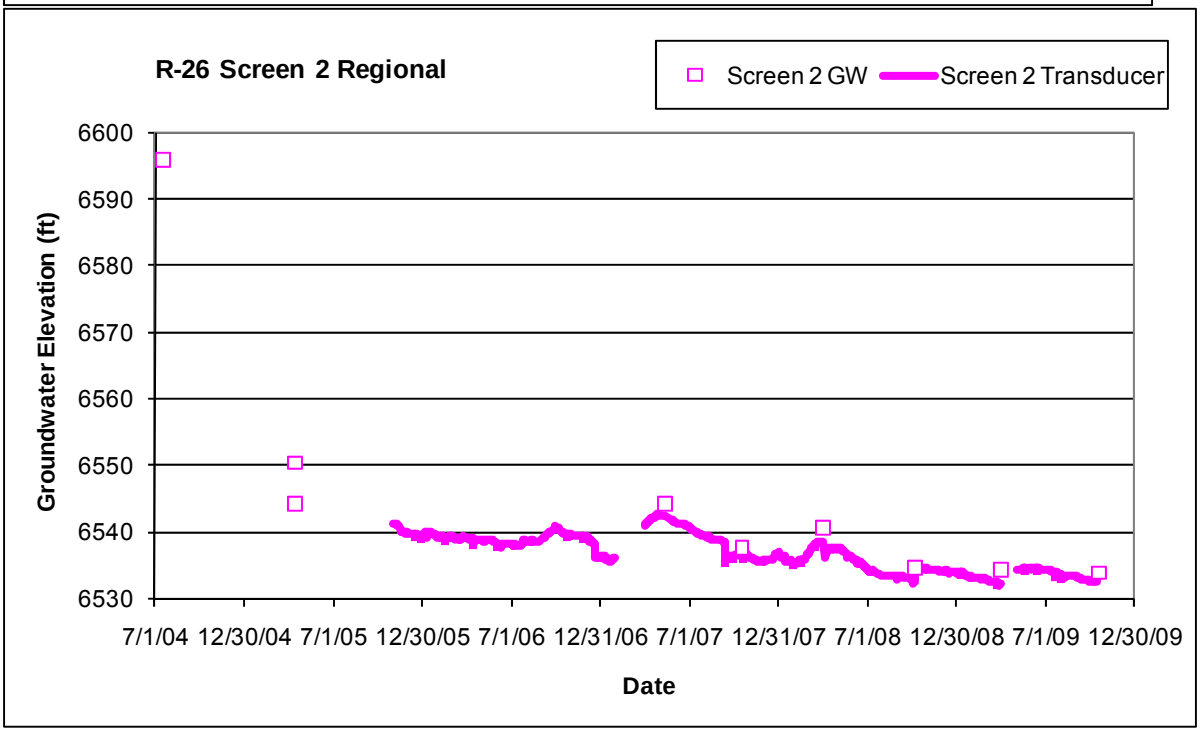
Remarks: Screen 2 is in a tight zone and/or improperly completed zone. Sampling attempts at MP2A caused plugging of the port and sampler with bentonite; the transducers were installed in the B ports on November 3, 2005; water level data from screen 2 at port MP2B appear valid with some questions as to validity pending additional data and review. There is no apparent response to supply well pumping at R-26.

R-26 Construction and Port Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elevation (ft)	Distance from Bottom of Screen (ft)	Sump Volume (L)	Comment
1	651.8	669.9	6989.9	6971.8	18.1	I	Qct	**MP1A**	659.3	6982.4	10.6		Within Screen
								PP1	664.7	6977.0	5.2		Within Screen
								MP1B	670.3	6971.4	-0.4	0.8	Below Screen
2	1421.8	1445.0	6219.9	6196.7	23.2	RT	Tp	**MP2A**	1427.0	6214.7	18.0		Within Screen
								PP2	1432.4	6209.3	12.6		Within Screen
								MP2B	1438	6203.7	7.0		Within Screen

Note: R-26 Brass Cap Ground Elevation: 7641.69 ft; all measurements are from this elevation;
MP = Monitor Port; PP = Pump Port; Monitor Ports shown in bold are instrumented ports


R-26 Screen 1 Intermediate
Screen 1 GW
Screen 1 Transducer
Groundwater Elevation (ft)
7035
7034
7033
7032
7031
7030
7/1/04 12/30/04 7/1/05 12/30/05 7/1/06 12/31/06 7/1/07 12/31/07 7/1/08 12/30/08 7/1/09 12/30/09
Date


R-26 Screen 2 Regional
Screen 2 GW
Screen 2 Transducer
Groundwater Elevation (ft)
6600
6590
6580
6570
6560
6550
6540
6530
7/1/04 12/30/04 7/1/05 12/30/05 7/1/06 12/31/06 7/1/07 12/31/07 7/1/08 12/30/08 7/1/09 12/30/09
Date

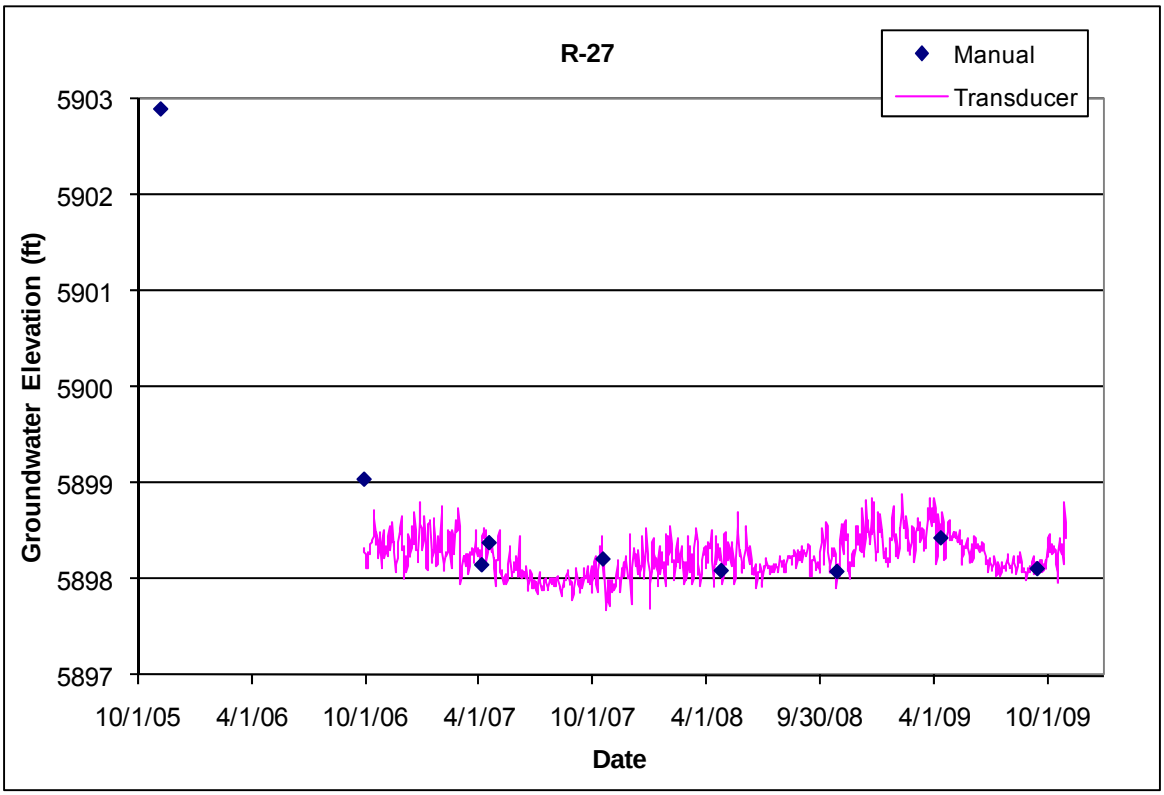
3.30 R-27

Location: R-27 is located in middle Water Canyon about 0.35 miles north of DT-10.
Completion Type: Single completion at the top of the regional aquifer in Puye fanglomerates. The top of the screen is about 38 ft below the water table.
Period of Record: Well completed November 2005, transducer installed September 29, 2006, transducer data through 2009.
Remarks: R-27 is installed to a depth of 878.7 ft, about 60 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer does not show a response to atmospheric pressure fluctuations. The aquifer at R-27 may show a small seasonal response to supply well pumping at PM-2.

R-27 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	852.0	875.0	5861.7	5838.7	23.0	847	5866.7	875.0	5838.7	878.7	3.7	11.6	RT	Tpf

Note: Brass Cap Ground Elevation: 6713.72 ft; all measurements are from this elevation



3.31 R-28

Location: R-28 is located in middle/lower Mortandad Canyon between and about 1300 ft from both R-42 and R-45.

Completion Type: Single completion at the top of the regional aquifer. The top of the screen is about 45 ft below the water table.

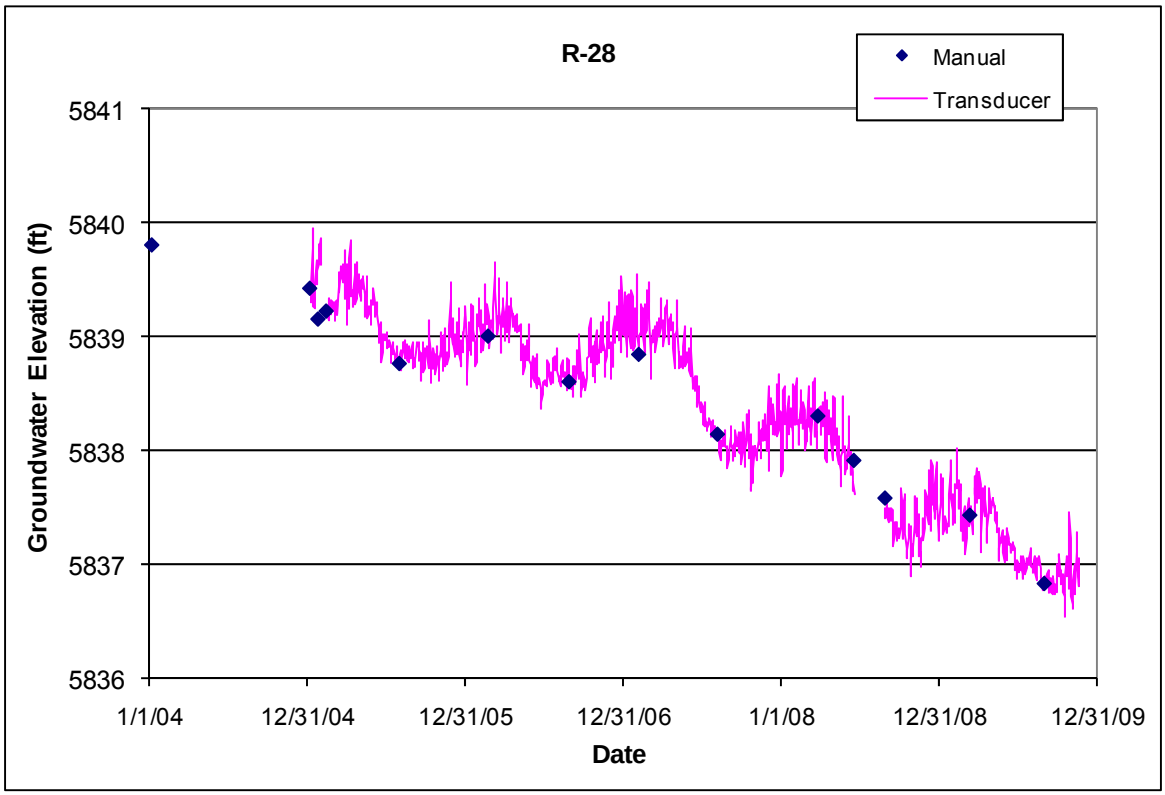
Period of Record: Well completed December 2003, transducer installed January 7, 2005, data through 2009.

Remarks: R-28 installed to a depth of 980.3 ft, about 100 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. R-28 exhibits a seasonal response to supply well pumping and responds primarily to pumping at PM-4 and PM-2 and possibly to PM-5, but apparently does not respond significantly to pumping at nearby supply well PM-3.

R-28 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	934.3	958.1	5794.3	5770.5	23.8	929.6	5799.0	958.1	5770.5	980.3	22.2	68.2	RT	Tpf

Note: R-28 Brass Cap Ground Elevation: 6728.61 ft; all measurements are from this elevation



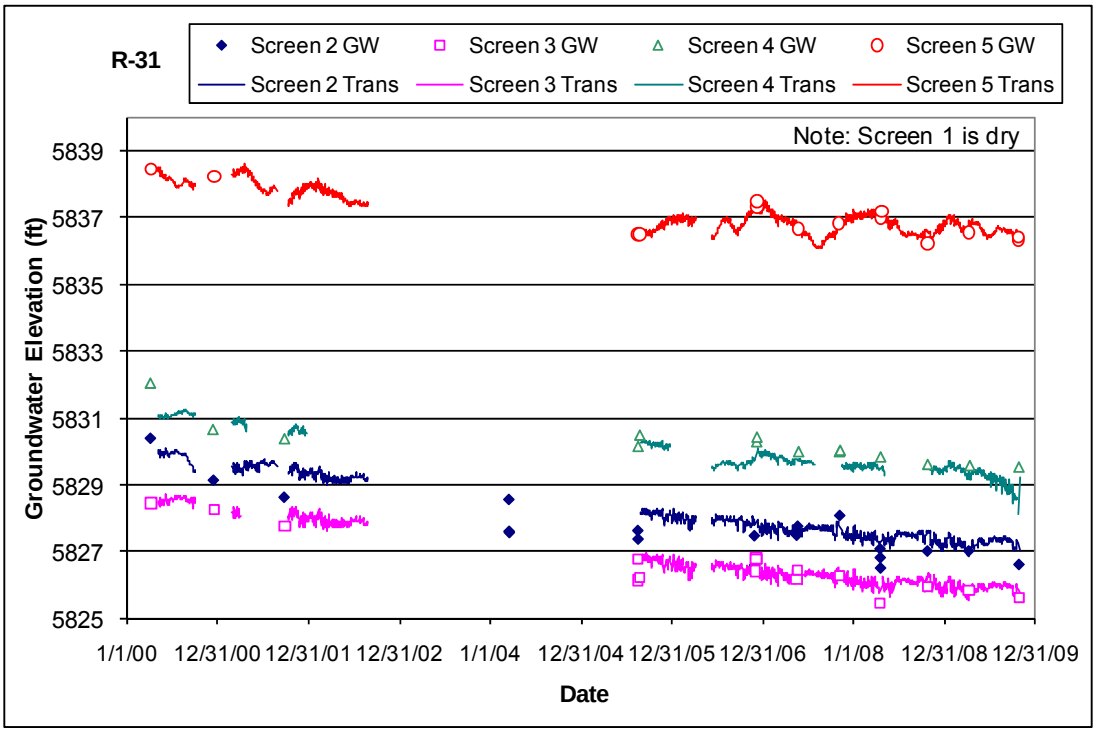
3.32 R-31

Location: R-31 is located in the southern part of LANL in the north Ancho Canyon tributary.
Completion Type: Multiple completion, one screen in an intermediate zone, and four screens in the regional aquifer. The intermediate screen 1 has been dry since Westbay® installation.
Period of Record: Westbay® installed April 7, 2000, transducers installed May 4, 2000, transducer data through 2009.
Remarks: Screen 5 has the highest head values, followed by screen 4 and screen 2; screen 3 has the lowest head values. Port MP2A was dry after Westbay installation so port MP2B is used to collect samples and groundwater level data. Screens 2 and 3 have 80% and 100% response to atmospheric pressure fluctuations, respectively, while screens 3 and 4 have about 45% response. Screens 4 and 5 show seasonal responses to supply well pumping that coincide with the non-pumping water levels at PM-2.

R-31 Construction and Port Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elev (ft)	Distance from Bottom of Screen (ft)	Sump Volume (L)	Comment
1	439.1	454.4	5923.4	5908.1	15.3	I	Tb4	MP1A	453.8	5908.7	0.6		Screen dry
								PP1	459.2	5903.3	-4.8	13.9	Below screen
								MP1B	464.8	5897.7	-10.4	30.1	Below screen
2	515.0	545.7	5847.5	5816.8	30.7	RT	Tb4	MP2A	532.2	5830.3	13.5		Within screen, port dry
								MP2B	542.5	5820.0	3.2		Within screen
								PP2	547.9	5814.6	-2.2	6.4	Below screen
								MP2C	553.5	5809.0	-7.8	22.6	Below screen
3	666.3	676.3	5696.2	5686.2	10.0	RD	Tb4	MP3A	670.3	5692.2	6.0		Within screen
								PP3	675.6	5686.9	0.7		Within screen
								MP3B	681.3	5681.2	-5.0	14.5	Below screen
4	826.6	836.6	5535.9	5525.9	10.0	RD	Tpt	MP4A	830.9	5531.6	5.7		Within screen
								PP4	836.3	5526.2	0.3		Within screen
								MP4B	841.9	5520.6	-5.3	15.3	Below screen
5	1007.1	1017.1	5355.4	5345.4	10.0	RD	Tpt	MP5A	1011.3	5351.2	5.8		Within screen
								PP5	1016.7	5345.8	0.4		Within screen
								MP5B	1022.3	5340.2	-5.2	15.1	Below screen

Brass Cap Elevation: 6362.5 ft; all measurements are from this elevation;
MP = measurement port; PP = pumping port



3.33 R-32

Location: R-32 is located in lower Pajarito Canyon about 1 mile east of supply well PM-2 and downgradient of Material Disposal Area (MDA) L at TA-54.

Completion Type: Multiple completion, three screens in the regional aquifer until September 2007 when screens 2 and 3 were plugged and abandoned. Screen 1 is about 90 ft below the water table.

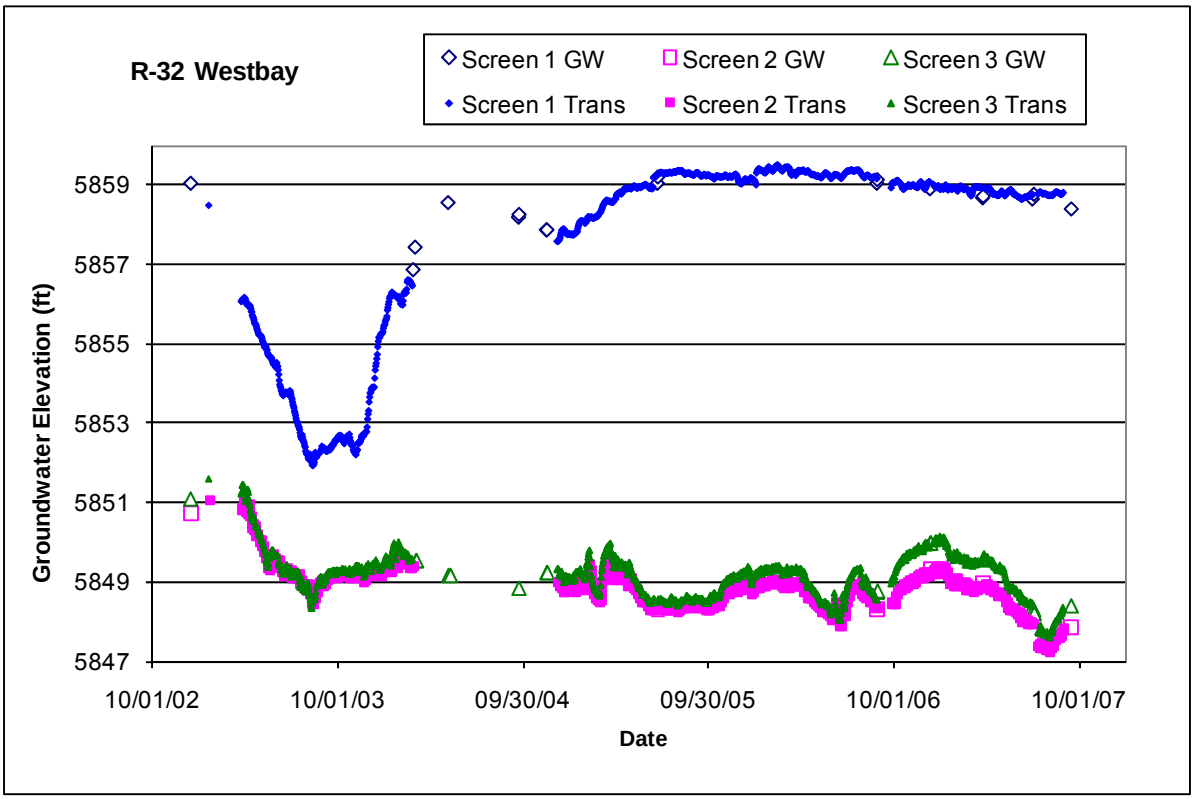
Period of Record: Westbay® installed December 14, 2002, transducers installed January 21, 2003, transducer data through August 2007. The Westbay® system was removed on September 18, 2007, and the well was rehabilitated to a single completion well at screen 1 in September 2007. A submersible pump was installed in November 2007 and a transducer was installed at screen 1 in February 2008; transducer data through 2009.

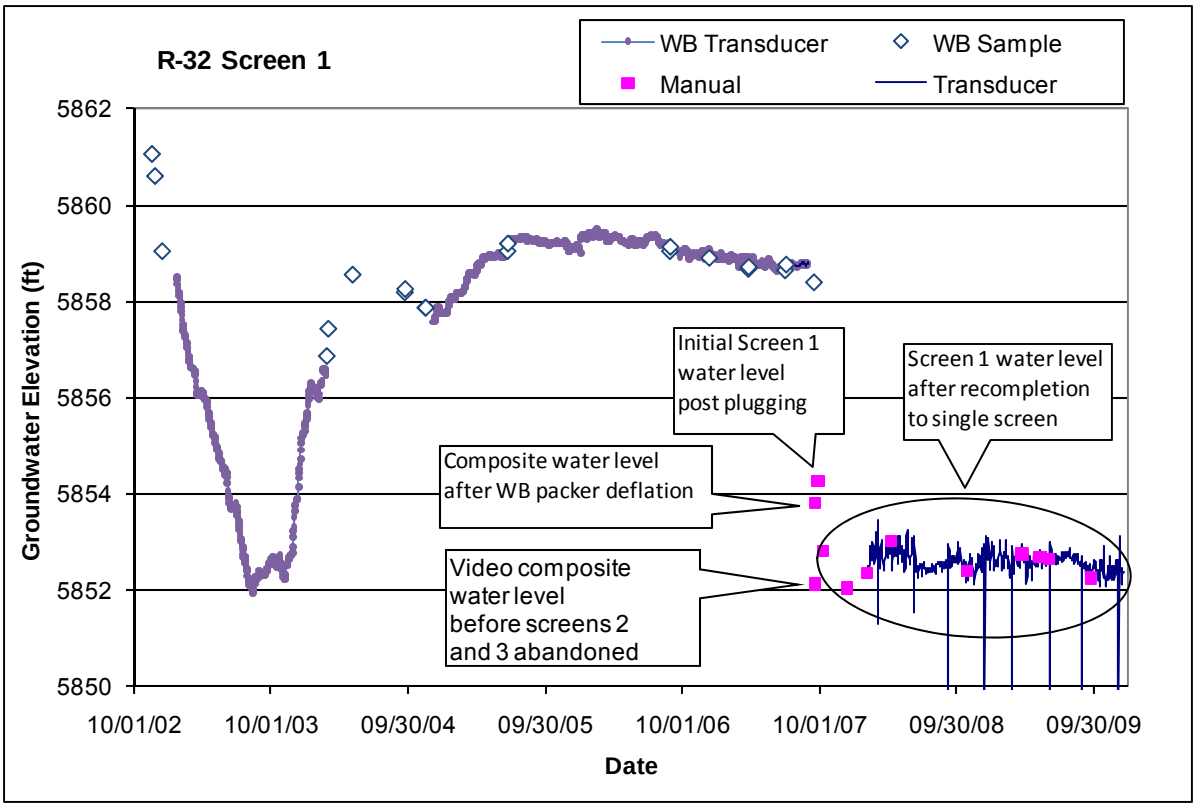
Remarks: Screens 2 and 3 had nearly identical head values and responded to pumping supply wells PM-2 and PM-4. Screen 1 apparently responded to long-term pumping of PM-4 in 2003, but vaguely to aquifer test pumping at PM-2 in 2004 and PM-4 in 2005. Screens 2 and 3 responded to the PM-2 aquifer test in January 2003 (McLin 2005), to the PM-4 aquifer test in January 2005 (McLin 2006), and to PM-4 pumping in June 2006 and July 2007.

R-32 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	867.5	875.2	5770.1	5762.4	7.7	858.6	5779.0	875.2	5762.4	893.6*	18.4	57.5	RT	Tb4
2	931.8	934.9	5705.8	5702.7	3.1		**Sceen plugged and abandoned Sept 2007**						RD	Tpf
3	972.9	980.6	5657.0	5657.0	7.7		**Sceen plugged and abandoned Sept 2007**						RD	Tpf

Note: R-32 Brass Cap Ground Elevation: 6637.63 ft; all measurements are from this elevation


R-32 Westbay
Screen 1 GW
Screen 2 GW
Screen 3 GW
Screen 1 Trans
Screen 2 Trans
Screen 3 Trans
Groundwater Elevation (ft)
5859
5857
5855
5853
5851
5849
5847
10/01/02
10/01/03
09/30/04
09/30/05
10/01/06
10/01/07
Date


R-32 Screen 1
WB Transducer
WB Sample
Manual
Transducer
Groundwater Elevation (ft)
5862
5860
5858
5856
5854
5852
5850
Initial Screen 1 water level post plugging
Screen 1 water level after recompletion to single screen
Composite water level after WB packer deflation
Video composite water level before screens 2 and 3 abandoned
10/01/02
10/01/03
09/30/04
09/30/05
10/01/06
10/01/07
09/30/08
09/30/09
Date

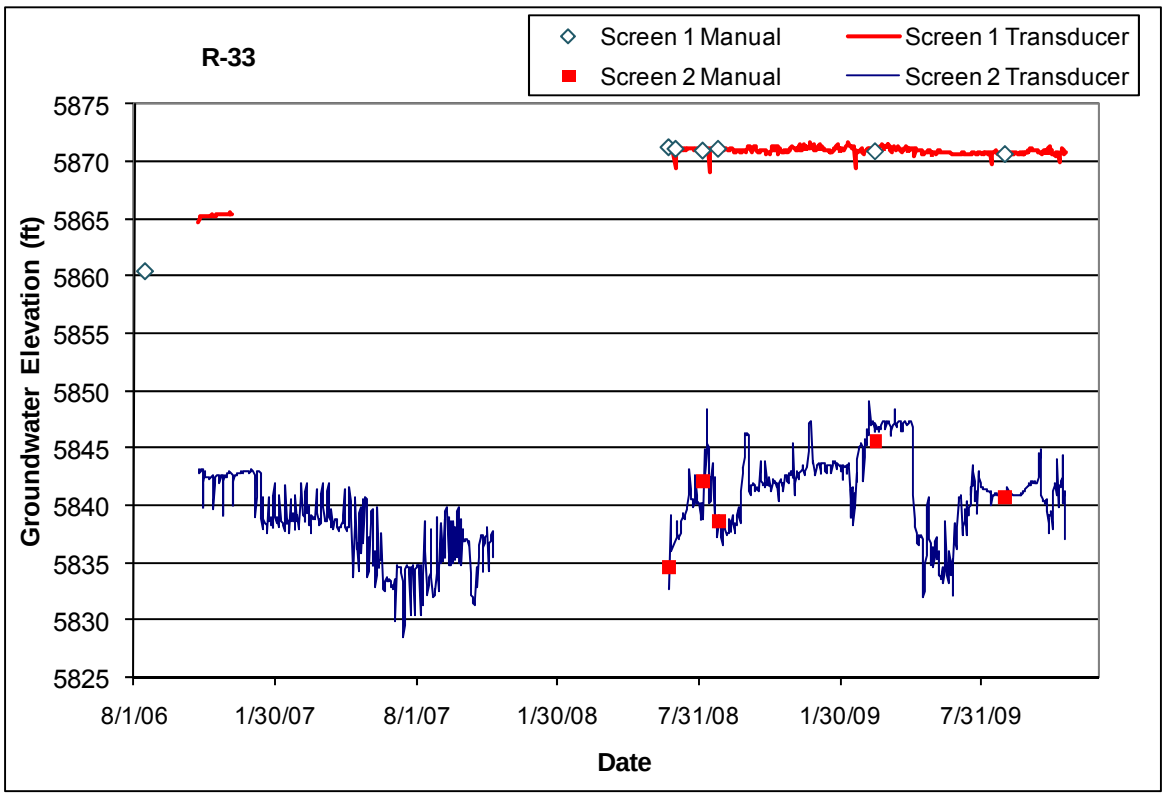
3.34 R-33

Location: R-33 is located in lower Ten Site Canyon about 1500 ft northeast of supply well PM-5.
Completion Type: Dual screen completion in the regional aquifer.
Period of Record: Well completed October 2004, transducers installed February 2005 but equipment problems hindered data collection. Transducers calibrated and the packer inflated in August 2006 and again in October 2006 with nitrogen bottle to maintain packer pressure. Water level data for screen 2 from October 24, 2006, to November 8, 2007; data for screen 1 ended December 5, 2006. New transducers installed July 2008; water level data through 2009.
Remarks: R-33 screen 1 installed about 10 ft below the regional water table at a depth of about 1020 ft, and screen 2 within the regional aquifer to a depth of 1126 ft, about 140 ft into the regional aquifer. Transducer equipment problems occurred from February 2005 until October 2006 when transducers and packer equipment became operational. The original transducer equipment was removed from the well on November 8, 2007, in preparation for removing the Barcad sampling system from the well. A dual valve Baski sampling system was installed July 2008 (LANL August 2008). The water level at screen 2 responds primarily to pumping of supply well PM-5 but also to pumping at PM-4.

R-33 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	APV Intake Depth (ft)	APV Intake Elev (ft)	Depth to Top of Packer/ Sump (ft)	Top of Packer/ Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	995.5	1018.5	5857.8	5834.8	23.0	1067.0	5786.3	1074.6	5778.8	1074.6	56.1	175.3	RT	Tpp
2	1112.4	1122.3	5740.9	5731.0	9.9	1110.8	5742.6	1122.3	5731.0	1126.0	3.7	11.6	RD	Tpp

Note: R-33 Brass Cap Ground Elevation: 6853.33 ft; all measurements are from this elevation; APV = access port valve



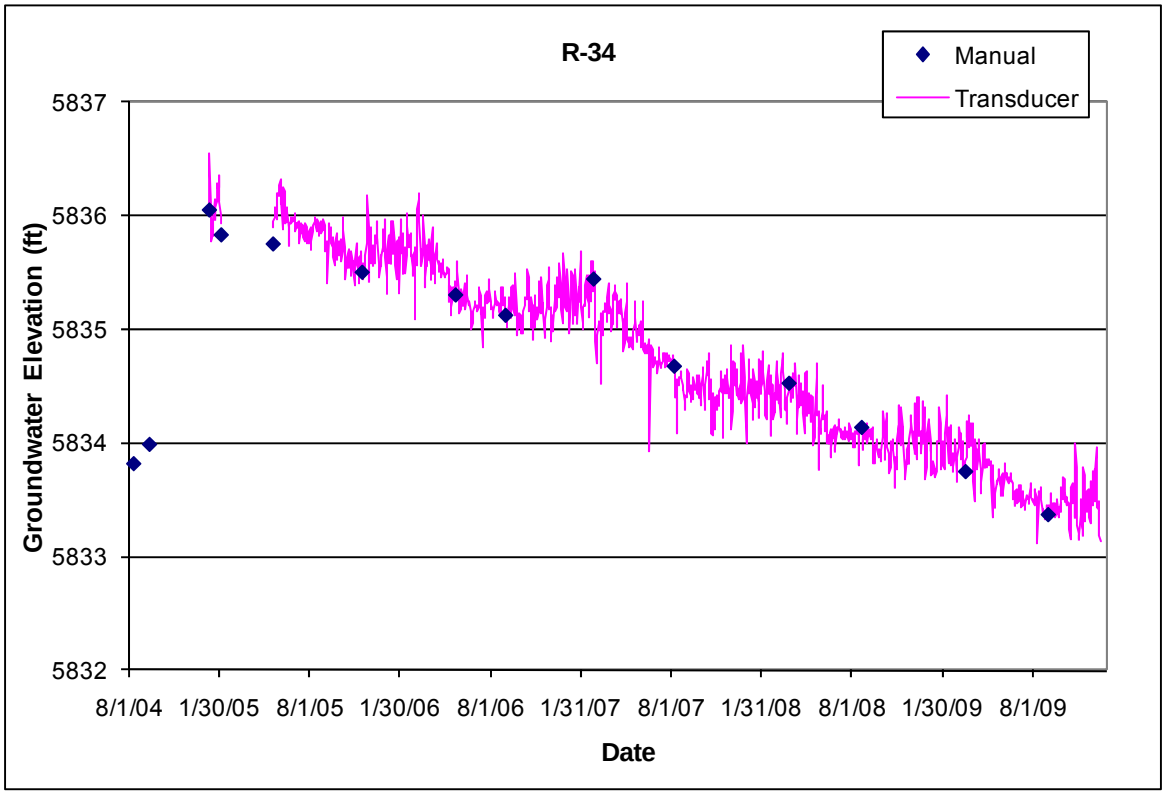
3.35 R-34

Location: R-34 is located in Cedro Canyon on San Ildefonso land east of LANL.
Completion Type: Single completion in the regional aquifer. The top of the screen is about 90 ft below the water table.
Period of Record: Well completed August 2004, transducer installed January 2005, water level data through 2009.
Remarks: R-34 installed at the top of the regional aquifer at a depth of 920.7 ft, about 110 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. R-34 exhibits a seasonal response to supply well pumping but does not indicate a response to any specific supply well.

R-34 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	883.7	906.6	5746.3	5723.4	22.9	881.6	5748.4	906.6	5723.4	920.7	14.1	44.1	RT	Tpp

Note: R-34 Brass Cap Ground Elevation: 6629.99 ft; all measurements are from this elevation



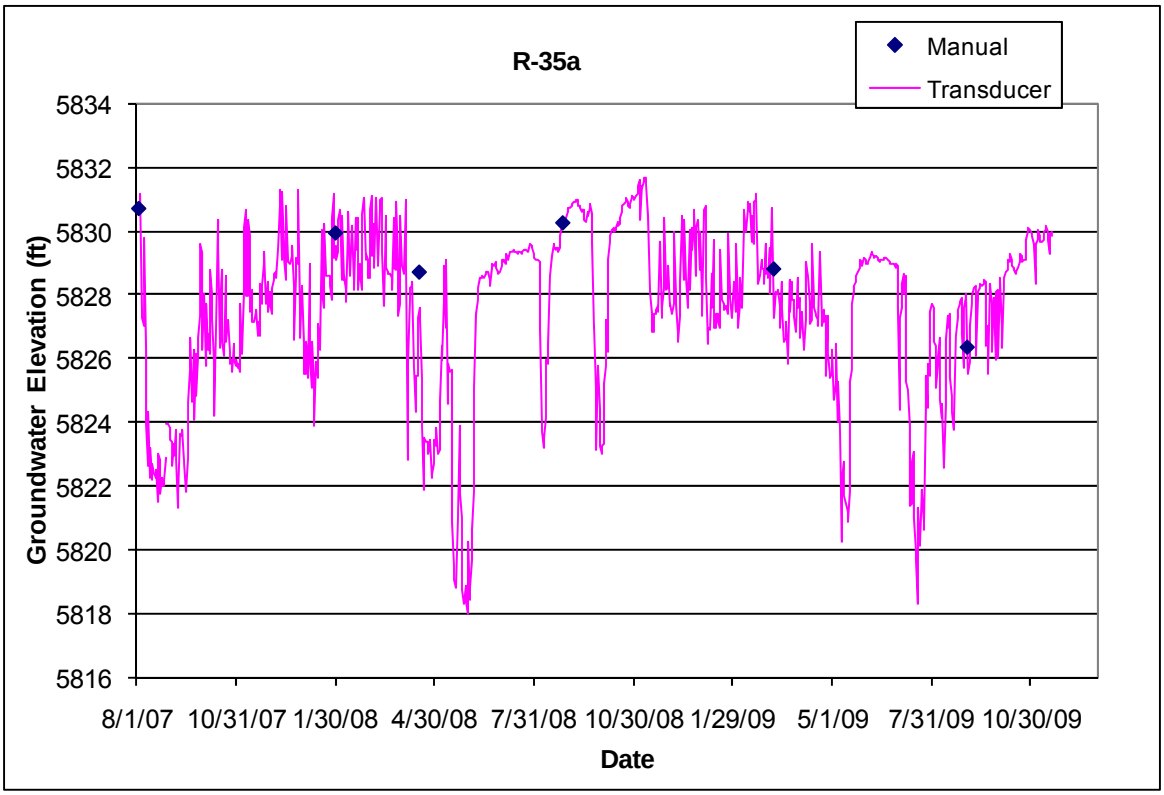
3.36 R-35a

Location: R-35a is located in Sandia Canyon about 340 ft southwest of supply well PM-3.
Completion Type: Single completion in the regional aquifer. The top of the screen is about 220 ft below the water table at the same elevation as the top of the PM-3 screen.
Period of Record: Well completed June 2007, transducer installed August 3, 2007; water level data through 2009.
Remarks: R-35a installed at a depth of 1082.2 ft, about 290 ft into the regional aquifer. R-35a responds primarily to pumping supply well PM-3, about 3 to 4 ft daily, but also shows a response to pumping supply well O-4. When the well was completed, the static water level at R-35a was about 7 ft lower than nearby monitoring well R-35b, which is screened at the top of the aquifer.

R-35a Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1013.1	1062.2	5610.0	5560.9	49.1	998.3	5624.8	1062.2	5560.9	1086.2	24.0	75.1	RD	Tsfu

Note: Brass Cap Ground Elevation: 6623.06 ft; all measurements are from this elevation



Note: Hydrograph shows mean daily values

3.37 R-35b

Location: R-35b is located in Sandia Canyon about 90 ft west of R-35a and about 400 ft southwest of supply well PM-3.

Completion Type: Single completion at the top of the regional aquifer. The top of the screen was about 37 ft below the water table when the well was installed.

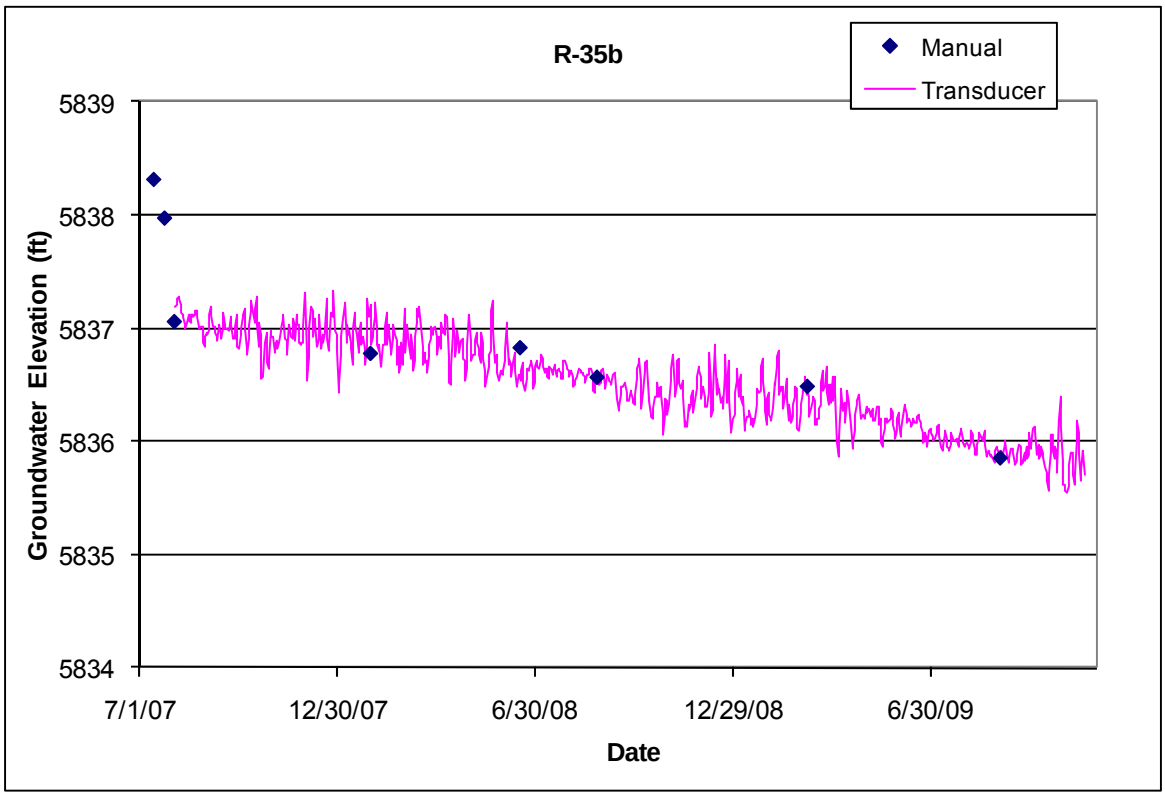
Period of Record: Well completed July 2007, transducer installed August 3, 2007; water level data through 2009.

Remarks: R-35b installed near the top of the regional aquifer at a depth of 872.2 ft, about 80 ft into the regional aquifer. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. R-35b does not indicate a response to pumping of nearby well PM-3.

R-35b Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	825.4	848.5	5799.8	5776.7	23.1	832.7	5792.5	848.5	5776.7	872.2	23.7	74.1	RT	Tpf

Note: Brass Cap Ground Elevation: 6625.21 ft; all measurements are from this elevation



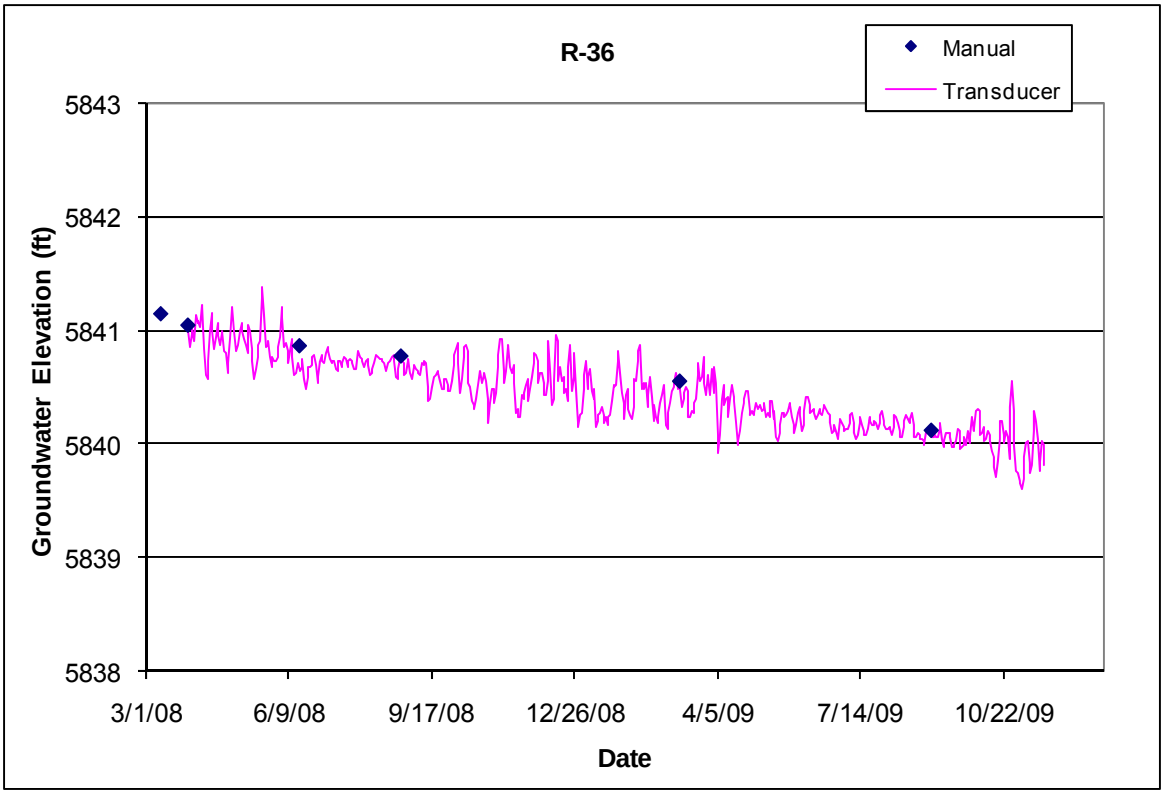
3.38 R-36

Location: R-36 is located in lower Sandia Canyon about 2200 ft southeast of supply well PM-3.
Completion Type: Single completion at the top of the regional aquifer.
Period of Record: Well completed February 2008, transducer installed March 31, 2008; water level data through 2009.
Remarks: R-36 installed near the top of the regional aquifer to a depth of 803.7 ft; top of screen is about 17 ft below the regional water table. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. Available water level data indicate that R-36 does not appear to respond to supply well pumping at nearby wells PM-1 and PM-3.

R-36 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	766.9	789.9	5824.5	5801.5	23.0	764.5	5826.9	789.9	5801.5	803.7	13.8	43.2	RT	Tsfu

Note: Brass Cap Ground Elevation: 6591.37 ft; all measurements are from this elevation



3.39 R-37

Location: R-37 is located on an unnamed mesa at TA-54 between Cañada del Buey and the south fork of Cañada del Buey. R-37 is about 3000 ft southeast of supply well PM-4 and 2500 ft northeast of supply well PM-2.

Completion Type: Dual completion in a perched intermediate zone and in the top of the regional aquifer. A Baski dual pump sampling system was installed on November 11, 2009, but due to a problem with the Bennett pump, the system was removed on December 14, 2009, and reinstalled on December 16, 2009.

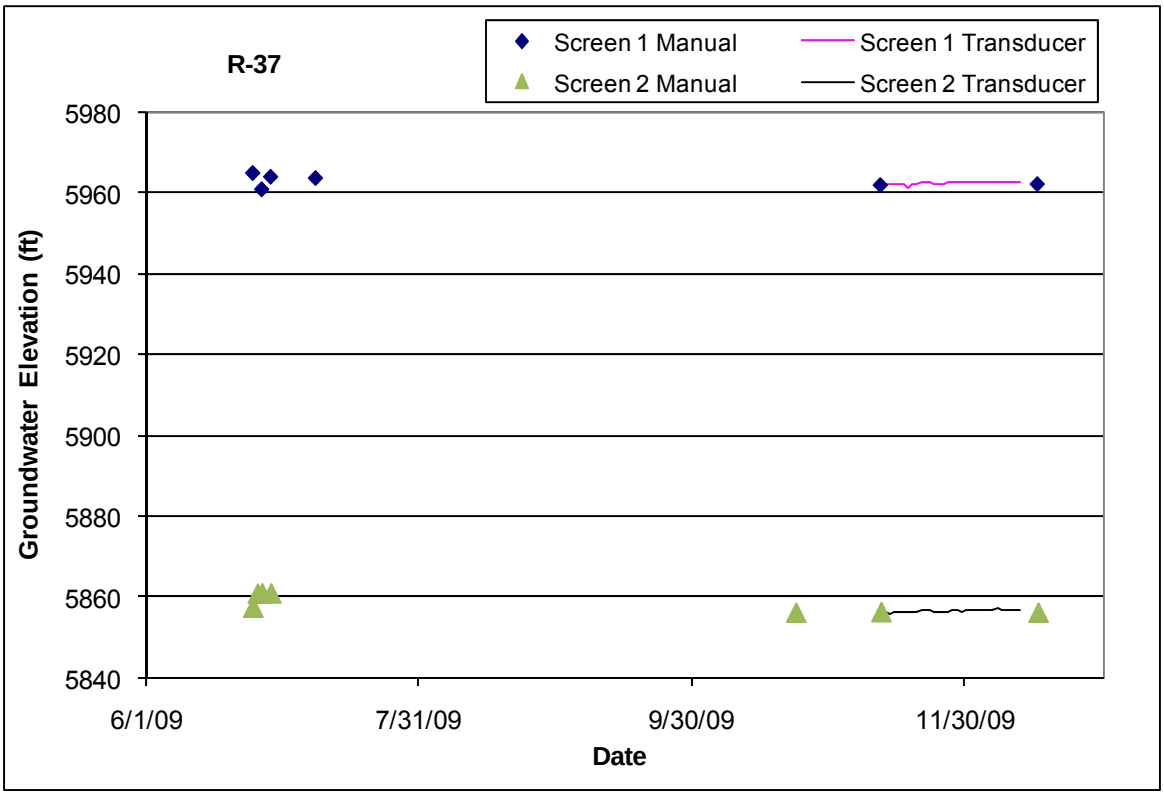
Period of Record: Well completed June 2009, transducers installed November 12, 2009, and again on December 17, 2009; water level data through 2009.

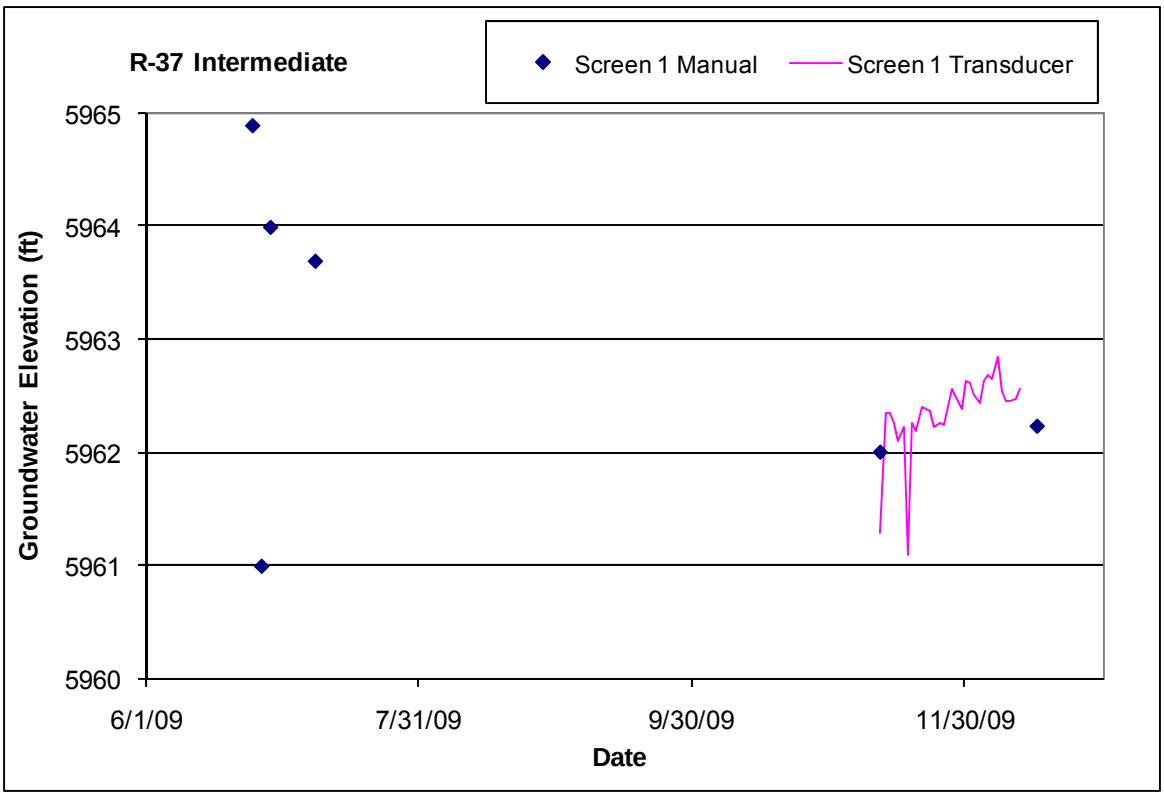
Remarks: The top of screen 2 is about 12 ft below the regional water table. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. Available water level data indicate that R-37 responds to supply well pumping at nearby well PM-4.

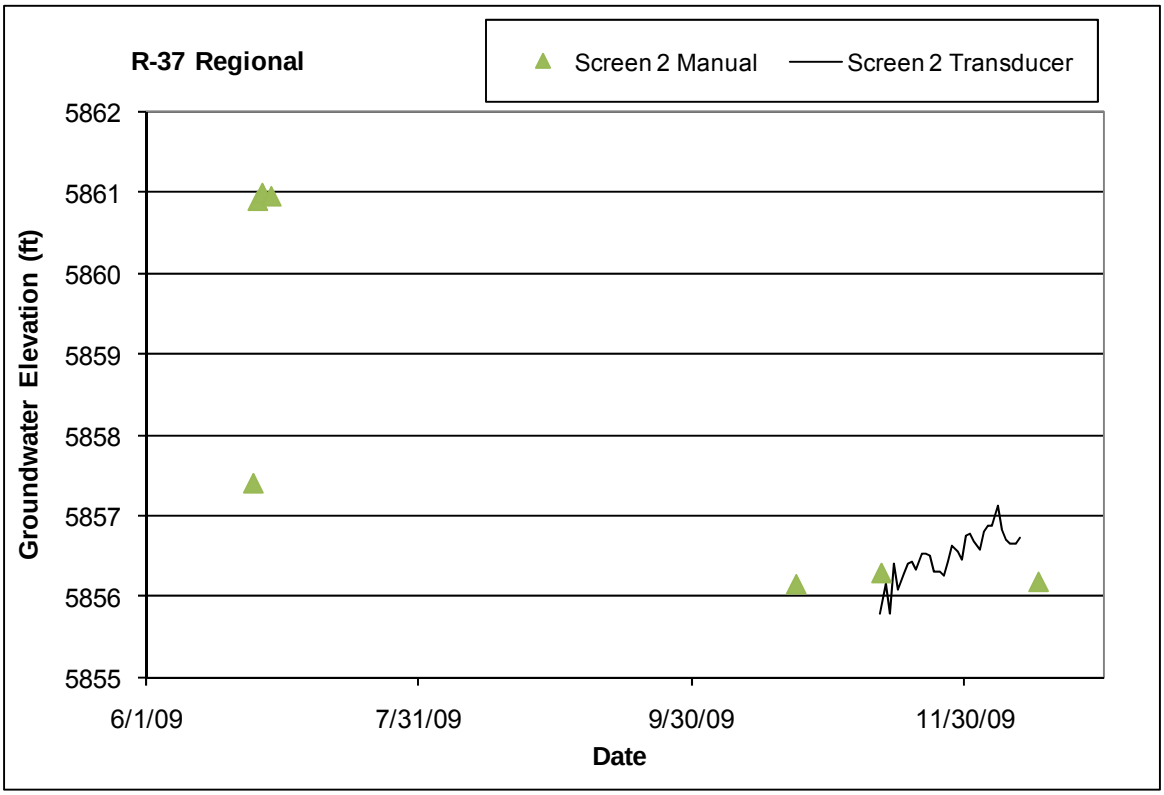
R-37 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Packer/ Sump Bottom (ft)	Depth to bottom of Packer	Sump Length (ft)	Bottom of Well Elev (ft)	Hydro Zone Code	Geo Unit Code
1	929.3	950.0	5941.3	5920.6	20.7	948.9	5921.7	959.3	NA	9.3	5911.3	I	Tpf
2	1026.0	1046.6	5844.6	5824.0	20.6	1055.9	5814.7	1068.8	964.1	22.2	5801.8	RT	Tpf

Note: Brass Cap Elevation: 6870.59 ft; all measurements are from this elevation




R-37 Intermediate
Screen 1 Manual
Screen 1 Transducer
Groundwater Elevation (ft)
5965
5964
5963
5962
5961
5960
6/1/09
7/31/09
9/30/09
11/30/09
Date


R-37 Regional
Screen 2 Manual
Screen 2 Transducer
Groundwater Elevation (ft)
5862
5861
5860
5859
5858
5857
5856
5855
6/1/09
7/31/09
9/30/09
11/30/09
Date

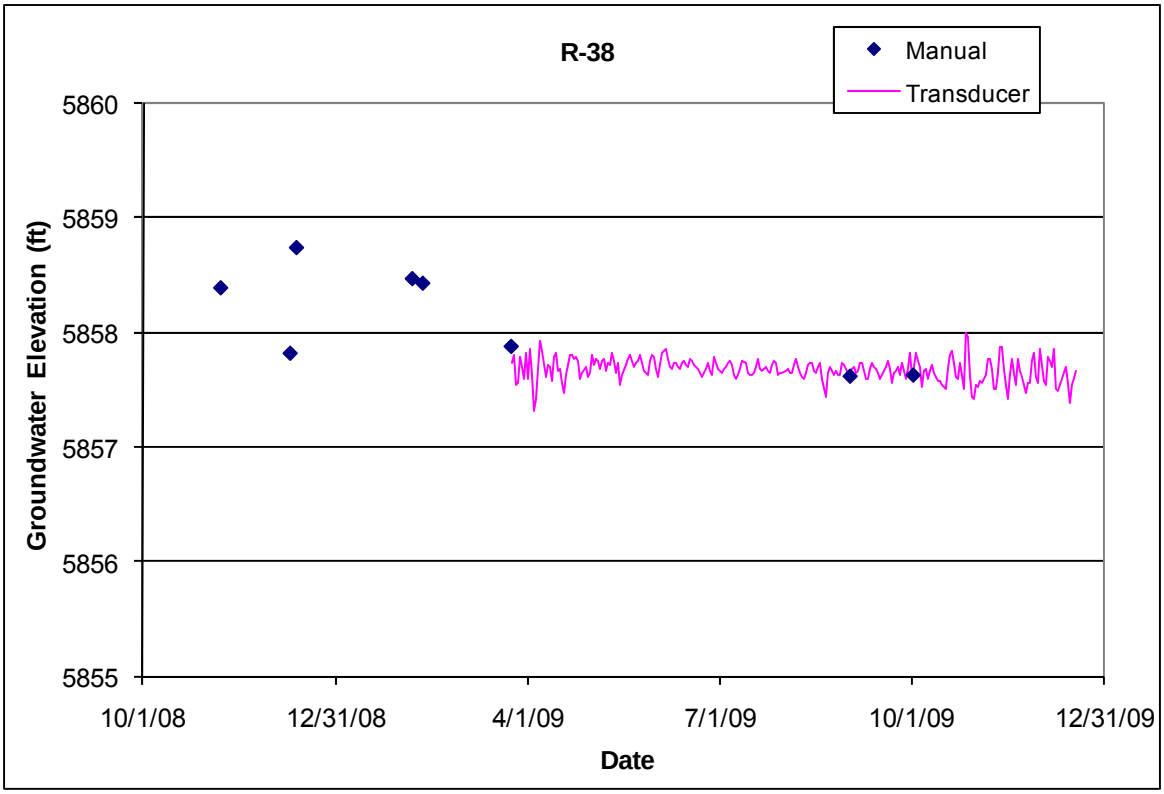
3.40 R-38

Location: R-38 is located in middle Cañada del Buey northeast of MDA L.
Completion Type: Single completion at the top of the regional aquifer in Cerros del Rio basalt.
Period of Record: Well completed December 2008, transducer installed March 25, 2009; data through 2009.
Remarks: R-38 installed near the top of the regional aquifer to a depth of 853 ft; top of screen is about 10 ft below the regional water table. The well is 100% barometrically efficient; however, the aquifer has a delayed response to atmospheric pressure fluctuations.

R-38 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	821.2	831.2	5847.4	5837.4	10.0			831.2	5837.4	853.0	21.8	84.2	RT	Tb4

Note: Brass Cap Ground Elevation: 6668.58 ft; all measurements are from this elevation



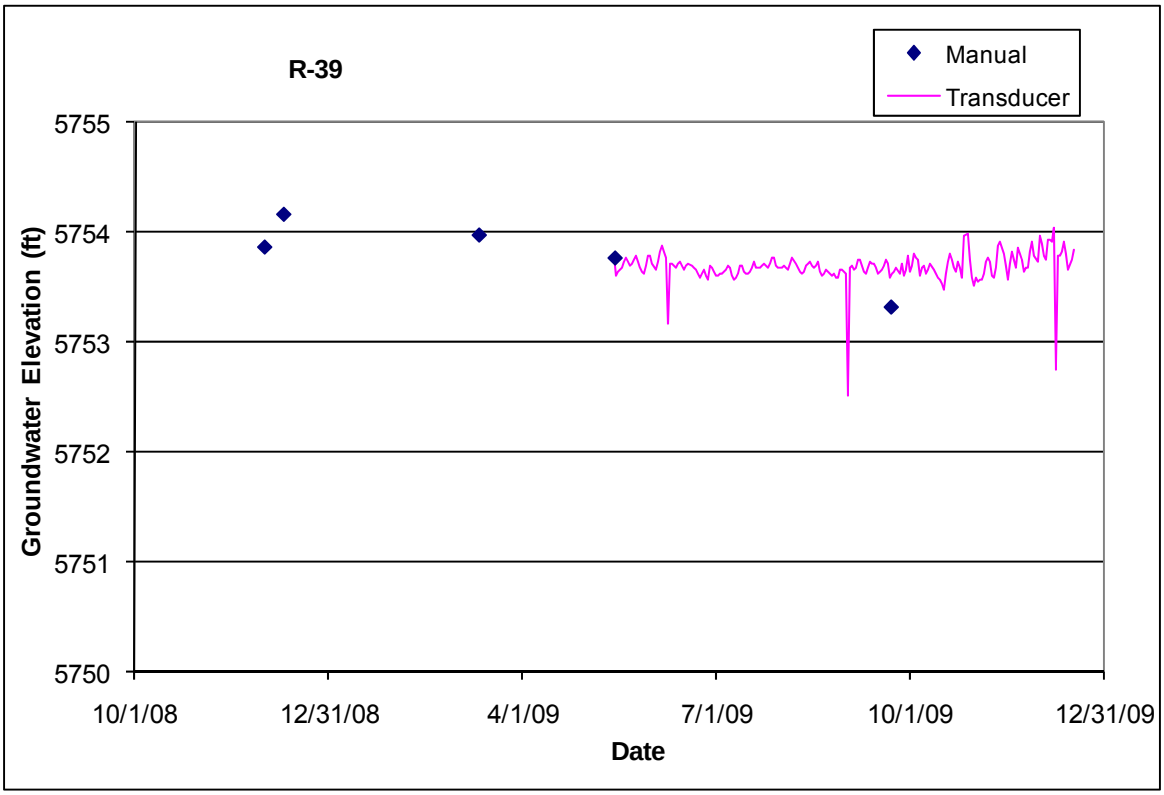
3.41 R-39

Location: R-39 is located in lower Pajarito Canyon southeast and downgradient of TA-54 and MDA G and about 700 ft southwest of monitoring well R-22.
Completion Type: Single completion at the top of the regional aquifer in Cerros del Rio basalt.
Period of Record: Well completed December 2008. Transducer installed May 15, 2009; data through 2009.
Remarks: R-39 installed near the top of the regional aquifer to a depth of 875.6 ft; top of the screen is about 30 ft below the regional water table. The well is 80% barometrically efficient; the aquifer indicates a partial response to atmospheric pressure fluctuations.

R-39 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	859.0	869.0	5721.8	5711.8	10.0	858.8	5722.1	869.0	5711.8	875.6	6.5	25.3	RT	Tb4

Note: Brass Cap Ground Elevation: 6580.86 ft; all measurements are from this elevation



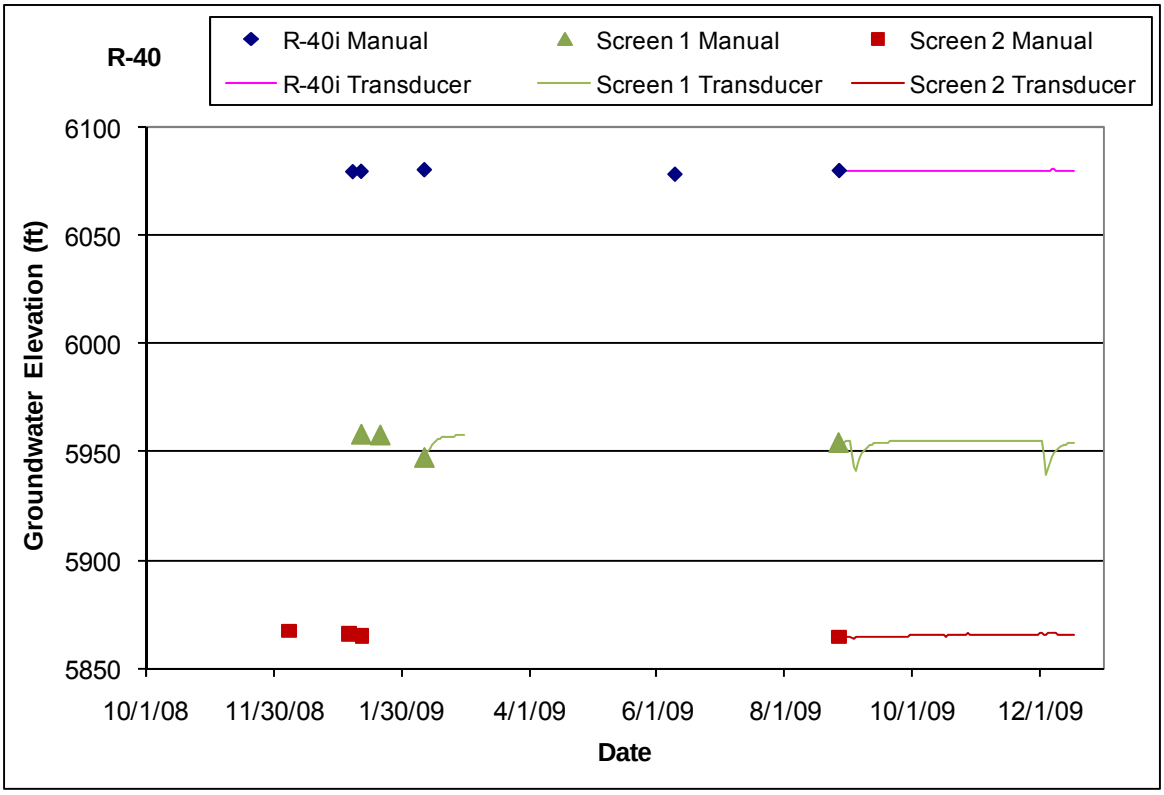
3.42 R-40

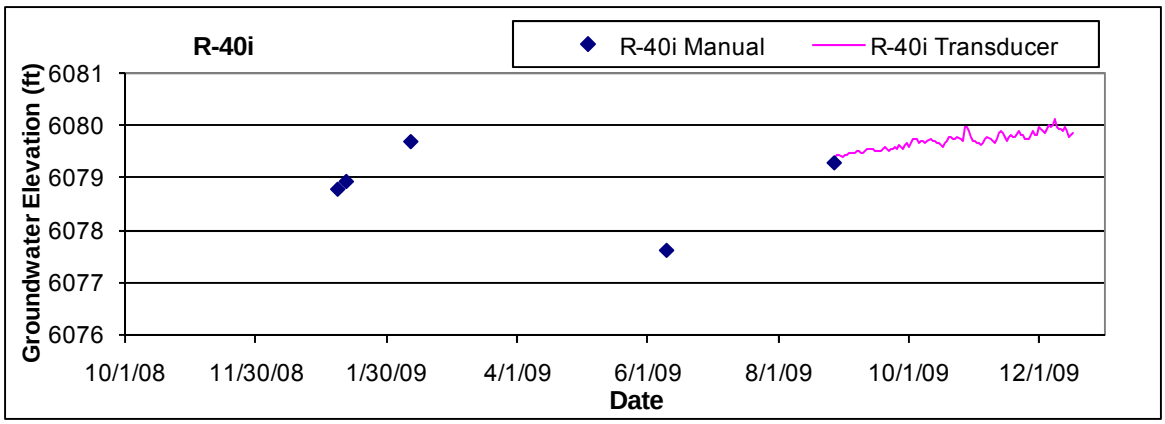
Location: R-40 is located in lower Pajarito Canyon east of TA-18 and 400 ft north of supply well PM-2.
Completion Type: Three screens in two piezometers; one intermediate 3-in.-ID PVC piezometer screen (R-40i) and two 5-in. ID stainless steel screens (R-40) with the upper screen in an intermediate zone and the lower screen at the top of the regional aquifer.
Period of Record: Well completed January 2009. Transducers installed at all three screens August 27, 2009; data through 2009. A temporary transducer was installed at the R-40 upper screen from February 11 to March 3, 2009, to monitor the slow recovery of the lower intermediate zone after attempting an aquifer test.
Remarks: Screen R-40i and the upper R-40 screen are completed in intermediate perched zones within the Cerros del Rio basalt. The lower R-40 screen is installed in Puye fanglomerates near the top of the regional aquifer to a depth of 895 ft; the lower R-40 screen straddles the regional water table. The regional aquifer indicates a response to pumping supply well PM-4; no data available as of January 2010 for possible response to nearby well PM-2.

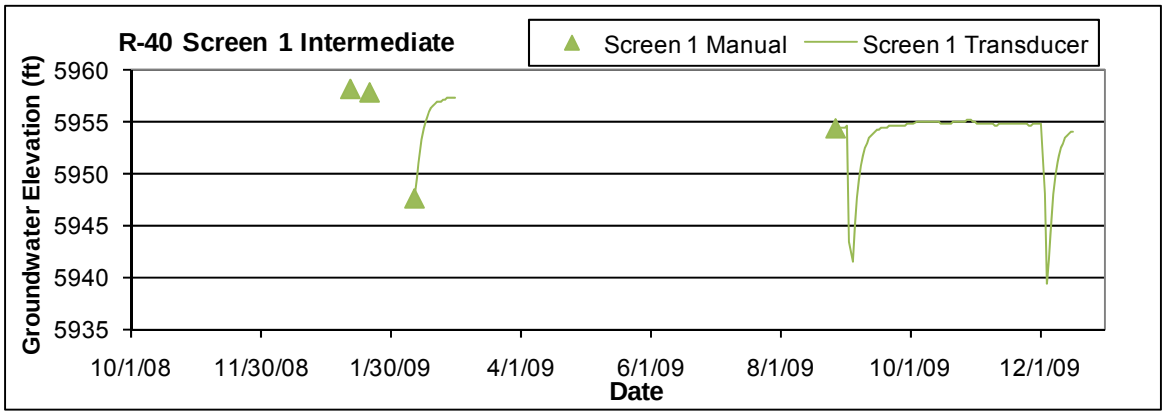
R-40 and R-40i Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Packer / Sump Bottom (ft)	Sump Length (ft)	Sump Vol (L)	Hydro Zone Code	Geo Unit Code	Comment
R-40i	649.7	669.0	6069.5	6050.2	19.3	669.0	6050.2	669.0	6050.2	674.6	5.6	7.8	I	Tb4	3" ID PVC Casing
1	751.6	785.1	5967.6	5934.1	33.5	778.0	5941.2	785.1	5934.1	794.1	9.0	34.8	I	Tb4	5" ID SS Casing
2	849.3	870.0	5869.9	5849.2	20.7	871.0	5848.2	870.0	5849.2	895.0	25.0	96.5	RT	Tpf	5" ID SS Casing

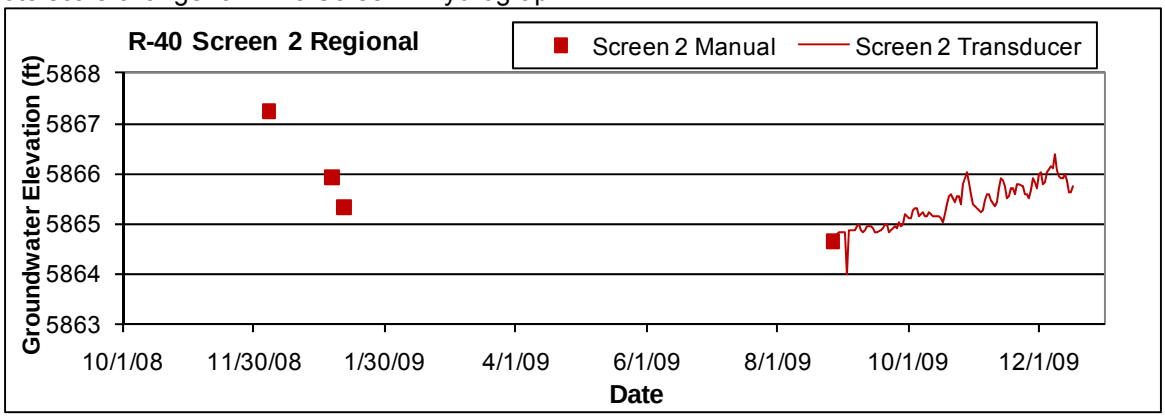
Note: Brass Cap Ground Elevation: 6719.24 ft; all measurements are from this elevation







Note scale change for R-40 Screen 1 hydrograph



3.43 R-41

Location: R-41 is located about 100 ft east of MDA G at TA-54 and about 650 ft north of monitoring well R-22.

Completion Type: Dual completion in a dry intermediate zone and at the top of the regional aquifer in Santa Fe Group sediments.

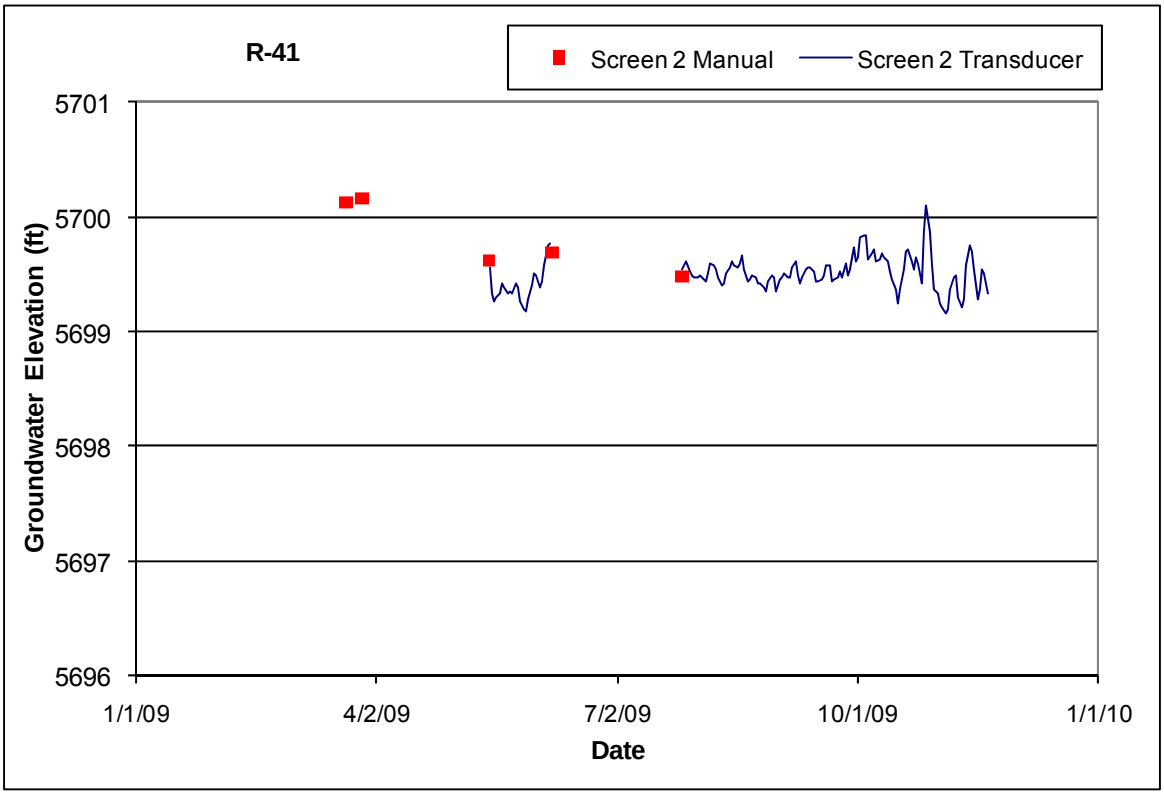
Period of Record: Well completed March 2009. Temporary transducer installed from May 15 to June 8, 2009. Dedicated transducer installed July 27, 2009; data through 2009.

Remarks: Screen 1 has been dry since installation. Screen 2 is installed near the top of the regional aquifer to a depth of 997.1 ft; the top of the screen is about 4 ft below the regional water table.

R-41 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Packer/ Sump (ft)	Top of Packer/ Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Vol (gal.)	Hydro Zone Code	Geo Unit Code
1	928.0	937.7	5732.5	5722.8	9.7	NA	NA	944.8	5715.7	944.8	7.1	7.2	I	Tsf
2	965.3	975.0	5695.2	5685.5	9.7	978.5	5682.0	975.0	5685.5	997.1	22.1	22.5	RT	Tsf

Note: Brass Cap Ground Elevation: 6660.53 ft; all measurements are from this elevation



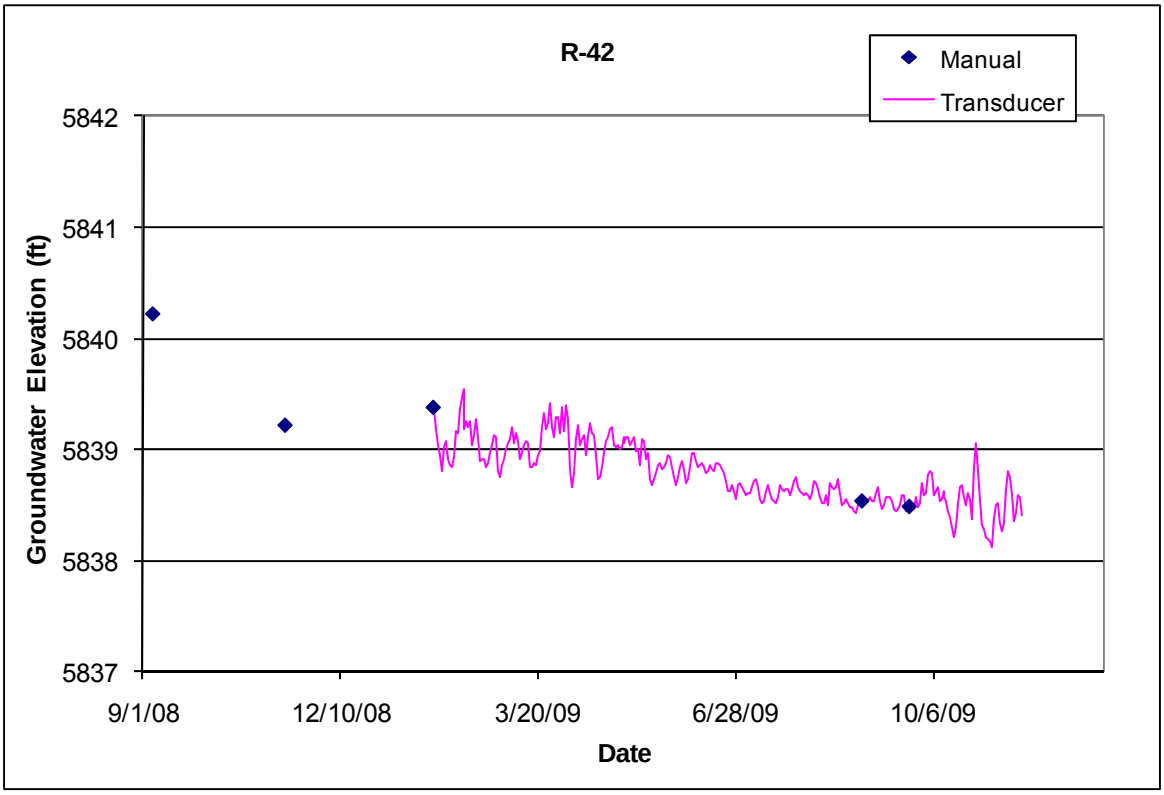
3.44 R-42

Location: R-42 is located in lower Mortandad Canyon between R-15 and R-28.
Completion Type: Single completion within the regional aquifer in Santa Fe Group sediments.
Period of Record: Well completed August 2008. Transducer installed January 26, 2009; data through 2009.
Remarks: R-42 installed in the regional aquifer to a depth of 973.5 ft. The top of the screen is about 12 ft below the water table. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations. The aquifer responds to supply well pumping but available data do not indicate a specific response to any individual pumping well.

R-42 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Vol (L)	Hydro Zone Code	Geo Unit Code
1	931.8	952.9	5827.2	5806.1	21.1	930.9	5828.2	952.9	5806.1	973.5	20.6	79.5	RT	Tsfu

Note: Brass Cap Ground Elevation: 6759.02 ft; all measurements are from this elevation



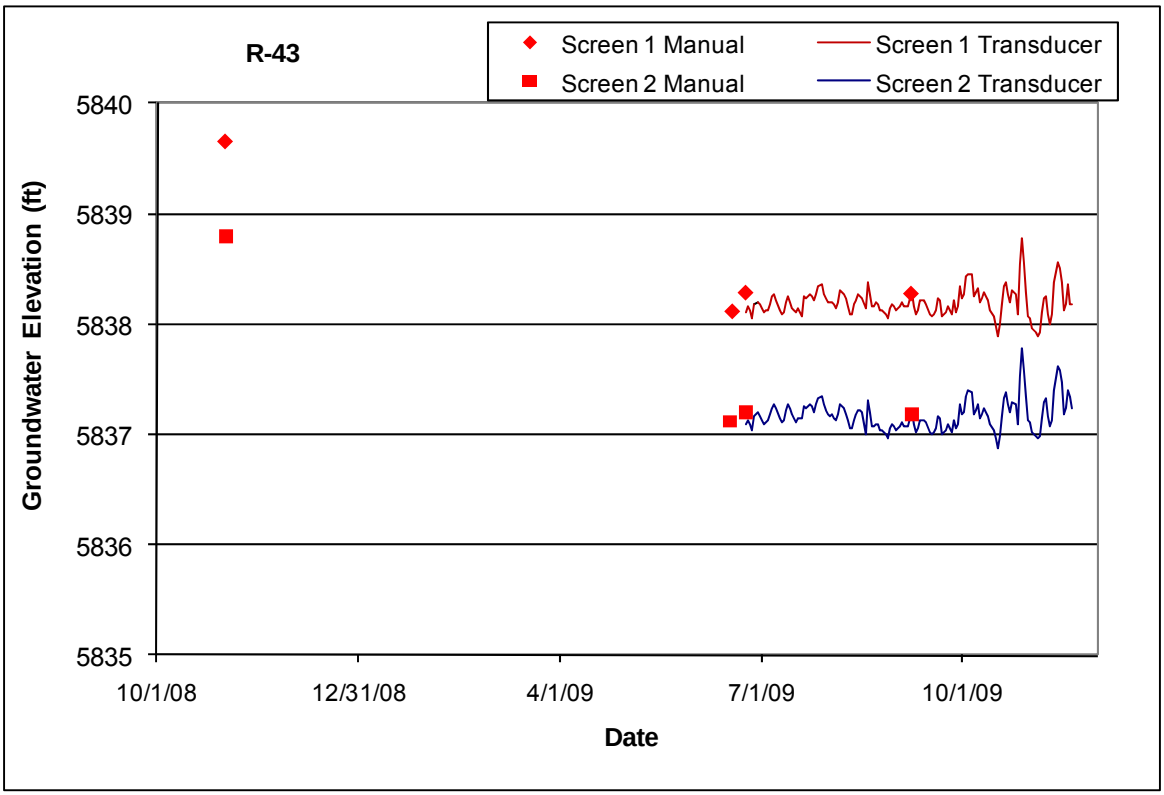
3.45 R-43

Location: R-43 is located in middle Sandia Canyon.
Completion Type: Dual completion within the regional aquifer. The top of screen 1 is about 10 ft below the water table.
Period of Record: Well completed October 2008. Transducers installed June 25, 2009; data through 2009.
Remarks: R-43 installed in the regional aquifer to a depth of 990 ft, about 95 ft into the aquifer. A Baski packer with dual valve, single submersible pump sampling system was installed June 8, 2009. The screens are 44.5 ft apart with a head difference of about 1 ft. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations.

R-43 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	APV Intake Depth (ft)	APV Intake Elev (ft)	Depth to Top of Packer/ Sump (ft)	Top of Packer/ Sump Elev (ft)	Bottom of Packer (ft)	Sump Length (ft)	Bottom of Sump/ Well Elev (ft)	Hydro Zone Code	Geo Unit Code
1	903.9	924.6	5828.8	5808.1	20.7	948.4	5784.3	960.7	5772.0	NA	36.1	5772.0	RT	Tsfu
2	969.1	979.1	5763.6	5753.6	10.0	967.5	5765.2	990.4	5742.3	965.4	11.3	5742.3	RD	Tsfu

Note: Brass Cap Ground Elevation: 6732.65 ft; all measurements are from this elevation



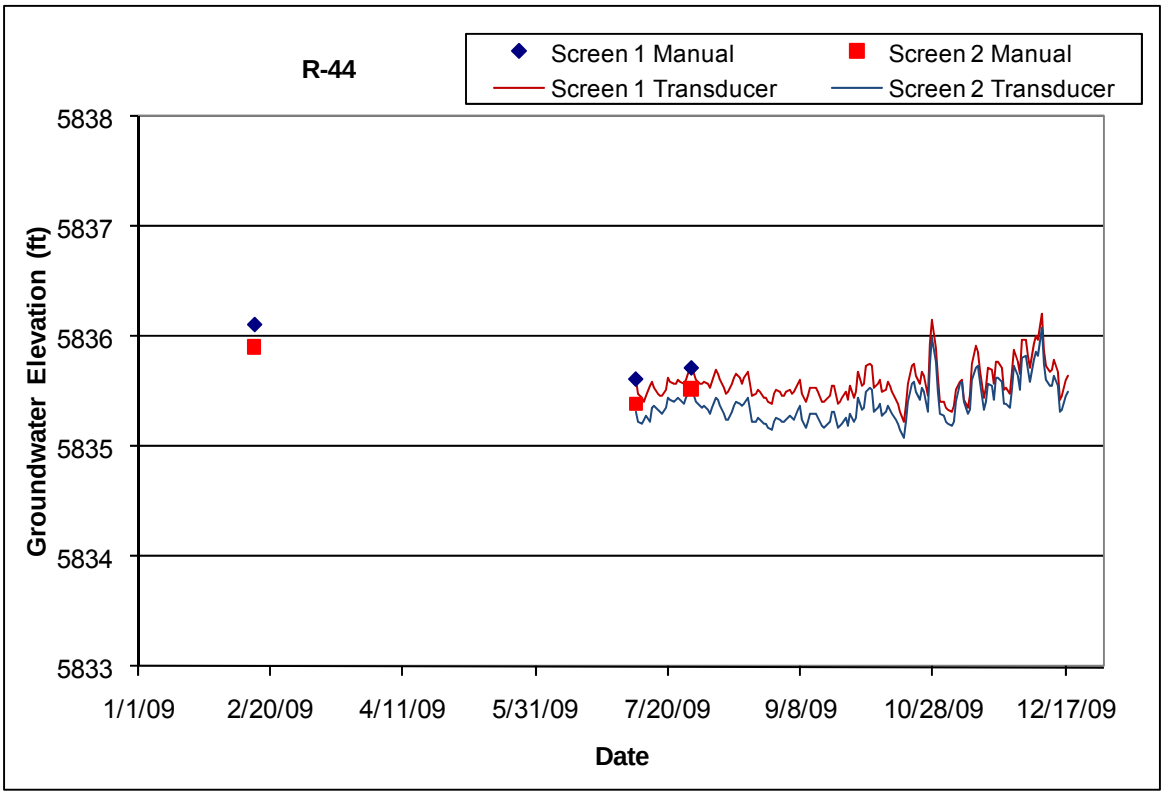
3.46 R-44

Location: R-44 is located in lower Mortandad Canyon about 925 ft west of R-13.
Completion Type: Dual screen completion within the regional aquifer.
Period of Record: Well completed January 2009; transducers installed July 8, 2009; data through 2009.
Remarks: R-44 installed in the regional aquifer to a depth of 1016 ft, about 110 ft into the aquifer. The screens are 80 ft apart. Both screens exhibit a response to pumping supply well PM-4; however, screen 2 shows more response than screen 1. During pumping PM-4, the head difference between screens was about 0.25 ft; however, after PM-4 was shut down for the season in 2009, the head difference declined. The well is 100% barometrically efficient; however, the aquifer shows a delayed response to atmospheric pressure fluctuations.

R-44 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	APV Intake Depth (ft)	APV Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Top/Bottom of Packer (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	895.0	905.0	5819.9	5809.9	10.0	921.9	5793.0	905.0	5809.9	936.3	936.3	31.3	120.9	RT	Tpf
2	985.3	995.2	5729.6	5719.7	9.9	983.2	5731.7	995.2	5719.7	941.1	1016.0	20.8	80.3	RD	Tpf

Note: Brass Cap Ground Elevation: 6714.91 ft; all measurements are from this elevation



3.47 R-45

Location: R-45 is located in lower Mortandad Canyon about 925 ft north of R-44 and 1285 ft east of R-28.

Completion Type: Dual screen completion within the regional aquifer.

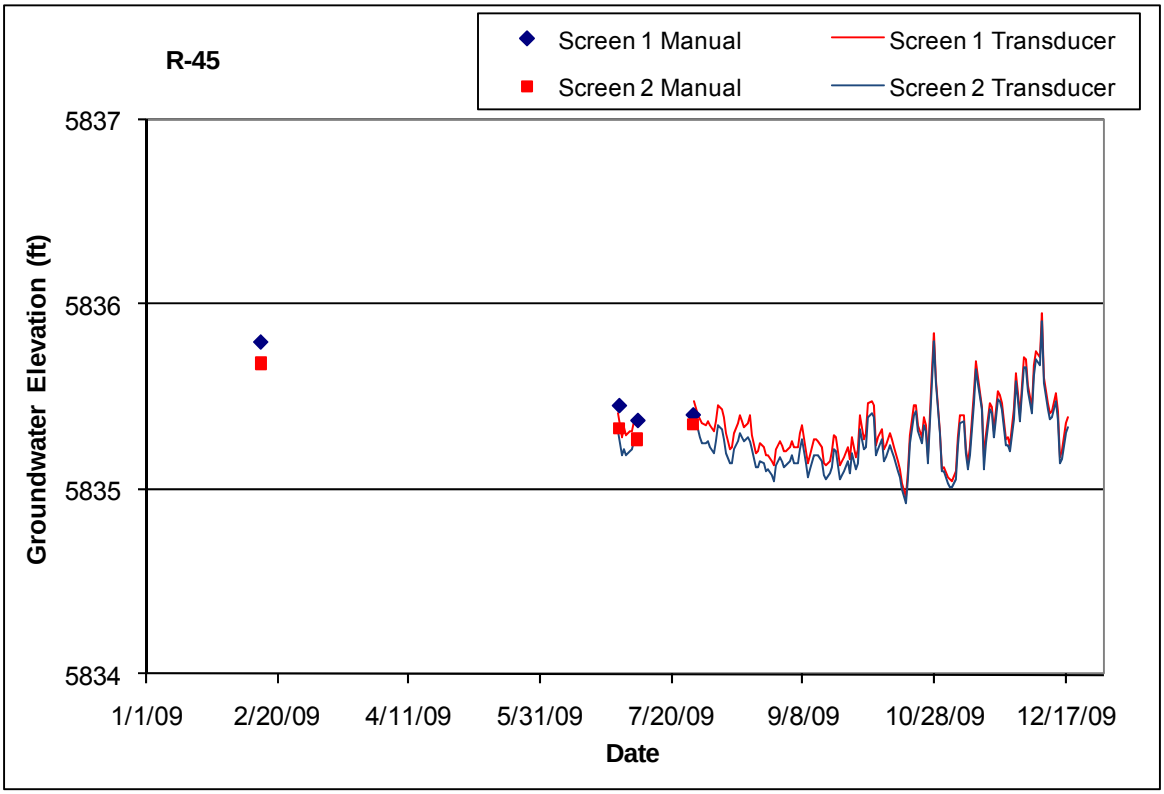
Period of Record: Well completed January 2009. Temporary transducers installed from June 30 to July 7, 2009. Dedicated transducers installed July 28, 2009; data through 2009.

Remarks: R-45 installed in the regional aquifer to a depth of 1016 ft, about 147 ft into the aquifer. The screens are 85 ft apart. Both screens exhibit a response to pumping supply well PM-4; however, screen 2 shows more response than screen 1. During pumping PM-4, the head difference between screens was about 0.108 ft; however after PM-4 was shut down for the season in 2009, the head difference declined. The well is 100% barometrically efficient; however, the aquifer shows a delayed response to atmospheric pressure fluctuations.

R-45 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	APV Intake Depth (ft)	APV Intake Elev (ft)	Top of Sump Depth (ft)	Top of Sump Elev (ft)	Top/ Bottom of Packer (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	880.0	890.0	5824.0	5814.0	10.0	905.5	5798.5	890.0	5814.0	921.3	921.26	31.26	120.7	RT	Tpf
2	974.9	994.9	5729.1	5709.1	20.0	973.2	5730.8	994.9	5709.1	926.0	1016.0	21.1	81.5	RD	Tsfu

Note: Brass Cap Ground Elevation: 6704.02 ft; all measurements are from this elevation



3.48 R-46

Location: R-46 is located on a mesa between Mortandad Canyon and Pajarito Canyon about 800 ft east (downgradient) of MDA C and 4700 ft west (upgradient) of supply well PM-5.

Completion Type: Single completion at the top of the regional aquifer. The screen is located about 12 ft below the water table.

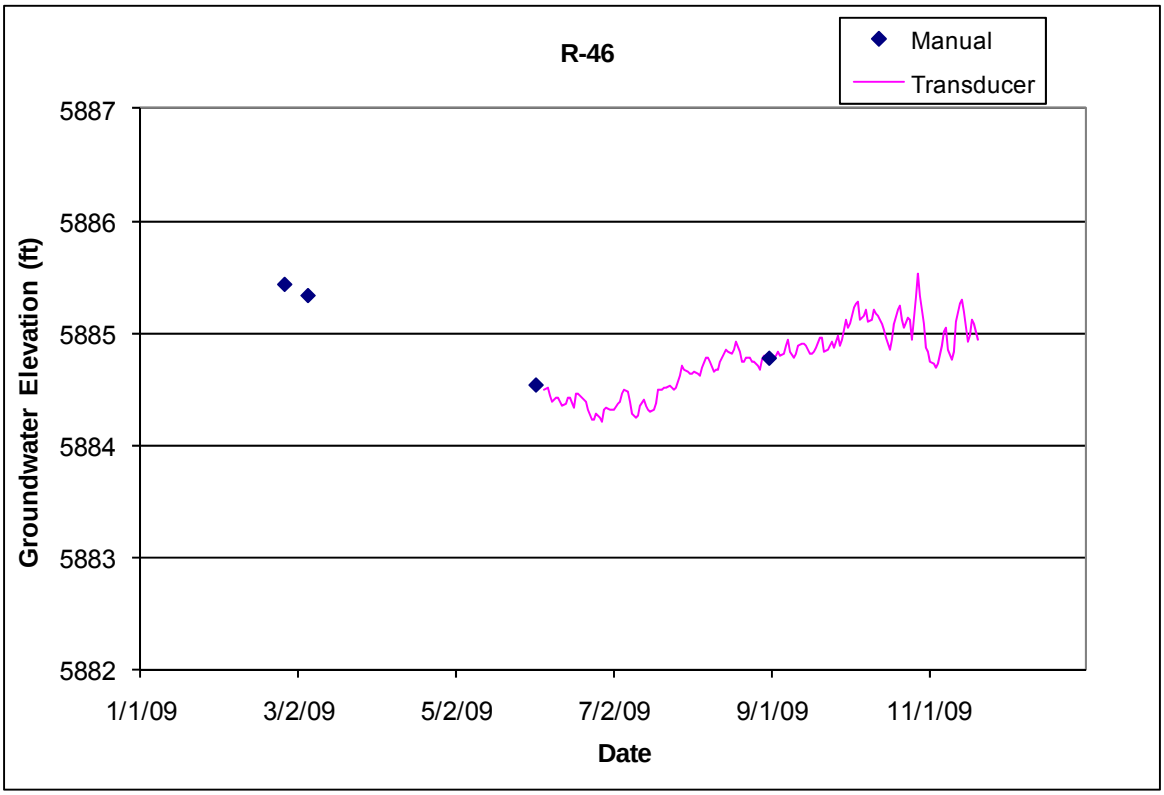
Period of Record: Well completed February 2009, transducer installed June 6, 2009, groundwater level data through 2009.

Remarks: R-46 installed in the regional aquifer to a depth of 1382.2 ft. The well has a 90% barometric efficiency, indicating that the aquifer may have a small response to atmospheric pressure fluctuations.

R-46 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1340.0	1360.7	5873.3	5852.6	20.7			1360.7	5852.6	1382.2	21.5	83.0	RT	Tpf

Note: Brass Cap Ground Elevation: 7213.33 ft; all measurements are from this elevation



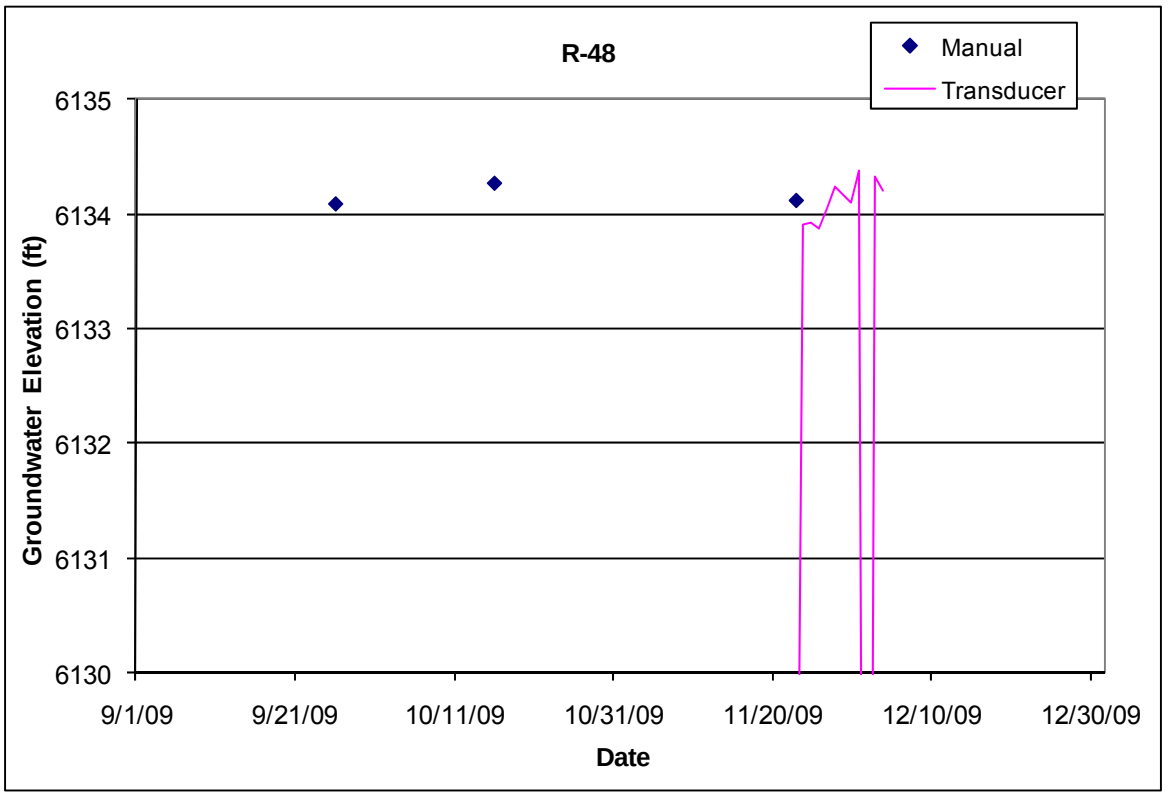
3.49 R-48

Location: R-48 is located at the east side of TA-16 about 1800 ft south of R-25. R-48 was formerly borehole CdV-16-3i, which was deepened and completed in the regional aquifer.
Completion Type: Single completion at the top of the regional aquifer. The screen is located about 147 ft below the water table in Tschicoma dacite.
Period of Record: Well completed September 2009, aquifer test conducted October 2009, transducer installed November 23, 2009, groundwater level data through 2009.
Remarks: R-48 installed in the regional aquifer to a depth of 1540 ft. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations.

R-48 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Hydro Zone Code	Geo Unit Code
1	1500.0	1520.6	5986.8	5966.2	20.6			1520.6	5966.2	1540	19.4	RT	Tt

Note: Brass Cap Ground Elevation: 7486.78 ft; all measurements are from this elevation



3.50 R-49

Location: R-49 is located in lower Pajarito Canyon south of TA-54 and MDA G and about 1100 ft west of R-39.

Completion Type: Dual completion, two screens in the regional aquifer. The screens are 50 ft apart. The upper screen is located in basalt about 35 ft below the water table.

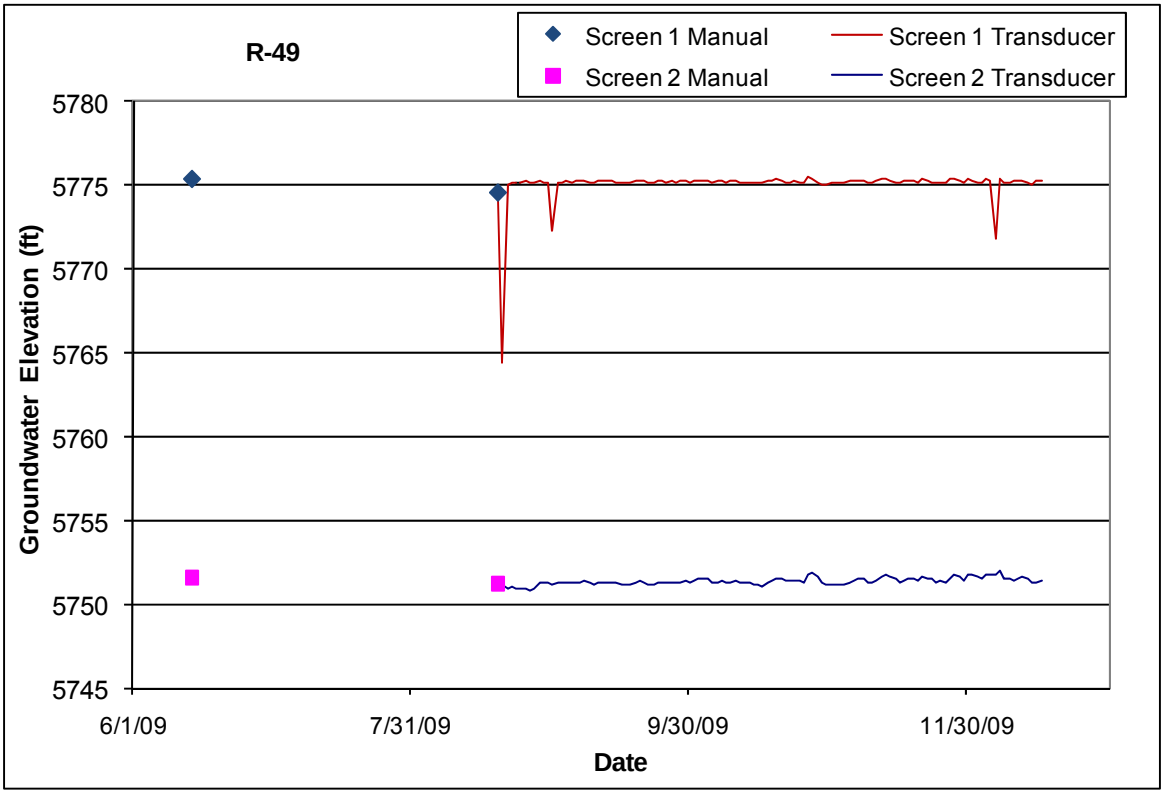
Period of Record: Well completed June 2009, transducers installed August 20, 2009, groundwater level data through 2009.

Remarks: R-49 installed in the regional aquifer to a depth of 949.3 ft. The well is 100% barometrically efficient; the aquifer does not respond to atmospheric pressure fluctuations; however, the groundwater shows a delayed response to atmospheric pressure fluctuations.

R-49 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	APV Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Packer/ Sump (ft)	Top of Packer/ Sump Elev (ft)	Bottom of Packer (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	845.0	855.0	5739.5	5729.5	10.0	874.3	5710.3	887.6	5697.0	N/A	887.6	32.6	125.8	RT	Tb4
2	905.6	926.4	5678.9	5658.1	20.8	904.4	5680.1	926.4	5658.1	892.3	949.3	22.9	88.4	RD	Tpt

Note: Brass Cap Ground Elevation: 6584.54 ft; all measurements are from this elevation



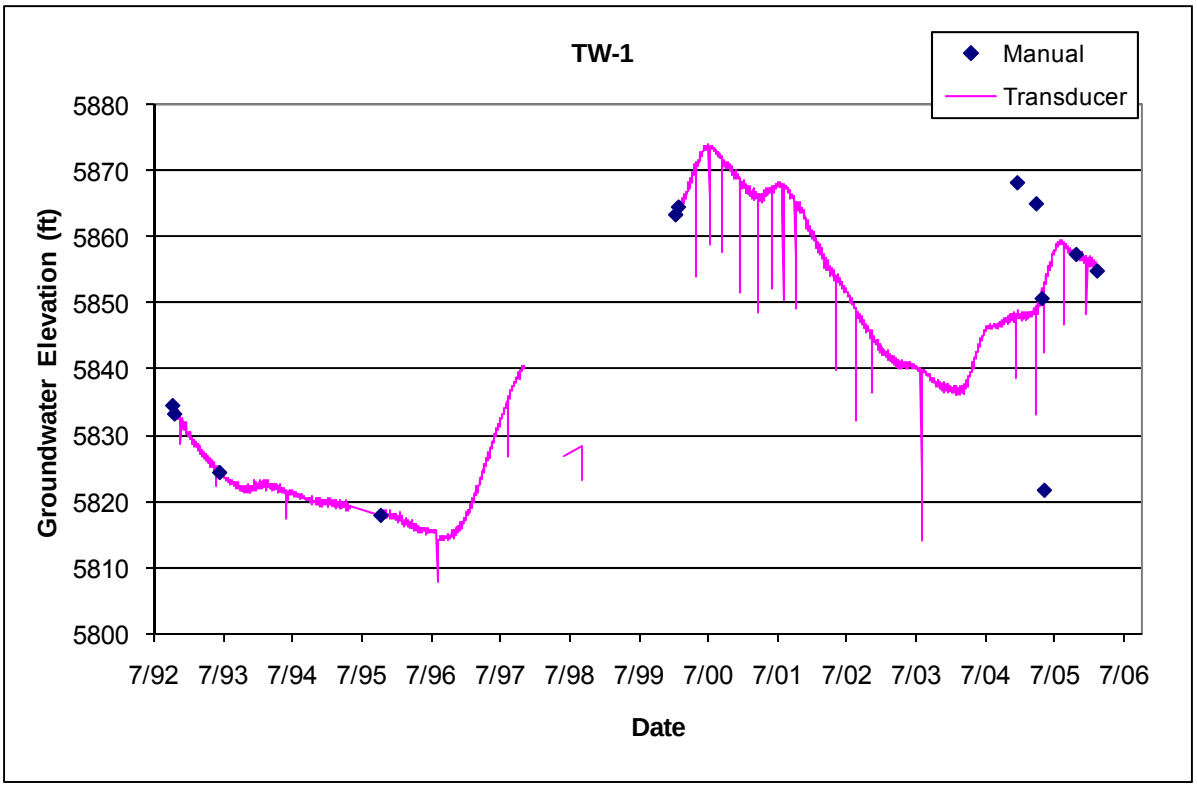
3.51 Test Well 1

Location: TW-1 is located in lower Pueblo Canyon downstream of supply well O-1.
Completion Type: Single completion within the regional aquifer. The top of the screen was about 120 ft below the water table in 2006.
Period of Record: Well completed January 1950, transducer installed January 23, 1992, intermittent water level data to February 6, 2006, when the transducer was removed for well plugging and abandonment.
Remarks: TW-1 installed in the regional aquifer at a depth of 642 ft, about 100 ft into the regional aquifer. Water level in TW-1 is recharged locally by surface water from Pueblo Canyon (Koch and Rogers 2003) and does not correlate with the water level of surrounding regional aquifer wells.

TW-1 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	632.0	642	5737.2	5727.2	10.0			642.0	5727.2	642	0.0	0.0	RT	Tpt

Note: TW-1 Ground Elevation: 6369.19 ft; all measurements are from this elevation



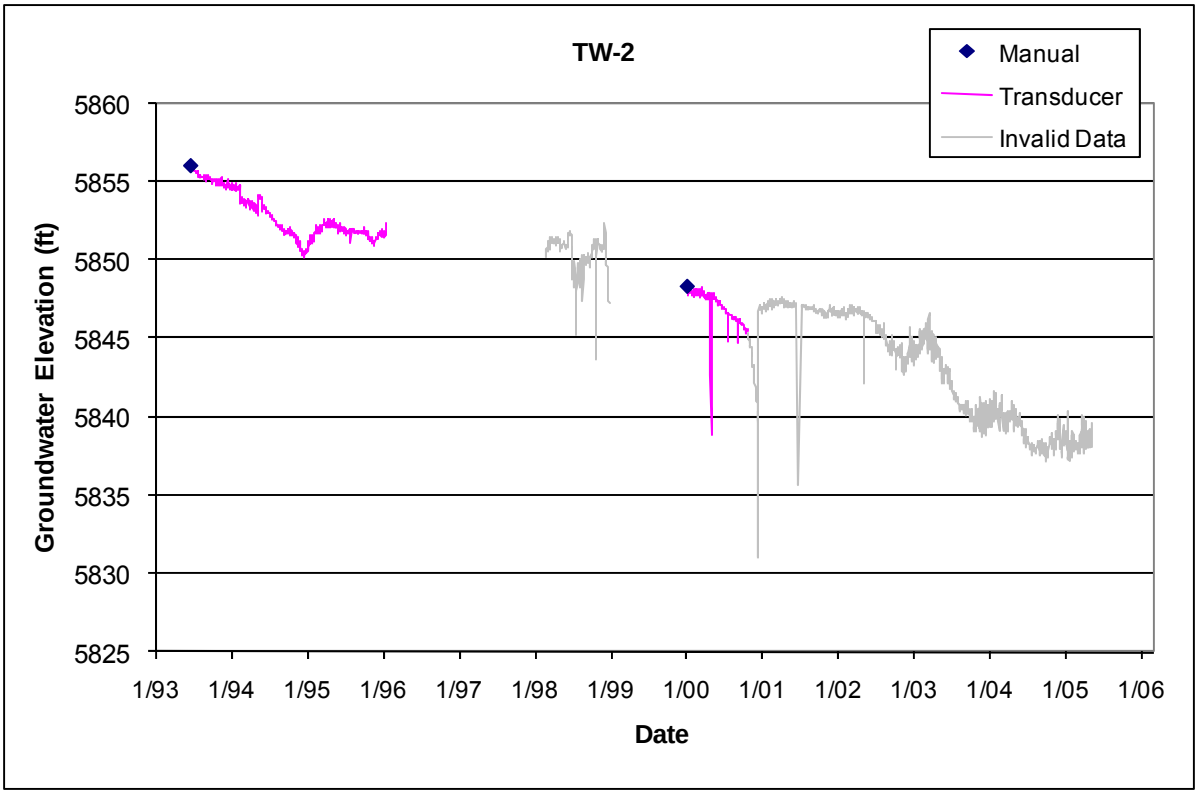
3.52 Test Well 2

Location: TW-2 is located in middle Pueblo Canyon.
Completion Type: Single completion at the top of the regional aquifer.
Period of Record: Well originally drilled in 1949, recompleted in 1990. Transducer installed June 1993; data to January 1996. Transducer reinstalled January 2000; transducer data to March 2005.
Remarks: TW-2 is completed at the top of the regional aquifer at a depth of 834 ft, about 35 ft into the regional aquifer. The transducer failed in November 2000, transducer data since then are questionable. A manual measurement attempt in March 2005 resulted in the measurement tape stuck in the well. Thus, transducer water level data since November 2000 are not valid with respect to elevation, but are shown for reference and character information only. TW-2 is scheduled to be plugged and abandoned in 2010.

TW-2 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	768.0	824	5880.1	5824.1	56.0			824.0	5824.1	834	10.0	55.6	RT	Tpt

Note: Test Well 2 Ground Elevation: 6648.06 ft; all measurements are from this elevation

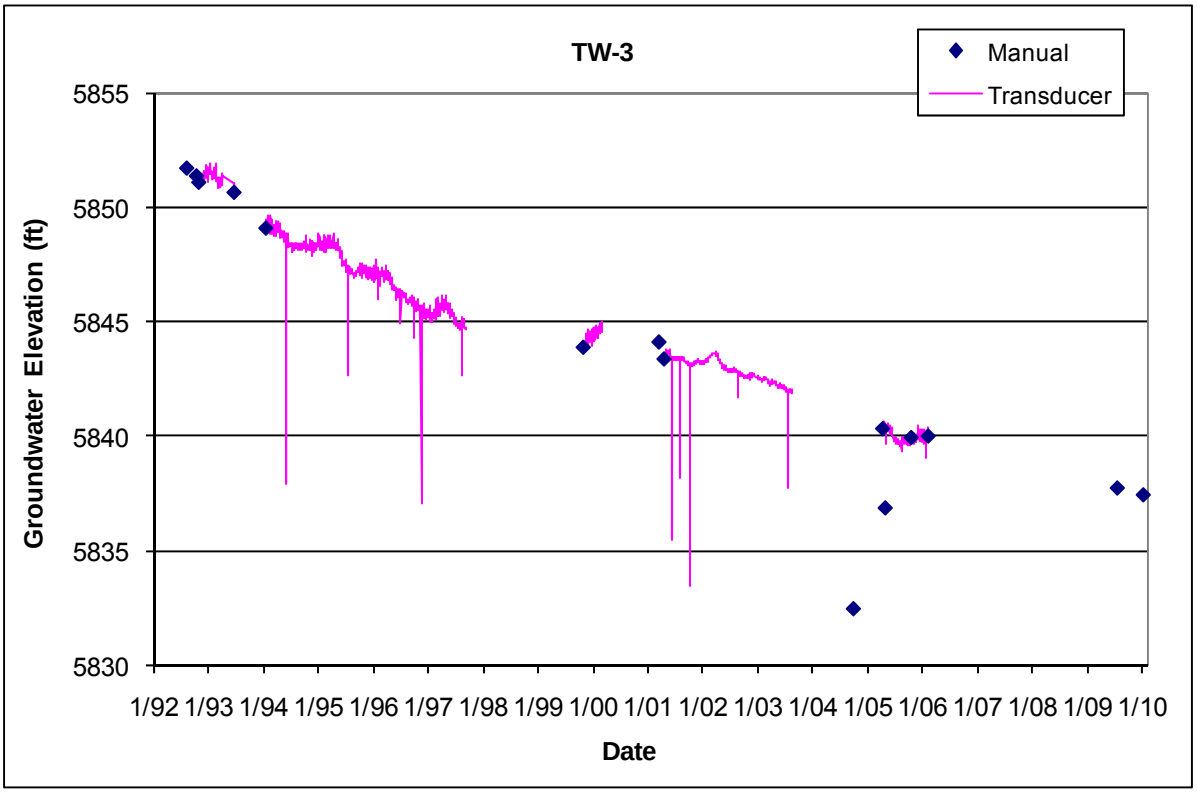


3.53 Test Well 3

Location: TW-3 is located in middle Los Alamos Canyon at the confluence with DP Canyon.
Completion Type: Single completion at the top of the regional aquifer.
Period of Record: Well drilled in 1949, transducer installed November 1992, intermittent data to February 2006.
Remarks: TW-3 completed at the top of the regional aquifer at a depth of 815 ft, about 30 ft into the regional aquifer. Transducer removed February 9, 2006, in preparation for well plugging and abandonment. The well was re-opened and sampled in July 2009 and January 2010.

TW-3 Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	805.0	815.0	5821.9	5811.9	10.0			815.0	5811.9	815.0	0.0	0.0	RT	Tpt

Note: Ground Elevation: 6626.9 ft; all measurements are from this elevation

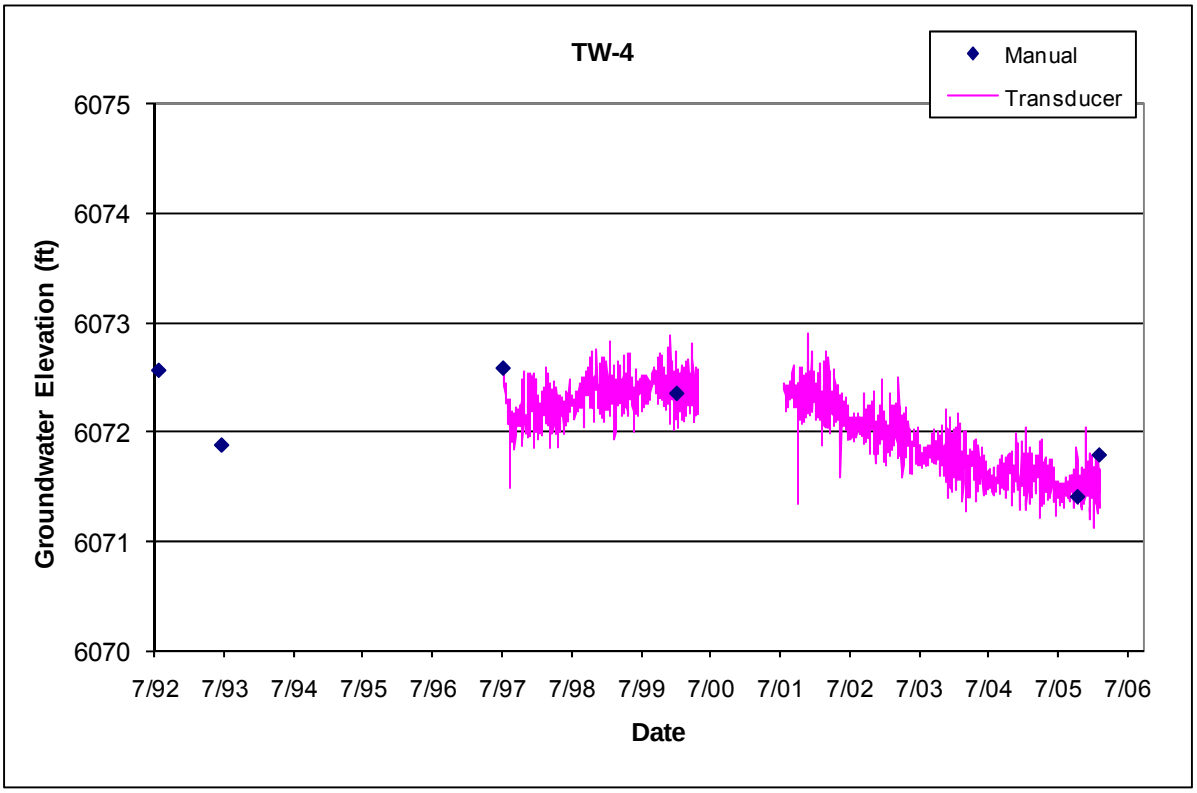


3.54 Test Well 4

Location: TW-4 is located in upper Pueblo Canyon east of Acid Canyon.
Completion Type: Single completion at the top of the regional aquifer.
Period of Record: Well drilled in 1950, transducer installed June 1993 but problems occurred with the transducer. Transducer reinstalled July 1997, intermittent data to February 8, 2006.
Remarks: Completed at the top of the regional aquifer to a depth of 1205 ft, about 30 ft into the regional aquifer. Transducer removed February 8, 2006, in preparation for well plugging and abandonment.

TW-4 Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1195.0	1205	6049.6	6039.6	10.0			1205.0	6039.6	1205.0	0.0	0.0	RT	Tt

Note: TW-4 Ground Elevation: 7244.56 ft; all measurements are from this elevation



3.55 Test Well 8

Location: TW-8 was located in middle Mortandad Canyon about 220 ft east of R-1, which was drilled to replace TW-8.

Completion Type: Single completion at the top of the regional aquifer. The screen straddled the water table.

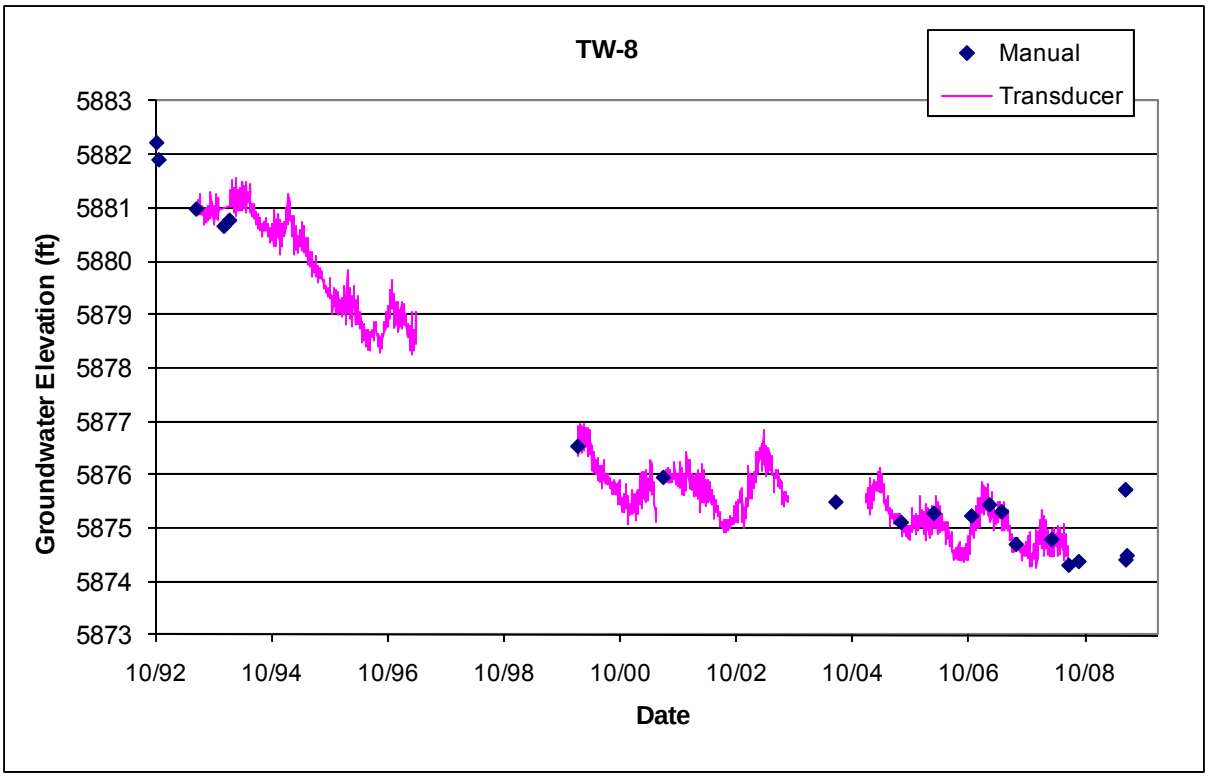
Period of Record: Well drilled in 1960, transducer installed June 1993, transducer data to March 1997. Transducer reinstalled January 2000; intermittent data to June 19, 2008, when the transducer was removed. Several manual measurements were obtained in June and July 2009 during preparations for plugging and abandonment.

Remarks: TW-8 was completed at the top of the regional aquifer at a depth of 1065 ft, about 70 ft into the regional aquifer. The well was nearly 100% barometrically efficient; the aquifer had no response to atmospheric pressure fluctuations. The aquifer indicated a seasonal response to supply well pumping and primarily responded to pumping PM-5 and possibly to pumping PM-4. The well was plugged and abandoned on August 13, 2009.

TW-8 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	953.0	1065	5920.5	5808.5	112.0			1065.0	5808.5	1065.0	0.0	0.0	RT	Tpf

Note: Ground Elevation 6873.5 ft; all measurements are from this elevation



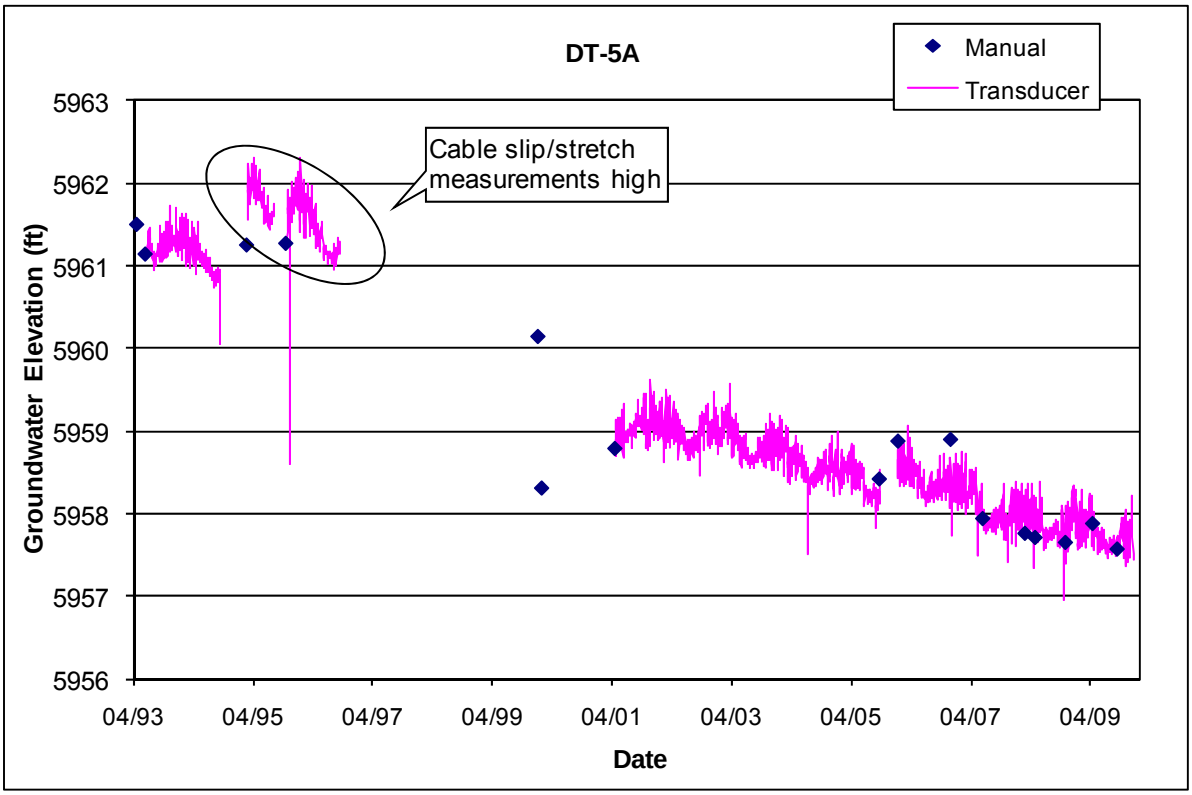
3.56 Test Well DT-5A

Location: DT-5A is located at TA-49 near the southern boundary of LANL.
Completion Type: Single completion at the top of the regional aquifer. The screen straddles the water table.
Period of Record: Well drilled in 1960, transducer installed June 1993, data to September 1996. Transducer reinstalled January 2000 but equipment problems occurred. Transducer reinstalled April 2001; data through 2009.
Remarks: DT-5A completed at the top of the regional aquifer at a depth of 1819.5 ft, about 650 ft into the regional aquifer. The long screen encompasses Tb4 basalt and Tp fanglomerates. The well is 100% barometrically efficient; the aquifer does not respond immediately to atmospheric pressure fluctuations but shows a delayed response. The long-term water level shows a decline of about 0.2 ft/yr, likely in response to supply well pumping.

Test Well DT-5A Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1171.5	1788.5	5972.4	5355.4	617.0			1788.5	5355.4	1819.5	31.0	306.4	RT	Tb4

Note: Brass Cap Elevation 7143.86 ft; all measurements are from this elevation



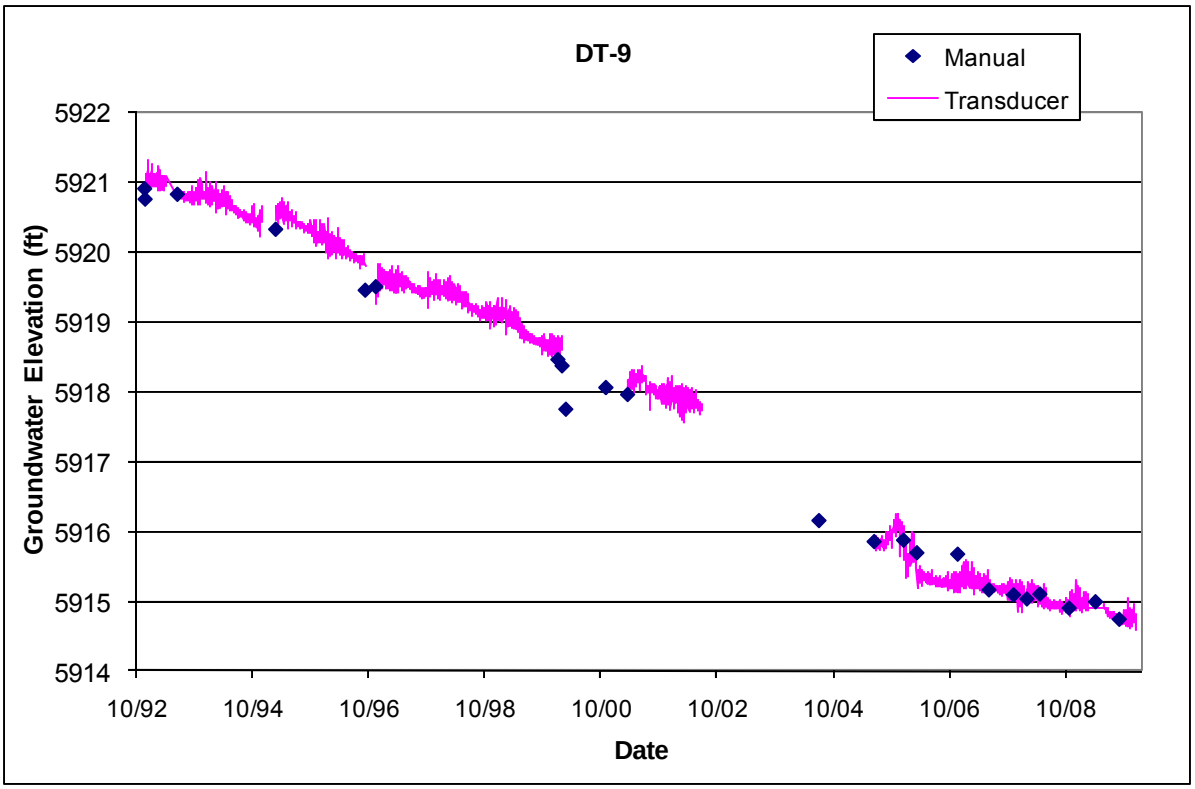
3.57 Test Well DT-9

Location: DT-9 is located at TA-49 near the southern LANL boundary.
Completion Type: Single completion at the top of the regional aquifer. The screen straddles the water table.
Period of Record: Well drilled in 1960, transducer installed November 1992, intermittent data to July 2002. Transducer reinstalled June 2005, data through 2009.
Remarks: DT-9 completed at the top of the regional aquifer at a depth of 1501 ft, about 500 ft into the regional aquifer. The long screen encompasses Tb4 basalt and Tp fanglomerates. The well is 100% barometrically efficient; the aquifer does not respond immediately to atmospheric pressure fluctuations but shows a delayed response. The aquifer shows a long-term decline of about 0.35 ft/yr, likely associated with supply well pumping.

Test Well DT-9 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	819.0	1500.0	6116.0	5435.0	681.0			1500.0	5435.0	1500.0	0.0	0.0	RT	Tb4

Note: Brass Cap Elevation 6935.0 ft; all measurements are from this elevation



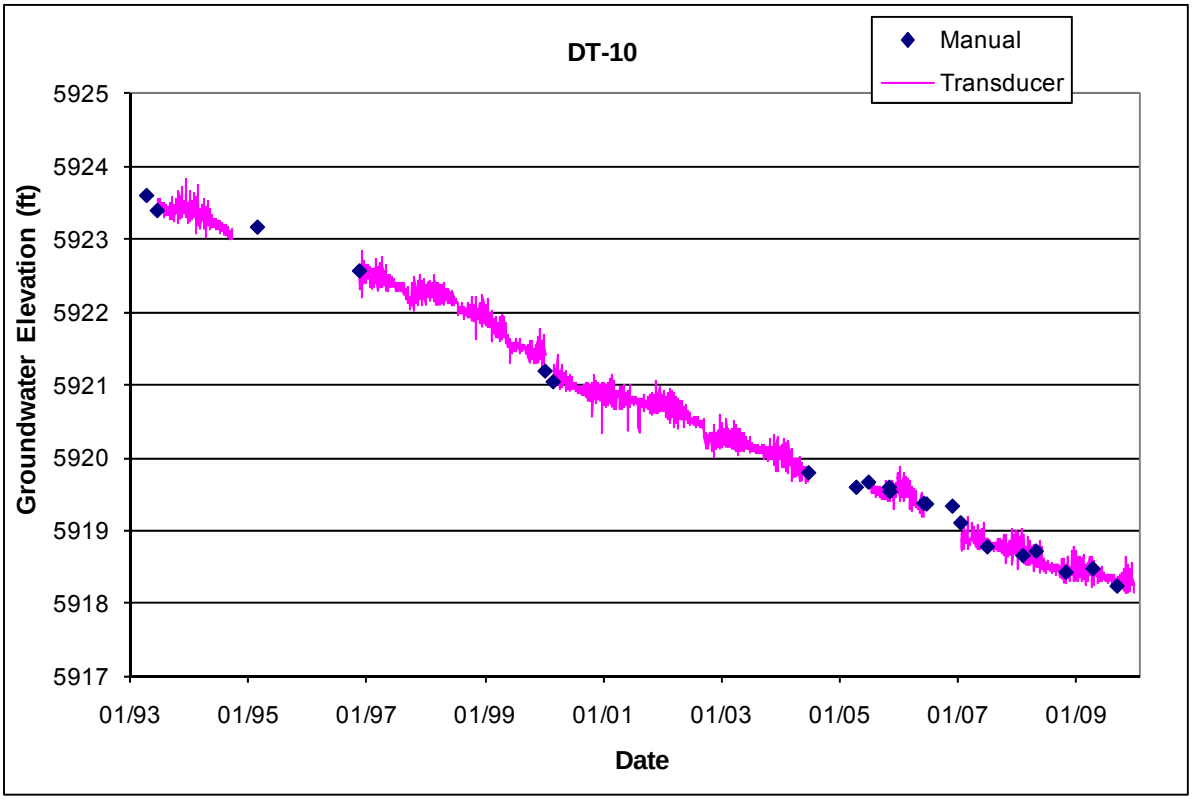
3.58 Test Well DT-10

Location: DT-10 is located at TA-49 near the southern LANL boundary.
Completion Type: Single completion at the top of the regional aquifer. The screen straddles the water table.
Period of Record: Well drilled in 1960, transducer installed June 1993 and again in November 1996 and June 2005. Transducer equipment failed June 2006, new transducer installed January 2007; data through 2009.
Remarks: DT-10 completed at the top of the regional aquifer at a depth of 1408 ft, about 300 ft into the regional aquifer. The long screen encompasses Tb4 basalt and Tp fanglomerates. The well is about 70% barometrically efficient; the aquifer shows a 30% response to atmospheric pressure fluctuations. The aquifer exhibits a long-term water level decline of about 0.32 ft/yr, likely associated with supply well pumping.

Test Well DT-10 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1078.4	1408.0	5941.5	5611.9	329.6			1408.0	5611.9	1408.0	0.0	0.0	RT	Tb4

Note: Ground Elevation: 7019.90 ft; all depths are from this elevation



4.0 Groundwater Level Data from Intermediate Wells

Table 4-1 lists the monitoring wells that specifically monitor intermediate groundwater at LANL; the table includes the well name, completed depth, surveyed location coordinates, and the date of completion. Note that R-12 was converted from a three-screen regional/intermediate to a two-screen intermediate monitoring well in December 2007. Table 4-2 lists the well construction information for the intermediate wells and for regional aquifer wells that have intermediate screens. The table includes information for the depth to the top and bottom of screens, screen casing size, geologic formation where the screen is completed, and whether the well/screen contains intermediate groundwater. The hydrographs for intermediate zones in the multiple completion regional aquifer wells are shown in the previous section.

Figure 4-1 shows the locations of the intermediate wells and regional wells that monitor intermediate groundwater. (Note that multiple completion regional wells that do not contain intermediate groundwater, such as CdV-R-15-3, CdV-R-37-2, and R-31, are not shown in Figure 4-1 because the intermediate screens in these wells are dry.) Appendix Table B-2 lists the average annual water levels for each intermediate screen.

Table 4-1. General Information for Intermediate Wells at LANL

Well Name	Date Completed	Completed Depth (ft)	Easting (ft)	Northing (ft)	Surface Elevation (ft)
03-B-9	6/3/2005	31.8	1616671.90	1773331.38	7457.98
03-B-10	6/10/2005	31.1	1616682.08	1773307.21	7458.28
03-B-13	6/4/2005	32.0	1616691.69	1773317.07	7458.26
16-26644	8/17/2007	150.0	1612087.16	1763729.94	7591.43
90LP-SE-16-02669	6/10/2005	163.4	1612152.57	1763749.00	7583.26
BCO-1	11/23/1994	68.0	1640648.74	1778914.70	6641.97
CdV-16-1(i)	11/9/2003	657.8	1615078.20	1764415.20	7382.17
CdV-16-2(i)	12/8/2003	1037.1	1616741.20	1764237.20	7457.11
CdV-16-2(i)r	7/30/2005	863.2	1616673.24	1764219.40	7456.67
CDV-37-1(i)	12/2/2009	657.8			
LADP-3	12/17/1993	326.0	1632989.00	1773469.10	6756.70
LAOI(a)-1.1	10/28/1994	309.8	1629427.38	1773924.51	6835.20
LAOI-3.2	5/1/2005	165.0	1637642.10	1773066.93	6622.60
LAOI-3.2a	1/20/2006	194.1	1637619.97	1773100.91	6624.43
LAOI-7	9/21/2005	264.9	1644788.53	1771584.11	6458.35
MCOBT-4.4	6/30/2001	545.0	1634196.30	1768513.00	6836.18
MCOI-1	1/9/2005	825.6	1628044.51	1769957.39	7106.20
MCOI-4	11/6/2004	525.7	1634128.53	1768542.01	6837.20
MCOI-5	10/25/2004	699.0	1635247.94	1768300.46	6819.70
MCOI-6	1/13/2005	713.2	1635345.65	1768428.06	6811.10
MCOI-8	1/7/2005	675.0	1633329.74	1769214.40	6859.20
MSC-16-02665	10/23/1997	124.0	1614427.59	1762530.55	7516.92
PCI-2	4/10/2009	533.3	1627648.27	1765872.63	6920.95
POI-4	5/1/1996	176.5	1649432.46	1772587.08	6372.29
R-3i	8/16/2005	220.3	1649196.5	1772599.2	6390.15
R-6i	12/20/2004	615.0	1635992.34	1773889.89	6996.90
R-9i	3/10/2000	309.9	1648202.70	1770837.80	6383.20
R-12	01/11/00	886.0	1647424.20	1767913.40	6499.60
R-23i	11/10/2005	550.7	1647898.02	1755148.04	6527.88
R-25b	10/13/2008	782.3	1615125.60	1764074.70	7517.00
R-25c	9/17/2008	1080.6	1615073.72	1764083.07	7517.59
R-27i	10/17/2009	630.2			
R-47i	11/15/2009	865.5			
SCI-1	10/7/2006	377.9	1636822.9	1770298.2	6738.27
SCI-2	8/31/2008	570.0	1637155.34	1769651.16	6735.70
TA-53i	3/10/2009	620.8	1635850.97	1771320.08	6987.17
TW-1A	1/11/1950	225.0	1650056.87	1772065.87	6369.28
TW-2A	2/7/1950	133.0	1634184.87	1777288.12	6650.40

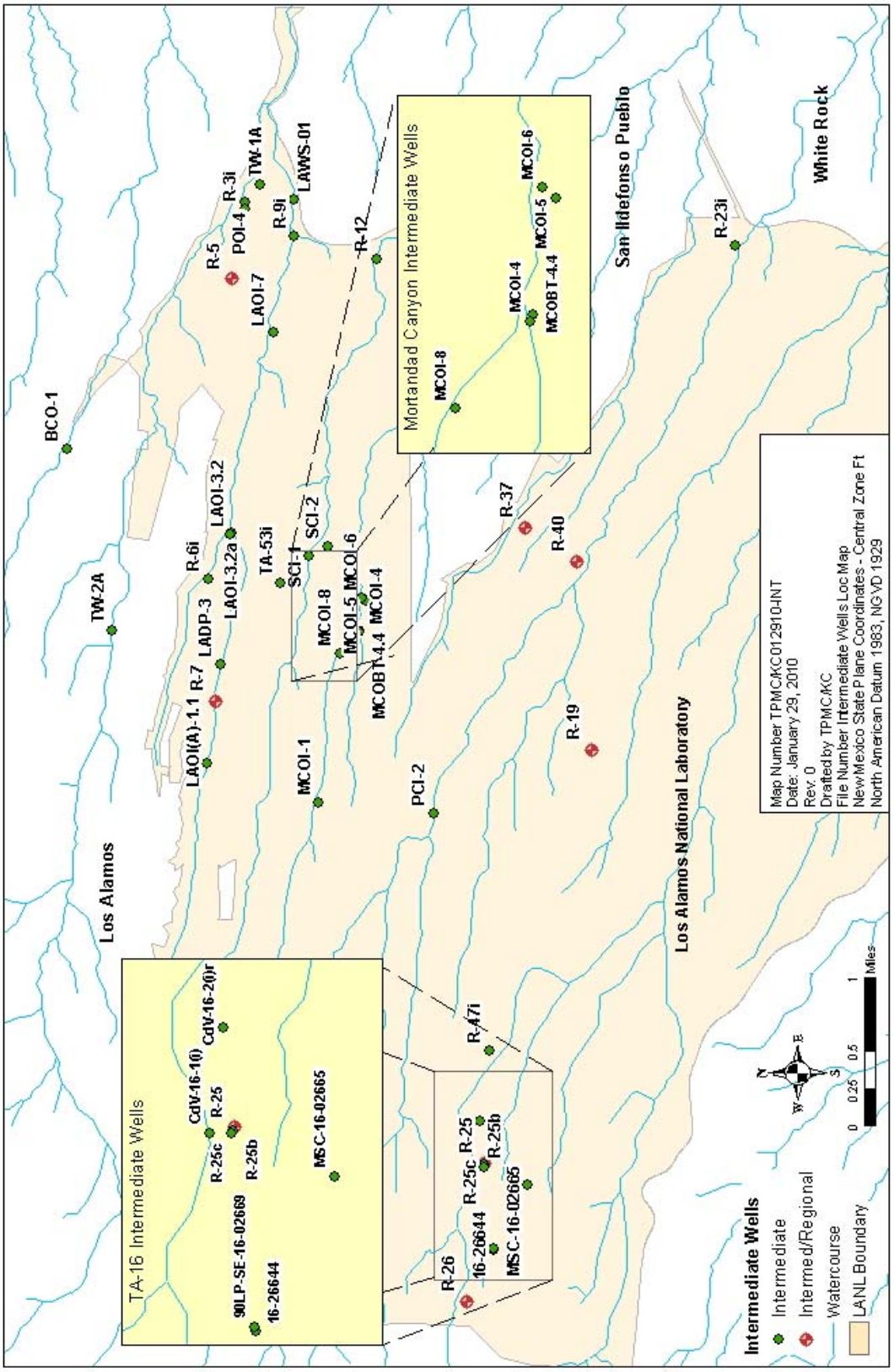


Figure 4-1. Intermediate monitoring wells.

Table 4-2. Well Completion Information for Intermediate Wells and Screens

Well Name	Screen Common Name	Screen Material	Top of Screen (ft)	Bottom of Screen (ft)	Screen Inside Diameter (in.)	Geologic Unit	Comment
03-B-9	03-B-9 Screen #1	PVC	21.3	31.3	2.00	Qbt3	
03-B-10	03-B-10 Screen #1	PVC	20.6	30.6	2.00	Qbt3	
03-B-13	03-B-13 Screen #1	PVC	21.5	31.5	2.00	Qbt3	
16-26644	16-26644 Screen #1	PVC	130.0	145.0	2.00	Qbt3	
90LP-SE-16-02669	16-02669 Screen #1	PVC	131.5	162.5	2.00	Qbt3	Dry
CdV-16-1(i)	CdV-16-1(i) Screen #1	SS304	624.0	634.0	4.50	Qbo	
CdV-16-1(i) CH	CdV-16-1(i) PZ #1	PVC	50.0	80.0	1.50	Qbt3	Dry
CdV-16-2(i)	CdV-16-2(i) Screen #1	SS304	850.2	867.8	4.46	Tp	Dry
CdV-16-2(i)	CdV-16-2(i) Screen #2	SS304	992.0	1015.2	4.46	Tp	P&A 2009
CdV-16-2(i)r	CdV-16-2(i)r Screen #1	SS304	850.0	859.7	4.46	Tpf	
CdV-16-3(i)	Open Borehole	NA	NA	NA	NA	Tt	Completed as R-48
CDV-37-1(i)	CDV-37-1(i) Screen #1	SS304	632.0	652.5	5.00	Tpf	
CdV-R-15-3	CdV-R-15-3 Screen 1	SS312	617.7	624.5	4.50	Qbo	Dry
CdV-R-15-3	CdV-R-15-3 Screen 2	SS312	800.8	807.8	4.50	Tp	Dry
CdV-R-15-3	CdV-R-15-3 Screen 3	SS312	964.8	980.9	4.50	Tb	Dry
CdV-R-37-2	CdV-R37-2 Screen #1	SS304	914.4	939.5	4.50	Tp	Dry
BCO-1	BCO-1 Screen #1	PVC	57.0	67.0	4.00	Tpf	Dry
LADP-3	LADP-3 Screen #1	PVC	316.0	325.0	3.00	Qbog	
LAOI(A)-1.1	LAOI(A)-1.1 Screen #1	PVC	295.2	305.0	3.00	Qbog	
LAOI-3.2	LAOI-3 Screen #1	PVC	153.3	162.8	4.46	Tb	
LAOI-3.2a	LAOI-3a Screen #1	SS304	181.4	191.0	3.10	Tpf	
LAOI-7	LAOI-7 Screen #1	SS304	240.0	259.6	3.00	Tb4	
MCOBT-4.4	MCOBT4.4 Screen #1	SS304	485.4	524.0	4.50	Tpf	
MCOI-1	MCOI-1 Screen #1	SS	815.0	825.5	1.10	Tpf	
MCOI-4	MCOI-4 Screen #1	PVC	498.9	522.0	4.50	Tpf	
MCOI-5	MCOI-5 Screen #1	PVC	689.0	699.0	4.50	Tb	
MCOI-6	MCOI-6 Screen #1	PVC	686.0	708.3	4.50	Tb	
MCOI-8	MCOI-6 Screen #1	PVC	665.0	675.0	4.46	Tb	
MSC-16-02665	16-02665 Screen #1	PVC	93.5	123.5	2.00	Qbt3	Usually dry
PCI-2	PCI-2 Screen #1	SS304	512.0	522.0	5.00	Tpf	
POI-4	POI-4 Screen #1	PVC	159.0	174.0	4.00	Tb4	
R-3i	R-3i Screen #1	PVC	215.2	220.0	2.00	Tb4	
R-12	R-12 Screen #1	SS304	459.0	467.5	4.50	Tb	
R-12	R-12 Screen #2	SS304	504.5	508.0	4.50	Tp	
R-19	R-19 Screen #1	SS304	827.2	843.6	4.50	Qbog	Dry
R-19	R-19 Screen #2	SS304	893.3	909.6	4.50	Tp	
R-23i	R-23i Screen #1	SS304	400.3	420.0	2.10	Tb4	
R-23i	R-23i Screen #2	SS304	470.2	480.1	4.50	Tb4	
R-23i	R-23i Screen #3	SS304	524.0	547.0	4.50	Tb4	
R-25	R-25 Screen #1	SS304	737.6	758.4	5.17	Qbo	
R-25	R-25 Screen #2	SS304	882.6	893.4	5.17	Tp	
R-25	R-25 Screen #3 damaged	SS304	1054.6	1064.6	5.17	Tp	Dry, sump water
R-25	R-25 Screen #4	SS304	1184.6	1194.6	5.17	Tp	
R-25b	R-25b Screen #1	SS304	750.0	770.8	5.00	Qbo	
R-25c	R-25c Screen #1	SS304	1039.6	1060.0	5.00	Tpf	Dry
R-26	R-26 Screen #1 (Upper)	SS304	643.0	662.0	4.50	Qct	
R-26 PZ-1	R-26 Piezometer Screen #1	PVC	230.0	250.0	1.00	Qbt3	Dry
R-26 PZ-2	R-26 Piezometer Screen #2	PVC	150.0	180.0	1.00	Qbt3	Dry

Note: SS = stainless steel, PVC = polyvinyl chloride, Qbo = Otowi Member of the Bandelier Tuff, Tp = Puye Formation, Qbog = Guaje Pumice member of the Bandelier Tuff, Tpf = fluvial facies of the Puye Formation, Tb = undifferentiated basalt, Tb4 = Cerros del Rio Basaltic Rocks; Qbt3 = Unit 3 of the Tshirege Member of the Bandelier Tuff, Tt = Tschicoma Formation (dacite).

Table 4-2. Well Completion Information for Intermediate Wells and Screens (Continued)

Well Name	Screen Common Name	Screen Material	Top of Screen (ft)	Bottom of Screen (ft)	Screen Inside Diameter (in.)	Geologic Unit	Comment
R-27i	R-27i Screen #1	SS304	619.0	629.0	5.00	Qbt3	
R-31	R-31 Screen #1	SS304	439.1	454.4	4.50	Tb	Dry
R-37	R-37 Screen #1	SS304	929.3	950.0	5.00	Tb4	
R-40	R-40i	PVC	649.67	669.02	3.00	Tb4	
R-40	R-40 Screen #1	SS304	751.59	785.06	5.00	Tb4	
R-41	R-41 Screen #1	SS304	928	937.7	5.00	Tsf	Dry
R-47i	R-47i Screen #1	SS304	840	860.6	5.00	Tpf	
R-5	R-5 Screen #1	SS304	326.4	331.5	4.50	Tp	Dry
R-5	R-5 Screen #2	SS304	372.8	388.8	4.50	Tp	
R-6i	R-6i Screen #1	SS304	602.0	612.0	4.46	Tpf	
R-7	R-7 Screen #1	SS304	363.2	379.2	4.50	Tp	Dry since 2005
R-7	R-7 Screen #2	SS304	730.4	746.4	4.50	Tp	Dry
R-9i	R-9i Screen #1	SS304	189.1	199.5	5.00	Tb	
R-9i	R-9i Screen #2	SS304	269.6	280.3	5.00	Tb	
SCI-1	SCI-1 Screen #1	PVC	358.4	377.9	3.80	Tpf	
SCI-2	SCI-2 Screen #1	PVC	548	568	2.00	Tb4	near R-43
TA-53i	TA-53i Screen #1	SS304	600	610	5.00	Tpf	
Test Well 1A	TW-1A Screen #1	CS	215.0	225.0	6.00	Tb	
Test Well 2A	TW-2A Screen #1a	CS	123.0	133.0	6.00	Tp	

Note: SS = stainless steel, PVC = polyvinyl chloride, Qbo = Otowi Member of the Bandelier Tuff, Tp = Puye Formation, Qbog = Guaje Pumice member of the Bandelier Tuff, Tpf = fluvial facies of the Puye Formation, Tb = undifferentiated basalt, Tb4 = Cerros del Rio Basaltic Rocks; Qbt3 = Unit 3 of the Tshirege Member of the Bandelier Tuff, Tt = Tschicoma Formation (dacite).

The following sections include additional port and construction information for single and multiple completion intermediate wells at LANL. Time-series groundwater level data are shown for each well.

4.1 03-B-9

Location: 03-B-9 was located at TA-3 behind building SM-30.

Completion Type: Single completion in an intermediate perched zone in Unit 3 of the Bandelier Tuff. The wellhead was completed below ground surface with a well cap flush with an asphalt roadway.

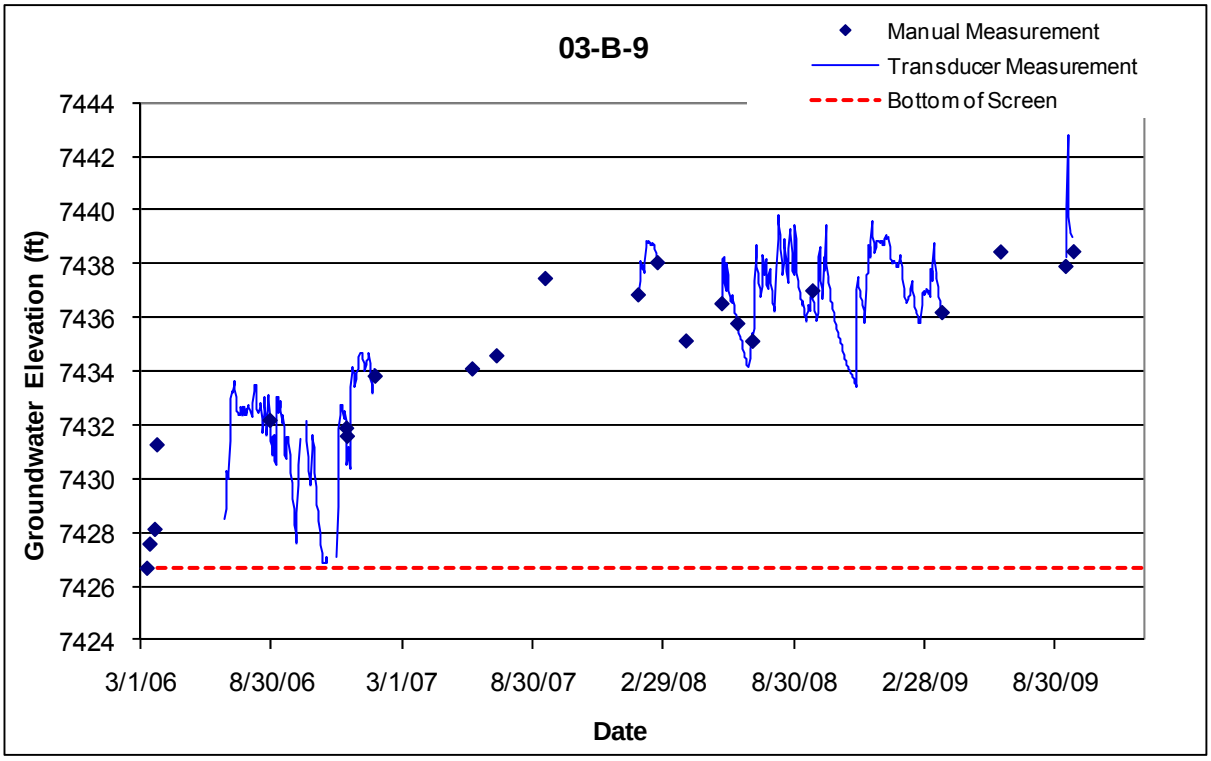
Period of Record: Well completed June 2006, transducer installed June 2006, periodic measurements to September 25, 2009.

Remarks: The surface completion was reworked in 2007 but snowmelt and storm runoff would pond on the well cover; surface water penetrated the well cover and entered the well. The well was plugged and abandoned September 25, 2009 (LANL October 2009).

03-B-9 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	21.30	31.3	7436.7	7426.7	10.0	None	None	31.3	7426.7	31.8	0.5	0.3	I	Qbt3

Note: Ground elevation is 7457.98 ft; all depths from this elevation



4.2 03-B-10

Location: 03-B-10 was located at TA-3 behind building SM-30.

Completion Type: Single completion in an intermediate perched zone in Unit 3 of the Bandelier Tuff. The wellhead was completed below ground surface with a waterproof well cap flush with an asphalt roadway.

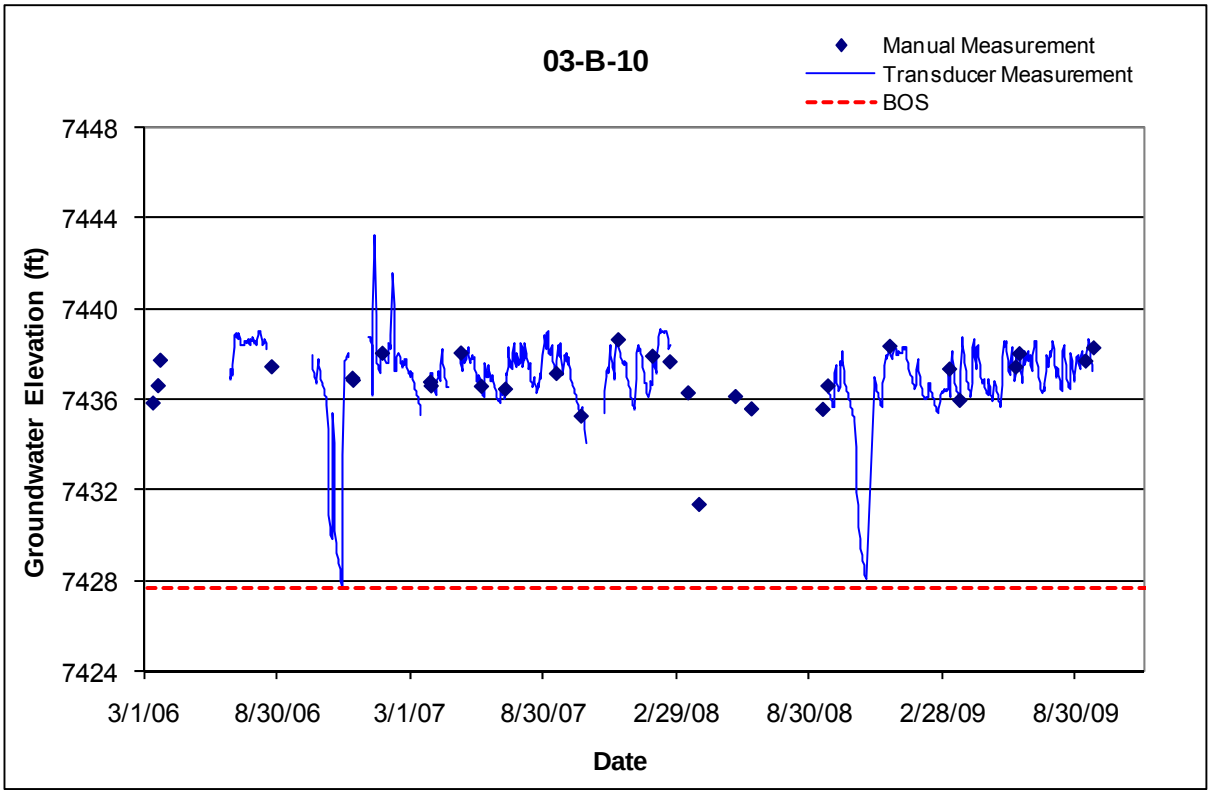
Period of Record: Well completed June 2006, transducer installed June 2006, periodic measurements until September 25, 2009. Transducer equipment problems occurred in 2008.

Remarks: The surface completion was reworked in 2007. Surface water entered the well protective cover at times and may have entered the well. The well was plugged and abandoned September 25, 2009 (LANL October 2009).

03-B-10 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	20.60	30.6	7437.7	7427.7	10.0	None	None	30.6	7427.7	31.1	0.5	0.3	I	Qbt3

Note: Ground elevation is 7458.28 ft; all depths from this elevation



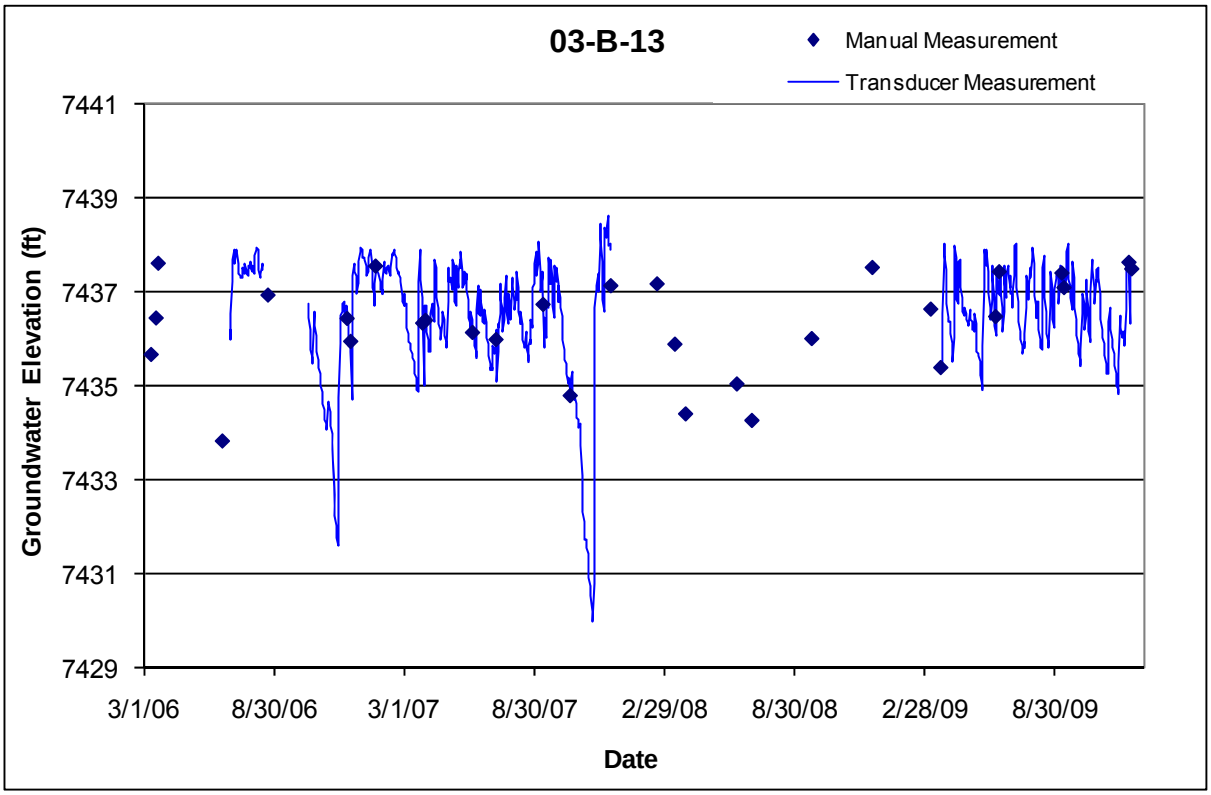
4.3 03-B-13

Location: 03-B-13 is located at TA-3 behind building SM-30.
Completion Type: Single completion in an intermediate perched zone in Unit 3 of the Bandelier Tuff. The wellhead is completed below ground surface with a waterproof well cap flush with an asphalt roadway.
Period of Record: Well completed June 2006, transducer installed June 2006, periodic measurements through 2009. Transducer equipment problems occurred in 2008.
Remarks: The surface completion was reworked in 2007. Surface water enters the well protective cover at times and may enter the well.

03-B-13 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	21.50	31.5	7436.8	7426.8	10.0	None	None	31.5	7426.8	32.0	0.5	0.3	I	Qbt3

Note: Ground elevation is 7458.26 ft; all depths from this elevation



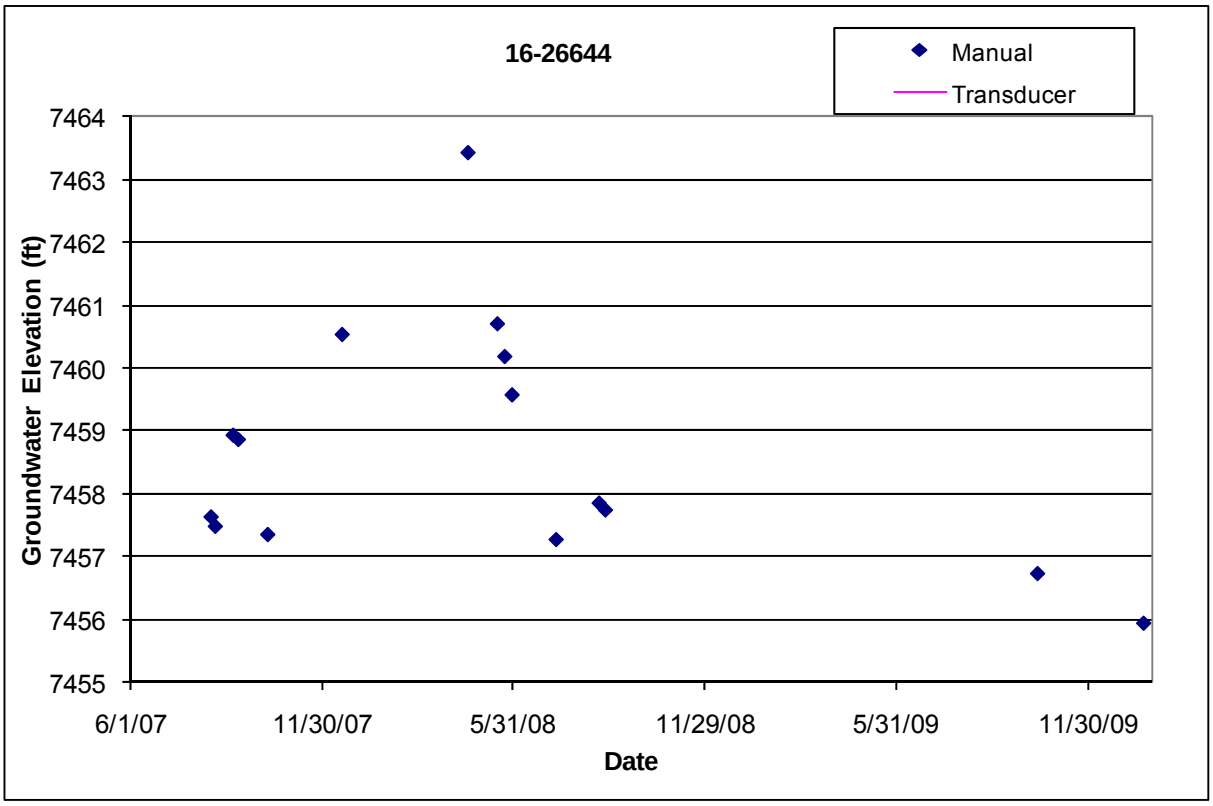
4.4 16-26644

Location: 16-26644 is located at TA-16 southeast and downgradient of the 90LP Pond and about 70 ft west of well 90LP-SE-16-02669.
Completion Type: Single completion in an intermediate zone in Unit 3 of the Bandelier Tuff.
Period of Record: Well drilled in August 2007, periodic manual measurements through 2009. A dedicated Bennett pump and transducer were installed in January 2010; data pending.
Remarks: The well has contained water when checked since completion of drilling, but several nearby boreholes and wells to a similar depth are dry.

16-26644 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	130.0	145.0	7461.4	7446.4	15.0	None	None	145.0	7446.4	150.0	5.0	3.1	I	Qbt3

Note: Ground Elevation: 7591.43 ft; all measurements are from this elevation



4.5 90LP-SE-16-02669

Location: 90LP-SE-16-02669 is located at TA-16 downgradient of the 90LP Pond.
Completion Type: Single completion in an intermediate zone in Unit 3 of the Bandelier Tuff.
Period of Record: Well drilled in March 1998, periodic measurements through 2009.
Remarks: The borehole contained water at the completion of drilling, but since completion of the well, water has not been present in the well; the well was last checked March 23, 2009.

90LP-SE-16-02669 Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	131.5	163.0	7451.8	7420.3	31.5	None	None	163.0	7420.3	163.4	0.4	0.2	I	Qbt3

Note: Ground Elevation: 7583.26 ft; all measurements are from this elevation

4.6 CdV-16-1(i)

Location: CdV-16-1(i) is located at TA-16 downgradient of the TA-6-260 outfall and about 360 ft north or intermediate well R-25b.

Completion Type: Single completion in an intermediate zone. The screen is located at similar depth as R-25 screen 1 and R-25b.

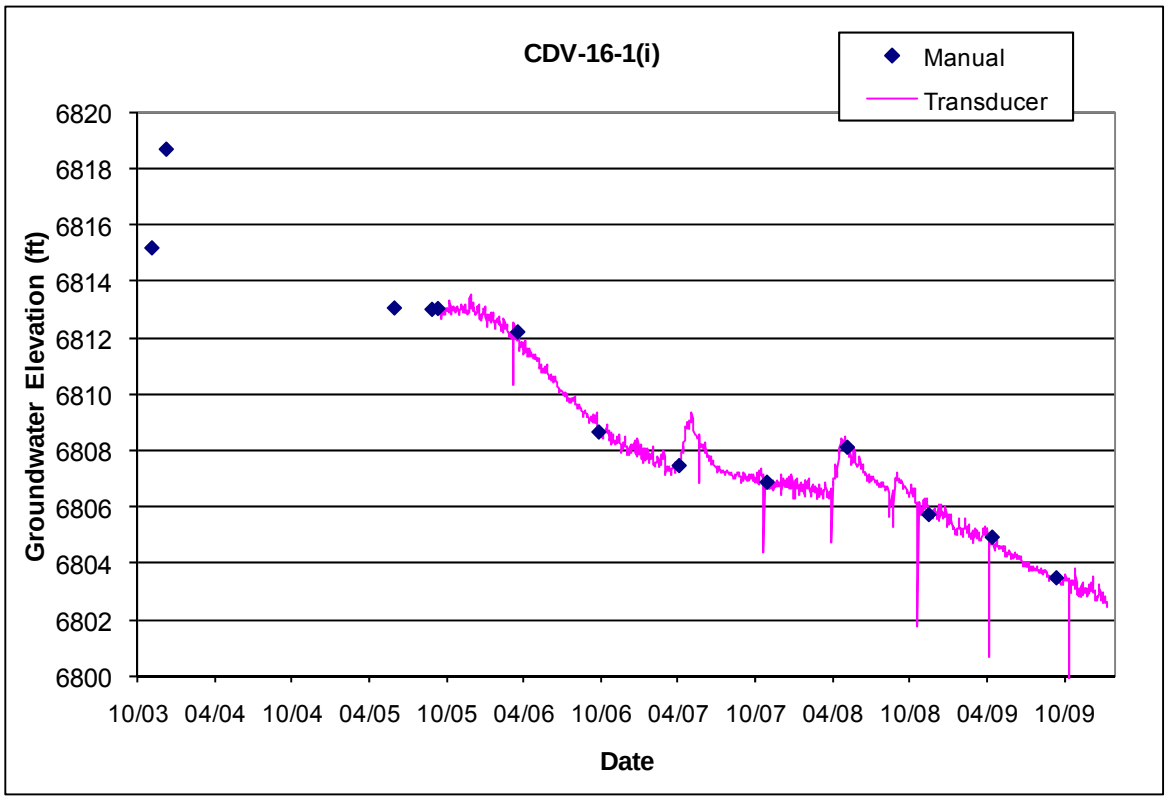
Period of Record: Well drilled in November 2003. Transducer installed September 2005; data through 2009.

Remarks: Well completed in an intermediate zone in the Otowi Member of the Tshirege Formation; the water level is about 50 ft above the top of the screen. The well is 100% barometrically efficient; the groundwater does not respond to atmospheric pressure fluctuations. The intermediate groundwater rose in response to snowmelt runoff in the spring of 2007 and 2008 and responded to drilling activities at R-25b and R-35c in 2008.

CDV-16-1(i) Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	624.0	634	6758.2	6748.2	10.0	618.8	6763.4	634.0	6748.2	657.8	23.8	73.1	I	Qbo

Note: Ground Elevation: 7382.17 ft; all measurements are from this elevation



4.7 CdV-16-2(i)r

Location: CdV-16-2(i)r is located at TA-16 downgradient of the TA-6-260 outfall and about 1450 ft east of R-25.

Completion Type: Single completion in intermediate zone in the Puye Formation.

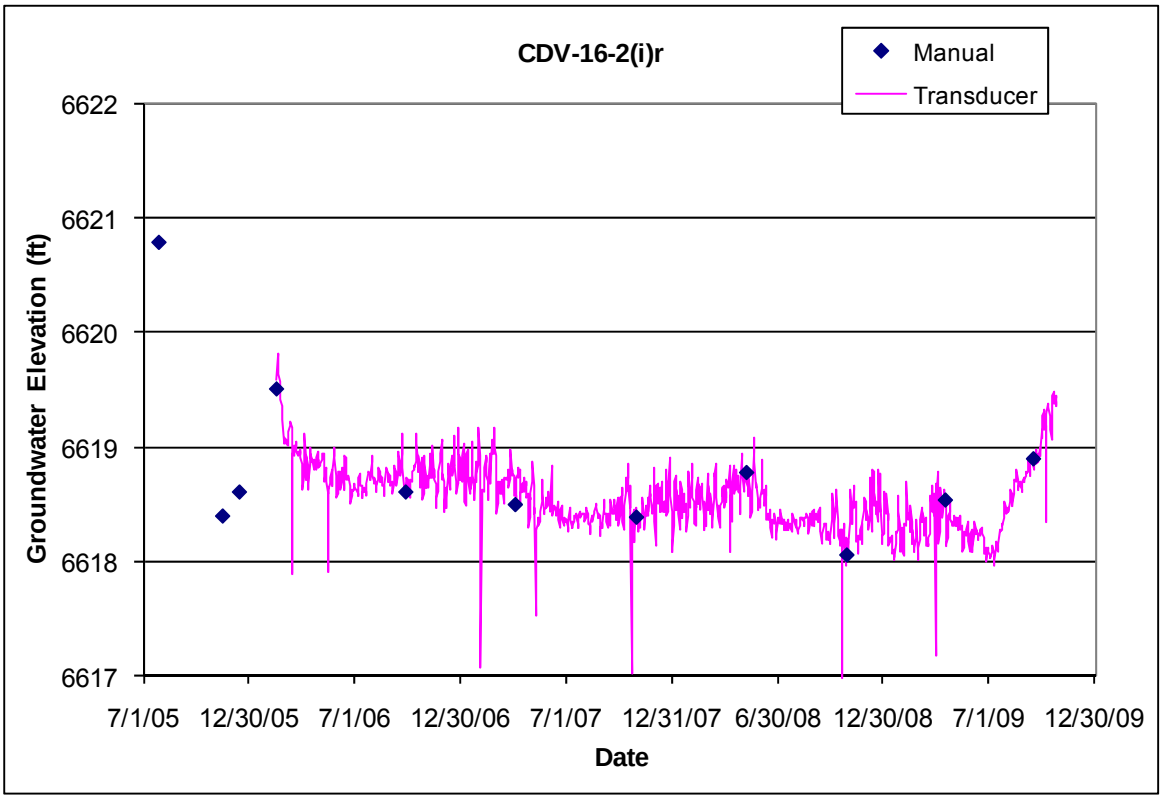
Period of Record: Well completed July 2005, periodic manual measurements in 2005. A transducer was installed February 16, 2006; data through 2009.

Remarks: Well replaces CdV-16-2(i). The water level is about 20 ft above bottom of screen. The well is about 90% barometrically efficient. The groundwater did not indicate a response to snowmelt runoff in 2007 but showed a small response to snowmelt runoff in the spring of 2008. Nearby dry well CdV-16-2(i) was plugged and abandoned in July 2009 (LANL August 2009b). The groundwater level at CdV-16-2(i)r began to recover on July 9, 2009, when pressure grouting activities commenced during plugging of the nearby well.

CDV-16-2(i)r Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Unit Code	Geo Unit Code
1	850.0	859.7	6606.7	6597.0	9.7	855.12	6601.6	859.7	6597.0	863.2	3.5	10.8	I	Tpf

Note: Ground Elevation: 7456.67 ft; all measurements are from this elevation

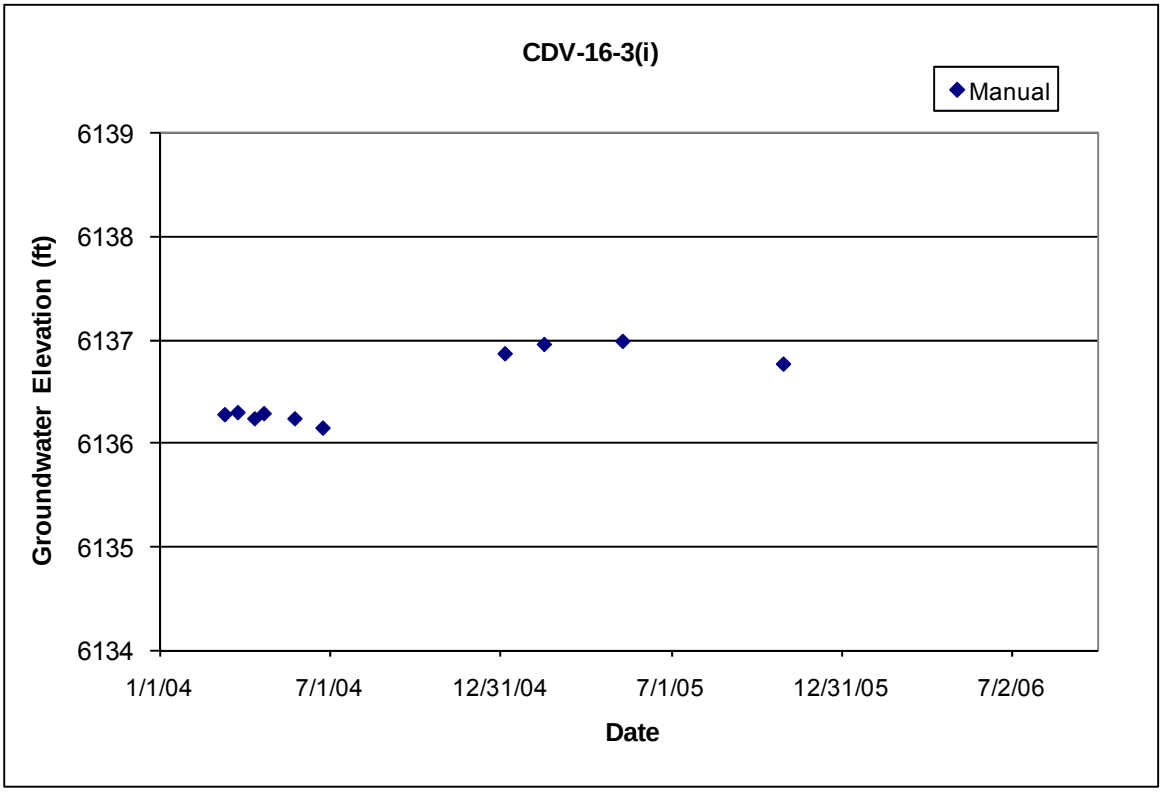


4.8 CdV-16-3(i)

Location: CdV-16-3(i) is located at TA-16 downgradient of the TA-6-260 outfall.
Completion Type: Open borehole, well not installed.
Period of Record: Well drilled in 2004, periodic manual measurements through 2005. Well monitoring ceased in 2005.
Remarks: Water not present in borehole when drilling was completed. Since January 2004, the borehole has contained about 40 ft of water. Note that the water level is similar to the top of the regional aquifer at CdV-R-37-2. CdV-16-3(i) was deepened and completed as regional aquifer well R-48 September 2009.

CDV-16-3(i) Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Borehole Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
None					0.0	None	None			1390		0.0	RT	Tt

Note: Mag NailGround Elevation: 7486.4 ft; all measurements are from this elevation;
Well not completed, open borehole with surface pad and protective casing



4.9 CDV-37-1(i)

Location: CDV-37-1(i) is located in Water Canyon near the confluence with Cañon de Valle.
Completion Type: Single completion in an intermediate zone in the Puye Formation fanglomerates.
Period of Record: Well completed December 2009. Transducer installation pending as of January 2010.
Remarks: A dedicated submersible pump was installed in January 2010.The screen is located about 5 ft below the level of the perched intermediate groundwater. After well completion the groundwater level was 627.9 ft below ground surface.

CDV-37-1(i) Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Bottom of Well Elev (ft)	Hydro Zone Code	Geo Unit Code
1	632.0	652.5	-632.0	-652.5	20.5		0.0	652.5	-652.5	657.8	5.3	-657.8	I	Tpf
Note: Brass Cap Ground Elevation: XXXXX ft; all measurements are from this elevation														

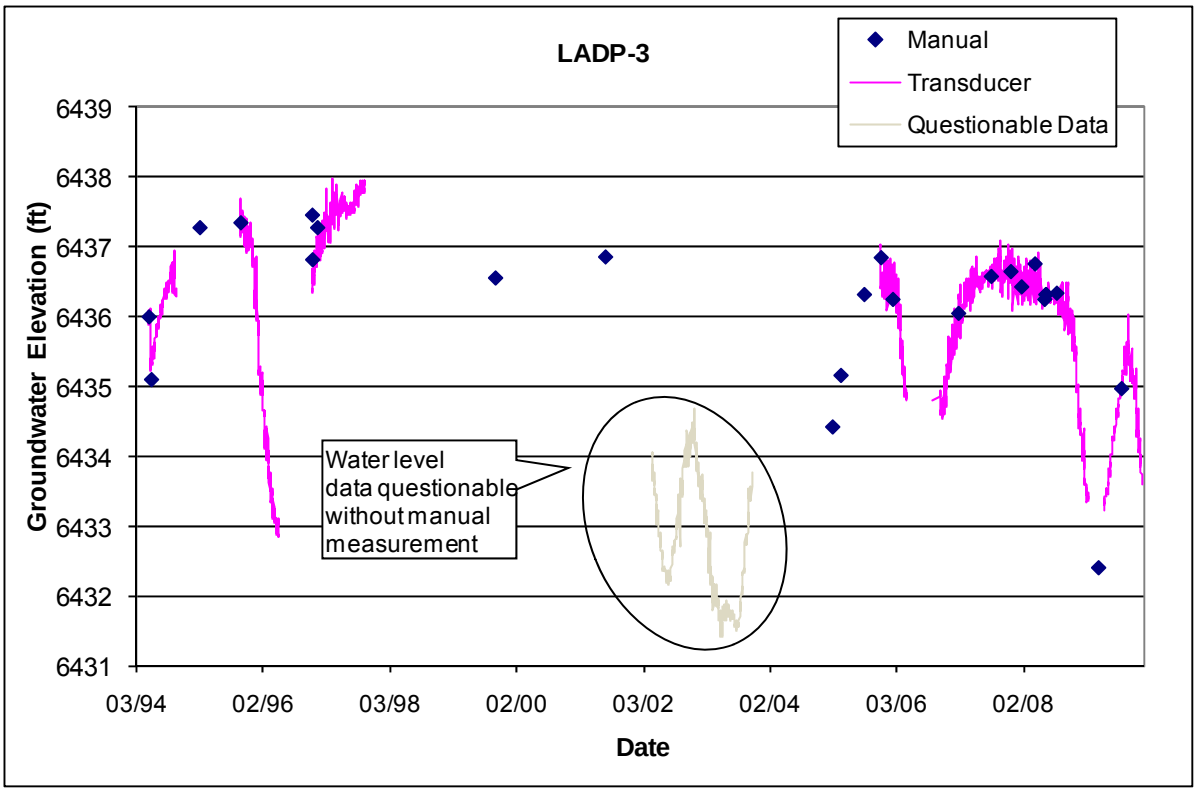
4.10 LADP-3

Location: LADP-3 is located in middle Los Alamos Canyon downgradient of TA-21 and about 0.9 miles upstream of the confluence with DP Canyon.
Completion Type: Single completion in an intermediate zone in the Guaje Pumice bed.
Period of Record: Well drilled in 1993. Transducer first installed May 1994, reinstalled in May 2005, intermittent transducer data through 2009.
Remarks: No manual measurement available for April 2002 transducer installation, data from April 2002 to November 2003 questionable. The water level declined below the transducer from April 2006 to November 2006 and again from March 2009 to June 2009. The well is 100% barometrically efficient; the groundwater does not respond to atmospheric pressure fluctuations. The groundwater did not indicate a response to snowmelt runoff in 2007 and 2008. A dedicated Bennett pump was installed in July 2008.

LADP-3 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	316.0	326	6440.7	6430.7	10.0	325.0	6431.7	326.0	6430.7	326	0.0	0.0	I	Qbog

Note: LADP-3 Ground Elevation: 6756.7 ft; all measurements are from this elevation



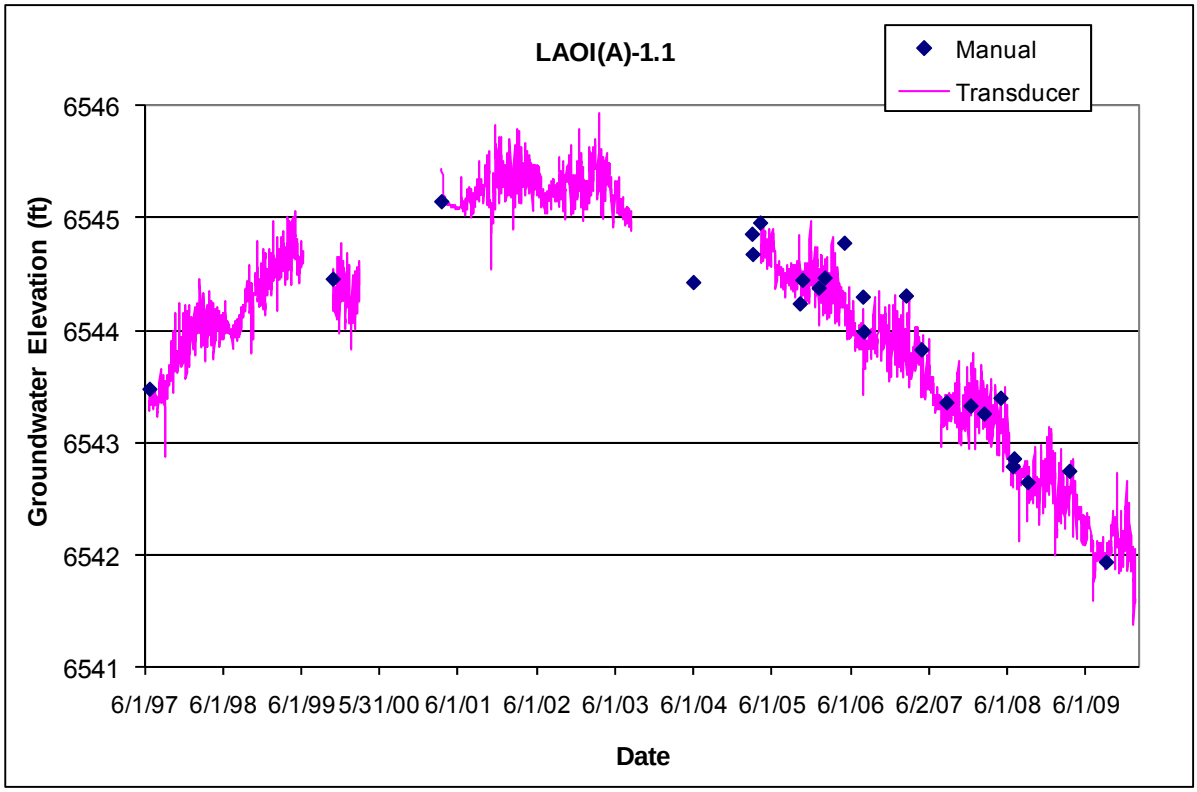
4.11 LAOI(a)-1.1

Location: LAOI(a)-1.1 is located in middle Los Alamos Canyon downstream of TA-2 and TA-41.
Completion Type: Single completion in an intermediate zone in the Guaje Pumice bed.
Period of Record: Well drilled in 1994. Transducer initially installed June 1997, reinstalled in April 2005; transducer data through 2009.
Remarks: The well is 100% barometrically efficient; the groundwater does not respond to atmospheric pressure fluctuations. The groundwater did not indicate a response to snowmelt runoff in 2007 and 2008. A dedicated Bennett pump was installed July 2008.

LAOI(A)-1.1 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	295.2	305	6540.0	6530.2	9.8	308.0	6527.2	305.0	6530.2	309.8	4.8	6.7	I	Qbog

Note: LAOI(A)-1.1 Ground Elevation: 6835.2 ft; all measurements are from this elevation



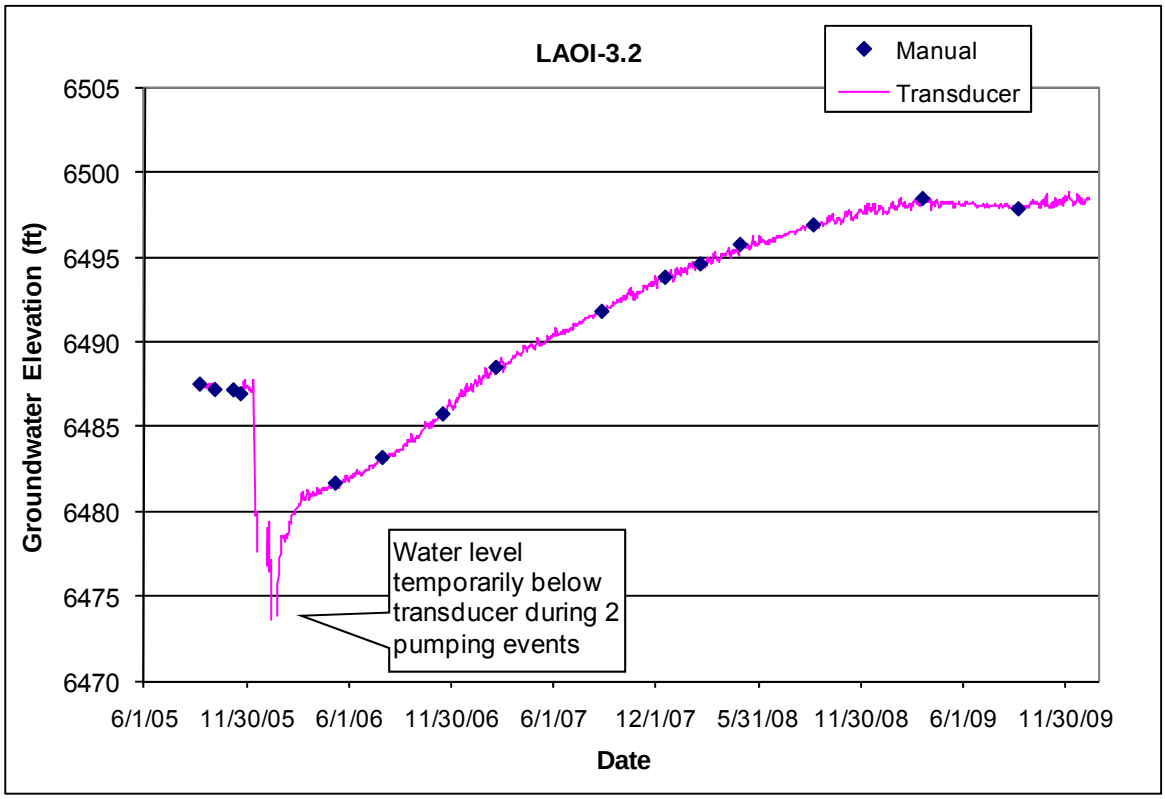
4.12 LAOI-3.2

Location: LAOI-3.2 is located in middle Los Alamos Canyon at the confluence with DP Canyon.
Completion Type: Single completion in an intermediate zone in the Guaje Pumice bed.
Period of Record: Well completed in March 2005. Transducer installed September 2005; transducer data through 2009.
Remarks: The transducer was removed in October 2005 for pump installation. The transducer was reinstalled in November 2005. The water level declined below the level of the transducer for a time during pumping of the well in December 2005. The well is 100% barometrically efficient; the groundwater does not respond to atmospheric pressure fluctuations. The groundwater did not indicate a response to snowmelt runoff in 2007 and 2008.

LAOI-3.2 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	153.3	162.8	6469.3	6459.8	9.5	159.3	6463.3	162.8	6459.8	165	2.2	1.5	I	Qbog

Note: Ground Elevation: 6622.6 ft; all measurements are from this elevation



4.13 LAOI-3.2a

Location: LAOI-3.2a is located in middle Los Alamos Canyon near the confluence with DP Canyon and about 50 ft northwest of LAOI-3.2.

Completion Type: Single completion in an intermediate zone in Puye fanglomerate.

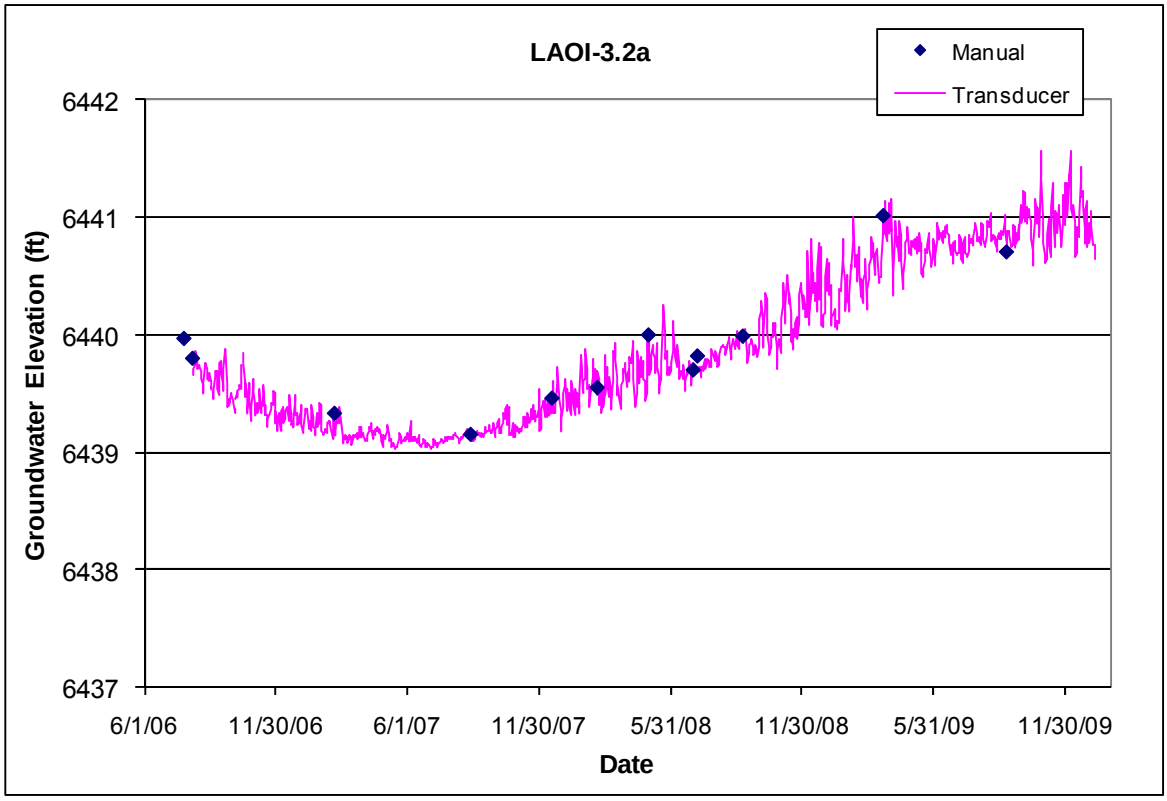
Period of Record: Well completed in January 2006. Transducer installed August 2006; transducer data through 2009.

Remarks: The water level is about 6 ft above the bottom of the screen. The well is 100% barometrically efficient, the groundwater does not respond to atmospheric pressure fluctuations. The groundwater did not indicate a response to snowmelt runoff in 2007 and 2008.

LAOI-3.2a Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	181.4	191	6443.0	6433.4	9.6	189	6435.4	191.0	6433.4	191.4	0.4	0.6	I	Tpf

Note: Ground Elevation: 6624.43 ft; all measurements are from this elevation



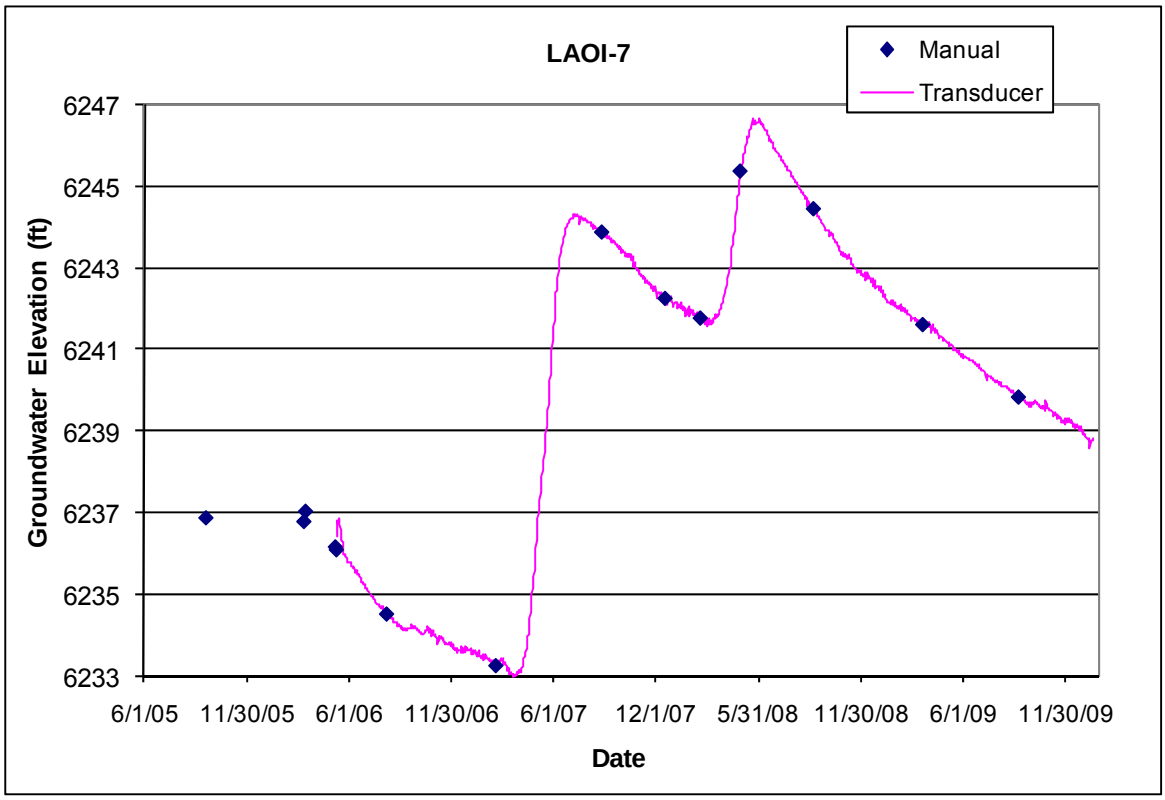
4.14 LAOI-7

Location: LAOI-7 is located in middle Los Alamos Canyon about 0.75 miles upstream of R-9i.
Completion Type: Single completion in an intermediate zone in Cerros del Rio basalt.
Period of Record: Well completed in September 2005, transducer installed May 2006, data through 2009.
Remarks: The well has an estimated 18% barometric efficiency (Kleinfelder 2006a); the groundwater shows a delayed, partial response to atmospheric pressure fluctuations. The groundwater rose about 11 ft in response to snowmelt runoff in 2007 and 5 ft in 2008.

LAOI-7 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	240.0	259.6	6218.4	6198.8	19.6	240.0	6218.4	259.6	6198.8	264.9	5.3	7.4	I	Tb4

Note: Brass Cap Elevation: 6458.35 ft; all measurements are from this elevation



4.15 MCOBT-4.4

Location: MCOBT-4.4 was located in lower Mortandad Canyon near the confluence with Ten Site Canyon.

Completion Type: Single completion at the base of the Puye Formation fanglomerate member and the top of Cerros del Rio basalt.

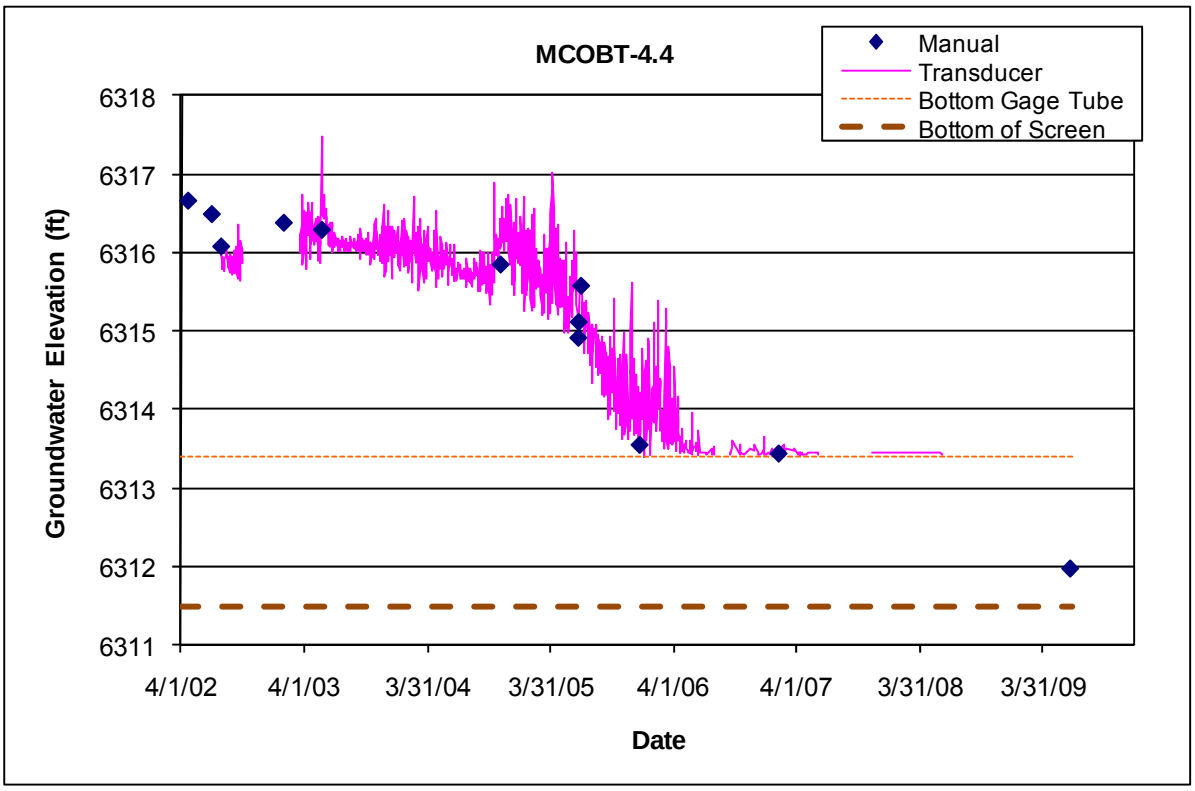
Period of Record: Well completed in June 2001, transducer installed July 2002, data to June 19, 2008, when the transducer was removed and monitoring ceased due to lack of measureable water.

Remarks: MCOI-4 is located about 70 ft west of MCOBT-4.4; the water level at MCOBT-4.4 declined after the installation of MCOI-4. The bottom of the transducer gage tube is located above the pump and about 1.2 ft above the bottom of the screen. The water level declined below the gage tube for portions of 2006 and most of 2007 and 2008. The water level remained near the bottom of the screen after 2006. MCOBT-4.4 was plugged and abandoned in July 2009 (LANL September 2009b).

MCOBT-4.4 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	485.4	524.0	6350.8	6312.2	38.6	524	6312.2	524.0	6312.2	545.0	21.0	64.5	I	Tpf

Note: Brass Cap Elevation: 6836.18 ft; all measurements are from this elevation



4.16 MCOI-1

Location: MCOI-1 is located adjacent to upper Mortandad Canyon below the confluence with Effluent Canyon.

Completion Type: Single completion in the Puye Formation.

Period of Record: Well completed in January 2005. Periodic manual checks for water through 2007. Monitoring of well ceased in 2007.

Remarks: MCOI-1 was dry when completed and has not contained water during periodic checks. Soundings for water throughout 2006 and 2007 have been dry with a total depth of about 814 ft below ground surface, encountering sand at total depth. This total depth is above the screen; thus it appears that the well screen in the 1-in.-diameter PVC may have parted from the tubing or has been somehow damaged, potentially rendering the well inoperative.

MCOI-1 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	815.0	825.5	6291.2	6280.8	10.5	None	None	825.5	6280.8	825.58	0.1	0.0	I	Tp

Note: Ground Elevation: 7106.20 ft; all measurements are from this elevation

4.17 MCOI-4

Location: MCOI-4 is located in lower Mortandad Canyon near the confluence with Ten Site Canyon and about 70 ft upstream of MCOBT-4.4.

Completion Type: Single completion at the base of the Puye Formation fanglomerate member and the top of Cerros del Rio basalt.

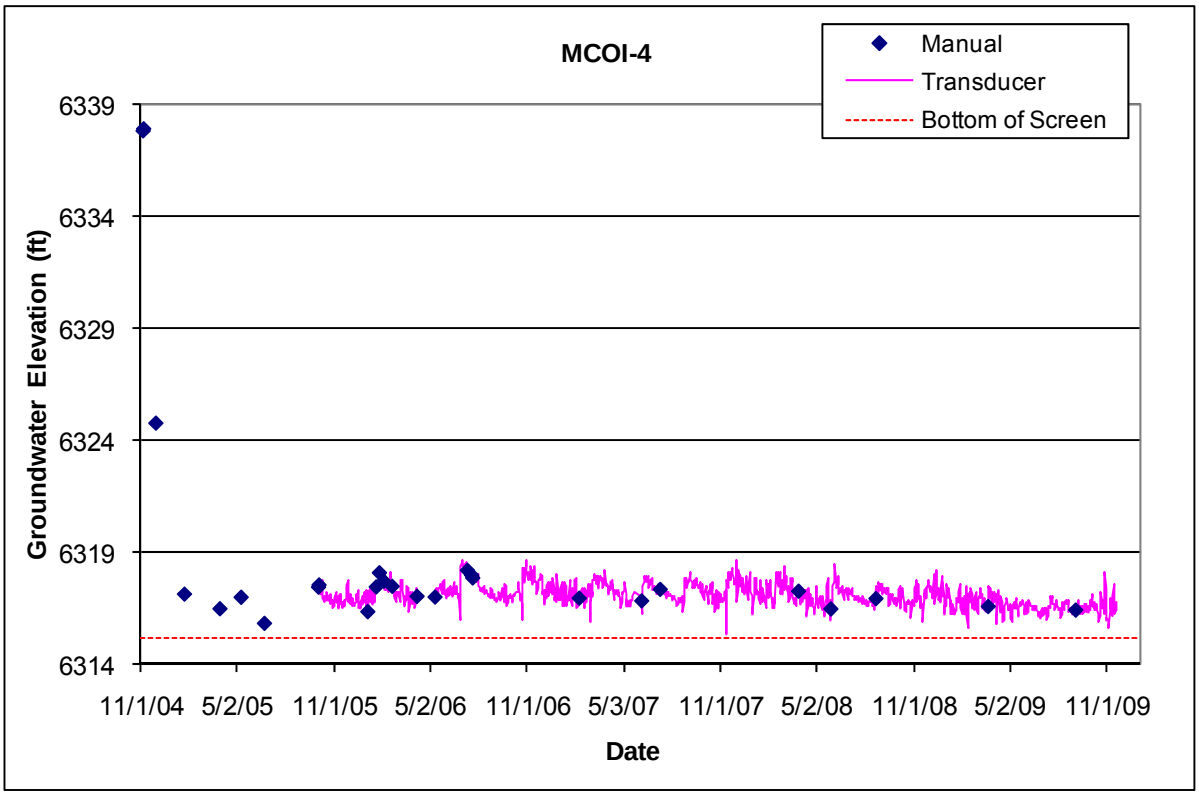
Period of Record: Well completed in November 2004, transducer installed October 2005, data through 2009.

Remarks: Since 2006, the water level in MCOI-4 has been 2 to 3 ft higher than in adjacent well MCOBT-4.4 and relatively constant about 1 ft above the bottom of the screen. During plugging operations at MCO-BT-4.4 from July 15 to 17, 2009, the water level at MCOI-4 rose about 1 ft and then declined over the next two weeks.

MCOI-4 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	499.0	522.0	6338.2	6315.2	23.0	524.0	6313.2	522.0	6315.2	525.7	3.7	11.6	I	Tpf

Note: Ground Elevation: 6837.20 ft; all measurements are from this elevation



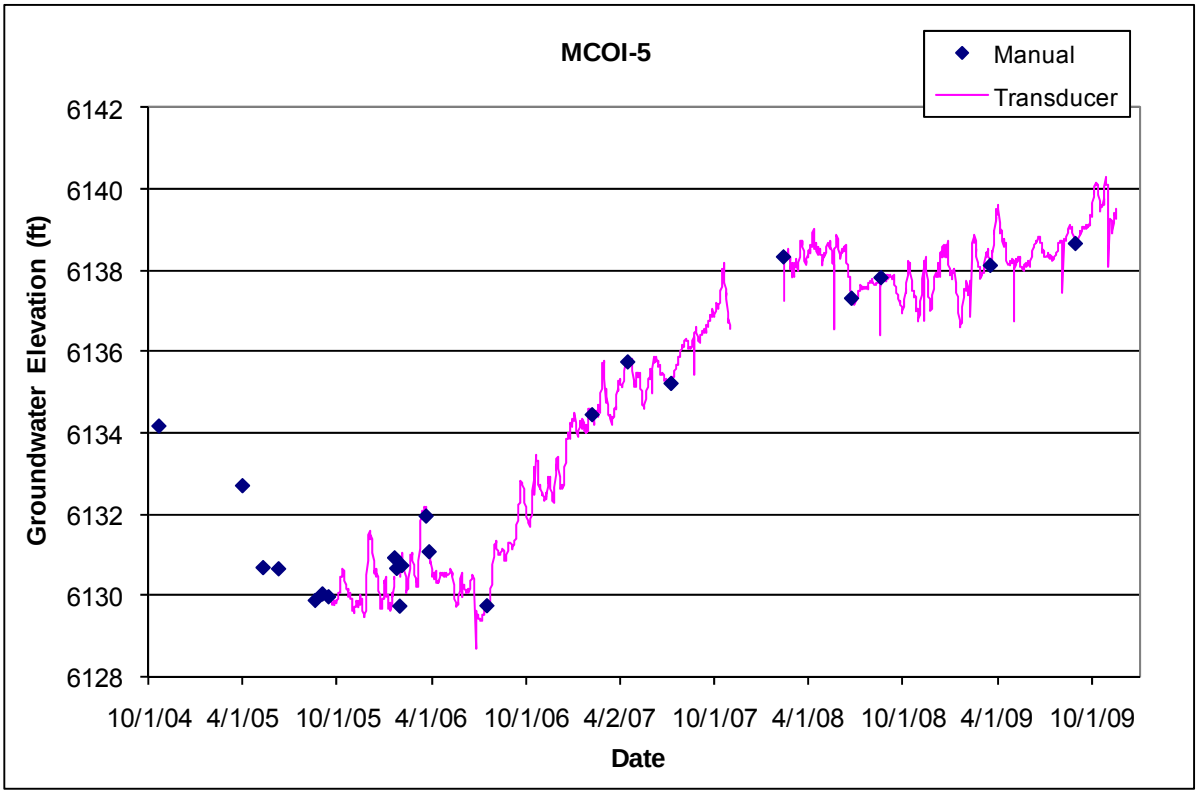
4.18 MCOI-5

Location: MCOI-5 is located in lower Mortandad Canyon near regional aquifer well R-15.
Completion Type: Single completion in Cerros del Rio basalt.
Period of Record: Well completed in October 2004, transducer installed August 2005, data through 2009.
Remarks: The transducer was removed for bailing sampling in 2005. A dedicated submersible pump was installed March 2006. The intermediate groundwater has a delayed response to atmospheric pressure fluctuations.

MCOI-5 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	689.0	699.0	6130.7	6120.7	10.0	696.0	6123.7	699.0	6120.7	702.7	3.7	11.6	I	Tb4

Note: Brass cap elevation: 6819.70 ft; all measurements are from this elevation



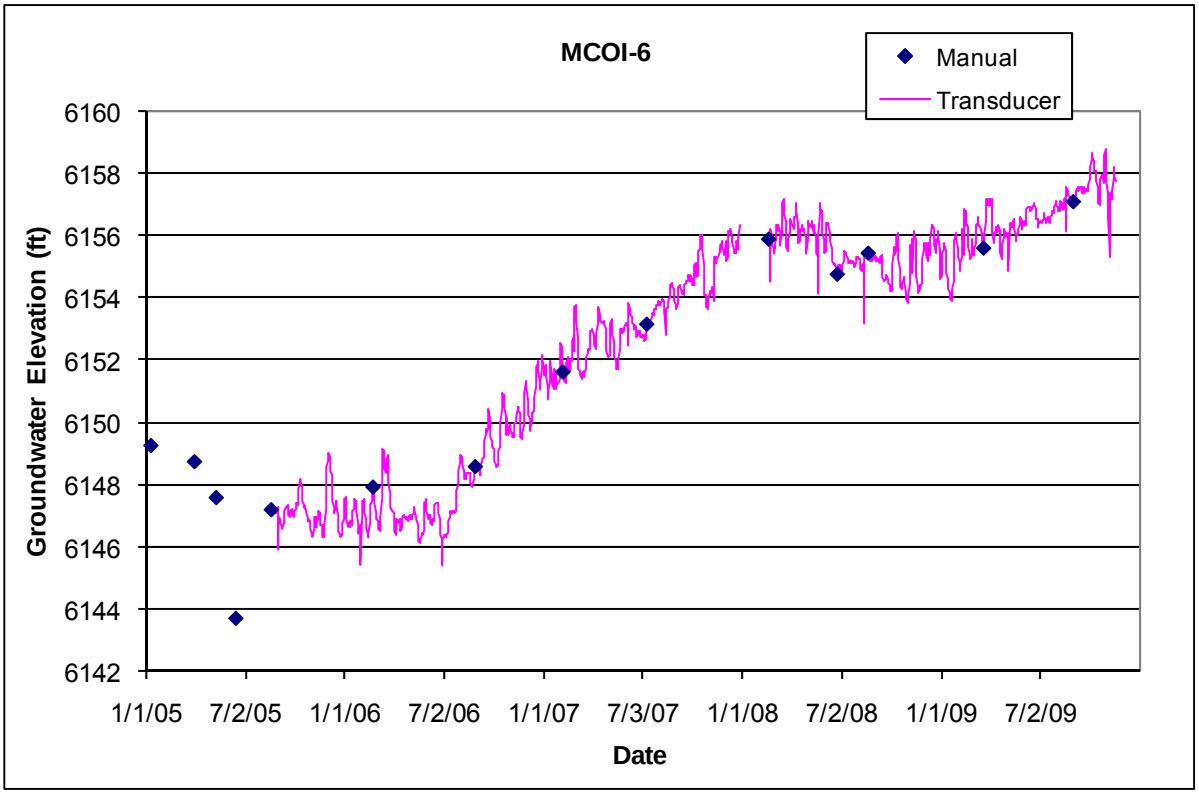
4.19 MCOI-6

Location: MCOI-6 is located in lower Mortandad Canyon about 160 ft northeast of MCOI-5.
Completion Type: Single completion in Cerros del Rio basalt.
Period of Record: Well completed in January 2005, transducer installed August 2005, data through 2009.
Remarks: The groundwater level is about 20 ft above the top of the screen and 17 to 18 ft higher than at MCOI-5. The intermediate groundwater has a delayed response to atmospheric pressure fluctuations.

MCOI-6 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	686.0	708.3	6125.1	6102.8	22.3	689.0	6122.1	708.3	6102.8	713.2	4.9	15.3	I	Tb4

Note: Brass cap elevation: 6811.10 ft; all measurements are from this elevation



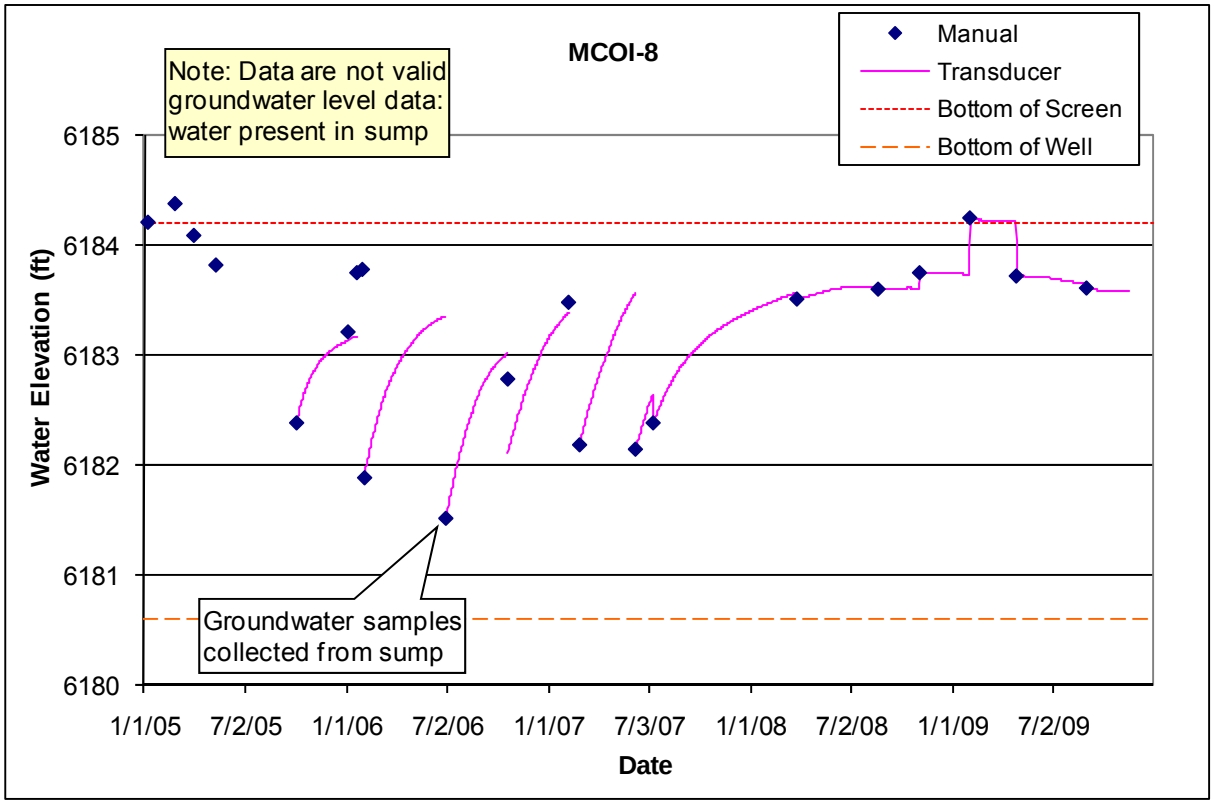
4.20 MCOI-8

Location: MCOI-8 is located in lower Mortandad Canyon above the confluence with Ten Site Canyon.
Completion Type: Single completion in Cerros del Rio basalt.
Period of Record: Well completed in January 2005, transducer installed August 2005, data through 2009.
Remarks: Since well completion, water has been measured in the sump of the well; thus data are not valid groundwater level data.

MCOI-8 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	665.0	675.0	6194.2	6184.2	10.0	None	None	675.0	6184.2	678.6	3.6	11.4	I	Tb4

Note: Ground Elevation: 6859.20 ft; all measurements are from this elevation



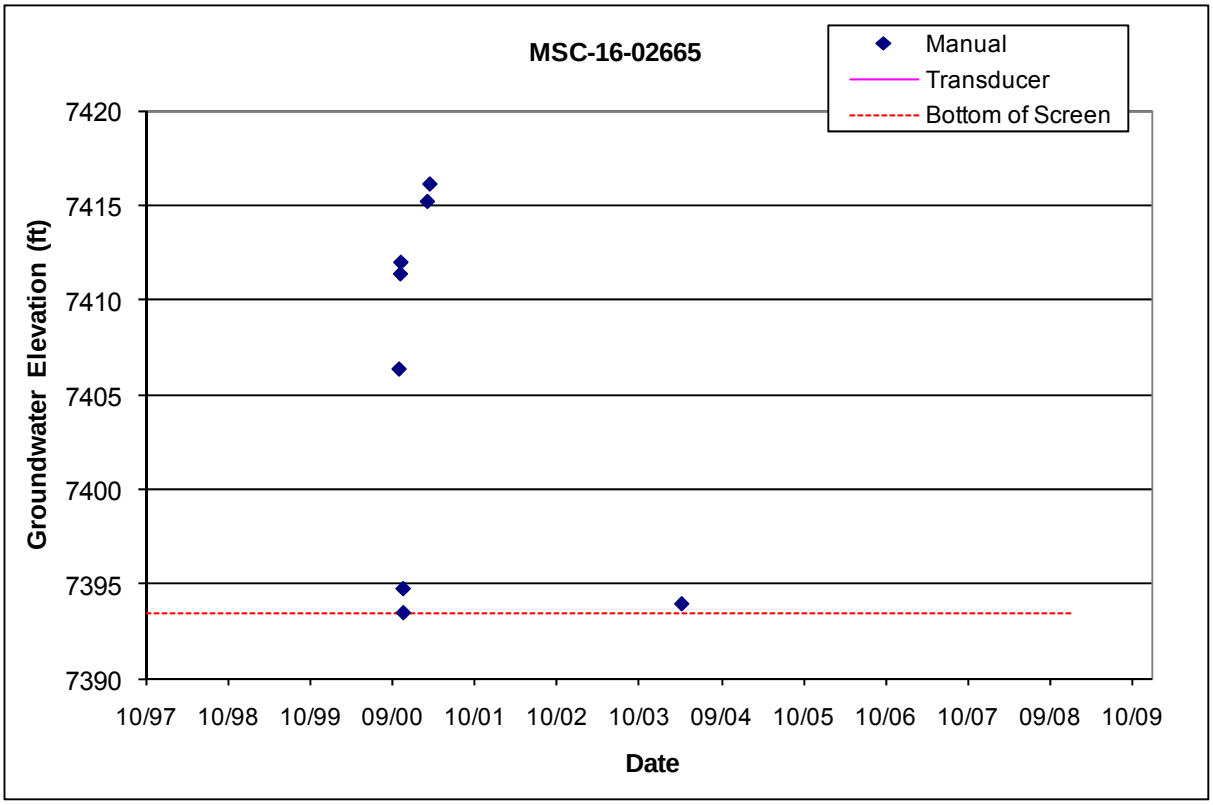
4.21 MSC-16-02665

Location: MSC-16-02665 is located at TA-16 at the head of Martin Spring Canyon (S-Site Canyon) about 1500 ft west of R-48 and about 700 ft northwest of Martin Spring.
Completion Type: Single completion in Unit 3 of the Bandelier tuff.
Period of Record: Well completed October 1997, no transducer has been installed, periodic manual measurements through March 2009.
Remarks: MSC-16-02665 has usually been dry; water has been observed in the well after heavy precipitation periods and snowmelt runoff (LANL 2003, p. 4-58). The well was dry when checked in the spring of 2005, 2006, 2007, 2008, and 2009.

MSC-16-02665 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	93.5	123.5	7423.4	7393.4	30.0	None	None	123.5	7393.4	124.0	0.5	0.3	I	Qbt3

Note: Ground Elevation: 7516.92 ft; all measurements are from this elevation



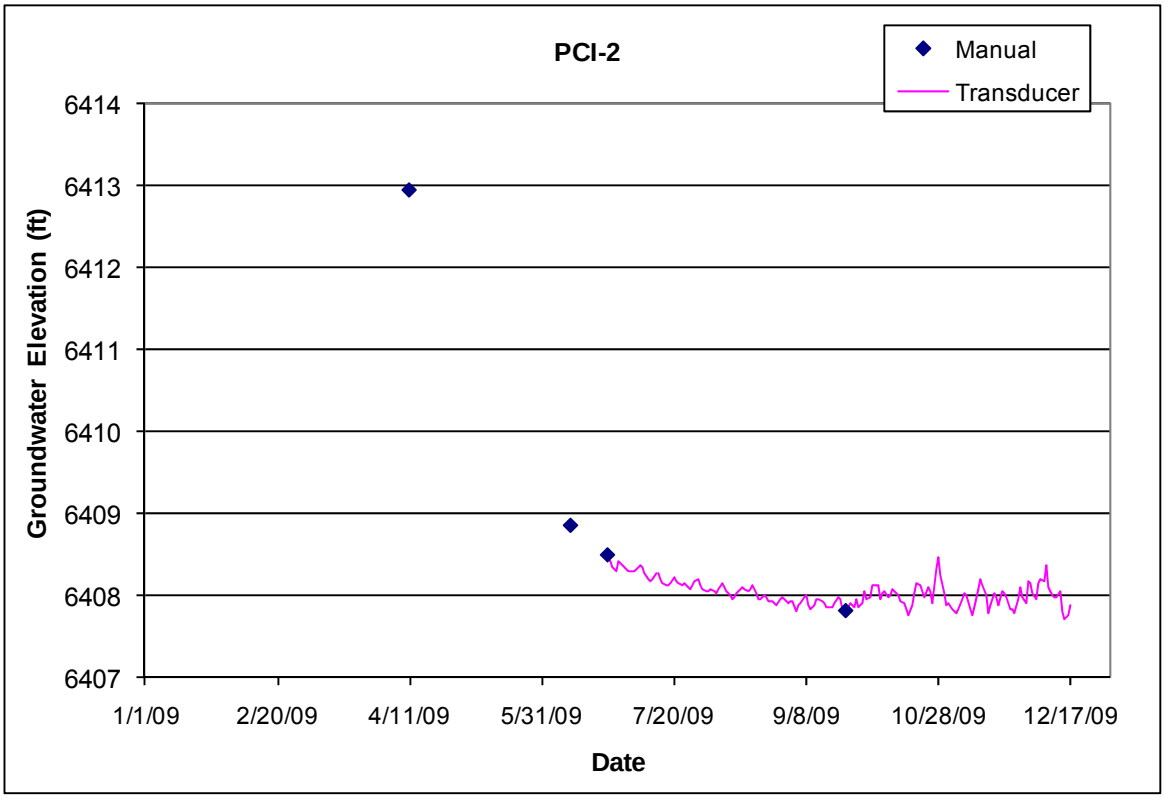
4.22 PCI-2

Location: PCI-2 is located in middle Pajarito Canyon about 150 ft west and upstream of R-17.
Completion Type: Single completion in the Puye fanglomerates and about 35 ft above Tschicoma dacite (LANL September 2009).
Period of Record: Well completed April 2009, transducer installed June 25, 2009; data through 2009.
Remarks: The well is 100% barometrically efficient; however, the aquifer exhibits a delayed response to atmospheric pressure fluctuations.

PCI-2 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Vol (Gal.)	Hydro Zone Code	Geo Unit Code
1	512.0	522.0	6409.0	6399.0	10.0	529.3	6391.7	522.0	6399.0	533.3	11.3	2.9	I	Tpf

Note: Brass Cap Elevation: 6920.95 ft; all measurements are from this elevation



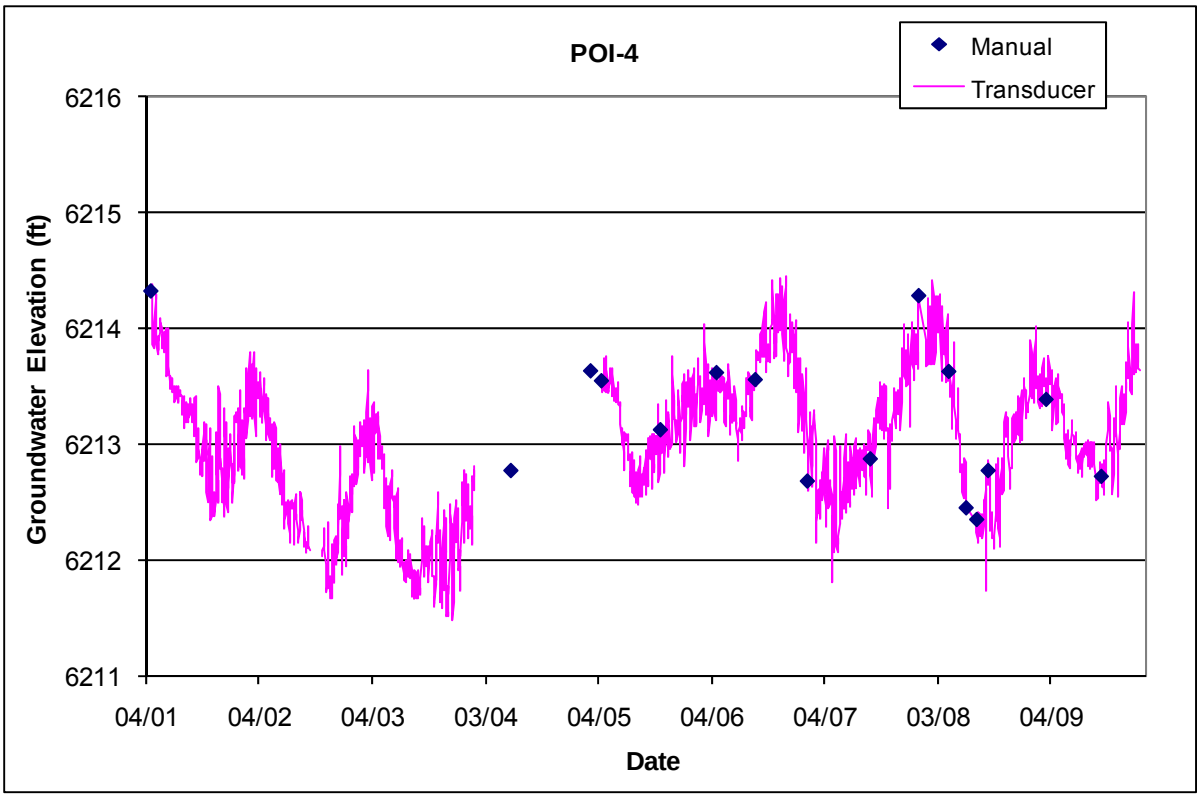
4.23 POI-4

Location: POI-4 is located in lower Pueblo Canyon about 800 ft upstream of TW-1 and about 370 ft north of supply well O-1.
Completion Type: Single completion in Cerros del Rio basalt.
Period of Record: Well completed in 1996, transducer installed April 2001 and again in April 2005; data through 2009.
Remarks: The well is 100% barometrically efficient; the groundwater displays a delayed response to atmospheric pressure fluctuations. The intermediate groundwater shows a seasonal water level fluctuation, generally lower in the summer and higher in the winter.

POI-4 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	159.0	174.0	6213.3	6198.3	15.0	173.0	6199.3	174.0	6198.3	176.5	2.5	6.2	I	Tb4

Note: Ground Elevation: 6372.29 ft; all measurements are from this elevation



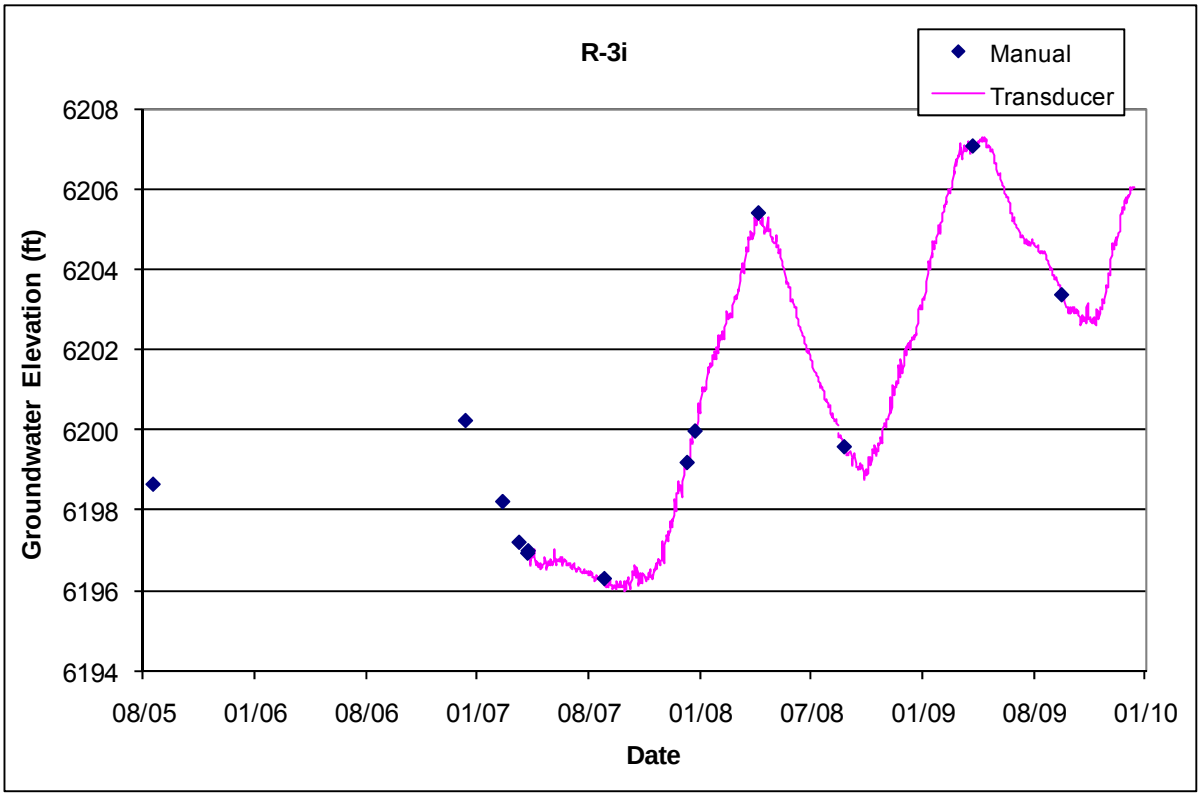
4.24 R-3i

Location: R-3i is located in lower Pueblo Canyon about 240 ft west of intermediate well POI-4 and about 425 ft northwest of supply well O-1.
Completion Type: Single completion in the Cerros del Rio basalt.
Period of Record: Well completed August 2005, transducer installed April 2007, data through 2009.
Remarks: The well is 100% barometrically efficient; the groundwater does not respond to atmospheric pressure fluctuations. The groundwater level rises during winter and falls during summer, but did not show a significant response to snowmelt runoff in 2007 or 2008. The intermediate groundwater appears to show a seasonal water level fluctuation similar to POI-4, but the water level at R-3i is 10 to 15 ft lower than at POI-4.

R-3i Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	215.2	220	6175.0	6170.2	4.8	217.0	6173.2	220.0	6170.2	220.34	0.3	0.2	I	Tb4

Note: Ground Elevation: 6390.15 ft; all measurements are from this elevation



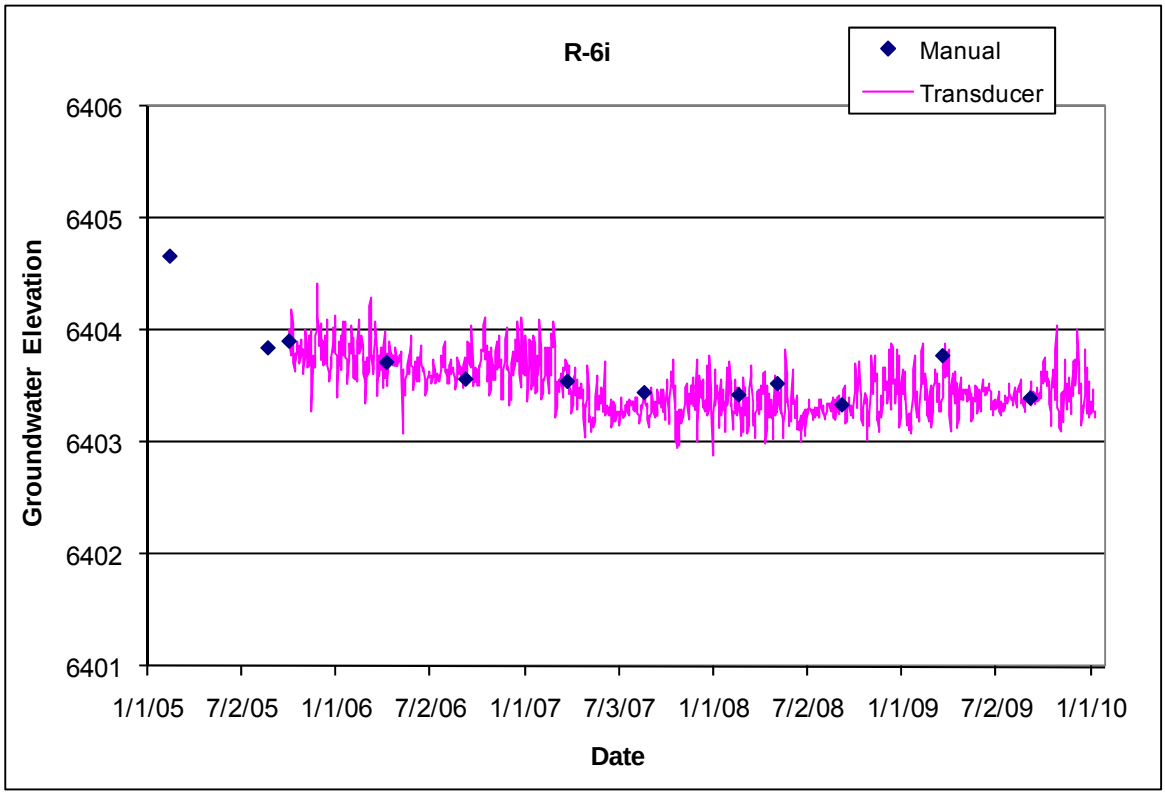
4.25 R-6i

Location: R-6i is located at the eastern extent of DP Mesa near the confluence of DP Canyon and Los Alamos Canyon and adjacent to regional aquifer monitoring well R-6.
Completion Type: Single completion in the Puye Formation fanglomerate member.
Period of Record: Well completed December 2004, transducer installed October 2005, data through 2009.
Remarks: The well is 100% barometrically efficient; the groundwater does not respond to atmospheric pressure fluctuations. The perched intermediate groundwater did not respond to snowmelt runoff in 2007 or 2008.

R-6i Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	602.0	612	6394.9	6384.9	10.0	609.0	6387.9	612.0	6384.9	615	3.0	9.2	I	Tpf

Note: Brass Cap Ground Elevation: 6996.9 ft; all depths are from this elevation



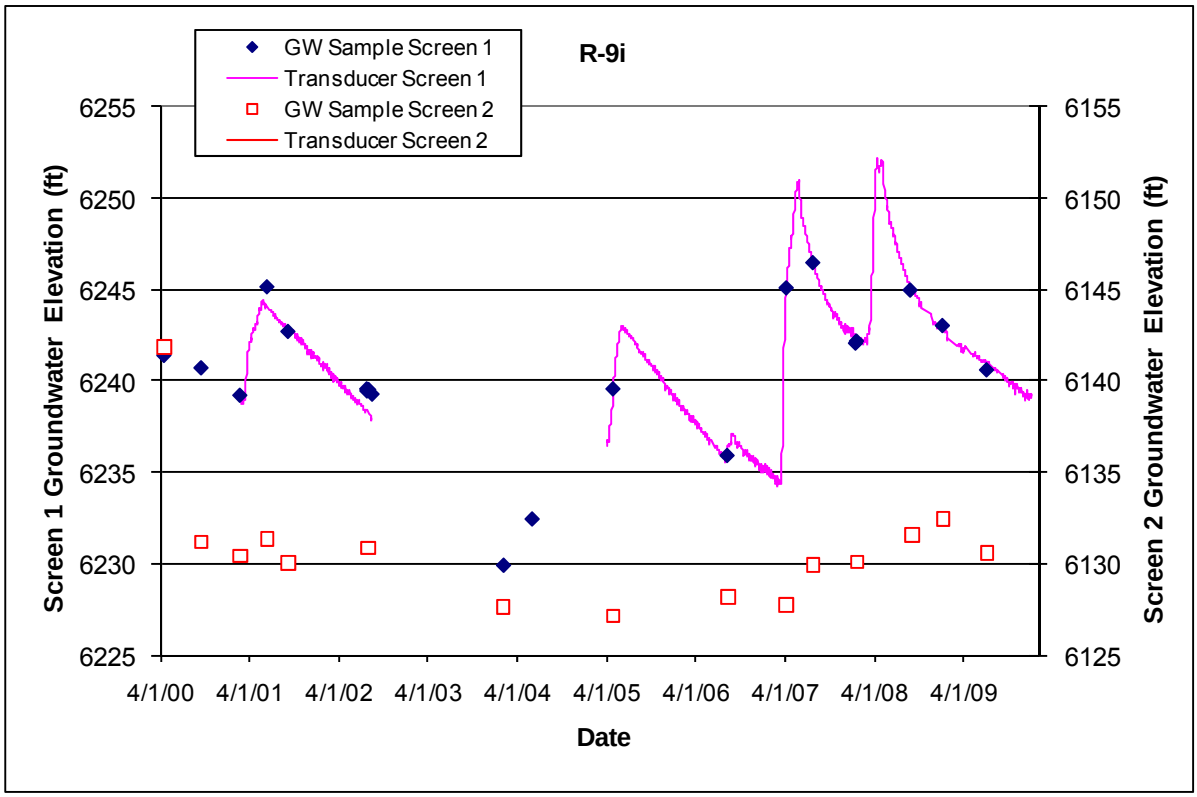
4.26 R-9i

Location: R-9i is located in Los Alamos Canyon near the eastern LANL boundary and adjacent to R-9.
Completion Type: Dual Westbay® completion; both screens in Cerros del Rio basalt.
Period of Record: Well completed March 2000, transducers installed March 2001, intermittent data through 2009.
Remarks: The screens are about 70 ft apart and the heads in the two intermediate zones are about 110 ft apart. The water level at screen 1 is about 40 ft above the top of the screen; the water level at screen 2 is about 15 ft above the top of the screen. Groundwater at screen 1 appears to be recharged from large runoff events in lower Los Alamos Canyon; the water level responded to snowmelt runoff in 2001, 2005, 2007, and 2008, and to large storm runoff events in the summer of 2006, while the water level at screen 2 shows a reduced response.

R-9i Construction and Port Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Hydro Zone Code	Geo Unit Code	Port	Port Depth (ft)	Port Elev (ft)	Distance from Bottom of Screen (ft)	Sump Volume (L)	Comment
1	189.1	199.5	6194.1	6183.7	10.4	I	Tb4	**MP1A**	198.8	6184.4	0.7		Within screen
								PP1	204.1	6179.1	-4.6	13.3	Below screen
								MP1B	209.8	6173.4	-10.3	29.8	Below screen
2	269.6	280.3	6113.6	6102.9	10.7	I	Tb4	**MP2A**	278.8	6104.4	1.5		Within screen
								PP2	284.1	6099.1	-3.8	11.0	Below screen
								MP2B	289.8	6093.4	-9.5	27.5	Below screen

Note: Brass Cap Elevation is 6383.2 ft; all measurements are from this elevation;
MP = Monitoring Port, PP = Pumping Port; Ports shown in Bold are instrumented with transducers



4.27 R-12 (Intermediate)

Location: R-12 is located in lower Sandia Canyon near SR-4 and supply well PM-1.

Completion Type: Multiple completion, originally two screens in intermediate zones, one screen at the top of the regional aquifer—until September 2006 when the well was recompleted as two intermediate screens; screen 3 was plugged and abandoned on December 13, 2007.

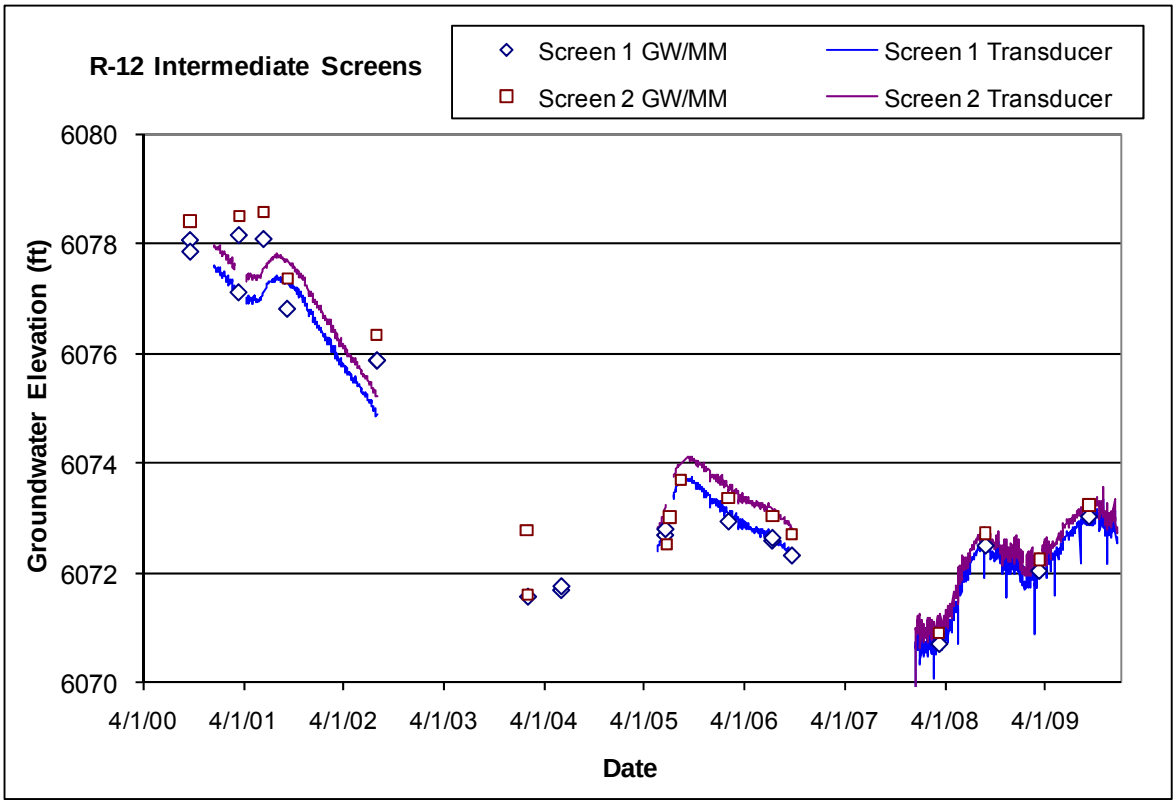
Period of Record: Westbay® system installed March 21, 2000, transducers installed December 14, 2000, intermittent data to September 21, 2006, when transducers were removed for removal of the Westbay® system for well rehabilitation and conversion. No water level data for most of 2007. Transducers were reinstalled at screens 1 and 2 on December 13, 2007; data through 2009.

Remarks: In December 2007, screen 3 was abandoned and a Baski packer with dual pump sampling system was installed at the two intermediate screens. Intermediate screens 1 and 2 have similar head values about 380 ft above the regional aquifer; intermediate screen 2 has a slightly higher head than screen 1. The intermediate screens responded to snowmelt runoff events in Los Alamos Canyon in 2001, 2005, and 2008; no data available during 2007 and no snowmelt runoff in 2009. The groundwater at screens 1 and 2 show a delayed response to atmospheric pressure fluctuations with a barometric efficiency of about 70%.

R-12 Screen Data

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Packer/ Sump (ft)	Top of Packer/ Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	459.0	467.5	6040.6	6032.1	8.5	465.0	6034.6	470.7	6028.9	470.7	3.2	9.1	I	Tb4
2	504.5	508.0	5995.1	5991.6	3.5	501.0	5998.6	508.0	5991.6	540.8	32.8	93.7	I	Tp
3	801.0	839.0	5698.6	5660.6	38	**Screen 3 Plugged and Abandoned December 2007**							RT	Tsfb

Brass Cap Elevation: 6499.6 ft; all measurements are from this elevation



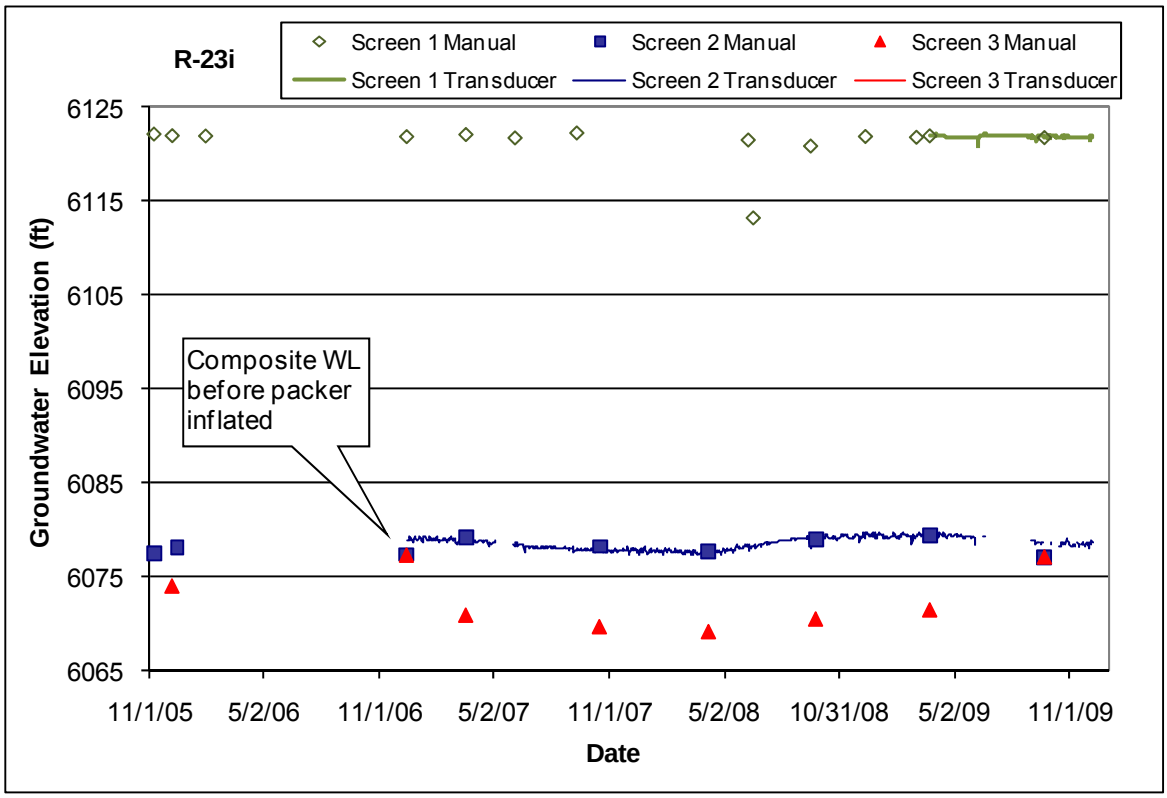
4.28 R-23i

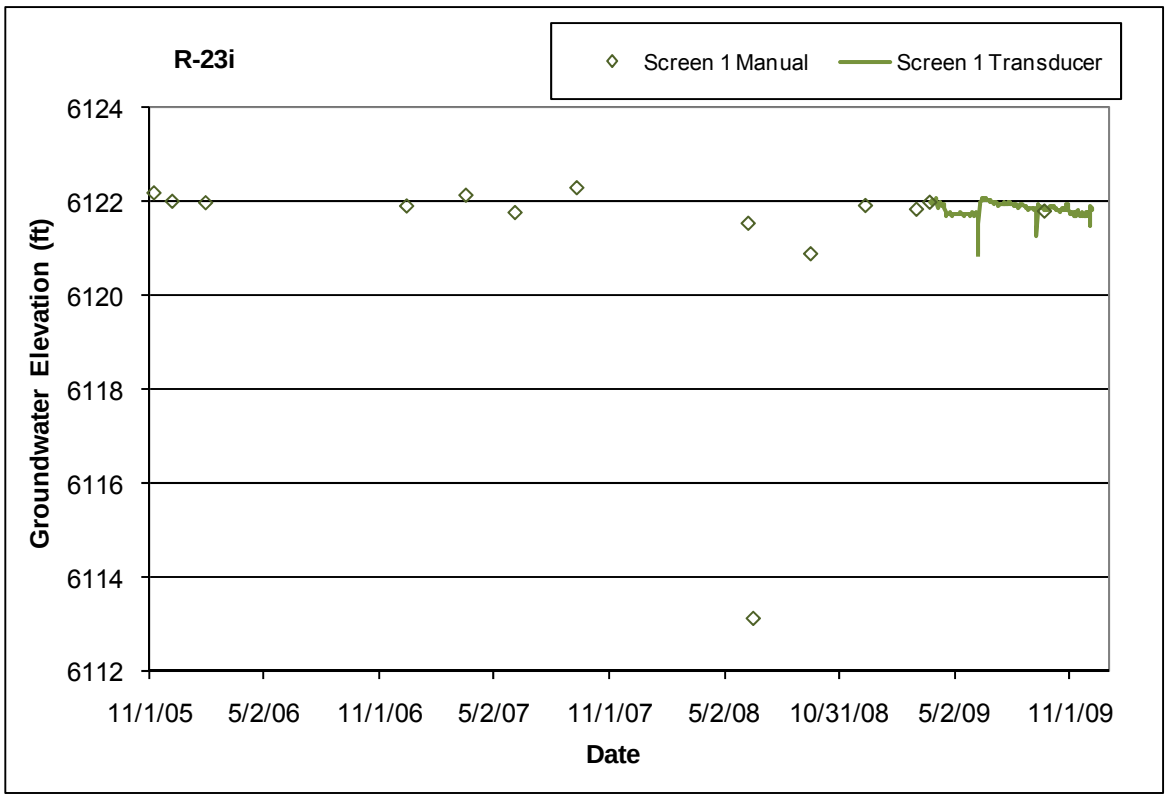
Location: R-23i is located in lower Pajarito Canyon near SR-4 and adjacent to regional well R-23.
Completion Type: Multiple completion, three screens, screen 1 is in a 2.1-in.-diameter piezometer and screens 2 and 3 are in a 4-in.-diameter well. A Baski packer and dual pump sampling system was installed at screens 2 and 3 in December 2006. All screens are in Cerros del Rio basalt.
Period of Record: Well completed November 2005; transducers installed at screens 2 and 3 in December 2006, transducer installed at screen 1 March 2009; data through 2009.
Remarks: The water levels at screens 2 and 3 are about 9 ft apart; the water level at screen 1 is about 44 ft higher than screen 2. The screen 3 gage tubing through the packer has shown occasional partial plugging, but water levels in the tubing appear to be representative of screen 2. Possible response to snowmelt runoff at screens 2 and 3 in the spring of 2008. Packer inflation problems in 2009 caused loss of screens 2 and 3 groundwater level data. The Baski system was removed from the well in December 2009 to repair the packer.

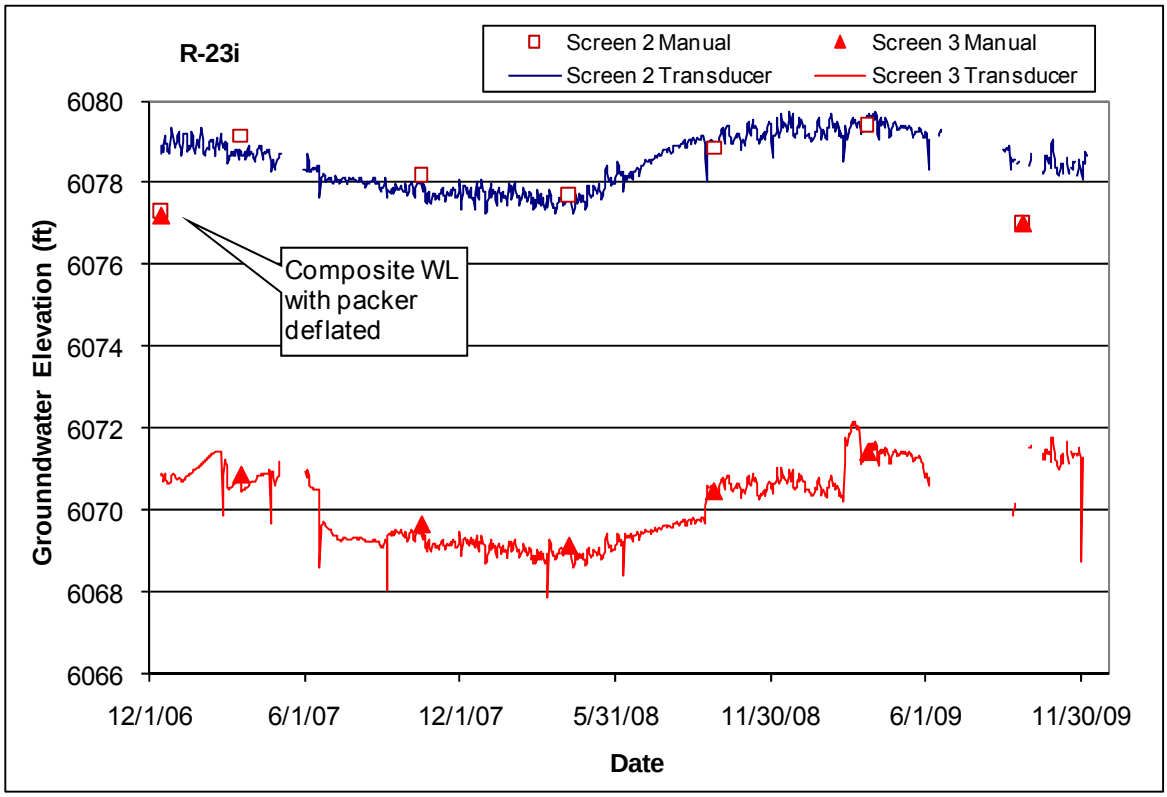
R-23i Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Packer/ Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (Gal.)	Hydro Zone Code	Geo Unit Code	Comment
1	400.3	420.0	6127.6	6107.9	19.7			420.0	6107.9	425.3	5.3	4.4	I	Tb4	2.1 in. Piez
2	470.2	480.1	6057.7	6047.8	9.9	477.1	6050.8	495.3	6032.5	495.3	15.2	12.6	I	Tb4	4.5 in. well
3	524.0	547.0	6003.9	5980.9	23.0	516.7	6011.2	547.0	5980.9	550.7	3.7	3.1	I	Tb4	4.5 in. well

Note: Brass Cap Ground Elevation: 6527.88 ft; all measurements are from this elevation




R-23i
Screen 1 Manual
Screen 1 Transducer
Groundwater Elevation (ft)
6124
6122
6120
6118
6116
6114
6112
11/1/05
5/2/06
11/1/06
5/2/07
11/1/07
5/2/08
10/31/08
5/2/09
11/1/09
Date


R-23i
Screen 2 Manual
Screen 3 Manual
Screen 2 Transducer
Screen 3 Transducer
Grounndwater Elevation (ft)
6080
6078
6076
6074
6072
6070
6068
6066
Composite WL with packer deflated
12/1/06
6/1/07
12/1/07
5/31/08
11/30/08
6/1/09
11/30/09
Date

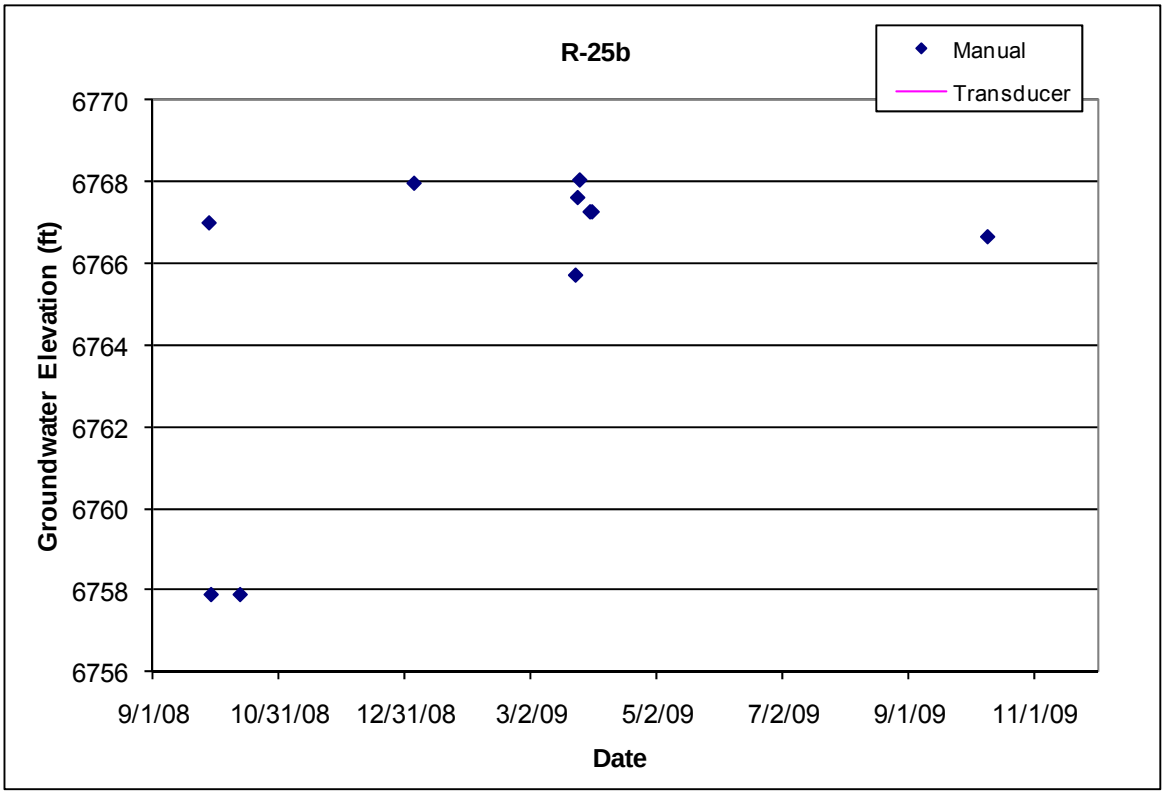
4.29 R-25b

Location: R-25b is located at TA-16 about 25 ft west of monitoring well R-25.
Completion Type: Single completion, one screen in the Otowi Member of the Bandelier Tuff at a similar location as R-25 screen 1.
Period of Record: Well completed October 2008; periodic manual measurement through 2009. Transducer installed January 13, 2010; transducer data pending.
Remarks: R-25b is screened adjacent to R-25 screen 1.

R-25b Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	750.0	770.8	6767.0	6746.2	20.8	770.0	6747.0	770.8	6746.2	782.3	11.5	7.6	I	Qbo

Note: Brass Cap Ground Elevation: 7517.00 ft; all measurements are from this elevation



4.30 R-25c

Location: R-25c is located at TA-16 about 25 ft west of monitoring well R-25b and about 50 ft west of monitoring well R-25.

Completion Type: Single completion, one screen in the Puye fanglomerates at a similar location as R-25 screen 3.

Period of Record: Well completed September 2008, transducer installed December 16, 2009. Data through 2009.

Remarks: R-25c is a replacement for R-25 screen 3. The borehole contained water during drilling, but the well was dry (some water in sump) at completion and did not retain water during attempted slug testing (LANL December 2008).

R-25c Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1039.6	1060.0	6478.0	6457.6	20.4	None	None	1060.0	6457.6	1080.6	20.6	79.5	I	Tpf

Note: Brass Cap Ground Elevation: 7517.59 ft; all measurements are from this elevation

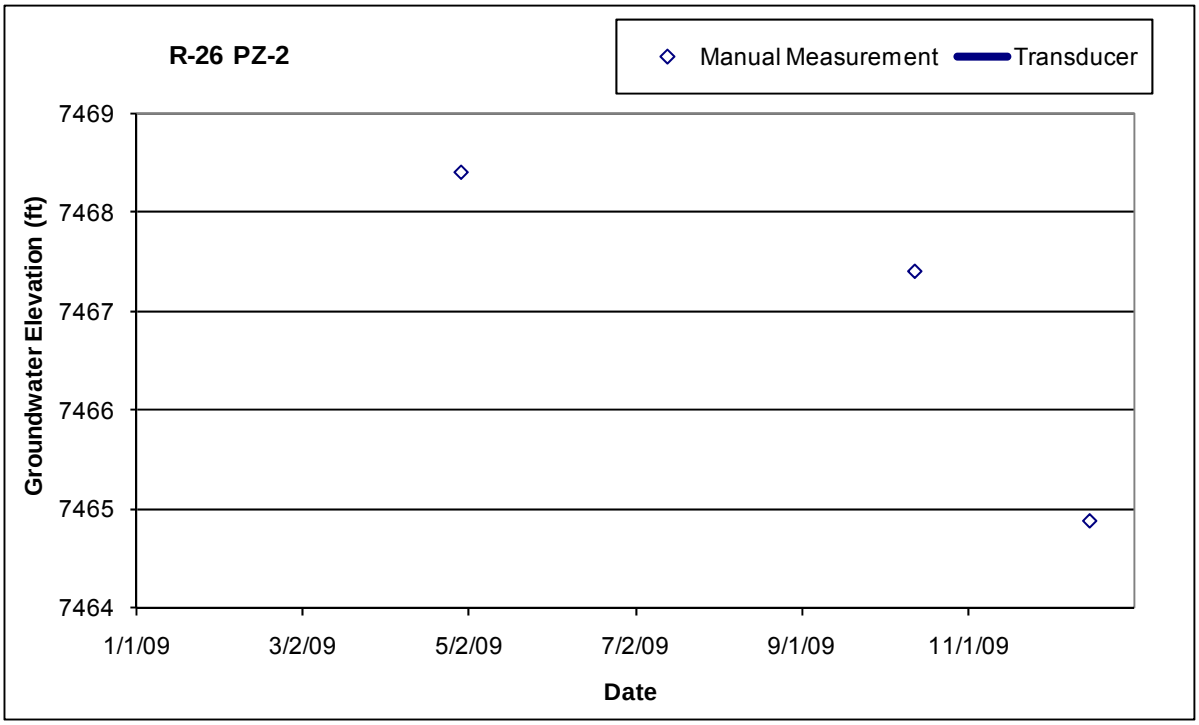
4.31 R-26 PZ-2

Location: R-26 PZ-2 is located at TA-16 about 90 ft southwest of monitoring well R-26.
Completion Type: Dual completion, R-26 PZ-1 is the deeper piezometer while R-26 PZ-2 is the shallower piezometer.
Period of Record: Piezometer completed October 2003, manual measurements began in April 2009, and transducer installed December 16, 2009.
Remarks: R-26 PZ-1 has always been dry when checked.

R-26 Piezometer Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Depth to Bottom of Sump (ft)	Bottom of Sump Elev (ft)	Sump Length (ft)	Sump Vol (gal.)	1 CV Purge Vol (gal.)	Hydro Zone Code	Geo Unit Code
PZ-1	230.0	250.0	7409.6	7389.6	20.0	250.0	7389.6	0.0	0.0	0.0	I	Qbt3t
PZ-2	150.0	180.0	7489.6	7459.6	30.0	185.0	7454.6	5.0	0.8	1.5	I	Qbt3t

Note: R-26 Ground Elevation: 7639.56 ft; all measurements are from this elevation; Top of Casing Elevation: 7641.95 ft.



4.32 R-27i

Location: R-27i is located in Water Canyon near monitoring well R-27.
Completion Type: Single completion, one screen in the Puye fanglomerates.
Period of Record: Well completed October 2009, dedicated Bennett pump and transducer installation pending as of January 2010.
Remarks: Preliminary groundwater level measurements indicate the groundwater is 616 to 621 ft below ground surface.

R-27i Construction Information													
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Sump Bottom (ft)	Bottom of Well Elev (ft)	Sump Length (ft)	Sump Vol (gal)	Hydro Zone Code	Geo Unit Code
1	619.0	629.0			10.0			630.2		1.2	1.2	I	Tpf
Note: Brass Cap Ground Elevation: XXXXX ft; all measurements are from this elevation													

4.33 SCI-1

Location: SCI-1 is located in Sandia Canyon between intermediate wells LAOI-3.2 in Los Alamos Canyon to the north and MCOI-6 in Mortandad Canyon to the southwest.

Completion Type: Single completion in the Puye Formation fanglomerate member; the screen is located above the Cerros del Rio basalt.

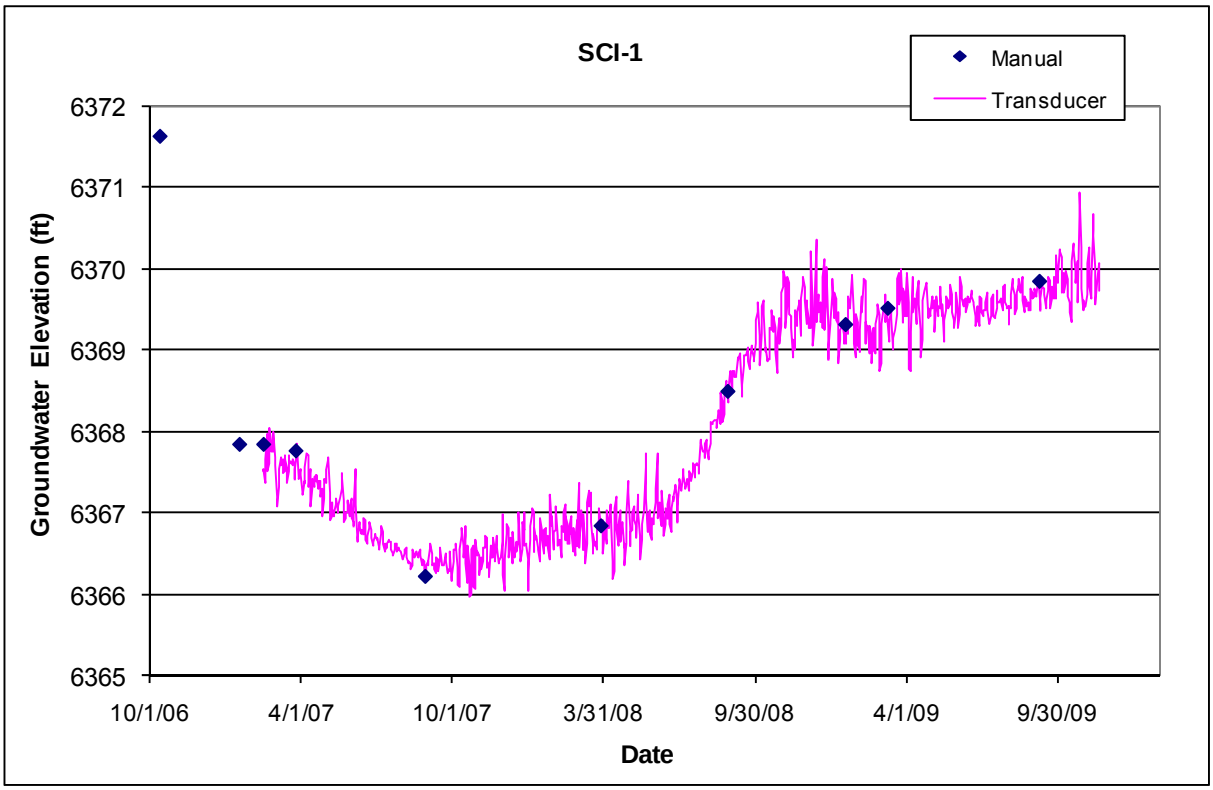
Period of Record: Well completed October 2006, transducer installed in February 2007, data through 2009.

Remarks: Originally drilled as core hole SCC-1, completed as intermediate well and named SCI-1. The well is immediately 100% barometrically efficient; additionally the groundwater shows a delayed response to atmospheric pressure fluctuations.

SCI-1 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	358.4	377.9	6379.9	6360.4	19.5	376.0	6362.3	377.9	6360.4	377.9	0.0	0.0	I	Tpf

Note: Brass Cap Elevation: 6738.27 ft; all measurements are from this elevation



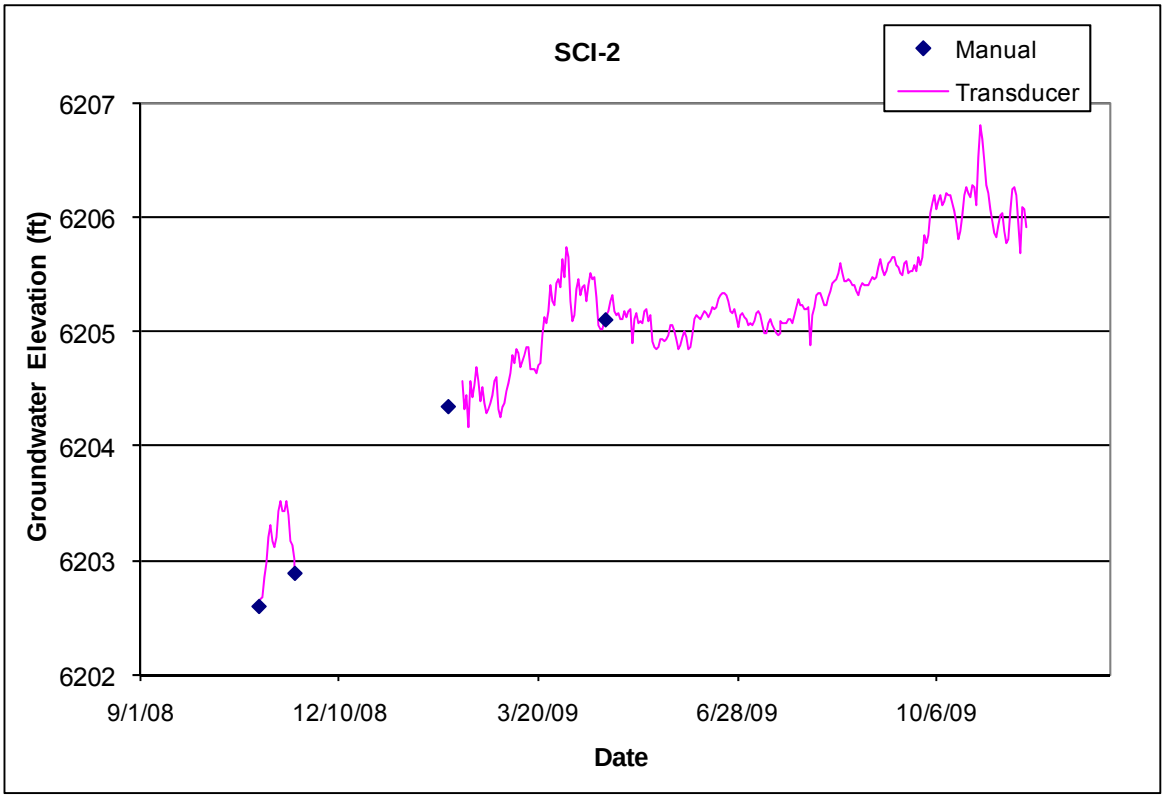
4.34 SCI-2

Location: SCI-2 is located in middle Sandia Canyon adjacent to regional monitoring well R-43.
Completion Type: Single completion in Cerros del Rio basalt.
Period of Record: Well completed August 2008, temporary transducer installed November 2008 for R-42 and R-43 aquifer testing; dedicated transducer installed February 10, 2009; data through 2009.
Remarks: The initial groundwater elevation at completion of the well was 6221.4 ft; subsequent measurements have been about 15 ft lower. The well is 100% barometrically efficient, the groundwater does not respond to atmospheric pressure fluctuations; however, the groundwater shows a delayed response to atmospheric pressure fluctuations.

SCI-2 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	548.0	568.0	6187.7	6167.7	20.0			568.0	6167.7	570	2.0	0.2	I	Tb4

Note: Brass Cap Elevation: 6735.70 ft; all measurements are from this elevation



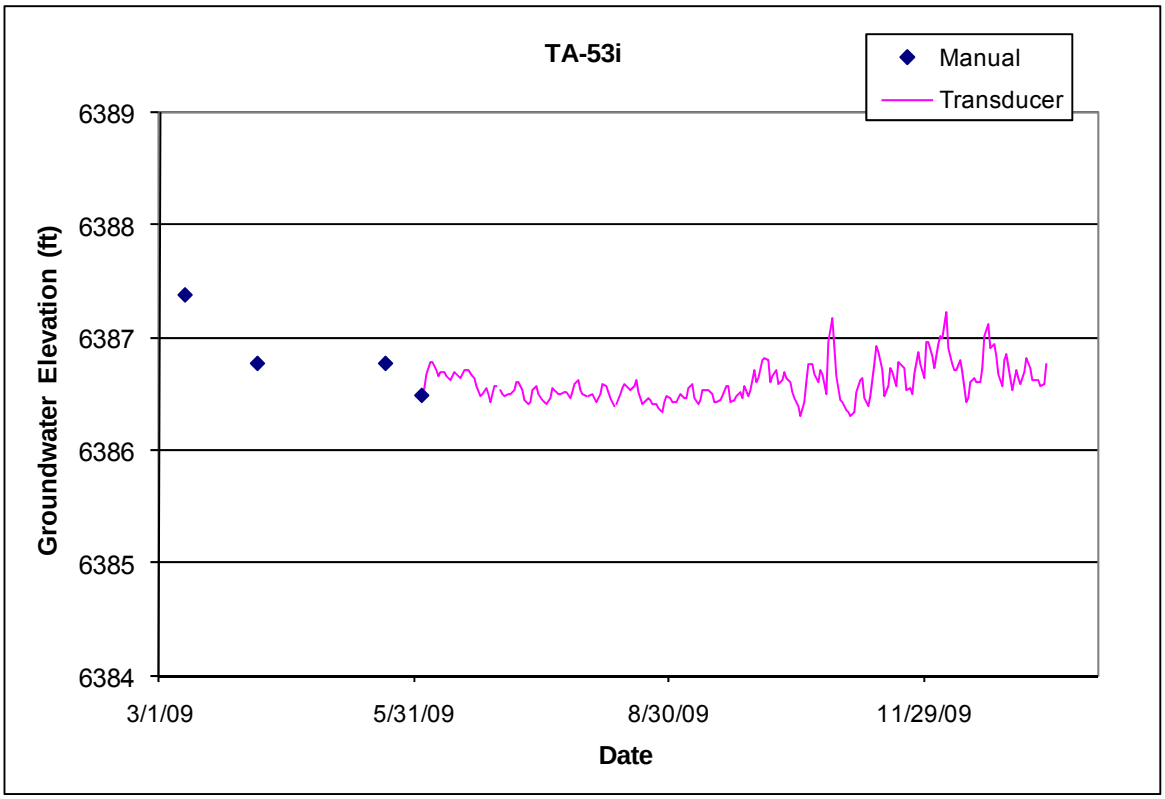
4.35 TA-53i

Location: TA-53i is located on Mesita de Los Alamos at TA-53 about 1400 ft northwest of SCI-1.
Completion Type: Single completion in Puye fanglomerates just above the Cerros del Rio basalt.
Period of Record: Well completed March 2009, transducer installed June 2009; data through 2009.
Remarks: The well is 100% barometrically efficient, the groundwater has no immediate response to atmospheric pressure fluctuations; however, the aquifer shows a delayed response to atmospheric pressure fluctuations.

TA-53i Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	600.0	610	6387.2	6377.2	10.0			610.0	6377.2	620.8	10.8	41.7	I	Tpf

Note: Brass Cap Elevation: 6987.17 ft; all measurements are from this elevation



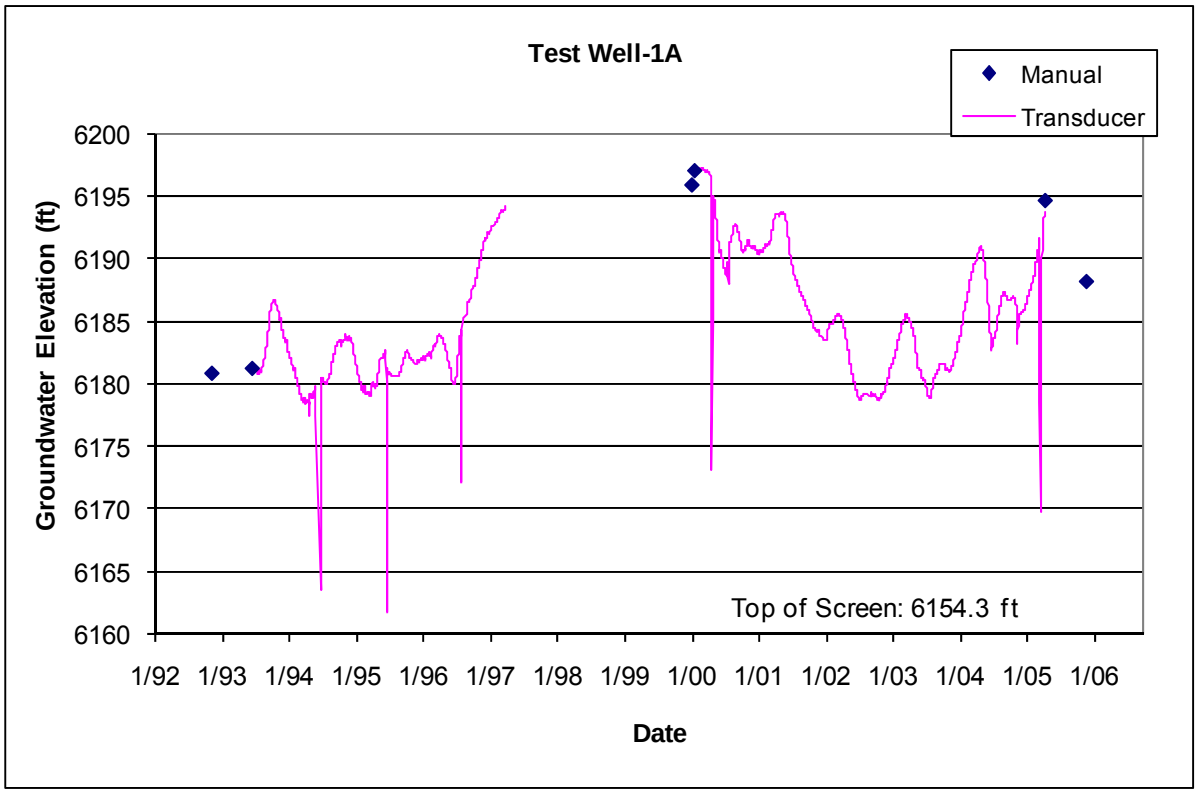
4.36 Test Well 1A

Location: TW-1A is located in lower Pueblo Canyon adjacent to TW-1.
Completion Type: Single completion in Cerros del Rio basalt.
Period of Record: Well completed in 1950, transducer installed June 1993, intermittent data to April 2005 when problems were encountered with equipment and the transducer was removed from the well.
Remarks: The wellhead equipment was removed from the well in February 2006 in preparation for plugging and abandonment of the well. The well is not planned for further monitoring.

TW-1A Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	215.0	225	6154.3	6144.3	10.0	None	None	225.0	6144.3	225	0.0	0.0	I	Tb4

Note: TW-1A Ground Elevation: 6369.28 ft; all measurements are from this elevation



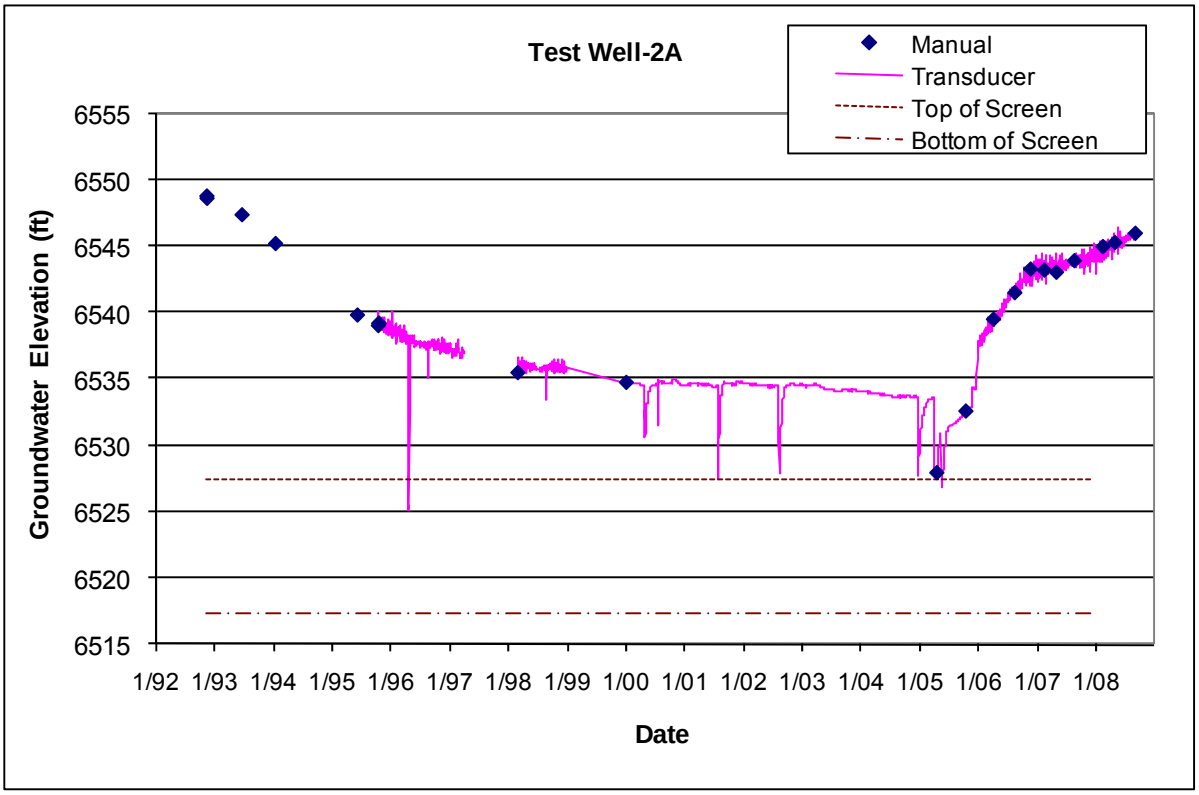
4.37 Test Well 2A

Location: TW-2A is located in middle Pueblo Canyon adjacent to TW-2.
Completion Type: Single completion in the Puye Formation.
Period of Record: Well completed in 1950, transducer installed January 1994 but equipment problems preclude data until 1995; intermittent data through 2009.
Remarks: Recent pumping of TW-2A when the water level is below 6535 ft has shown slow recovery of the intermediate groundwater.

TW-2A Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	123.0	133.0	6527.4	6517.4	10.0	130.0	6520.4	133.0	6517.4	133.0	0.0	0.0	I	Tp

Note: TW-2A Ground Elevation: 6650.4 ft; all measurements are from this elevation



5.0 Groundwater Level Data from Alluvial Wells

Table 5-1 lists the alluvial wells that were monitored for groundwater levels in 2009. The table provides the well name, date of completion, well depth, surveyed location coordinates, ground surface elevation, and the screen top and bottom depths for each well. Figure 5-1 shows the locations of the wells. In the following alluvial groundwater sections, the first graph for each well represents the entire period of record, while the second graph represents groundwater level data for recent years. Alluvial groundwater levels respond to snowmelt runoff, storm runoff, and, in some canyons, effluent discharges. Some alluvial wells have been historically dry and do not show a seasonal response to precipitation and runoff.

Table 5-1. Information and Location Data for Alluvial Aquifer Wells at LANL

Well Name	Date Completed	Completed Depth (ft)	Easting (ft)	Northing (ft)	Surface Elevation (ft)	Screen Top Depth (ft)	Screen Bottom Depth (ft)
18-BG-1	8/1/1994	35.0	1634152.90	1762575.36	6776.45	10.0	35.0
18-BG-4	2/18/1998	6.5	1633510.00	1760760.00	6768.00	2.5	6.5
18-MW-7	7/6/1994	30.0	1634846.28	1761791.52	6755.50	10.0	30.0
18-MW-8	8/4/1994	37.9	1634714.26	1760658.14	6747.79	8.0	38.0
18-MW-9	7/21/1994	21.0	1635949.81	1760893.56	6732.91	6.0	31.0
18-MW-17	8/1/1995	22.0	1637778.20	1759717.10	6695.20	12.0	22.0
18-MW-18	7/31/1995	23.0	1639925.00	1758247.20	6654.70	12.5	23.0
39-UM-3	8/15/1994	54.0	1637032.00	1747663.00	6394.20	44.0	54.0
39-DM-6	8/15/1994	60.0	1637094.00	1747228.00	6384.57	50.0	60.0
APCO-1	8/15/1990	19.7	1649209.62	1773020.12	6367.53	4.7	14.7
CDBO-1	4/17/1985	13.0	1637968.59	1760943.96	6757.60	5.1	13.1
CDBO-2	4/18/1985	18.0	1638119.02	1761103.11	6758.20	5.9	17.9
CDBO-3	4/18/1985	12.0	1640677.11	1759611.02	6670.20	4.4	12.4
CDBO-4	4/18/1985	12.0	1645474.90	1758546.90	6564.50	4.1	12.1
CDBO-5	6/1/1992	17.0	1633583.37	1765818.37	6879.01	7.0	17.0
CDBO-6	6/1/1992	49.0	1636209.25	1764759.75	6817.20	34.0	44.0
CDBO-7	6/1/1992	44.0	1637400.00	1763301.00	6771.81	29.0	39.0
CDBO-8	6/1/1992	23.0	1639294.00	1762366.00	6722.47	3.0	13.0
CDBO-9	6/1/1992	34.0	1642119.12	1759702.87	6633.00	19.0	29.0
CDV-16-02655	9/27/1997	7.6	1611299.09	1764153.13	7583.70	2.3	7.3
CDV-16-02656	11/5/1997	8.2	1613634.46	1764932.79	7443.18	3.0	8.0
CDV-16-02657	10/10/1997	5.7	1613813.19	1764850.10	7433.25	0.4	5.4
CDV-16-02658	9/16/1997	7.2	1615071.38	1764469.56	7375.60	1.9	6.9
CDV-16-02659	9/8/1997	7.0	1616712.08	1765035.06	7300.50	1.7	6.7
FCO-1	8/22/1989	12.4	1642409.00	1751177.00	6509.24	2.4	12.4
FLC-16-25278	10/10/2005	3.2	1618820.88	1762605.72	7272.20	1.6	3.2
FLC-16-25279	10/10/2005	4.3	1617679.48	1762856.43	7309.30	2.7	4.3
FLC-16-25280	10/10/2005	4.2	1616646.29	1763365.10	7352.90	2.6	4.2
LAO-B	4/28/1994	27.2	1615148.80	1775170.40	7323.59	11.8	26.8
LAO-0.3	5/17/1994	11.3	1624799.00	1774511.60	6968.13	5.9	10.9
LAO-0.6	5/6/1994	13.4	1626748.10	1774332.90	6910.74	8.0	13.0
LAO-0.91	5/12/1994	14.9	1628654.30	1774207.00	6861.74	9.5	14.5
LAO-1	2/1/1996	28.0	1629395.00	1773956.37	6836.24	8.0	28.0

Well Name	Date Completed	Completed Depth (ft)	Easting (ft)	Northing (ft)	Surface Elevation (ft)	Screen Top Depth (ft)	Screen Bottom Depth (ft)
LAO-1.2	8/15/1969	18.0	1632646.25	1773361.37	6720.00	8.0	18.0
LAO-1.6g	3/20/1996	30.8	1636083.42	1772557.63	6658.01	10.5	25.5
LAO-1.8	4/15/1969	18.0	1635446.25	1772661.37	6680.00	8.0	18.0
LAO-2	2/1/1996	32.0	1637607.75	1773095.87	6592.97	7.0	32.0
LAO-3a	9/14/1989	14.7	1637980.87	1773099.75	6579.40	4.7	14.7
LAO-4.5c	11/1/1989	23.3	1643547.37	1772076.50	6457.63	13.3	23.3
LAO-5	2/15/1966	25.0	1646202.25	1771424.12	6398.30	5.0	25.0
LAO-6	2/1/1966	16.0	1646222.12	1771329.50	6395.30	6.0	16.0
LAO-6a	8/1/1989	14.2	1646221.62	1771344.00	6395.88	4.2	14.2
LAUZ-1		10.6	1633435.13	1774809.81	7032.42	5.4	10.4
LLAO-1b	7/16/1997	24.2	1659738.70	1772381.65	5850.34	11.3	21.3
LLAO-3	7/22/1997	21.5	1665475.00	1775952.59	5692.62	8.7	18.7
LLAO-4	9/30/1996	18.1	1671820.23	1774468.01	5515.46	5.2	15.2
LLAO-5	6/27/1996	24.2	1672275.40	1774271.60	5508.21	11.4	21.4
MCA-1	1/24/2005	5.9	1626586.50	1770410.77	7070.60	2.4	5.4
MCA-2	10/24/2004	65.0	1634097.23	1768585.88	6837.20	45.0	60.0
MCA-3a	11/29/2004	43.4	1633586.89	1769068.28	6853.00	42.9	43.4
MCA-3c	11/30/2004	43.4	1633586.89	1769068.28	6853.00	38.4	38.9
MCA-3b	11/22/2004	42.1	1633589.40	1769069.84	6852.90	40.9	41.4
MCA-3d	12/2/2004	55.8	1634886.02	1768523.27	6819.80	54.6	55.1
MCA-3e	12/2/2004	55.8	1634886.02	1768523.27	6819.80	51.0	51.5
MCA-3f	12/2/2004	55.8	1634886.02	1768523.27	6819.80	47.5	48.0
MCA-4	2/1/2005	6.0	1625945.50	1770129.55	7135.10	3.3	5.3
MCA-5	2/1/2005	5.4	1627354.17	1770233.59	7053.80	1.8	5.8
MCA-8	9/29/2004	86.3	1641325.48	1767372.92	6668.80	66.0	81.0
MCA-9	12/4/2004	113.0	1641470.29	1767393.22	6671.70	92.8	107.8
MCO-0.6	2/25/1999	3.1	1623987.80	1771179.50	7188.28	1.1	3.1
MCO-2	11/1/1960	9.0	1625919.25	1770135.12	7136.60	2.0	9.0
MCO-3	3/1/1967	12.0	1627362.50	1770236.75	7052.60	2.0	12.0
MCO-4B	8/1/1990	33.9	1632036.37	1769697.00	6886.75	8.9	28.9
MCO-5	10/1/1960	46.0	1632466.12	1769538.00	6875.66	21.0	46.0
MCO-6	3/1/1974	47.0	1633635.37	1769012.75	6849.48	27.0	47.0
MCO-7	10/1/1960	69.0	1634517.87	1768509.87	6827.31	39.0	69.0
MCO-7.5	4/1/1974	60.0	1635454.87	1768440.50	6808.88	35.0	60.0
MCWB-5	12/6/1994	33.0	1632578.31	1769484.60	6876.22	17.0	27.0
MCWB-5.5B	12/22/1994	37.5	1633420.54	1769125.78	6856.89	22.5	32.5
MCWB-6.2A	12/7/1994	45.5	1633754.49	1768968.15	6848.29	30.5	40.5
MCWB-6.5E	12/21/1994	50.0	1633833.36	1768583.81	6843.80	35.0	45.0
MCWB-7A	12/9/1994	52.0	1634356.62	1768551.02	6831.17	37.0	47.0
MCWB-7.4B	12/13/1994	70.0	1635287.73	1768407.84	6813.07	45.0	65.0
MCWB-7.7B	12/20/1994	70.0	1635921.84	1768517.26	6798.97	55.0	65.0
MSC-16-06293	1/27/2000	7.3	1615809.67	1761331.78	7370.79	2.0	7.0
MSC-16-06294	1/26/2000	7.6	1617848.17	1761298.78	7288.44	2.5	7.3

Well Name	Date Completed	Completed Depth (ft)	Easting (ft)	Northing (ft)	Surface Elevation (ft)	Screen Top Depth (ft)	Screen Bottom Depth (ft)
MSC-16-06295	1/31/2000	6.9	1618630.67	1761004.78	7257.03	1.5	6.5
MT-1	11/1/1988	69.0	1635262.86	1768493.96	6811.63	39.0	59.0
MT-2	11/1/1988	64.0	1636019.79	1768544.59	6796.20	44.0	64.0
MT-3	11/1/1988	74.0	1635980.95	1768657.83	6796.65	44.0	64.0
MT-4	11/1/1988	74.0	1636558.75	1768634.37	6783.59	54.0	64.0
PAO-1	10/30/1998	13.7	1624165.85	1778988.72	6954.97	5.9	10.9
PAO-2	11/2/1998	13.9	1625040.90	1778710.00	6930.98	6.1	11.1
PAO-2.5	8/31/1998	10.3	1630646.12	1777700.31	6722.39	2.4	7.4
PAO-3	8/27/1998	13.5	1637747.70	1776856.31	6578.58	5.6	10.6
PAO-4	7/24/1997	9.8	1646090.28	1775098.35	6437.37	2.0	7.0
PAO-5N	3/24/1998	15.3	1649271.93	1773133.50	6369.79	7.4	12.4
PAO-5S	3/23/1998	20.9	1649180.35	1772991.48	6368.30	8.1	18.1
PCO-1	6/30/1985	12.0	1637919.25	1759990.62	6687.00	4.0	12.0
PCO-2	6/30/1985	9.5	1641700.37	1757442.75	6618.30	1.5	9.5
PCO-3	6/30/1985	17.7	1646088.62	1755489.37	6546.30	5.7	17.7
SCA-1	8/25/2006	2.1	1622482.45	1773264.59	7211.22	1.3	1.9
SCA-2	8/24/2006	15.6	1636115.02	1770282.78	6749.08	10.3	15.0
SCA-3	9/9/2006	32.6	1637200.75	1769917.84	6723.22	27.6	32.0
SCA-4	9/10/2006	42.0	1638261.23	1769566.62	6703.58	37.0	41.5
SCA-5	9/11/2006	64.9	1639878.28	1769725.47	6669.02	55.0	64.4
SCO-1	8/15/1989	19.3	1642297.62	1769502.25	6618.67	9.3	19.3
SCO-2	8/16/1989	19.4	1647259.00	1767864.00	6500.67	9.4	19.4
SCP-1abc	9/12/2006	41.8	1638254.68	1769567.80	6703.65	41.2	41.7
SCP-1abc	9/12/2006	41.8	1638254.68	1769567.80	6703.65	39.4	39.9
SCP-1abc	9/12/2006	41.8	1638254.68	1769567.80	6703.65	37.8	38.3
SCP-2a	9/13/2006	45.1	1637209.65	1769911.26	6722.95	44.5	45.0
SCP-2b	9/12/2006	50.1	1637205.05	1769914.53	6723.11	49.5	50.0
TSCA-6	11/9/2004	21.3	1632954.60	1768471.44	6863.20	16.2	20.9
TSWB-6	12/21/1994	40.0	1633383.09	1768490.75	6853.21	25.0	35.0
WCO-1	10/31/1989	34.4	1632758.75	1755069.12	6616.41	24.4	34.4
WCO-2	10/26/1989	23.5	1636870.37	1753228.37	6524.57	13.5	23.5
WCO-3	10/25/1989	12.4	1640212.50	1750620.25	6436.43	7.4	12.4

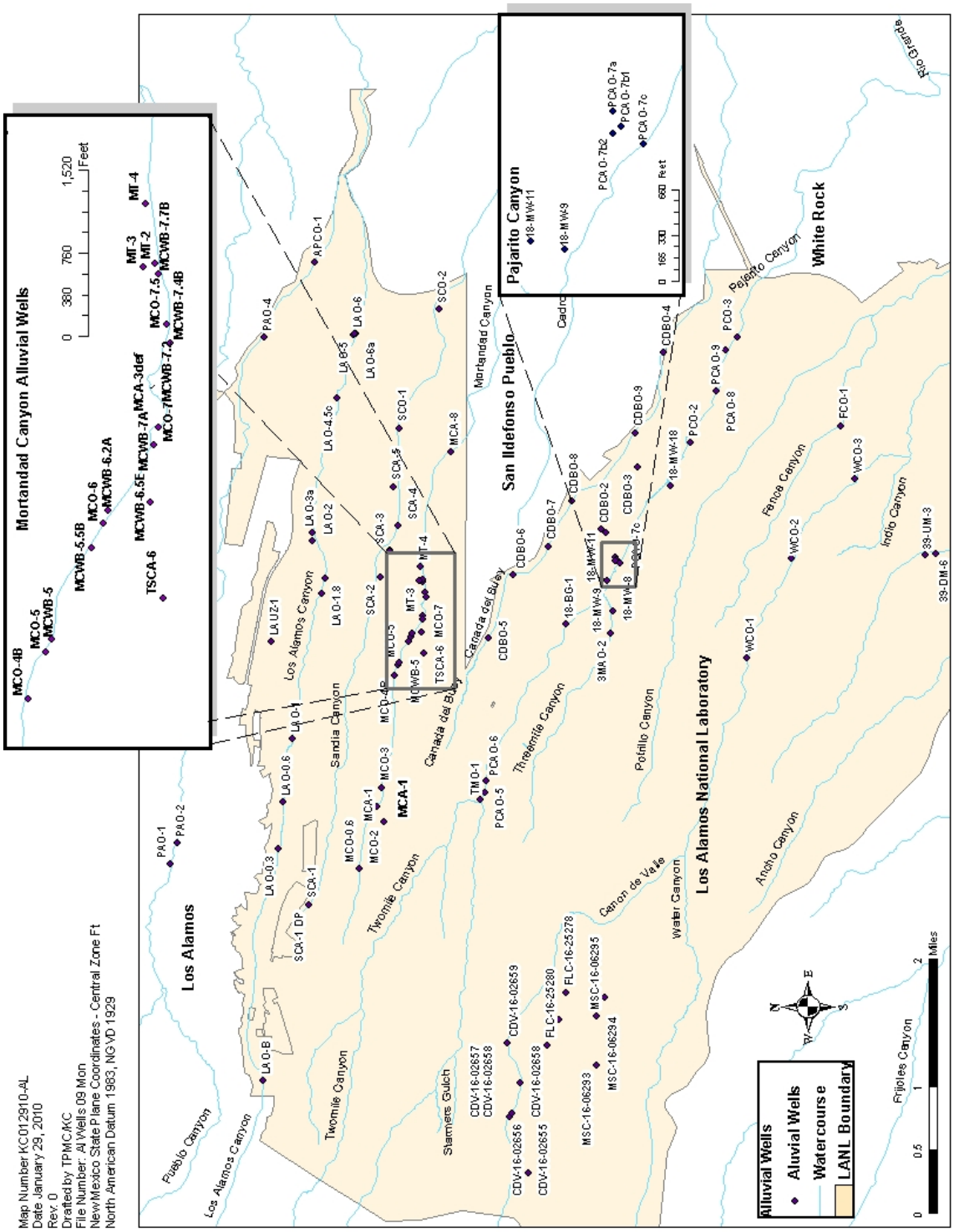


Figure 5-1. Alluvial wells monitored for groundwater levels in 2009.

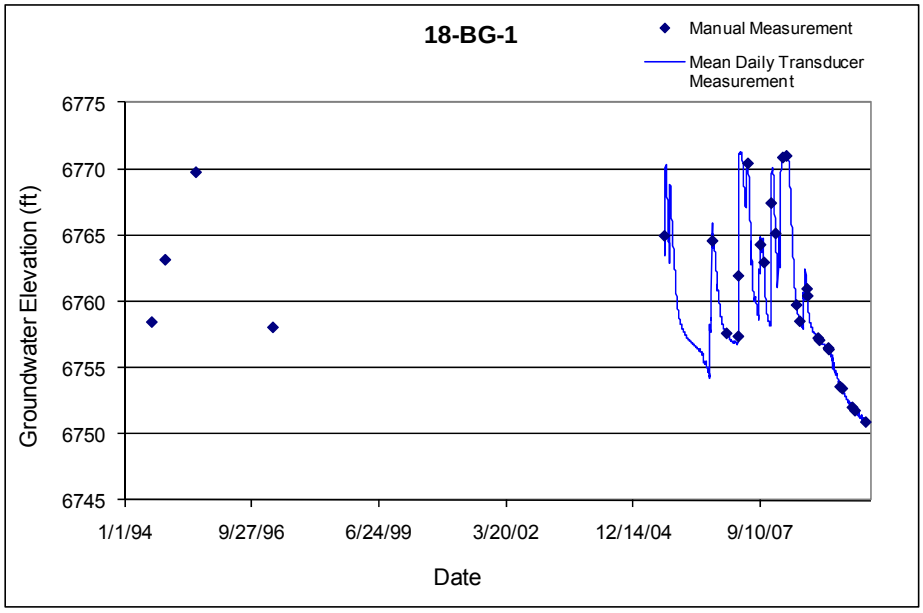
5.1 18-BG-1

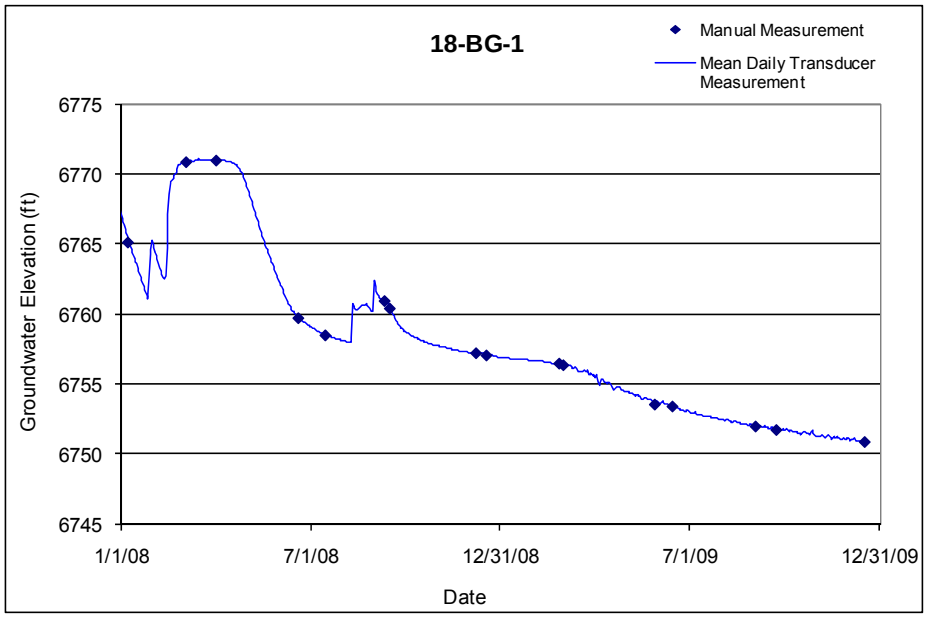
Location: Lower Pajarito Canyon, about 0.4 miles west of the TA-18 facilities.
Period of Record: August 1, 1994, through December 17, 2009.
Remarks: None.

18-BG-1 Construction Information

Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	10.0	35.0	6766.5	6741.5	25.0			35.0	6741.5	35	0.0	0.0	Alluvial groundwater

Note: Ground Elevation: 6776.45 ft; all depths are from this elevation





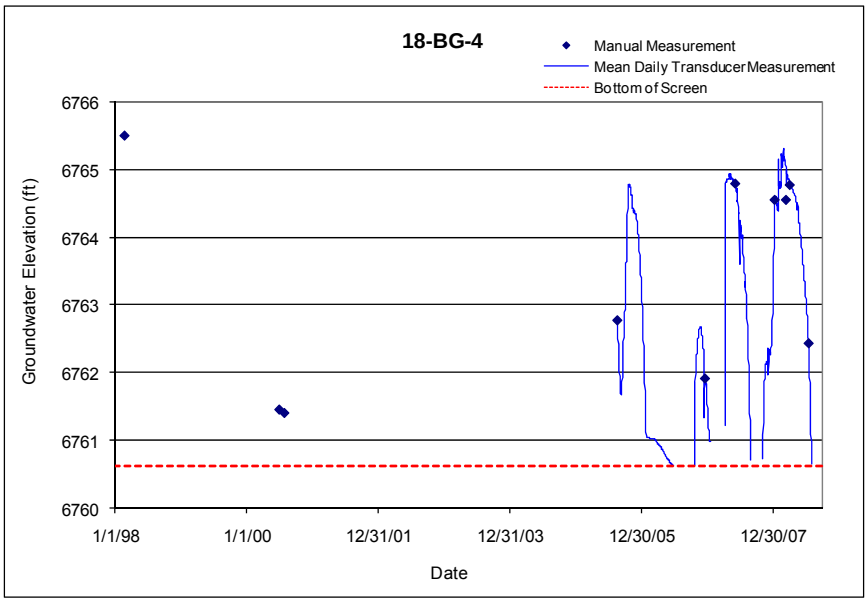
5.2 18-BG-4

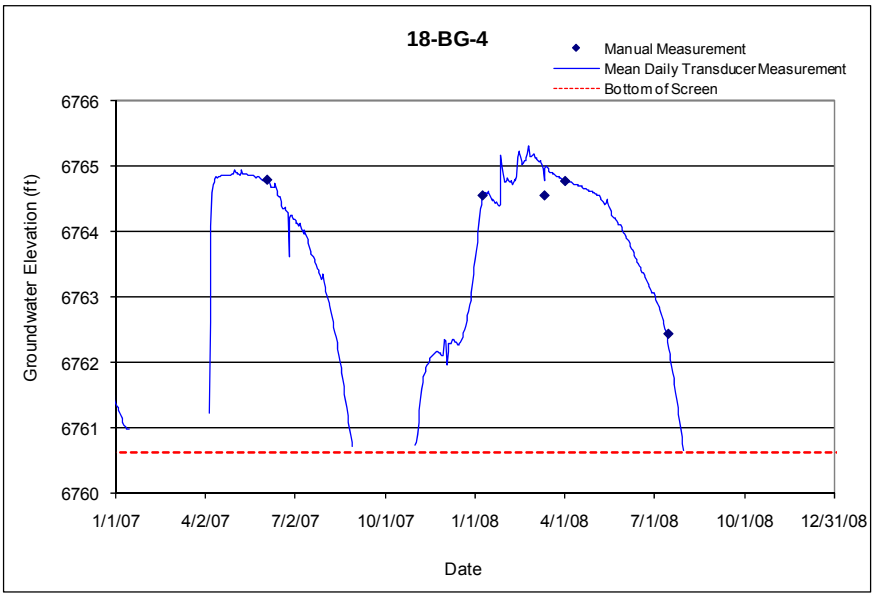
Location: Three-Mile Canyon above the confluence with Pajarito Canyon, about 0.3 miles west of the TA-18 facilities.
Period of Record: February 18, 1998, through December 1, 2008.
Remarks: Monitoring of 18-BG-4 was discontinued on December 1, 2008, having been replaced with new monitoring well 3MAO-2 in 2008.

18-BG-4 Construction Information

Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.5	6.5	6765.5	6761.5	4.0			6.5	6761.5	6.5	0.0	0.0	Alluvial groundwater

Note: Ground Elevation: 6768 ft; all depths are from this elevation



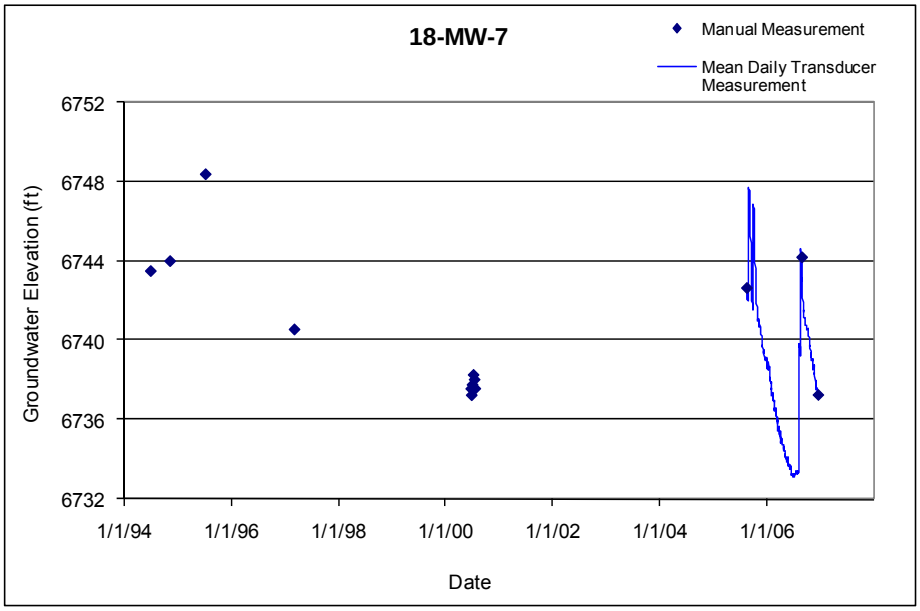


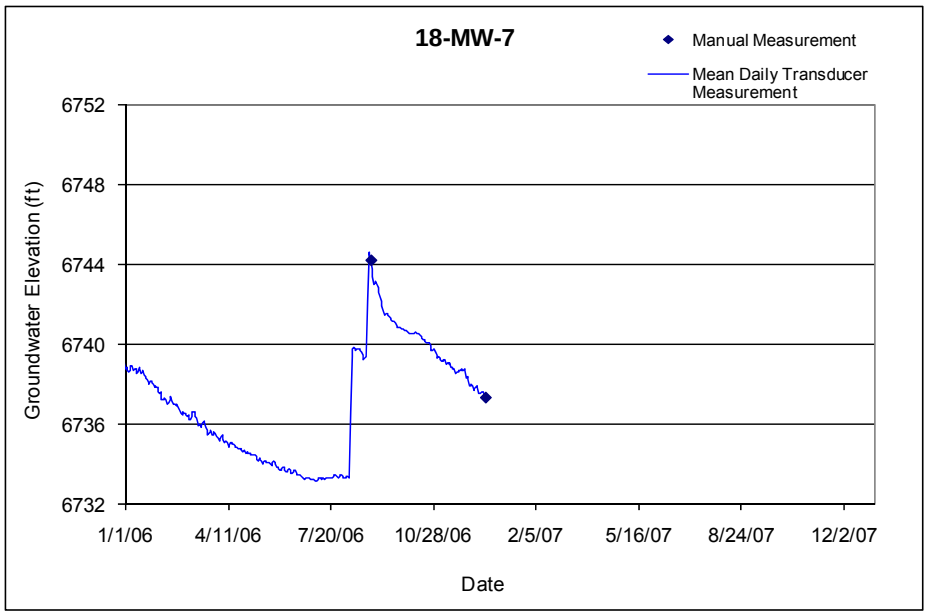
5.3 18-MW-7

Location: Pajarito Canyon, about 0.2 miles west of the TA-18 facilities.
Period of Record: July 6, 1994, through December 18, 2006.
Remarks: The transducer was removed on December 18, 2006; monitoring of this location was transferred to 18-MW-11.

18-MW-7 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	10.0	30	6745.5	6725.5	20.0			30.0	6725.5	30	0.0	0.0	Alluvial groundwater

Note: Ground Elevation: 6755.5 ft; all depths are from this elevation



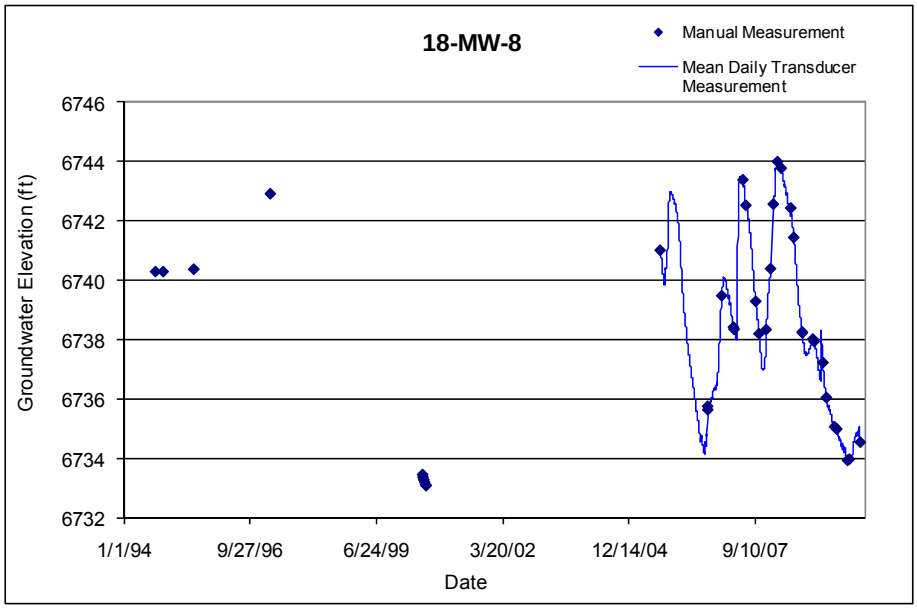


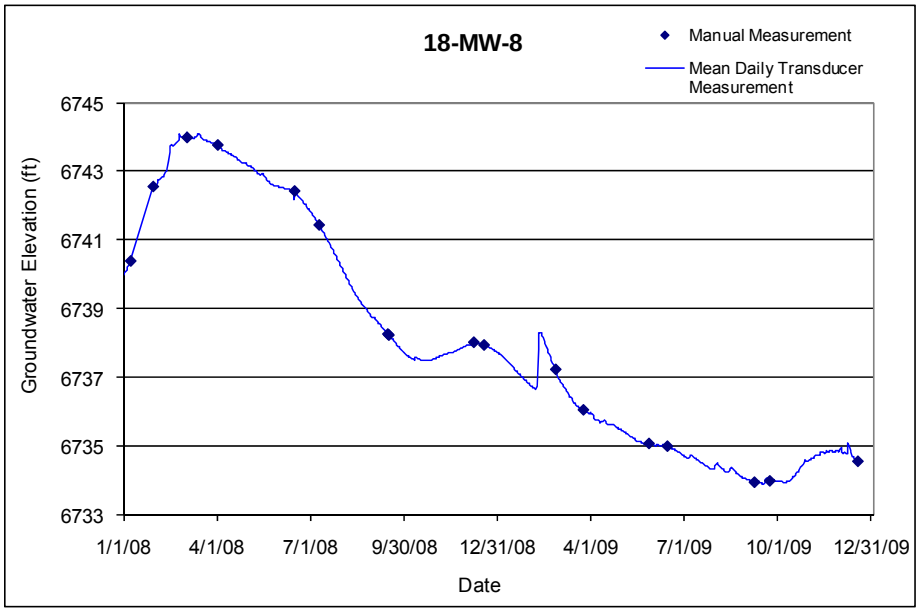
5.4 18-MW-8

Location: In Three-Mile Canyon above the confluence with Pajarito Canyon, about 0.1 miles west of the TA-18 facilities.
Period of Record: September 15, 1994, through December 18, 2009.
Remarks: None.

18-MW-8 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	8.0	38.0	6739.8	6709.8	30.0			38.0	6709.8	38.0	0.0	0.0	Alluvial groundwater

Note: Ground Elevation: 6747.79 ft; all depths are from this elevation



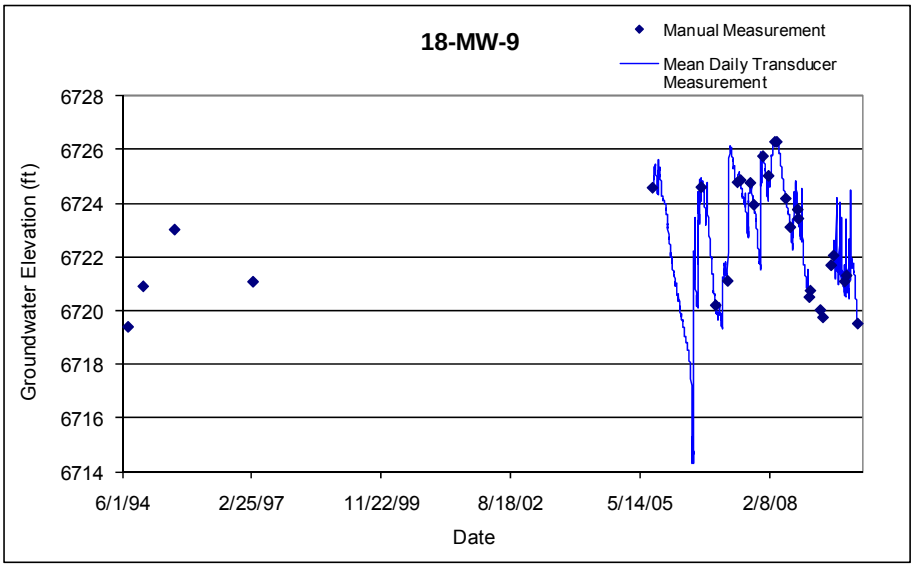


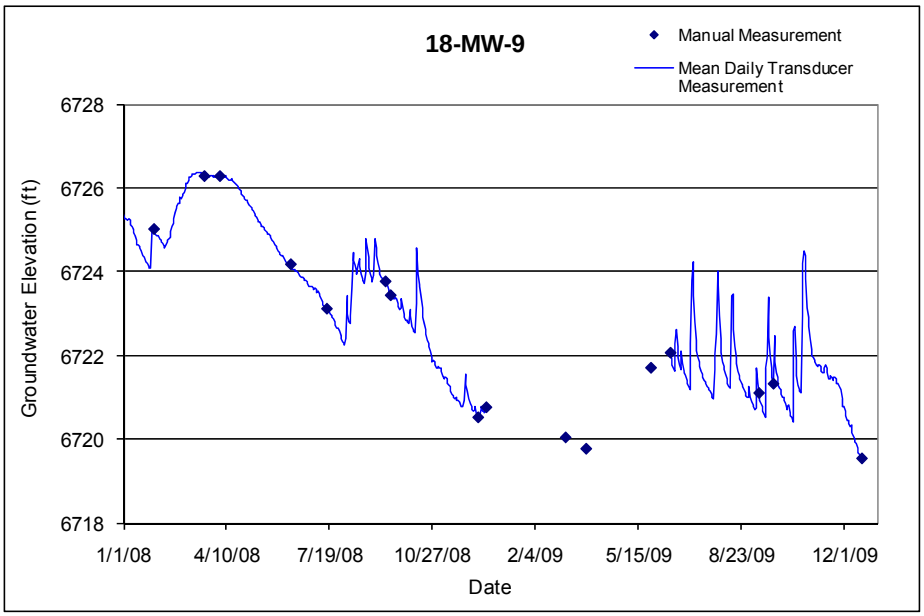
5.5 18-MW-9

Location: Pajarito Canyon, directly south of the main guard gate to TA-18.
Period of Record: July 21, 1994, through December 18, 2009.
Remarks: Data gap from December 2008 through April 2009 resulted from a succession of malfunctioning transducers.

18-MW-9 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	6.0	21.0	6726.9	6711.9	15.0			21.0	6711.9	21	0.0	0.0	Alluvial groundwater

Note: Ground Elevation: 6732.91 ft; all depths are from this elevation



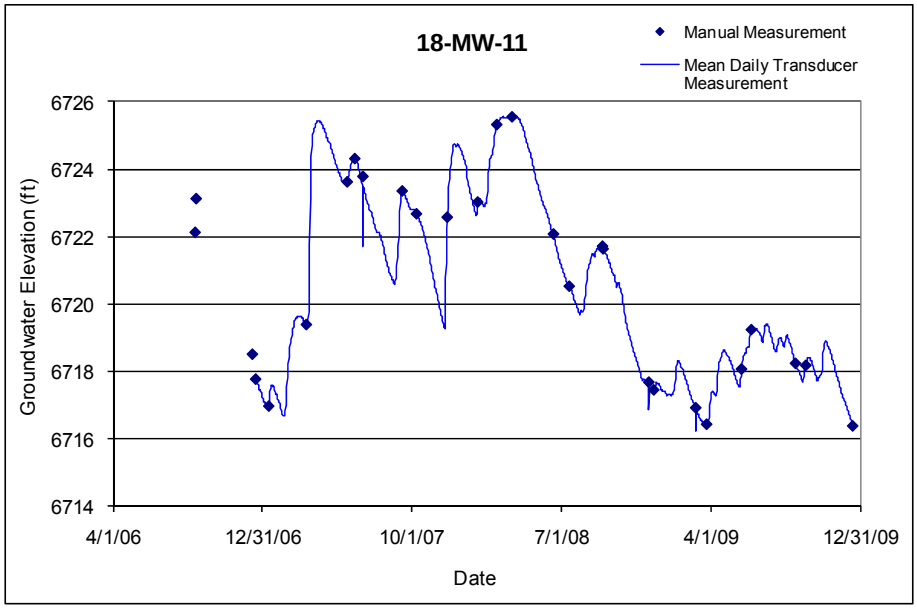


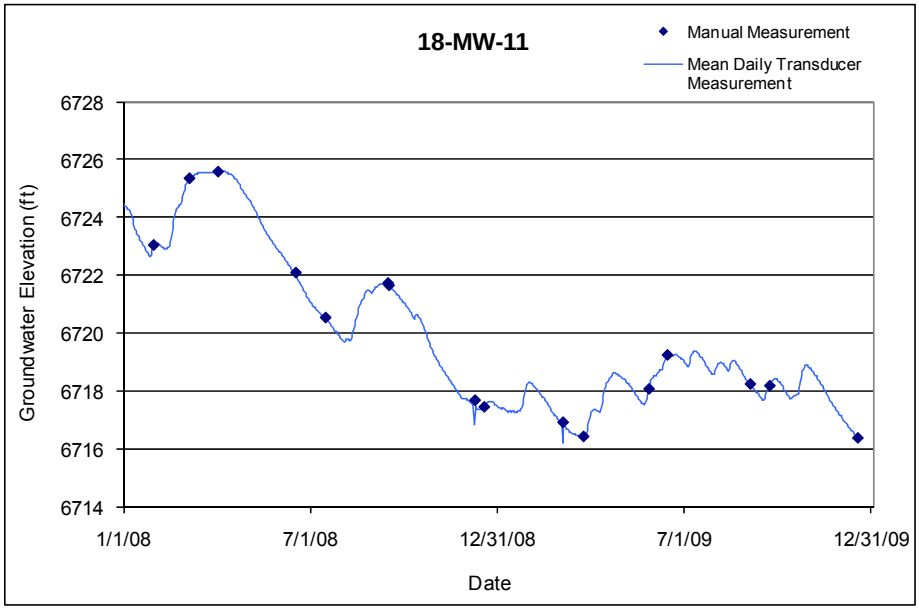
5.6 18-MW-11

Location: Pajarito Canyon, approximately 200 ft north of 18-MW-9 in the TA-18 parking lot.
Period of Record: August 29, 2006, through December 18, 2009.
Remarks: None.

18-MW-11 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	27.0	47.0	6713.1	6693.1	20.0			47.0	6693.1	0	0.0	0.0	Alluvial Groundwater

Note: Ground Elevation: 6740.13 ft; all measurements are from this elevation





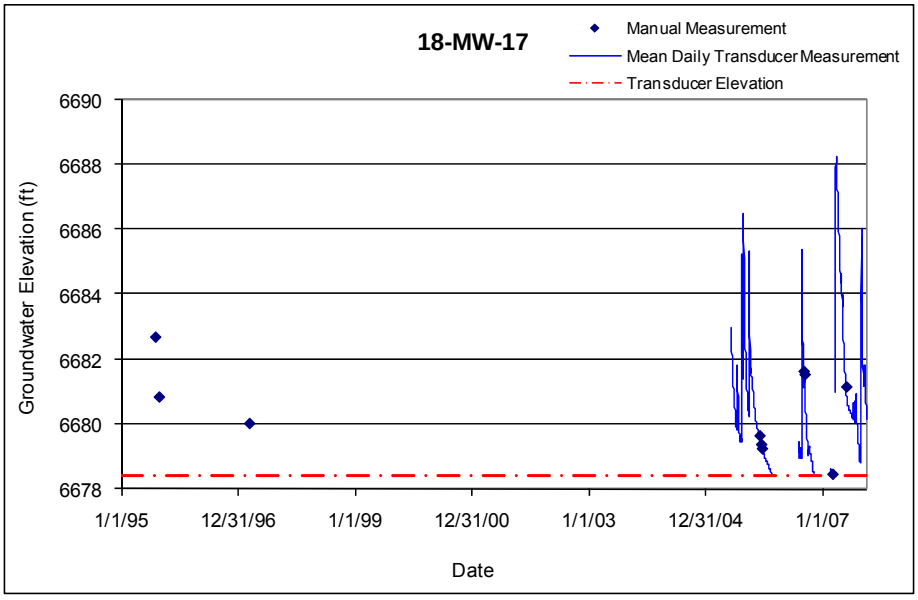
5.7 18-MW-17

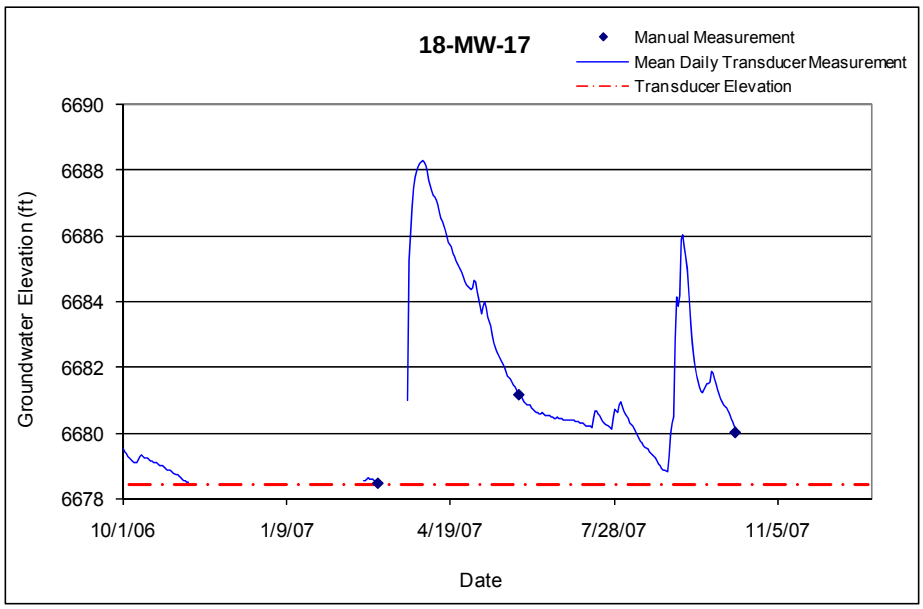
Location: Pajarito Canyon, east of TA-18, approximately 50 ft west of R-20.
Period of Record: August 1, 1995, through September 30, 2007.
Remarks: The pressure transducer in this well was removed September 30, 2007. Due to the 2-in.-diameter inner casing, the transducer did not fit below the bladder pump, and was therefore installed immediately above the pump. The water was below the transducer sensor when water levels fell below 6678.4 ft.

18-MW-17 Construction Information

Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	12.0	22.0	6683.2	6673.2	10.0			22.0	6673.2	22.0	0.0	0.0	Alluvial groundwater

Note: Ground Elevation: 6695.2 ft; all depths are from this elevation





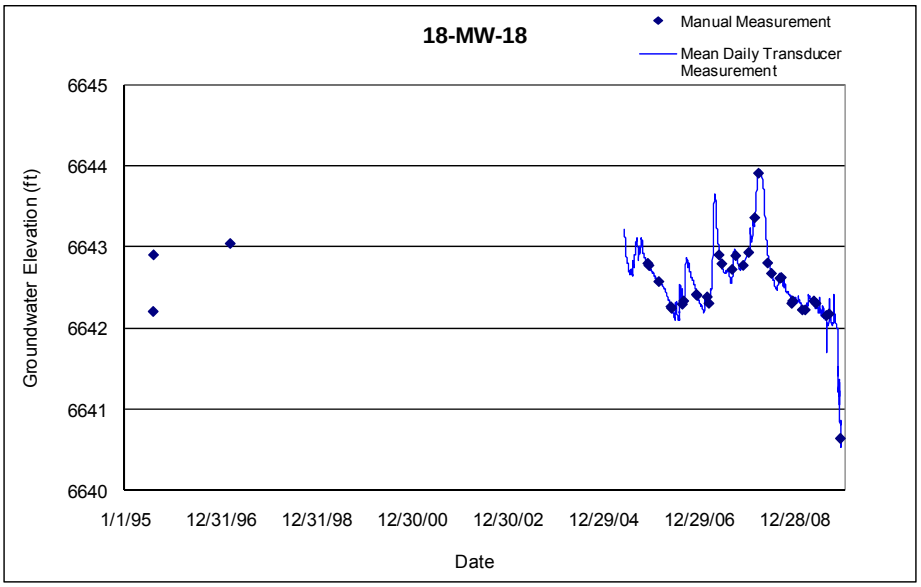
5.8 18-MW-18

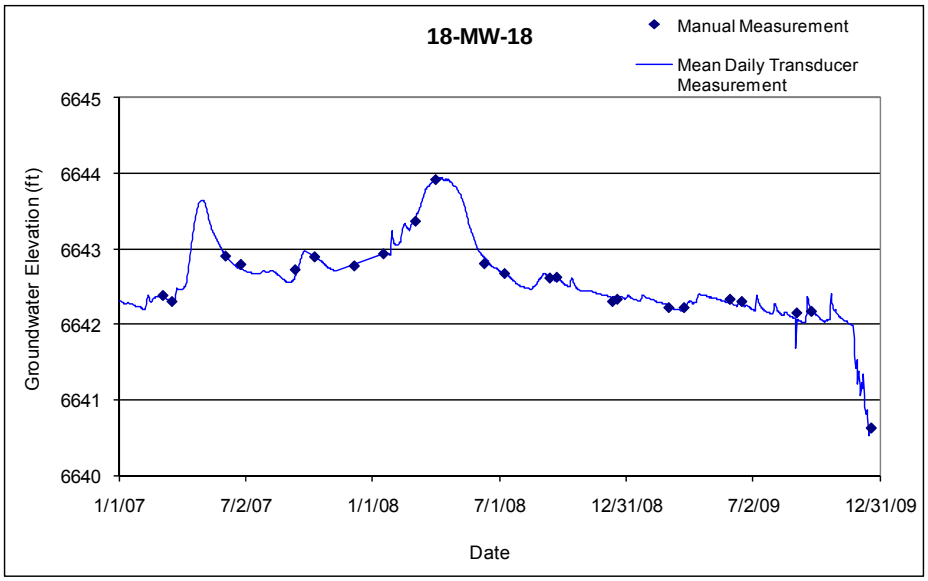
Location: Alluvial well 18-MW-18 is located in Pajarito Canyon, 1000 ft east of 18-MW-17.
Period of Record: July 31, 1995, through December 18, 2009.
Remarks: None.

18-MW-18 Construction Information

Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	12.5	23	6642.2	6631.7	10.5			23	6631.7	23	0	0	Alluvial groundwater

Note: Ground Elevation: 6654.7 ft; all depths are from this elevation



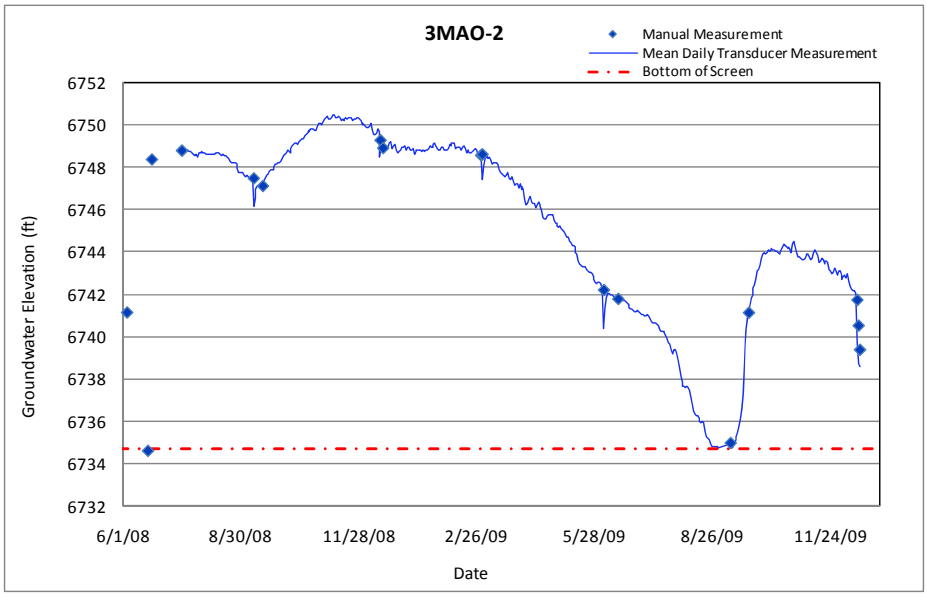


5.9 3MAO-2

Location: In lower Three-Mile Canyon in TA-18, just above the confluence with Pajarito Canyon, on the south bank of the stream; located roughly half way between 18-BG-4 and 18-MW-18.
Period of Record: June 4, 2008, through December 17, 2009.
Remarks: None.

3MAO-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	14.7	24.7	6744.7	6734.7	10.0			24.7	6734.7	30.0	5.3	13.1	Alluvial groundwater

Note: Ground elevation is 6759.44 ft; all depths from this elevation



5.10 39-UM-3

Location: Ancho Canyon, TA-39, approximately 2100 ft north of regional well R-31.
Period of Record: March 9, 2006, through July 2, 2009.
Remarks: Well has historically been dry during quarterly manual measurements. There is no transducer installed in this well. Monitoring was discontinued in August 2009.

39-UM-3 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	44.0	54.0	6350.2	6340.2	10.0			54.0	6340.2	54.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6394.20 ft; all depths are from this elevation

39-UM-3 Manual Water Levels	
Date	Comments
3/9/2006	Dry
6/13/2006	Dry
9/7/2006	Dry
11/30/2006	Dry
12/12/2006	Dry
3/15/2007	Dry
5/10/2007	Dry
6/6/2007	Dry
9/5/2007	Dry
11/1/2007	Dry
1/16/2008	Dry
4/7/2008	Dry
7/26/2008	Dry
10/15/2008	Dry
3/31/2009	Dry
7/2/2009	Dry

5.11 39-DM-6

Location: Ancho Canyon, TA-39, approximately 1600 ft north of regional well R-31.
Period of Record: March 9, 2006, through July 2, 2009.
Remarks: Well has historically been dry during quarterly manual measurements. There is no transducer installed in this well. Monitoring was discontinued In August 2009.

39-DM-6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	50.0	60.0	6334.6	6324.6	10.0			60.0	6324.6	60.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6384.57 ft; all depths are from this elevation

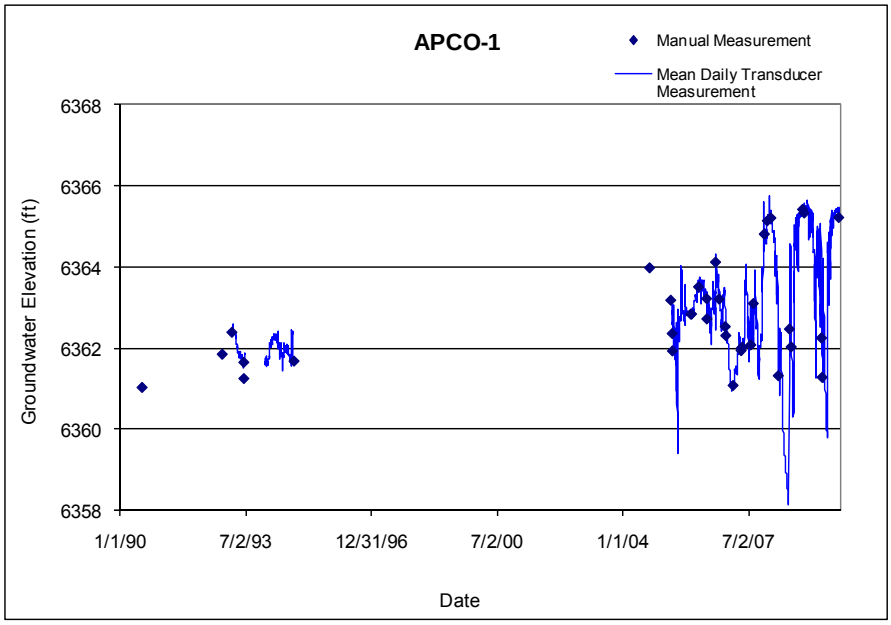
39-DM-6 Manual Water Levels	
Date	Comment
3/9/2006	Dry
6/13/2006	Dry
9/7/2006	Dry
11/30/2006	Dry
12/12/2006	Dry
3/15/2007	Dry
5/10/2007	Dry
6/6/2007	Dry
9/5/2007	Dry
11/1/2007	Dry
1/16/2008	Dry
4/7/2008	Dry
7/26/2008	Dry
10/15/2008	Dry
3/31/2009	Dry
7/2/2009	Dry

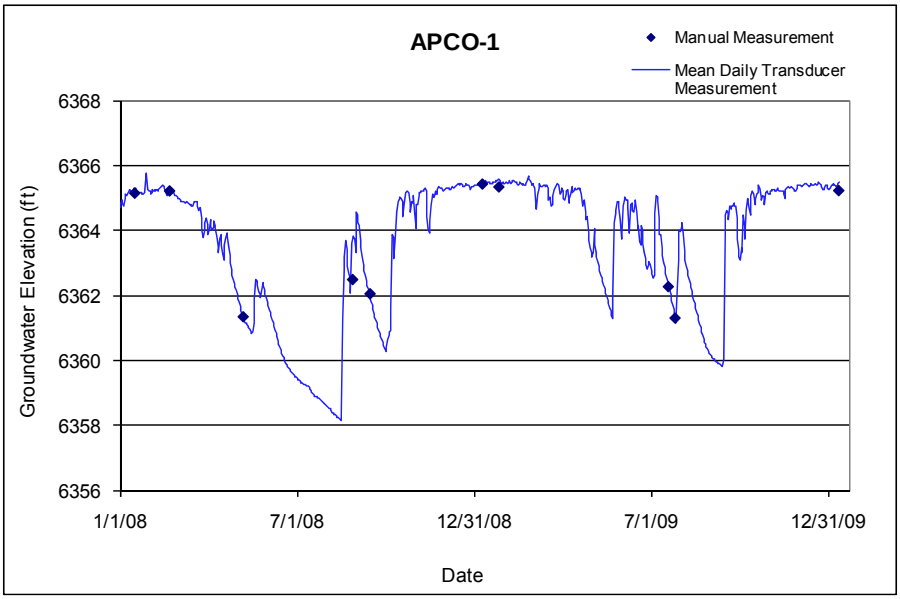
5.12 APCO-1

Location: In lower Pueblo Canyon, approximately 0.1 miles north of POI-4 and R-3i.
Period of Record: August 17, 1990, through January 12, 2010.
Remarks: A pressure transducer was installed in APCO-1 from February 17, 1993, through June 17, 1993; from January 11, 1994, through November 9, 1994; and from May 9, 2005, through present.

APCO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	4.7	14.7	6362.83	6352.83	10.0			14.7	6352.83	19.7	5.0	3.1	Alluvial groundwater

Note: Ground Elevation: 6367.53 ft; all depths are from this elevation





5.13 CDBO-1

Location: Alluvial well CDBO-1 is located in Cañada del Buey, approximately 1320 ft north of regional well R-20.
Period of Record: March 8, 2006, through August 25, 2009.
Remarks: Well has historically been dry during quarterly measurements. There is no transducer installed in this well.

CDBO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	5.1	13.1	6752.5	6744.5	8.0			13.1	6744.5	13.0	0.1	0.2	Alluvial groundwater

Note: Ground elevation is 6757.6 ft; all depths are from this elevation

CDBO-1 Manual Water Levels	
Date	Comments
3/8/2006	Dry
6/26/2006	Dry
9/6/2006	Dry
9/27/2006	Dry
12/8/2006	Dry
2/22/2007	Dry
3/19/2007	Dry
6/5/2007	Dry
6/11/2007	Dry
9/10/2007	Dry
1/24/2008	Dry
2/11/2008	Dry
4/1/2008	Dry
5/22/2008	Dry
7/24/2008	Dry
8/11/2008	Dry
11/3/2008	Dry
2/3/2009	Dry
4/27/2009	Dry
8/25/2009	Dry

5.14 CDBO-2

Location: Alluvial well CDBO-2 is located in Cañada del Buey, approximately 260 ft northeast of CDBO-1.
Period of Record: March 8, 2006, through August 25, 2009.
Remarks: Well has historically been dry during quarterly measurements. There is no transducer installed in this well.

CDBO-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	5.9	17.9	6742.3	6730.3	12.0			17.9	6730.3	18.0	0.1	0.2	Alluvial groundwater

Note: Ground elevation is 6748.2 ft; all depths are from this elevation

CDBO-2 Manual Water Levels	
Date Time	Comments
3/8/2006	Dry
6/26/2006	Dry
9/6/2006	Dry
9/27/2006	Dry
12/8/2006	Dry
2/22/2007	Dry
3/19/2007	Dry
6/5/2007	Dry
6/11/2007	Dry
9/10/2007	Dry
1/24/2008	Dry
2/11/2008	Dry
4/1/2008	Dry
5/22/2008	Dry
7/24/2008	Dry
8/11/2008	Dry
11/3/2008	Dry
2/3/2009	Dry
4/27/2009	Dry
8/25/2009	Dry

5.15 CDBO-3

Location: Alluvial well CDBO-3 is located in Cañada del Buey, approximately 630 ft northwest of regional well R-21.
Period of Record: December 6, 2005, through August 25, 2009.
Remarks: Well has historically been dry during quarterly measurements. There is no transducer installed in this well.

CDBO-3 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	4.4	12.4	6665.8	6657.8	8.0			12.4	6657.8	12.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6670.2 ft; all depths are from this elevation

CDBO-3 Manual Water Levels	
Date	Comments
12/6/2005	Dry
3/8/2006	Dry
6/26/2006	Dry
9/6/2006	Dry
9/27/2006	Dry
12/8/2006	Dry
2/22/2007	Dry
3/19/2007	Dry
6/5/2007	Dry
6/11/2007	Dry
9/10/2007	Dry
1/24/2008	Dry
2/11/2008	Dry
4/1/2008	Dry
5/22/2008	Dry
7/24/2008	Dry
8/11/2008	Dry
11/3/2008	Dry
2/3/2009	Dry
4/27/2009	Dry
8/25/2009	Dry

5.16 CDBO-4

Location: Alluvial well CDBO-4 is located in Cañada del Buey, approximately 1600 ft north of regional well R-22.

Period of Record: December 7, 2005, through December 14, 2009.

Remarks: Well has historically been dry during quarterly measurements. A transducer was installed in this well January 9, 2009, and has not yet recorded any water in the well.

CDBO-4 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	4.1	12.1	6560.4	6552.4	8.0			12.1	6552.4	12.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6564.5 ft; all depths are from this elevation

CDBO-4 Manual Water Levels	
Date	Comments
12/7/2005	Dry
3/8/2006	Dry
6/26/2006	Dry
9/6/2006	Dry
10/2/2006	Dry
12/8/2006	Dry
2/22/2007	Dry
3/19/2007	Dry
6/5/2007	Dry
6/11/2007	Dry
9/10/2007	Dry
1/24/2008	Dry
2/11/2008	Dry
4/1/2008	Dry
5/22/2008	Dry
7/24/2008	Dry
8/11/2008	Dry
11/3/2008	Dry
1/9/2009	Dry
2/3/2009	Dry
4/27/2009	Dry
7/14/2009	Dry
8/4/2009	Dry
12/14/2009	Dry

5.17 CDBO-5

Location: Alluvial well CDBO-5 is located in Cañada del Buey, approximately 0.5 miles west-northwest of CDBO-6.
Period of Record: December 7, 2005, through December 14, 2009.
Remarks: Well has historically been dry during quarterly measurements. A transducer was installed in this well January 12, 2009, and has not yet recorded any water in the well.

CDBO-5 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	7.0	17.0	6872.0	6862.0	10.0			17.0	6862.0	17.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6879.01 ft; all depths are from this elevation

CDBO-5 Manual Water Levels	
Date	Comments
12/7/2005	Dry
10/2/2006	Dry
12/8/2006	Dry
2/22/2007	Dry
3/19/2007	Dry
6/5/2007	Dry
9/11/2007	Dry
1/24/2008	Dry
2/11/2008	Dry
4/1/2008	Dry
5/22/2008	Dry
7/24/2008	Dry
8/11/2008	Dry
11/3/2008	Dry
1/12/2009	Dry
2/3/2009	Dry
4/27/2009	Dry
7/14/2009	Dry
8/4/2009	Dry
12/14/2009	Dry

5.18 CDBO-6

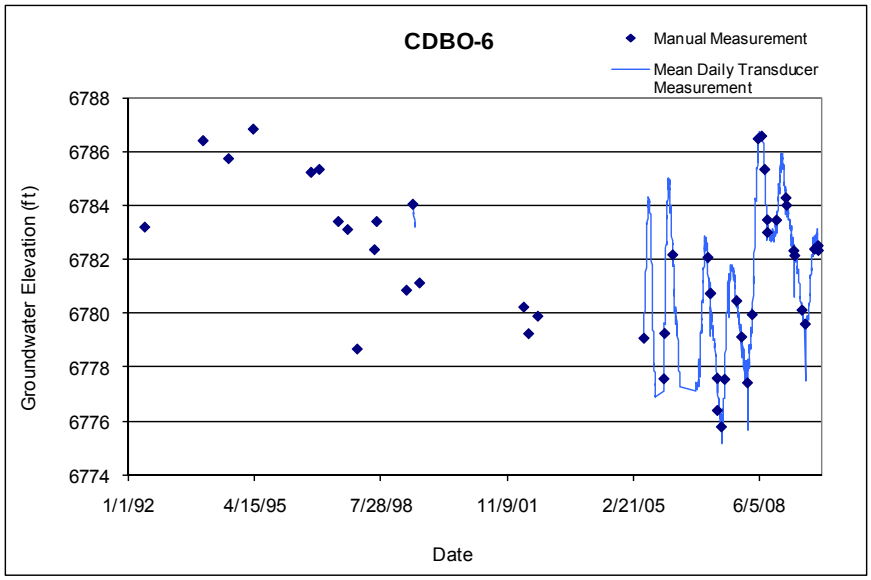
Location: In Cañada del Buey, a branch of Mortandad Canyon, approximately 420 ft east of production well PM-4.

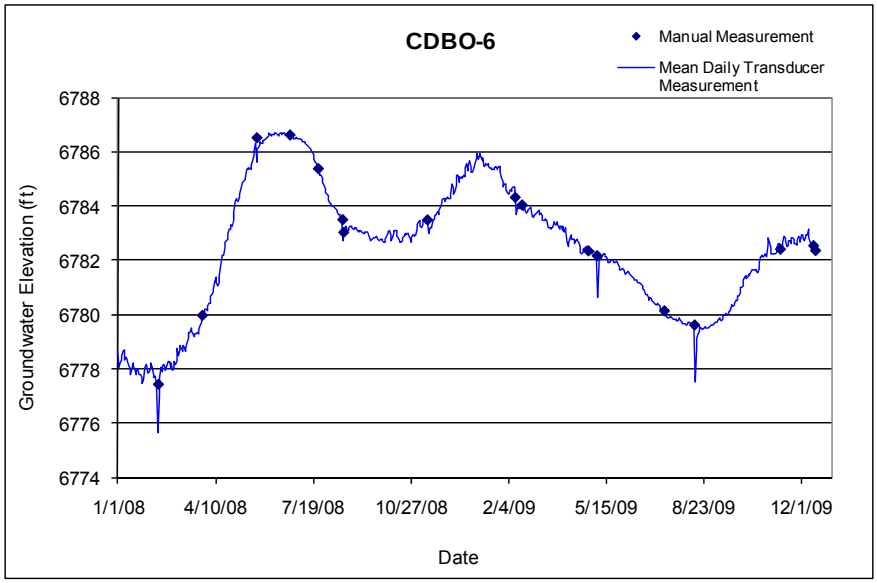
Period of Record: June 1, 1992, through December 16, 2009.

Remarks: A pressure transducer was installed above the pump until April 30, 2007, when the pump was removed from the well. Transducer data before April 30, 2007, do not represent water levels below 6776.83 ft. The dedicated pump was reinstalled November 10, 2009, and the transducer is once again located above the pump.

CDBO-6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	34.0	44.0	6783.2	6773.2	10.0			44.0	6773.2	49.0	5.0	3.1	Alluvial groundwater

Note: Ground Elevation: 6817.2 ft; all depths are from this elevation





5.19 CDBO-7

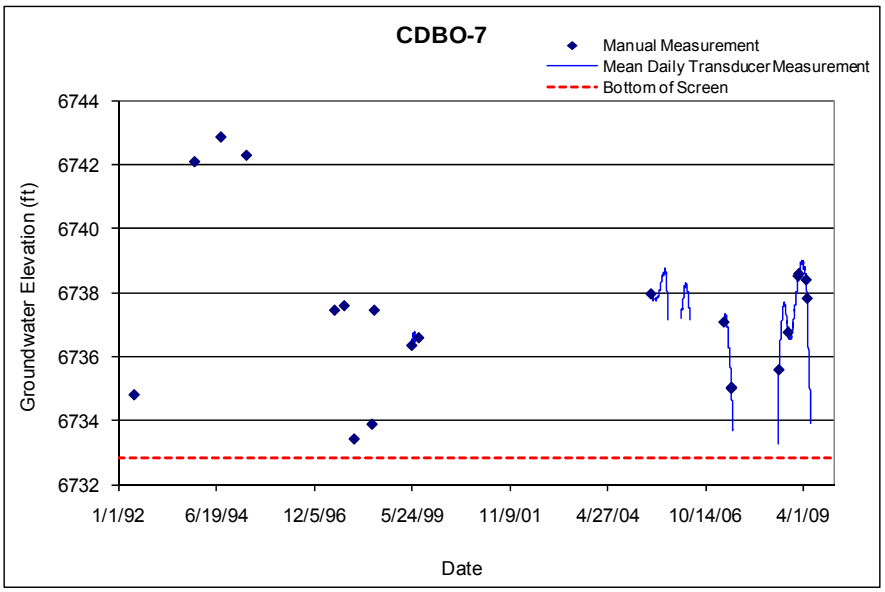
Location: In Cañada del Buey, a branch of Mortandad Canyon, approximately 0.3 miles southeast of CDBO-6.

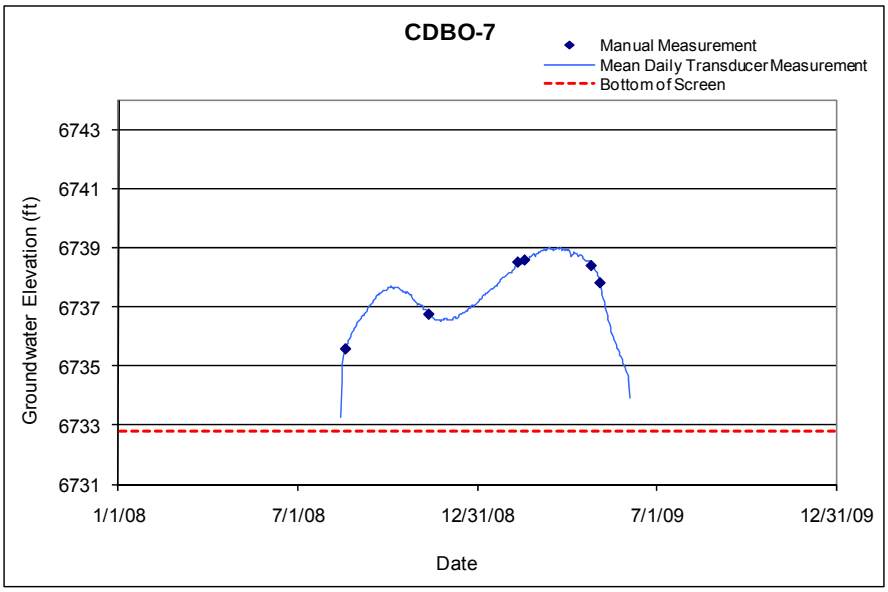
Period of Record: June 1,1992, through December 14, 2009.

Remarks: Initially, a pressure transducer was installed above the well's bladder pump at an elevation of 6737.14 ft. The transducer was lowered in the well after removal of the pump on April 2, 2007. Data before April 2, 2007, do not represent water levels below 6737.14 ft. The water level rose above the sump from August 2008 through June 2009.

CDBO-7 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	29.0	39.0	6742.8	6732.8	10.0			39.0	6732.8	44.0	5.0	3.1	Alluvial groundwater

Note: Ground Elevation: 6771.81 ft; all depths are from this elevation





5.20 CDBO-8

Location: Alluvial well CDBO-8 is located in Cañada del Buey, approximately 0.4 miles southeast of CDBO-7.

Period of Record: July 2, 2001, through December 14, 2009.

Remarks: Well has historically been dry during quarterly measurements. A transducer was installed in this well January 9, 2009, and has not yet recorded any water in the well.

CDBO-8 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	3.0	13.0	6719.5	6709.5	10.0			13.0	6709.5	23.0	10.0	6.2	Alluvial groundwater

Note: Ground elevation is 6722.47 ft; all depths are from this elevation

CDBO-8 Manual Water Levels				
Date	Comments		Date	Comments
7/2/2001	Dry		6/8/2007	Dry
8/22/2001	Dry		9/10/2007	Dry
10/18/2001	Dry		1/24/2008	Dry
4/16/2002	Dry		2/11/2008	Dry
8/27/2002	Dry		4/1/2008	Dry
11/15/2002	Dry		5/22/2008	Dry
2/19/2003	Dry		7/24/2008	Dry
12/7/2005	Dry		8/11/2008	Dry
3/8/2006	Dry		11/3/2008	Dry
6/26/2006	Dry		1/12/2009	Dry
9/7/2006	Dry		2/3/2009	Dry
10/2/2006	Dry		4/27/2009	Dry
12/8/2006	Dry		7/14/2009	Dry
2/22/2007	Dry		8/4/2009	Dry
3/19/2007	Dry		12/14/2009	Dry
6/5/2007	Dry			

5.21 CDBO-9

Location: Alluvial well CDBO-9 is located in Cañada del Buey, approximately 0.7 miles southeast of CDBO-8.

Period of Record: July 2, 2001, through December 14, 2009.

Remarks: Well has historically been dry during quarterly measurements. A transducer was installed in this well January 9, 2009, and has not yet recorded any water in the well.

CDBO-9 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	19.0	29.0	6614.0	6604.0	10.0			29.0	6604.0	34.0	5.0	3.1	Alluvial groundwater

Note: Ground elevation is 6633.0 ft; all depths are from this elevation

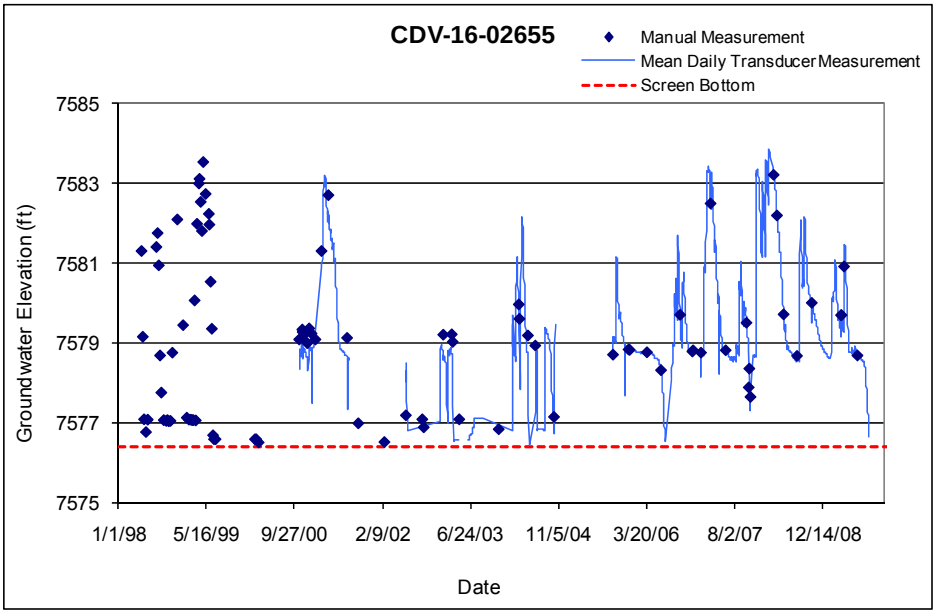
CDBO-9 Manual Water Levels				
Date	Comments		Date	Comments
7/2/2001	Dry		6/5/2007	Dry
8/22/2001	Dry		6/8/2007	Dry
10/18/2001	Dry		9/10/2007	Dry
4/16/2002	Dry		1/24/2008	Dry
8/27/2002	Dry		2/11/2008	Dry
11/15/2002	Dry		4/1/2008	Dry
2/19/2003	Dry		5/22/2008	Dry
6/3/2003	Dry		7/24/2008	Dry
12/6/2005	Dry		8/11/2008	Dry
3/8/2006	Dry		11/3/2008	Dry
6/26/2006	Dry		1/9/2009	Dry
9/6/2006	Dry		2/3/2009	Dry
10/2/2006	Dry		4/27/2009	Dry
12/8/2006	Dry		7/14/2009	Dry
2/22/2007	Dry		8/4/2009	Dry
3/19/2007	Dry		12/14/2009	Dry

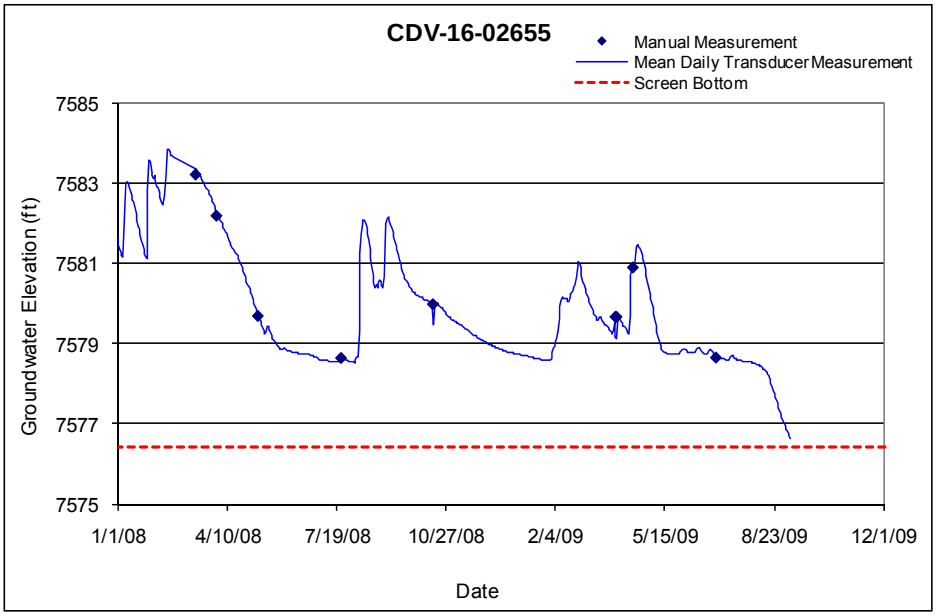
5.22 CDV-16-02655

Location: Westernmost upper Cañon de Valle in TA-16, approximately 800 ft east of Anchor Ranch Road.
Period of Record: May 15, 1998, through October 27, 2009.
Remarks: None.

CDV-16-02655 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.3	7.3	7580.91	7575.91	5.0			7.3	7575.91	7.6	0.3	0.7	Alluvial groundwater

Note: Aluminum cap elevation: 7583.70; Ground Elevation: 7583.21 ft; all depth measurements are from this elevation



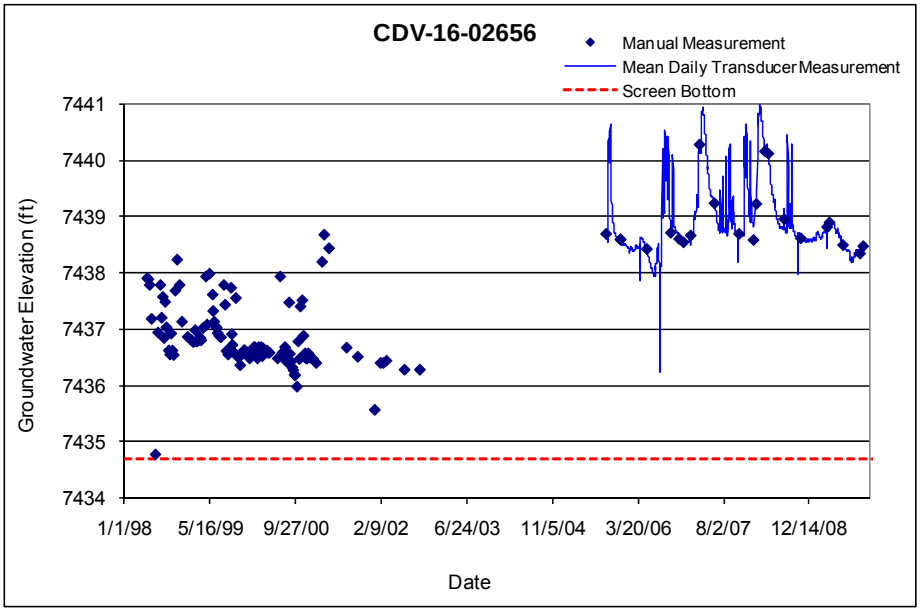


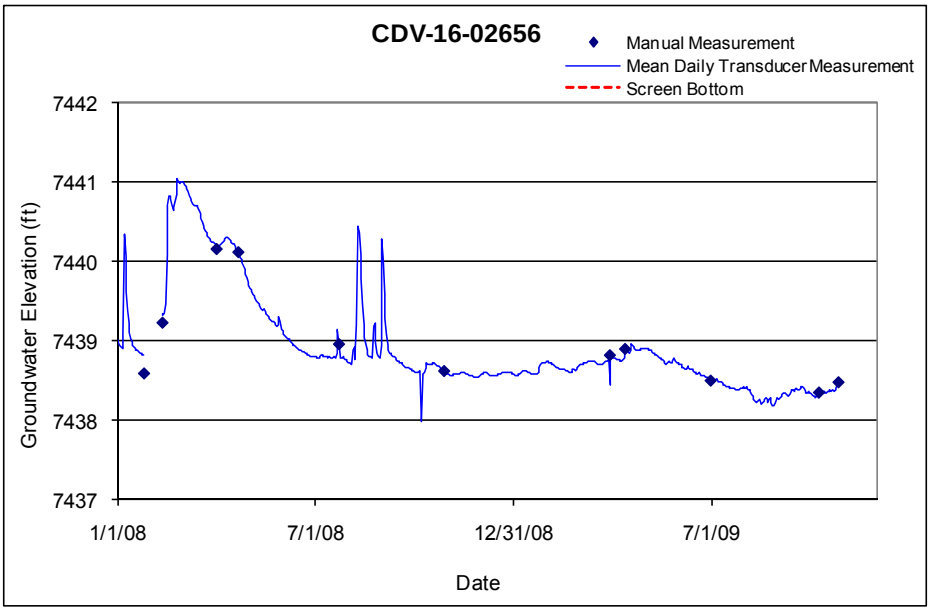
5.23 CDV-16-02656

Location: In upper Cañon de Valle at the northern boundary of TA-16.
Period of Record: May 15, 1998, through October 27, 2009.
Remarks: None.

CDV-16-02656 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	3.0	8.0	7439.69	7434.69	5.0			8.0	7434.69	8.3	0.3	0.7	Alluvial groundwater

Note: Aluminum cap Elevaton: 7443.18 ft; Ground Elevation: 7442.69 ft; all depths are from this elevation



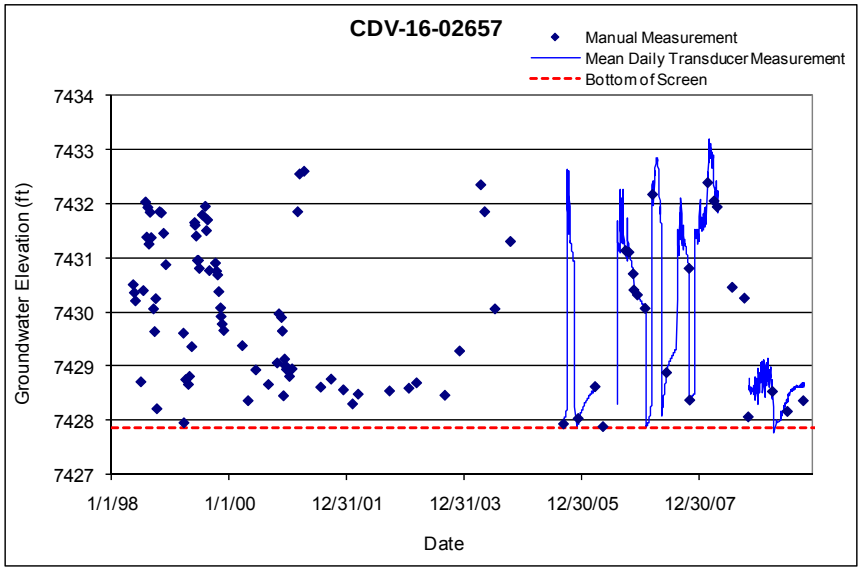


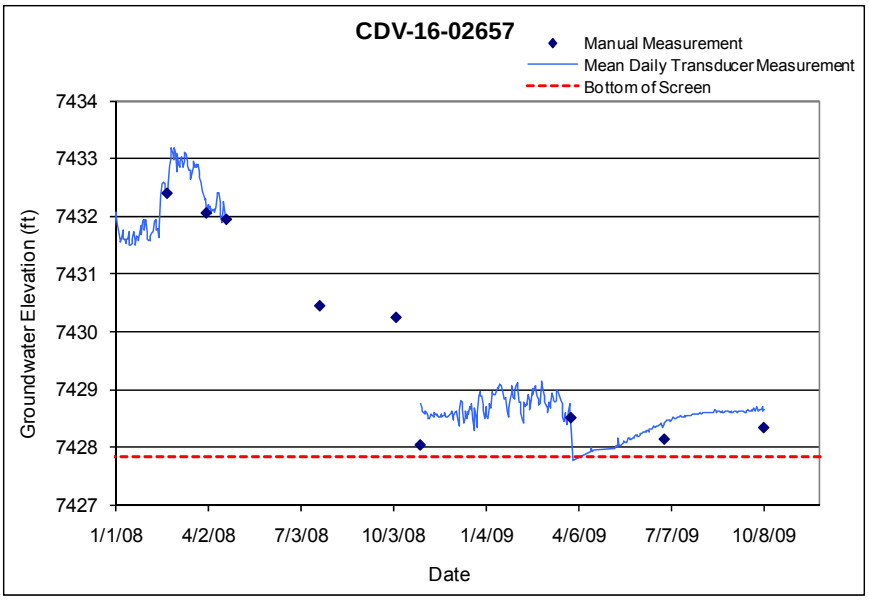
5.24 CDV-16-02657

Location: Upper Cañon de Valle at northern boundary of TA-16, approximately 200 ft east-southeast of well CDV-16-02656.
Period of Record: May 15, 1998, through October 27, 2009.
Remarks: Transducer began to malfunction around April 21, 2008; replaced October 31, 2008. This well is closed by a manhole cover, and the cable often cannot vent, resulting in mean daily transducer measurements that differ from the corresponding manual measurements.

CDV-16-02657 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	0.4	5.4	7432.85	7427.85	5.0			5.4	7427.85	5.7	0.3	0.7	Alluvial groundwater

Note: Ground Elevation: 7433.25 ft; all depths are from this elevation

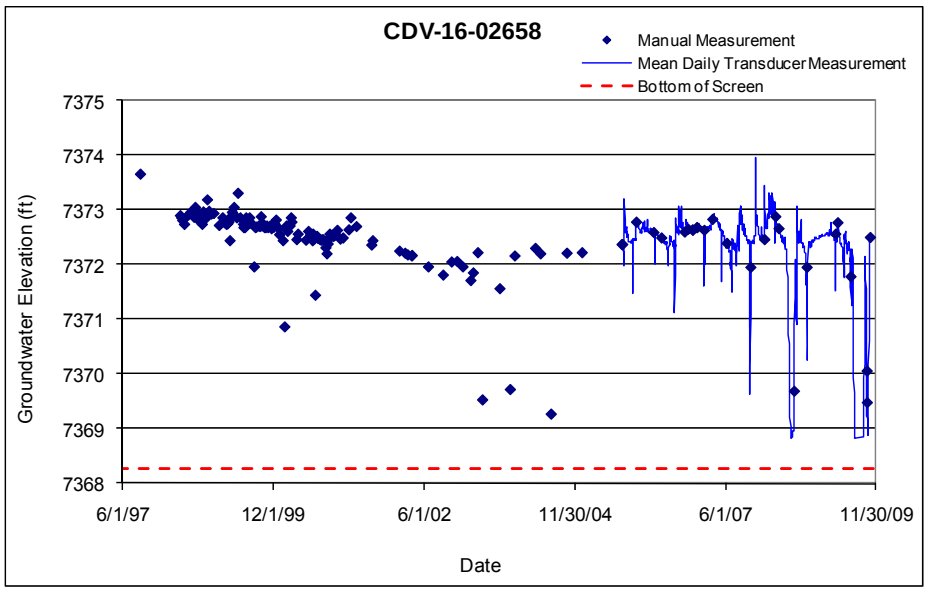


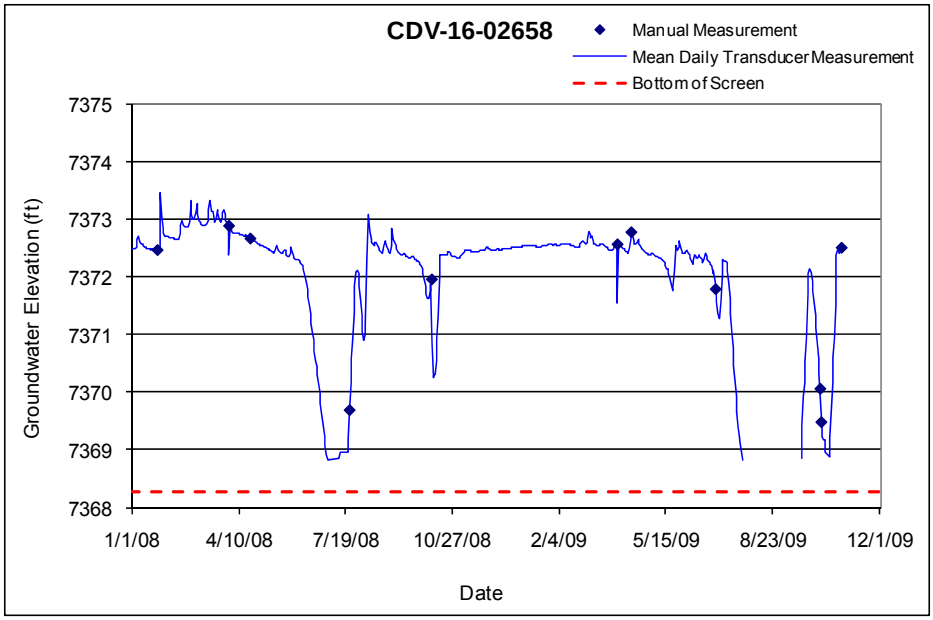


5.25 CDV-16-02658

Location: Upper Cañon de Valle at northern boundary of TA-16, approximately 200 ft east-southeast of well CDV-16-02657 and approximately 800 ft east-southeast of Burning Ground Spring.
Period of Record: September 15, 1997, through October 27, 2009.
Remarks: None.

CDV-16-02658 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.9	6.9	7373.26	7368.26	5.0			6.9	7368.26	7.2	0.3	0.7	Alluvial groundwater
Note: Aluminum Cap Elevation: 7375.60 ft; Ground Elevation: 7375.16 ft; all depths are from this elevation													

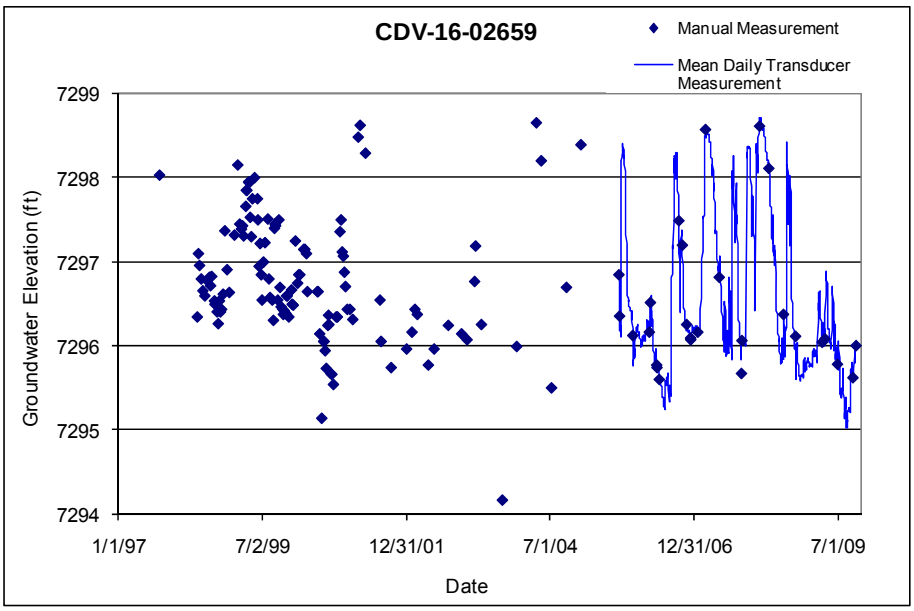


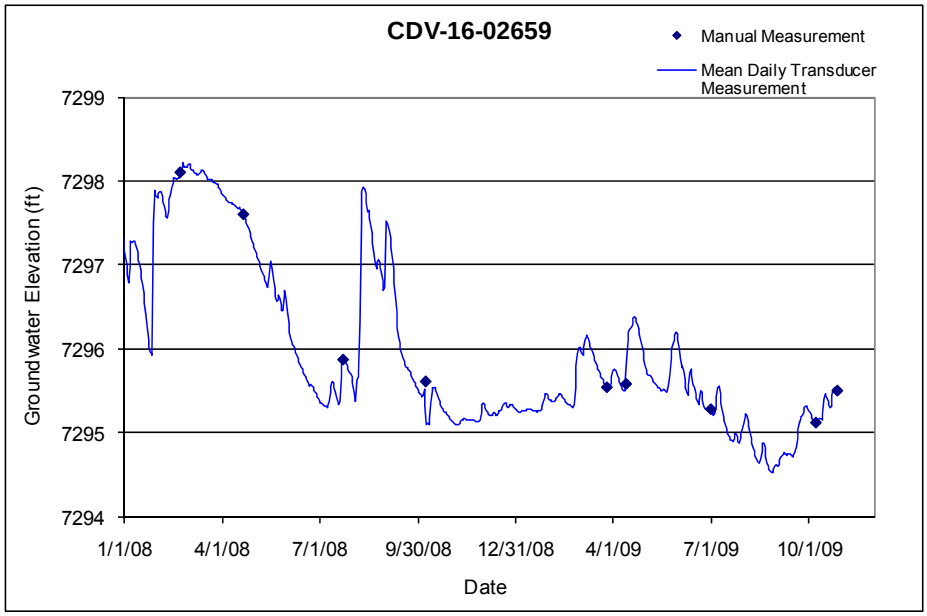


5.26 CDV-16-02659

Location: Upper Cañon de Valle at northern boundary of TA-16, approximately 1800 ft east-northeast of well CDV-16-02657.
Period of Record: September 17, 1997, through October 27, 2009.
Remarks: None.

CDV-16-02659 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.7	6.7	7298.32	7293.32	5.0			6.7	7293.32	7.0	0.3	0.7	Alluvial groundwater
Note: Aluminum Cap Elevation: 7300.50 ft, Ground Level: 7300.02; all depths are from this elevation													





5.27 FCO-1

Location: Fence Canyon, approximately 0.1 miles northwest of SR-4.
Period of Record: June 9, 1997, through October 7, 2009.
Remarks: Well has been dry since completion. A transducer was installed January 16, 2008. Water levels have remained below the screen since installation.

FCO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.4	12.4	6506.8	6496.8	10.0			2.4	6506.8	12.4	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6509.24 ft; all depths are from this elevation

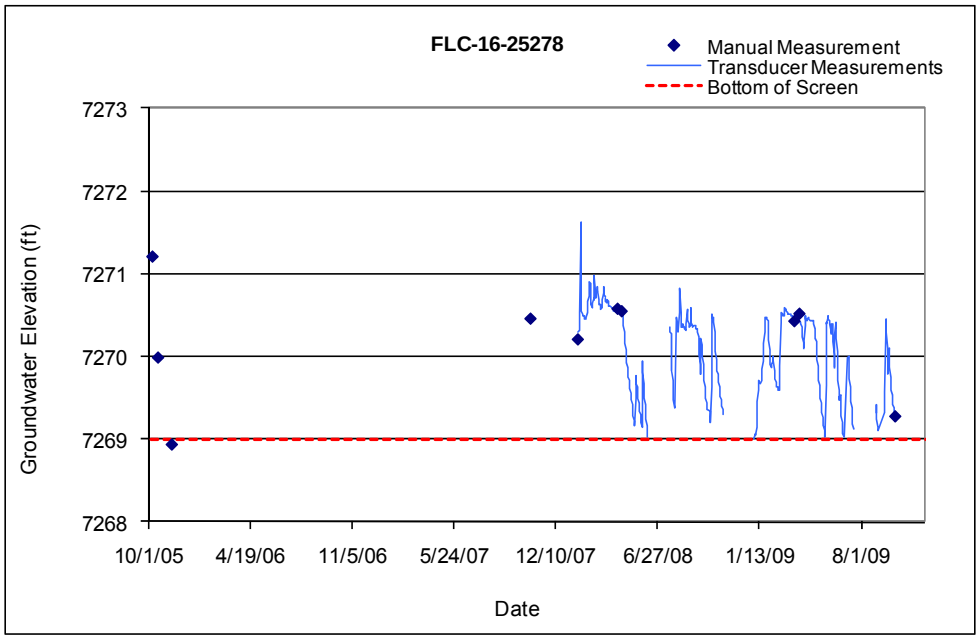
FCO-1 Manual Water Levels				
Date	Comments		Date	Comments
6/9/1997	Dry		9/14/2005	Dry
10/13/1997	Dry		6/23/2006	Dry
3/25/1998	Dry		9/8/2006	Dry
5/29/1998	Dry		12/15/2006	Dry
7/28/1998	Dry		1/24/2007	Dry
3/3/1999	Dry		3/15/2007	Dry
6/23/1999	Dry		5/24/2007	Dry
8/30/1999	Dry		6/6/2007	Dry
11/15/1999	Dry		9/5/2007	Dry
3/26/2000	Dry		10/17/2007	Dry
5/16/2000	Dry		1/16/2008	Dry
8/30/2000	Dry		4/8/2008	Dry
10/8/2000	Dry		4/25/2008	Dry
4/16/2002	Dry		7/18/2008	Dry
8/19/2002	Dry		10/7/2008	Dry
11/13/2002	Dry		3/23/2009	Dry
2/19/2003	Dry		7/2/2009	Dry
5/18/2003	Dry		10/7/2009	Dry
4/7/2004	Dry			

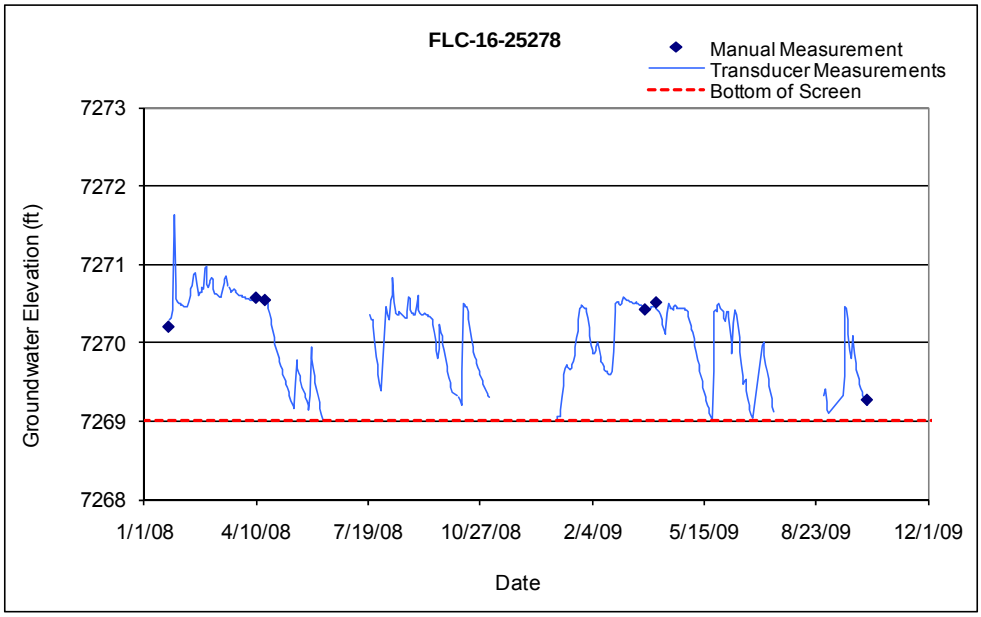
5.28 FLC-16-25278

Location: Fish Ladder Canyon, approximately 0.1 miles southeast of the TA-16 Burning Grounds.
Period of Record: June 9, 1997, through October 7, 2009.
Remarks: Water levels frequently drop below the screen.

FLC-16-25278 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.6	3.2	7270.6	7269.0	1.6			3.2	7269	3.4	0.2	0.12	Alluvial groundwater

Note: Ground Elevation: 7272.20 ft; all measurements are from this elevation



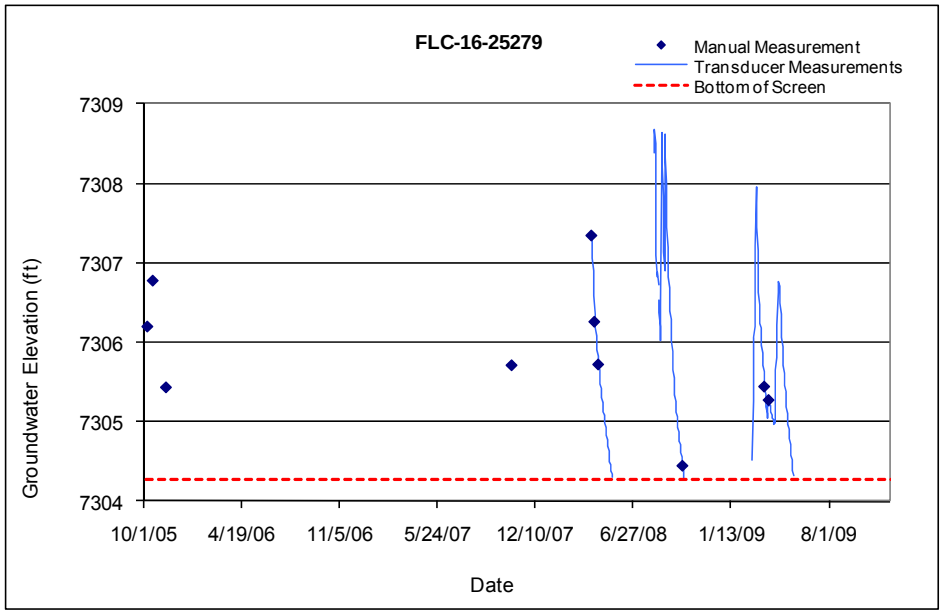


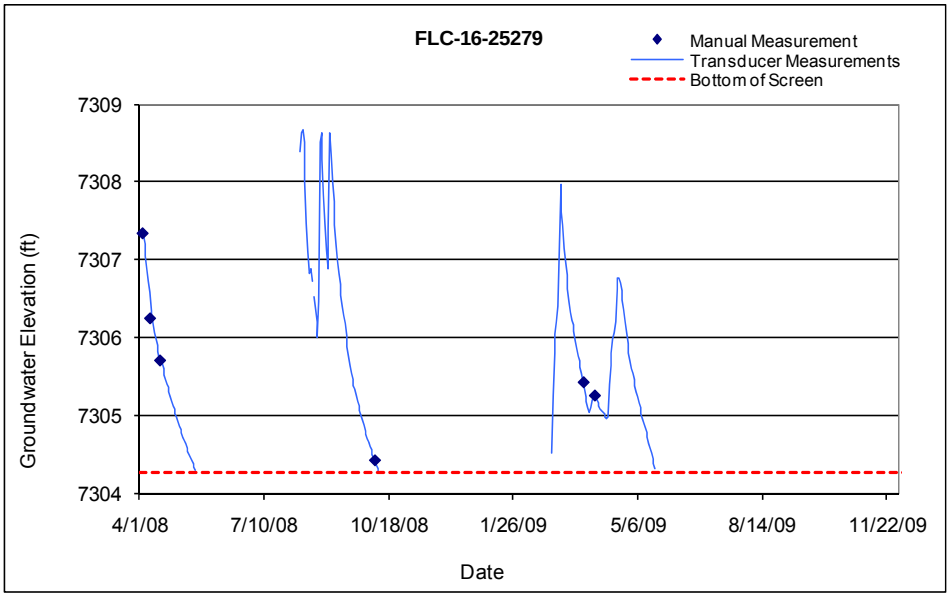
5.29 FLC-16-25279

Location: Fish Ladder Canyon, approximately 0.2 miles east of the FLC-16-25278.
Period of Record: June 9, 1997, through October 7, 2009.
Remarks: Water levels frequently drop below the screen. Bottom of screen is calculated to be at 7304.29 ft, rather than what was originally reported.

FLC-16-25279 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.7	4.3	7306.60	7305.00	1.6			4.3	7305	4.5	0.2	0.12	Alluvial groundwater

Note: Ground Elevation: 7309.30 ft; all measurements are from this elevation



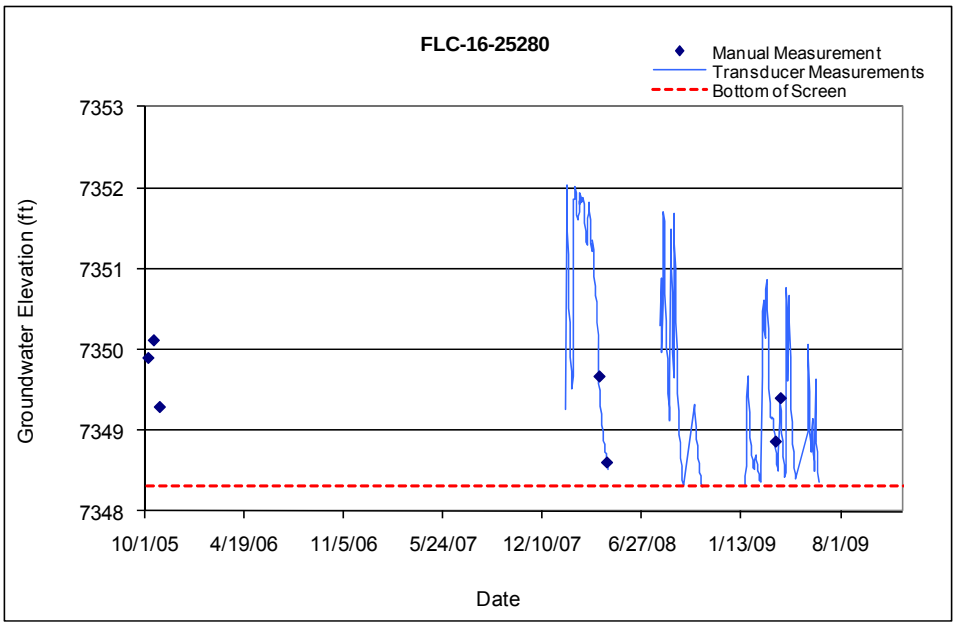


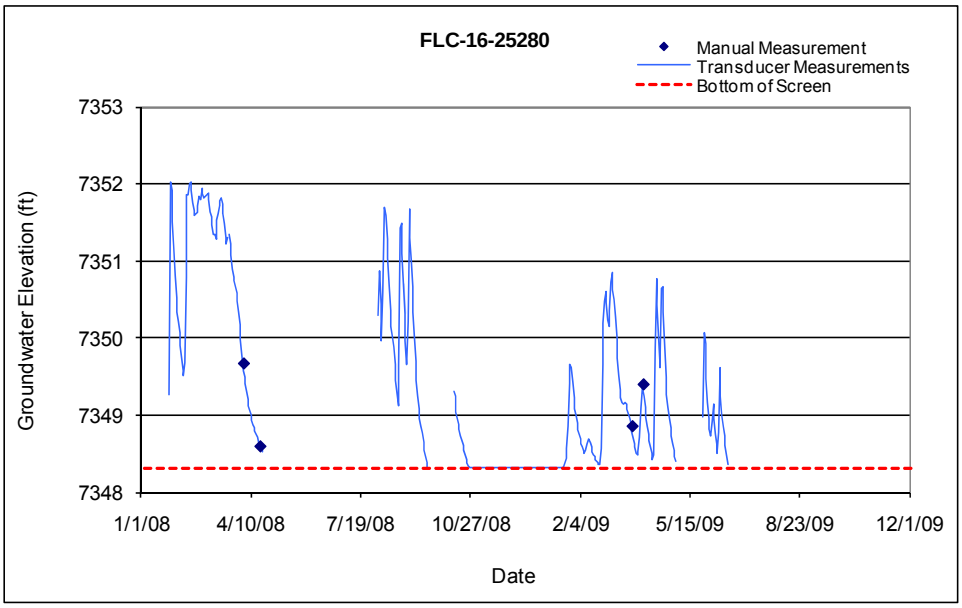
5.30 FLC-16-25280

Location: Fish Ladder Canyon, approximately 0.2 miles east of the FLC-16-25279.
Period of Record: June 9, 1997, through October 7, 2009.
Remarks: Water levels frequently drop below the screen.

FLC-16-25280 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.6	4.2	7350.3	7348.7	1.6			4.2	7348.7	4.4	0.2	0.12	Alluvial groundwater

Note: Ground Elevation: 7352.90 ft; all measurements are from this elevation



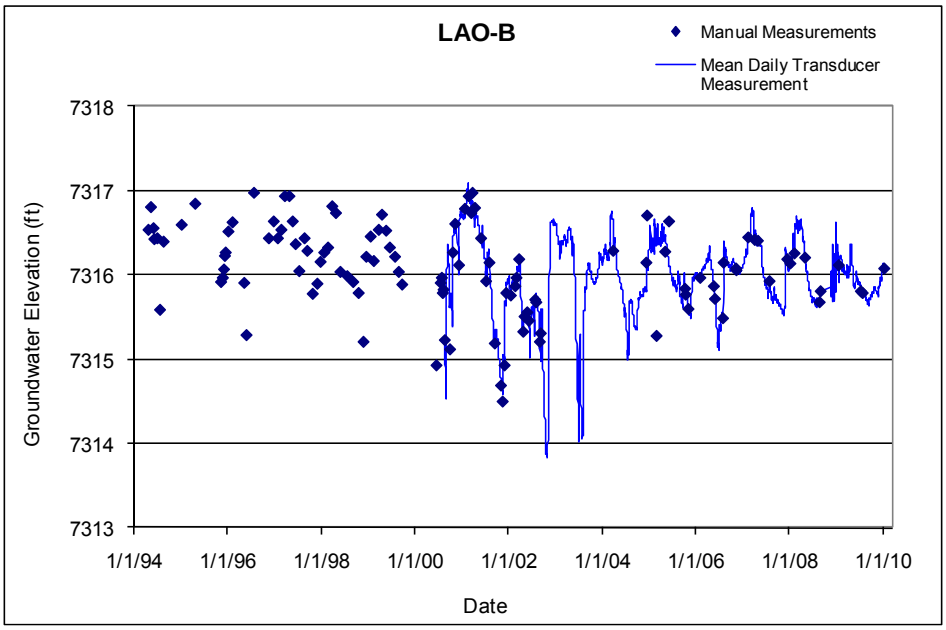


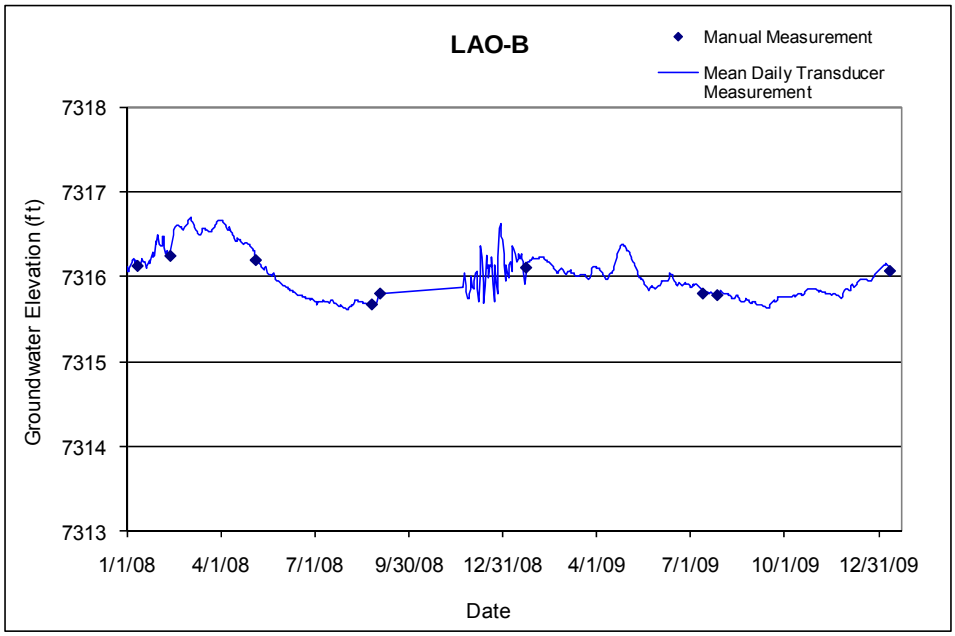
5.31 LAO-B

Location: Upper Los Alamos Canyon, approximately 3000 ft west of the Diamond Drive bridge.
Period of Record: April 28, 1994, through January 12, 2010.
Remarks: None.

LAO-B Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	11.8	26.8	7311.8	7296.8	15.0			26.8	7296.8	27.2	0.4	0.9	Alluvial groundwater

Note: Ground elevation is 7323.59 ft; all depths are from this elevation





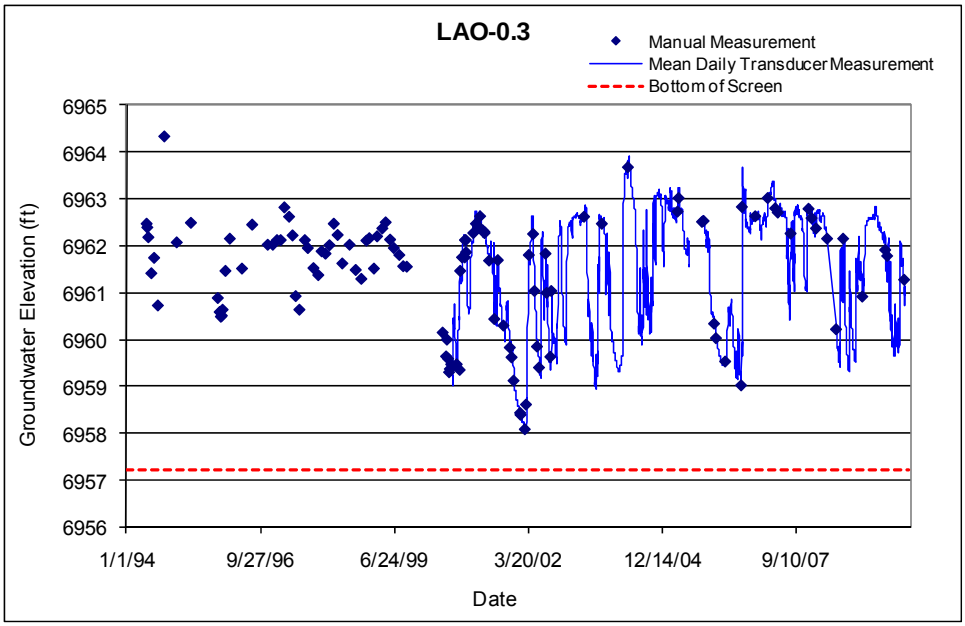
5.32 LAO-0.3

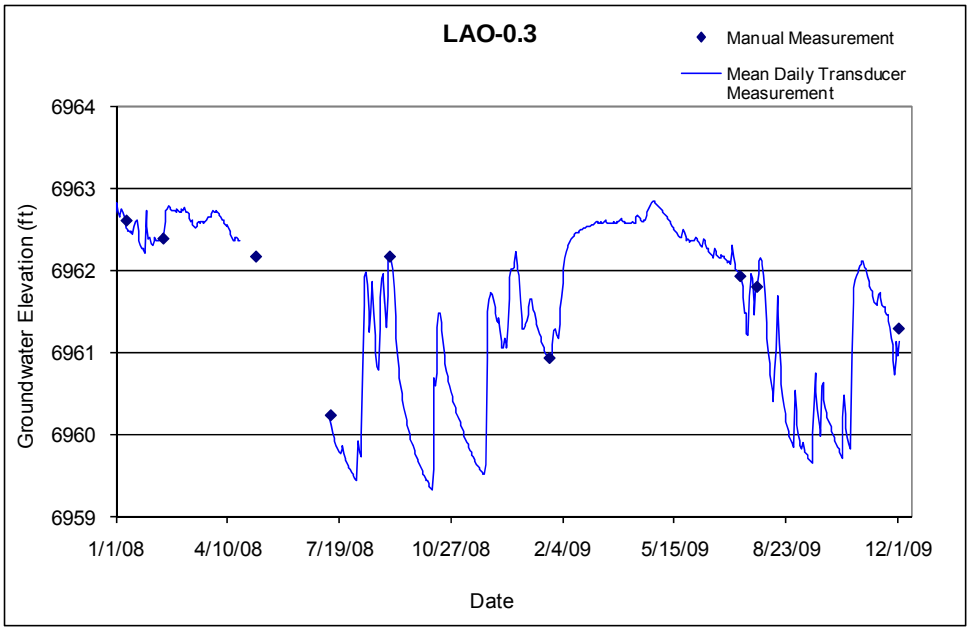
Location: Upper Los Alamos Canyon, approximately 5700 ft east of the Diamond Drive bridge.
Period of Record: June 1, 1994, through December 2, 2009.
Remarks: Transducer readings were not valid from July 7, 2005, through October 12, 2005; the pressure sensor was in the mud at the bottom of the well.

LAO-0.3 Construction Information

Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	5.9	10.9	6962.23	6957.23	5.0			10.9	6957.23	11.25	0.35	0.86	Alluvial groundwater

Note: LAO-0.3 Ground elevation is 6968.13 ft; all depths are from this elevation



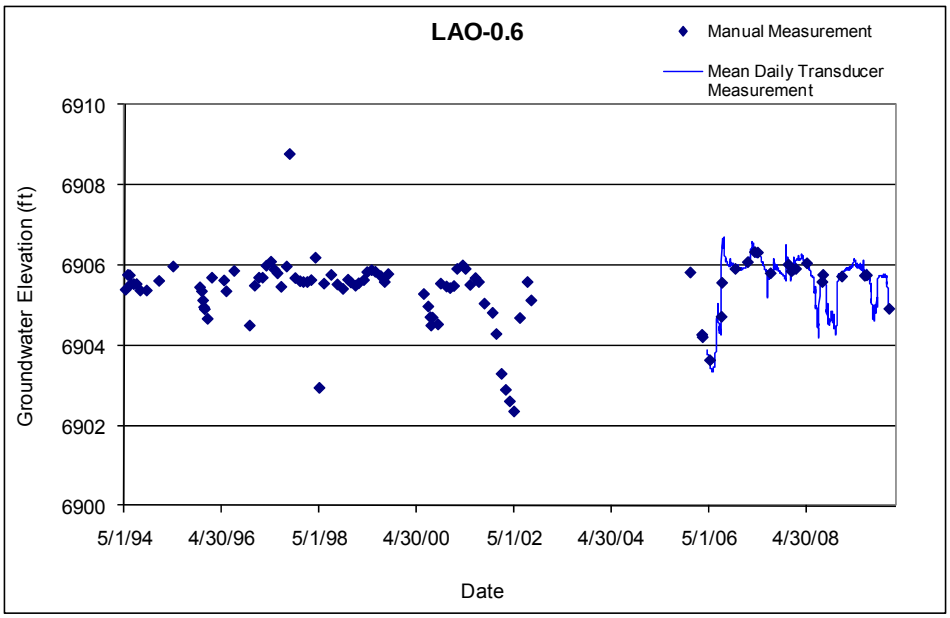


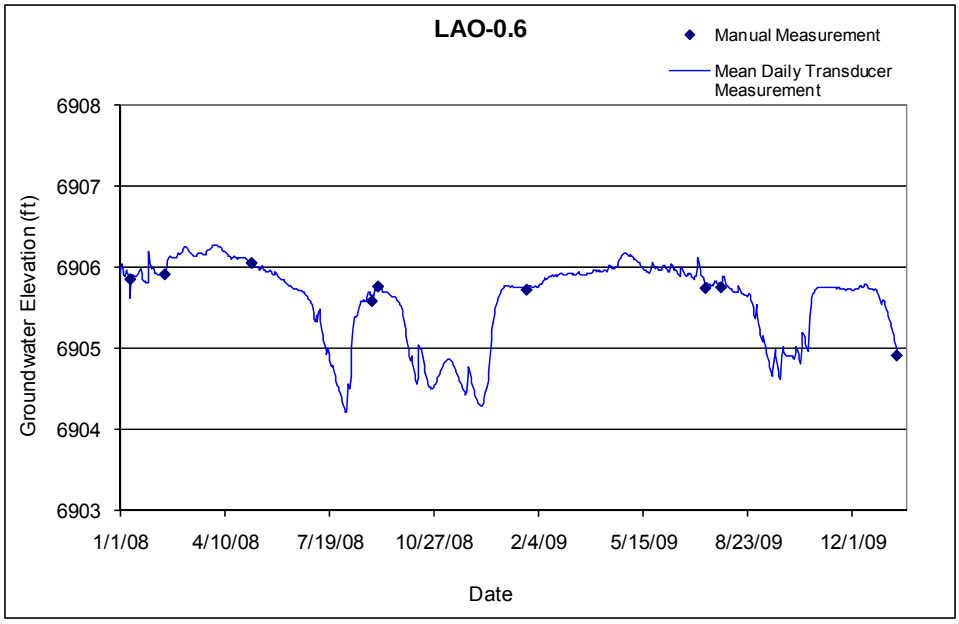
5.33 LAO-0.6

Location: Los Alamos Canyon, approximately 7500 ft east of the Diamond Drive bridge.
Period of Record: May 6, 1994, through January 12, 2010.
Remarks: None.

LAO-0.6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	8.0	13.0	6902.34	6897.34	5			13.0	6897.34	13.35	0.35	0.86	Alluvial Groundwater

Note: Aluminum Cap Elevation: 6910.74 ft; Ground elevation is 6910.34 ft; all depths are from this elevation



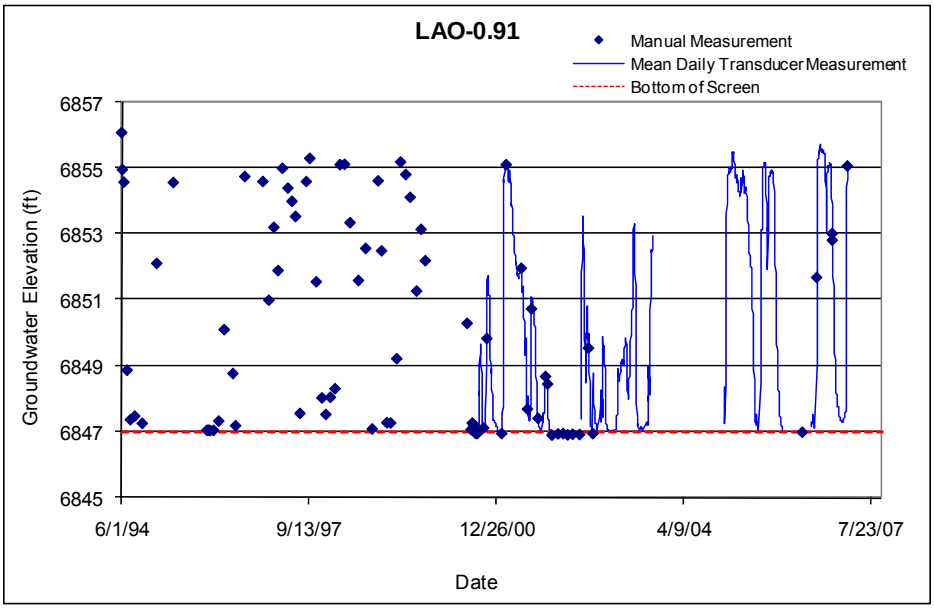


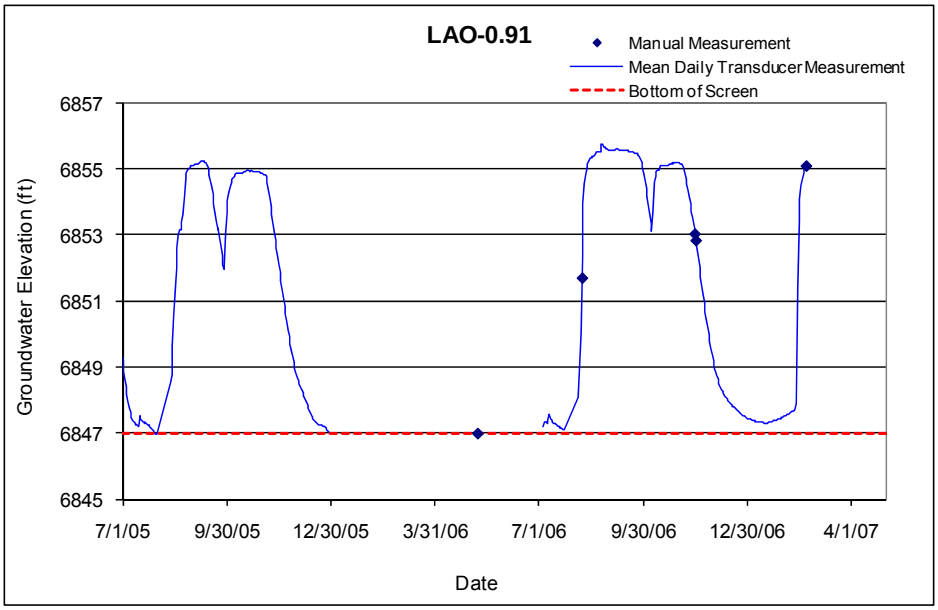
5.34 LAO-0.91

Location: Los Alamos Canyon approximately 10,200 ft east of the Diamond Drive bridge and approximately 100 ft east of the eastern boundary of TA-2.
Period of Record: June 1, 1994, through February 21, 2007.
Remarks: Monitoring of this well was discontinued February 21, 2007.

LAO-0.91 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	9.5	14.5	6851.66	6846.66	5.0	NA	NA	14.5	6846.66	14.9	0.4	0.9	Alluvial groundwater

Note: Ground elevation is 6861.74 ft; all depths from this elevation



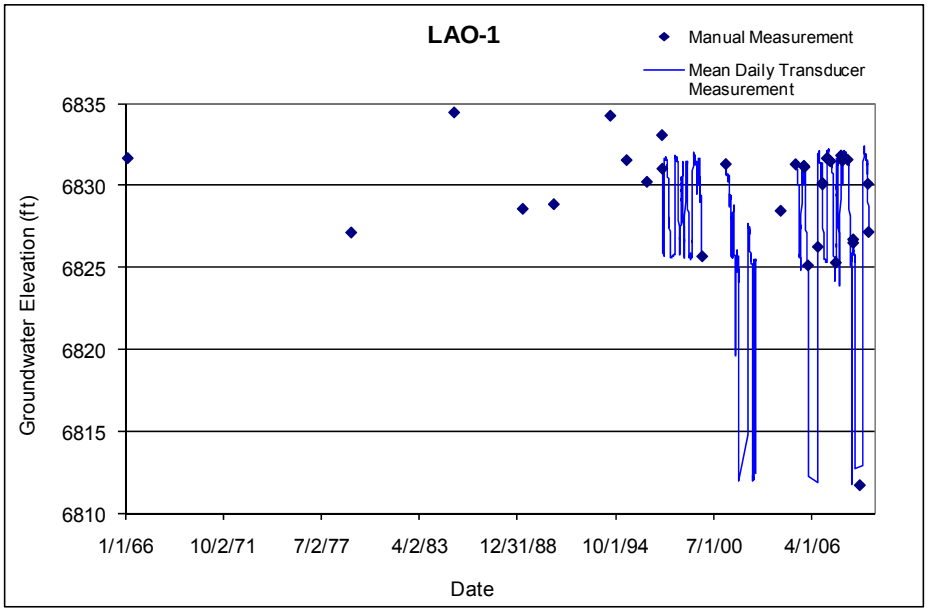


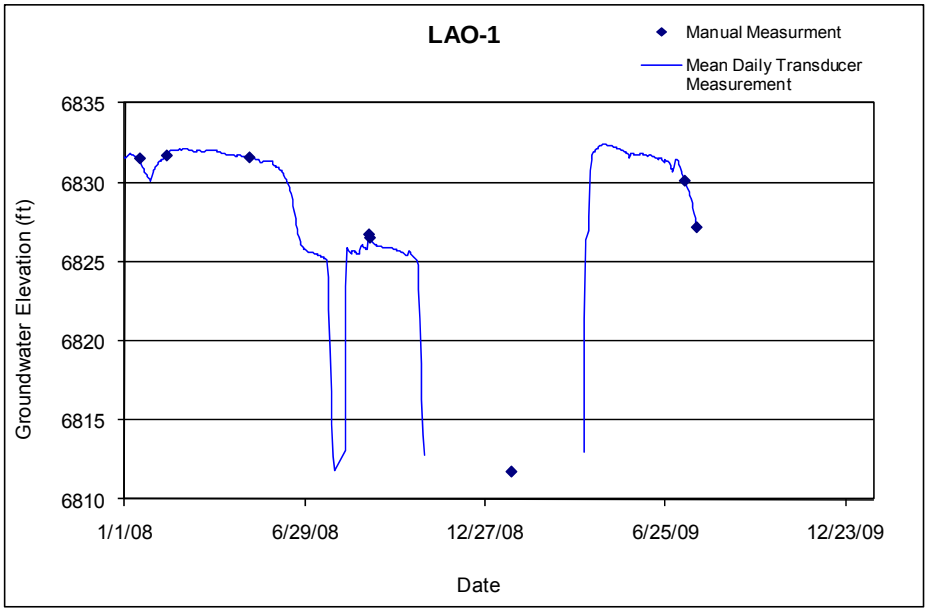
5.35 LAO-1

Location: Los Alamos Canyon, near the eastern border of TA-2.
Period of Record: February 15, 1966, through January 12, 2010.
Remarks: LAO-1 is a 2-in.-diameter well with a dedicated bladder pump. The transducer is sitting on top of the pump. Water levels were below the transducer in December 2008 and January 2009.

LAO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	8	28	6828.24	6808.24	20			28	6808.24	28	0	0	Alluvial groundwater

Note: Ground elevation is 6836.24 ft; all depths are from this elevation



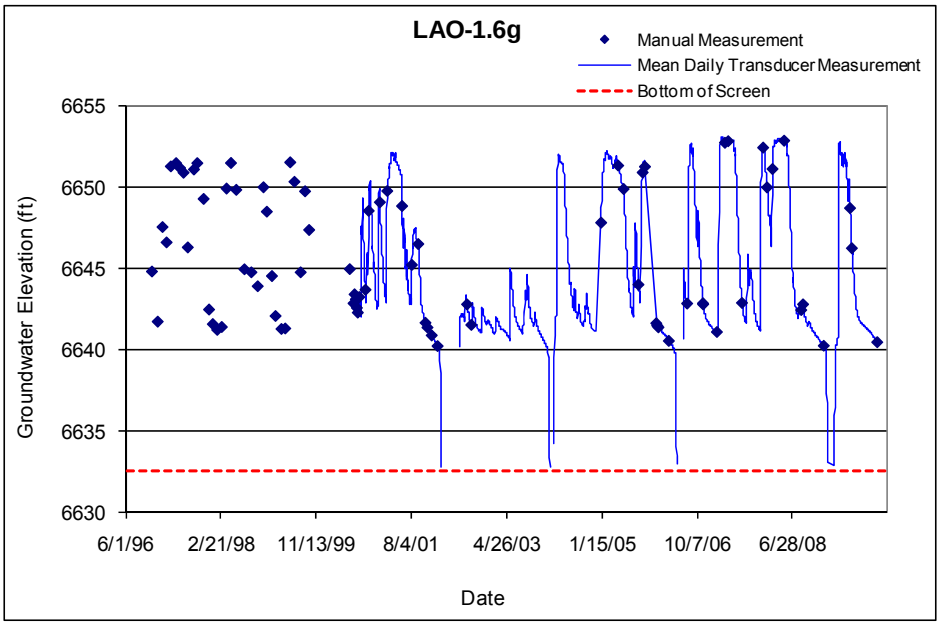


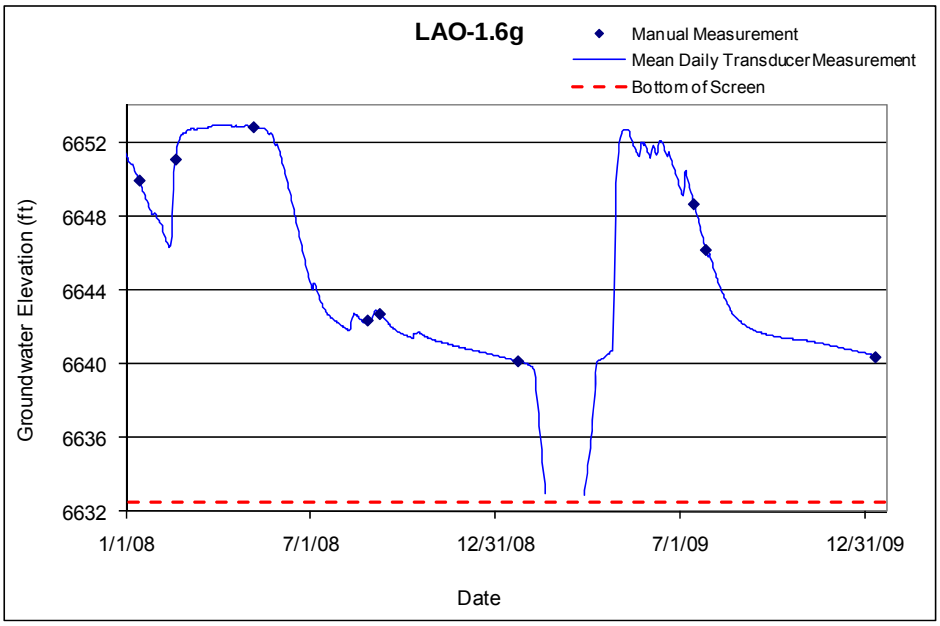
5.36 LAO-1.6g

Location: Los Alamos Canyon, approximately 400 ft west of the confluence with DP Canyon.
Period of Record: November 22, 1996, through January 12, 2010.
Remarks: None.

LAO-1.6G Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	10.5	25.5	6647.5	6632.5	15.0		6658.0	25.5	6632.5	30.82	5.4	13.2	Alluvial well

Note: Ground elevation is 6658.01 ft; all depths are from this elevation



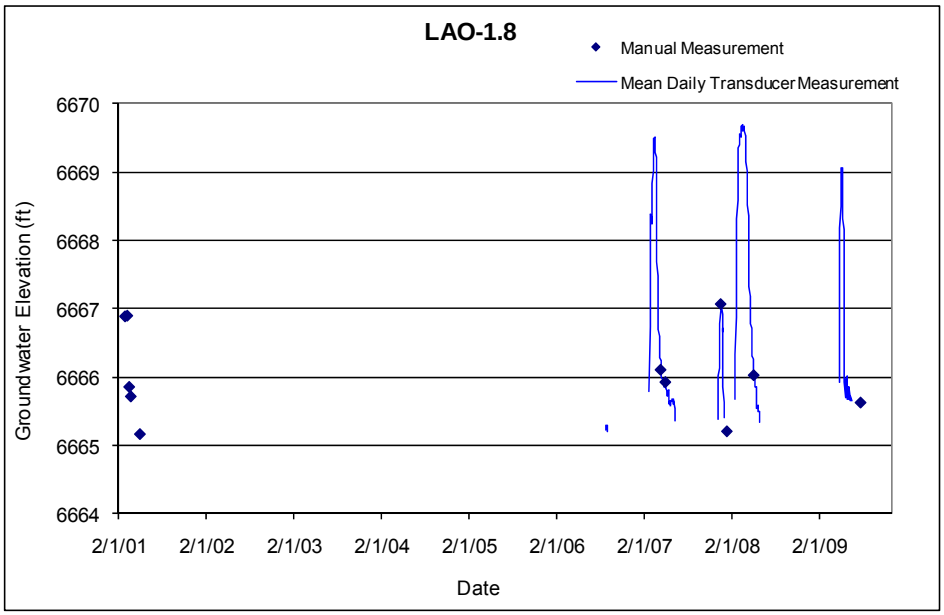


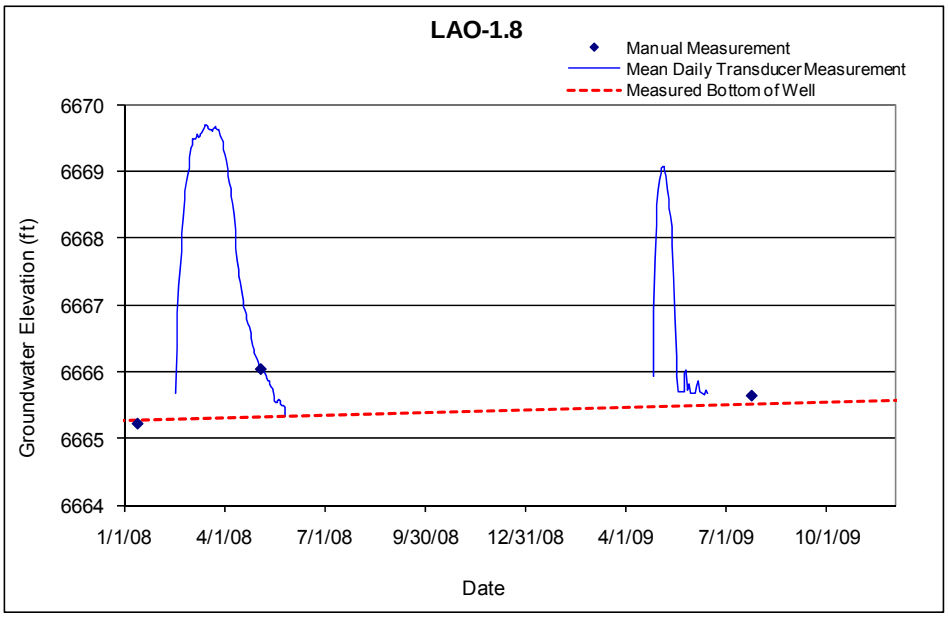
5.37 LAO-1.8

Location: Los Alamos Canyon, approximately 650 ft west of LAO-1.6g.
Period of Record: January 8, 2001, through January 7, 2010.
Remarks: This well frequently runs dry. The total depth of the well has changed over the years as it silts in, and is currently around 6665.6 ft. Monitoring in this well ceased on January 7, 2010.

LAO-1.8 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	8	18	6672.00	6662.00	10			18	6662.00	18	0	0	Alluvial Groundwater

Note: Brass Cap Elevation: 6680.00 ft; all depths are from this elevation



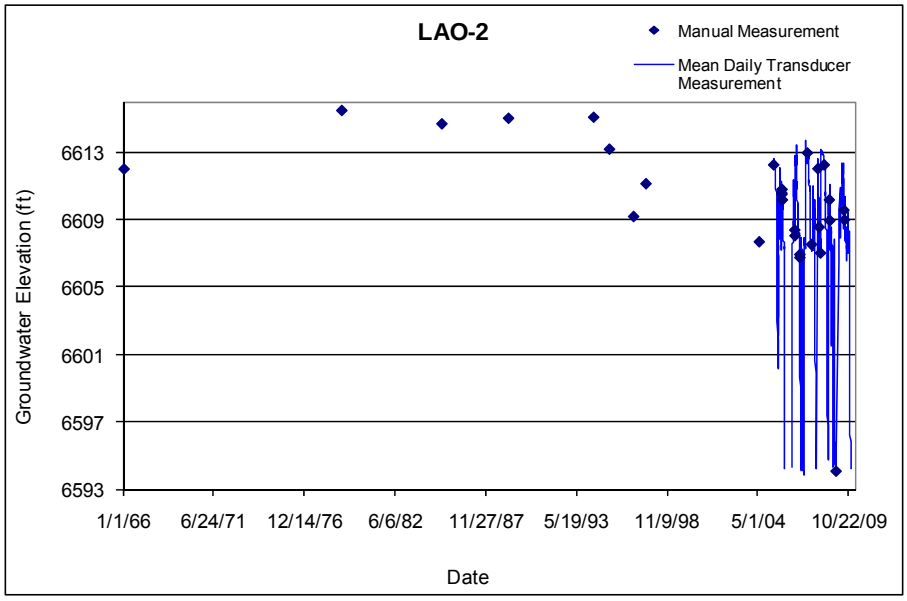


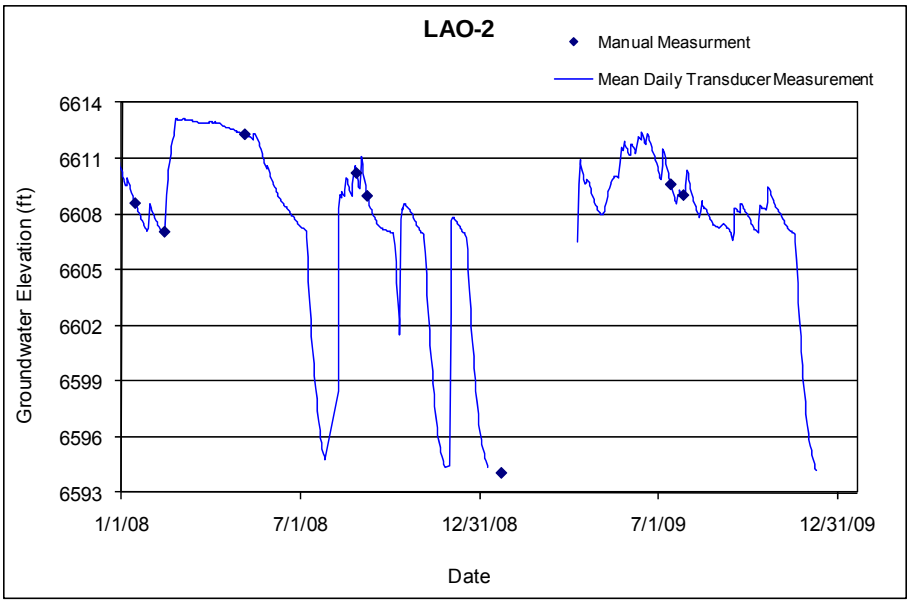
5.38 LAO-2

Location: Los Alamos Canyon, approximately 75 ft north of the confluence with DP Canyon.
Period of Record: February 1, 1966, through January 12, 2010.
Remarks: The transducer in this well is installed above the top of the pump with the transducer sensor at 6563.88 ft. Water level elevations below 6563.88 ft are not represented by transducer data.

LAO-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	12	32	6580.97	6560.97	20			32	6560.97	32	0	0	Alluvial Groundwater

Note: Brass Cap Elevation is 6592.97 ft; all depths are from this elevation



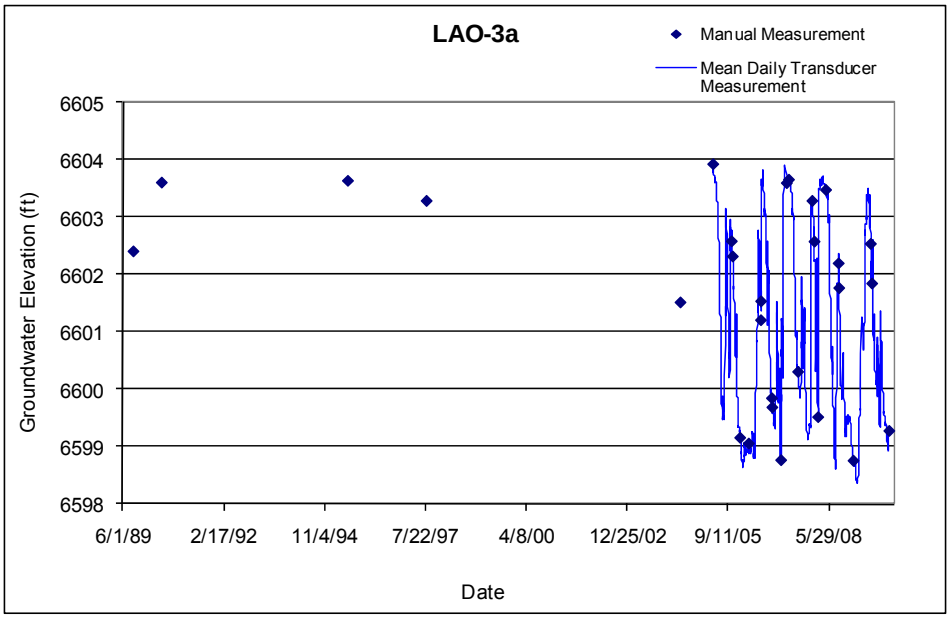


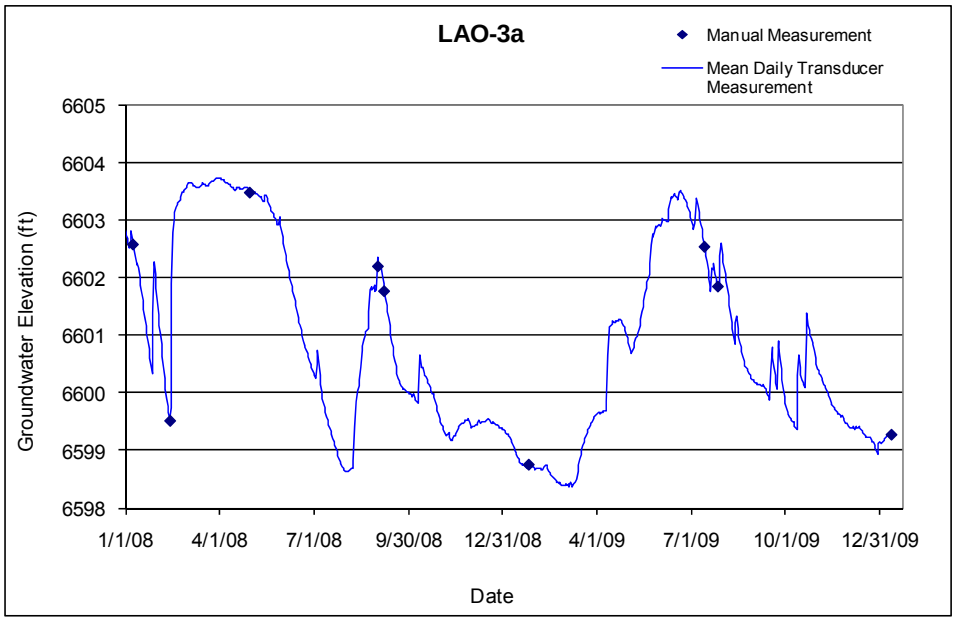
5.39 LAO-3a

Location: Los Alamos Canyon, approximately 1000 ft east of the confluence with DP Canyon.
Period of Record: September 15,1989, through January 12, 2010.
Remarks: None.

LAO-3a Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	4.7	14.7	6574.7	6564.7	10.0			14.7	6564.7	15	0.3	0.2	Alluvial groundwater

Note: Ground elevation is 6579.40 ft; all depths are from this elevation



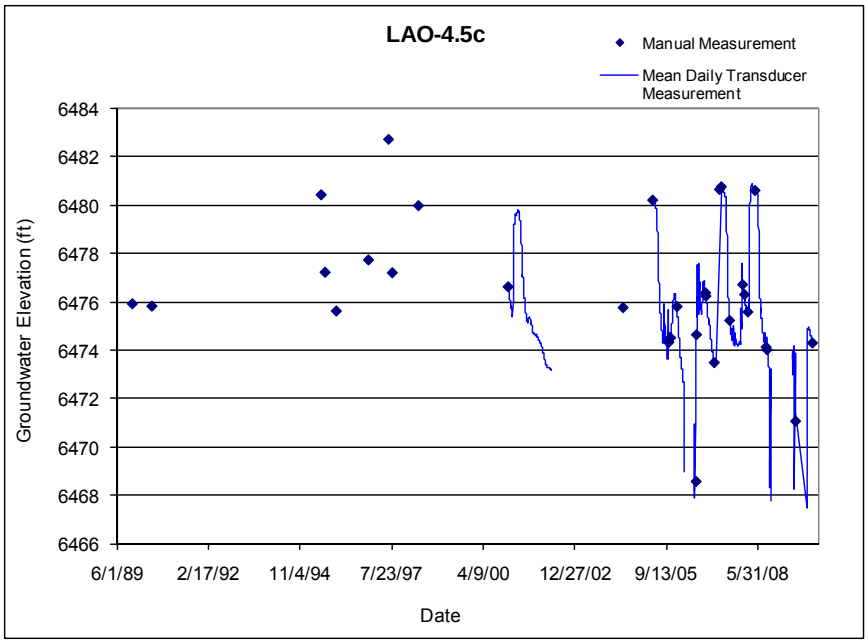


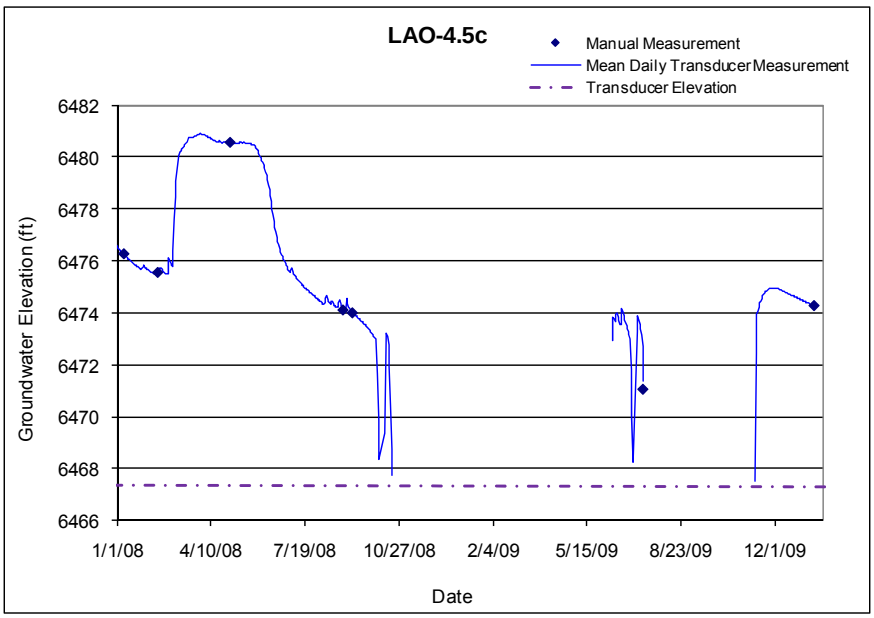
5.40 LAO-4.5c

Location: Los Alamos Canyon, approximately 1.25 miles east of the confluence with DP Canyon.
Period of Record: November 22, 1989, through January 12, 2010.
Remarks: The transducer is resting on top of the bladder pump; water levels below 6438.34 ft are not recorded by the transducer. This well also tends to run dry.

LAO-4.5c Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	13.3	23.3	6444.33	6434.33	10.0			23.3	6434.33	23.3	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6457.63 ft; all depths are from this elevation





5.41 LAO-5

Location: Los Alamos Canyon, approximately 1 mile west of SR-4.
Period of Record: December 14, 2005, through January 7, 2010.
Remarks: LAO-5 was not installed with a pressure transducer and was measured manually on a quarterly schedule. Regular monitoring of the well was discontinued January 9, 2008, and manual water levels are currently only taken for sampling events.

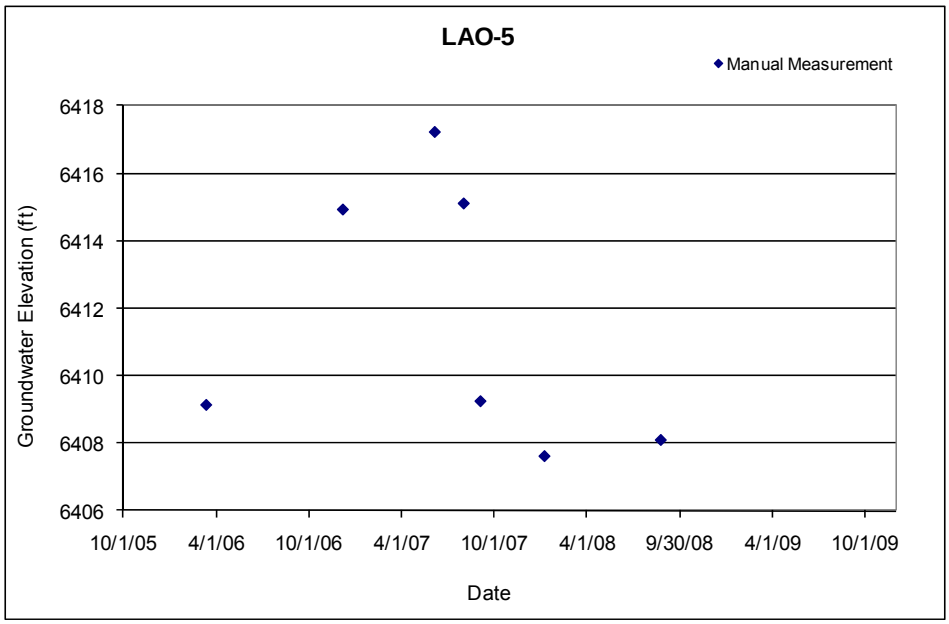
LAO-5 Construction Information

Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	5.0	25.0	6393.3	6373.3	20.0			25.0	6373.3	25.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6398.3 ft; all depths are from this elevation

LAO-5 Manual Water Levels

Date	Manual Water Level (ft)
12/14/05	Dry
3/14/06	6409.12
6/13/06	Dry
8/2/06	Dry
8/3/06	Dry
9/7/06	Dry
12/8/06	6414.92
3/13/07	Dry
6/7/07	6417.22
8/3/07	6415.1
9/5/07	6409.23
1/9/08	6407.6
8/25/08	6408.08
1/6/09	Dry
7/8/09	Dry
1/7/2010	Dry



5.42 LAO-6

Location: Los Alamos Canyon, approximately 1 mile west of SR-4.
Period of Record: June 26, 1995, through January 28, 2009.
Remarks: Regular monitoring of this well was discontinued January 2, 2008, and manual water levels were obtained for sampling events only. All monitoring of this well was discontinued as of December 2009.

LAO-6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	6.0	16.0	6389.3	6379.3	10.0			16.0	6379.3	16.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6395.3 ft; all depths are from this elevation

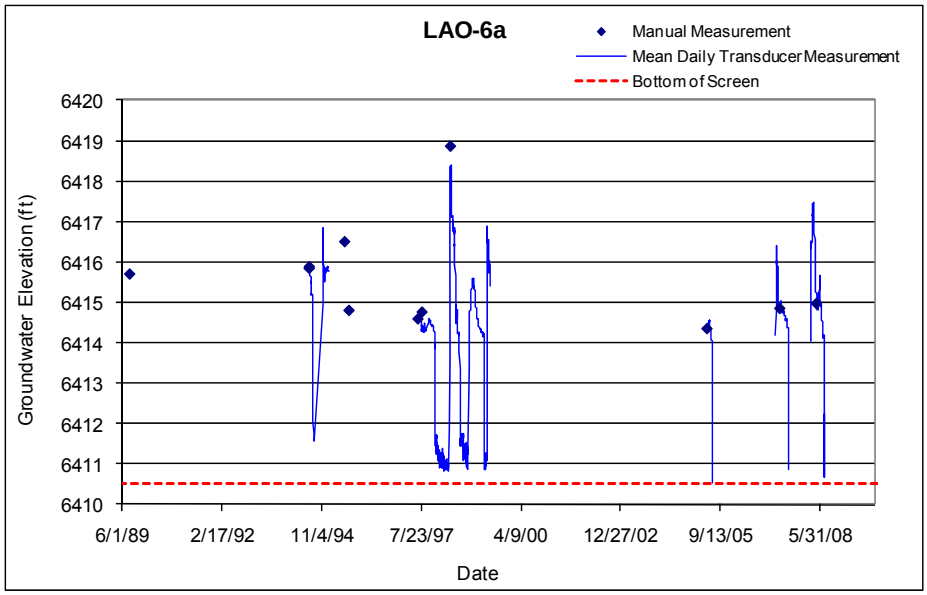
Date	Manual Water Level (ft)
6/26/1995	6385.6
8/8/1995	6385.1
12/7/1995	6383.5
3/14/2006	Dry
4/19/2006	Dry
6/13/2006	Dry
7/27/2006	Dry
9/7/2006	Dry
12/8/2006	Dry
3/13/2007	Dry
6/7/2007	6383.47
9/5/2007	Dry
1/9/2008	Dry
1/7/2009	Dry

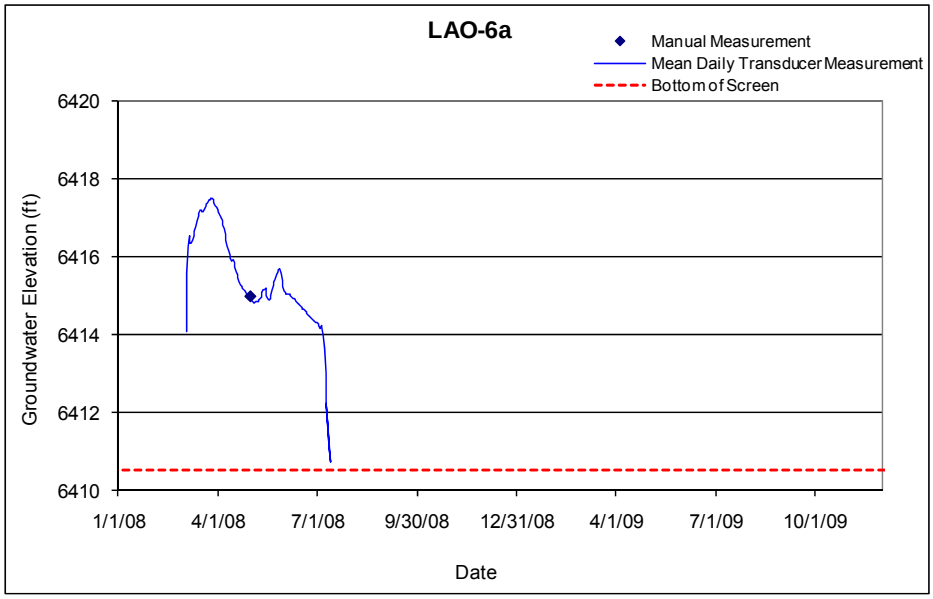
5.43 LAO-6a

Location: Los Alamos Canyon, approximately 1 mile west of SR-4.
Period of Record: August 17, 1989, through January 7, 2010.
Remarks: Well is seasonally dry.

LAO-6a Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	4.2	14.2	6391.68	6381.68	10.0			14.2	6381.68	14.2	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6395.88 ft; all depths are from this elevation



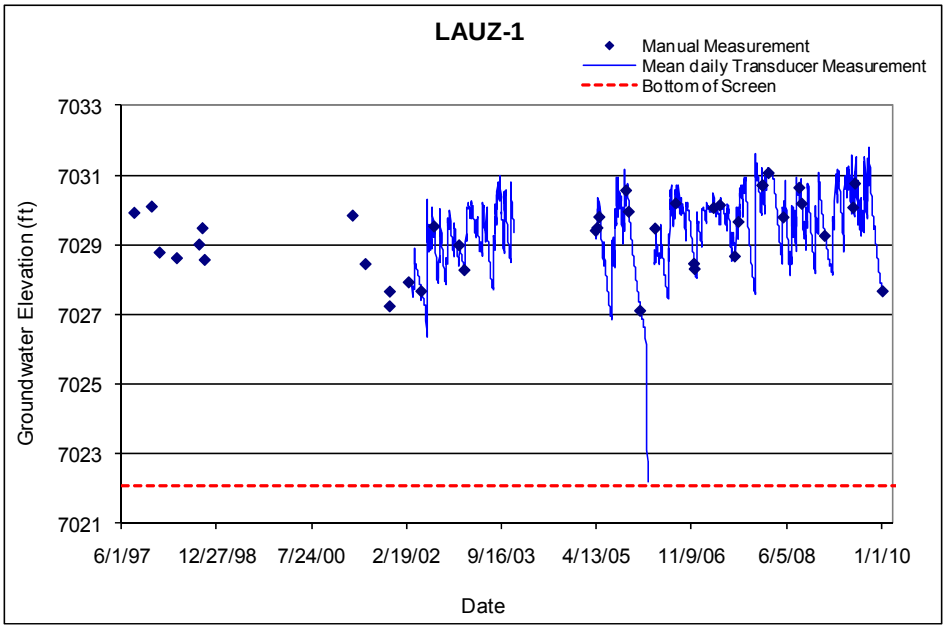


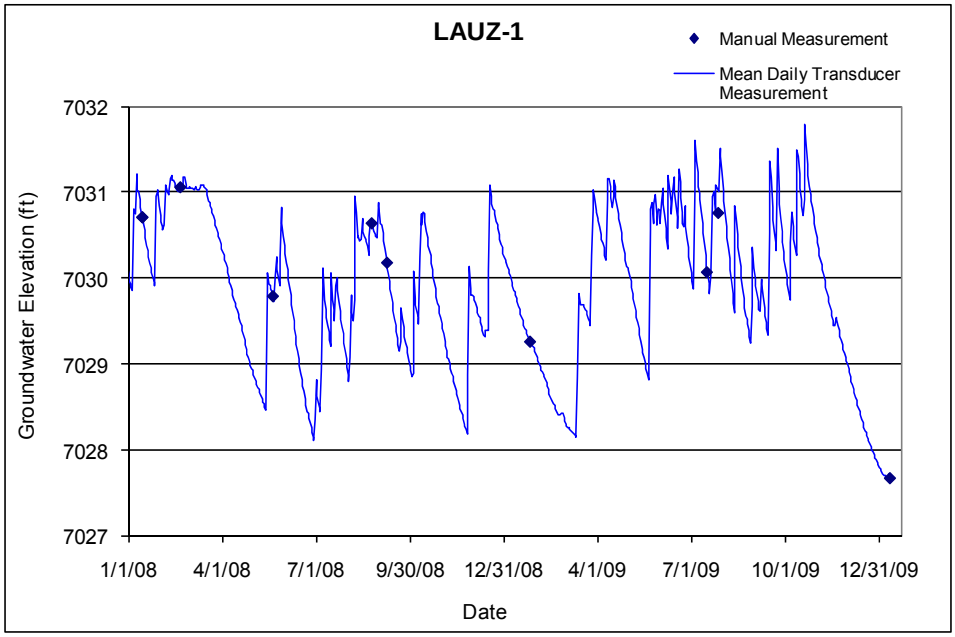
5.44 LAUZ-1

Location: DP Canyon, north of TA-21.
Period of Record: August 20, 1997, through January 11, 2010.
Remarks: None.

LAUZ-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	5.35	10.35	7027.07	7022.07	5.00			10.35	7022.07	10.55	0.20	0.49	Alluvial groundwater

Note: Ground elevation is 7032.42 ft; all depths are from this elevation



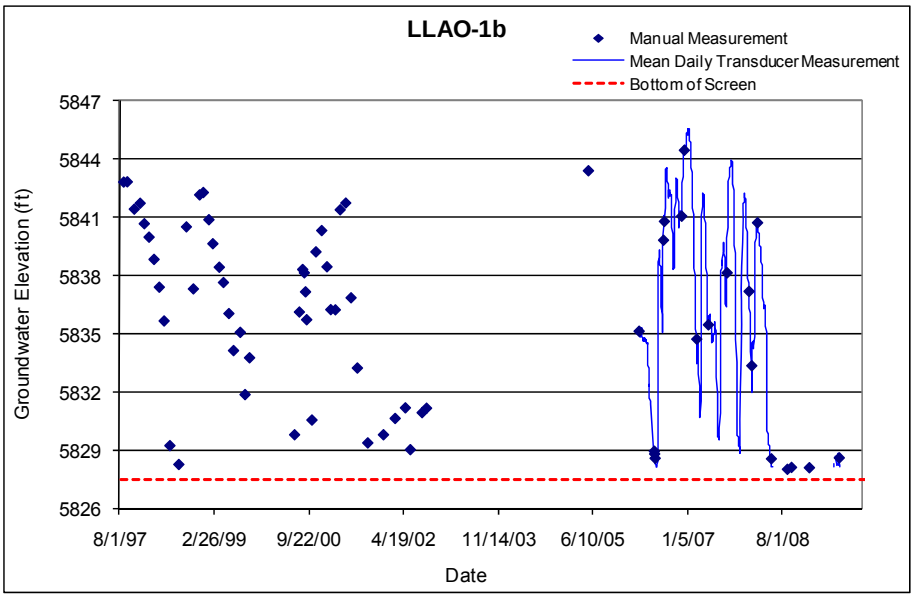


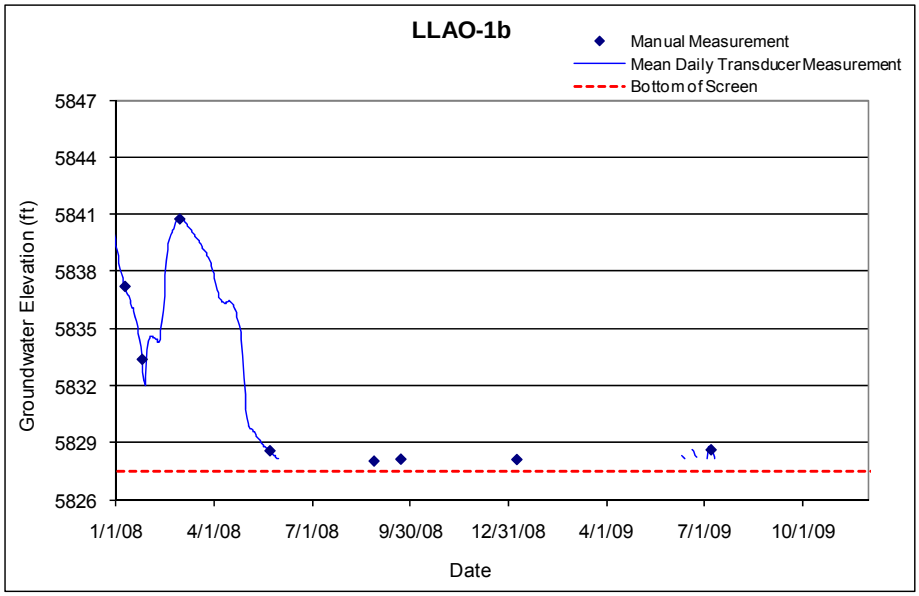
5.45 LLAO-1b

Location: Lower Los Alamos Canyon, approximately 3000 ft southwest of Totavi on San Ildefonso Pueblo land.
Period of Record: August 27, 1997, through January 7, 2010.
Remarks: Well has mostly remained dry since June 1, 2008, with the exception of a brief rise in June 2009.

LLAO-1b Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	11.32	21.32	5837.52	5827.52	10.00			21.32	5827.52	24.17	2.85	7.04	Alluvial groundwater

Note: Ground elevation is 5850.34 ft; all measurements are from this elevation



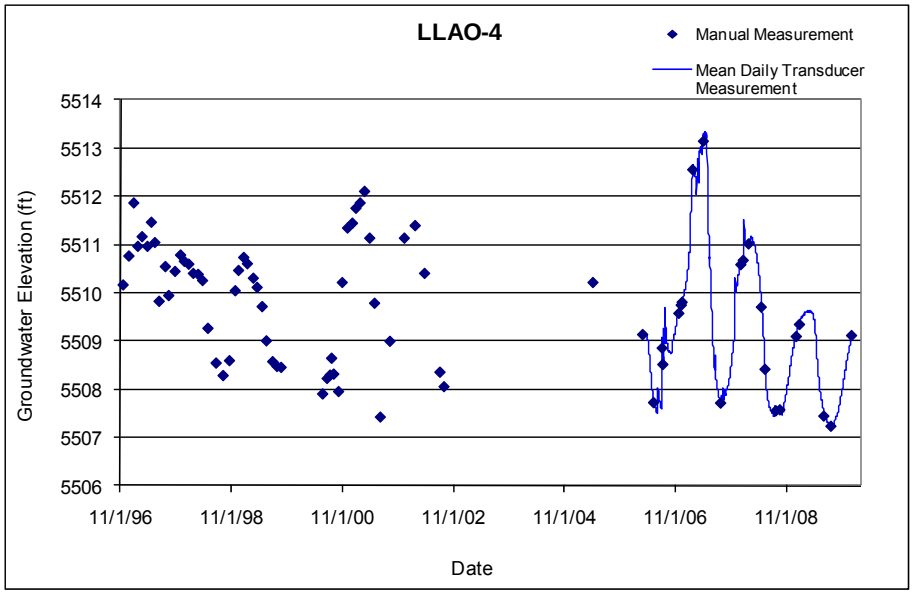


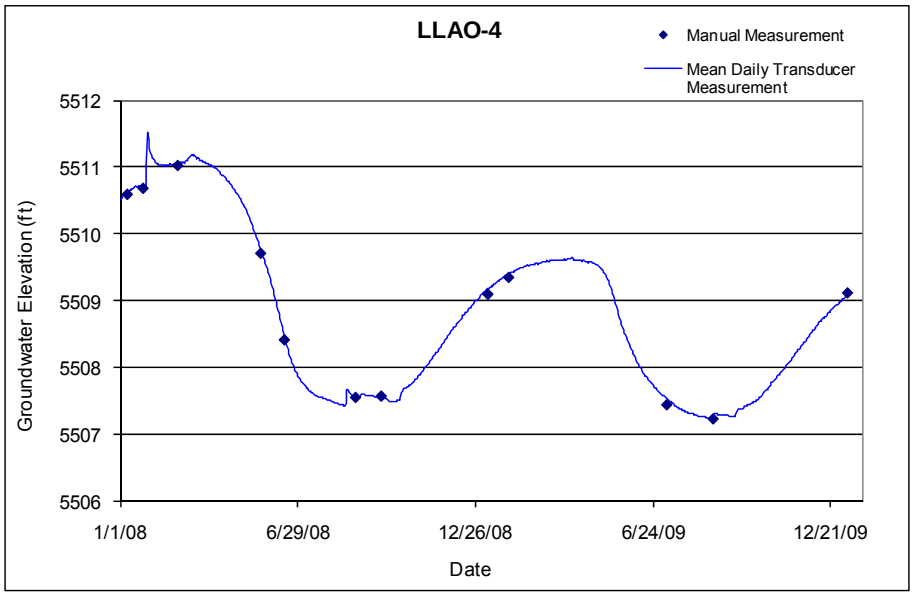
5.46 LLAO-4

Location: Lower Los Alamos Canyon, approximately 700 ft northwest of the Rio Grande at SR-502 on San Ildefonso Pueblo land.
Period of Record: November 22, 1996, through January 7, 2010.
Remarks: None.

LLAO-4 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	5.24	15.24	5509.97	5499.97	10.00			15.24	5499.97	18.09	2.85	7.04	Alluvial groundwater

Note: Ground elevation is 5515.46 ft; all depths are from this elevation



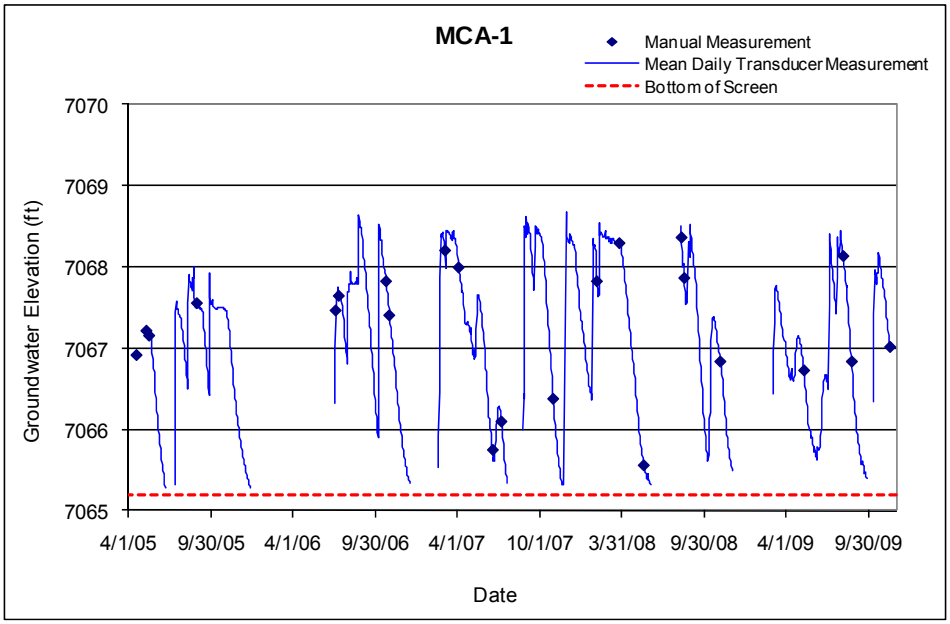


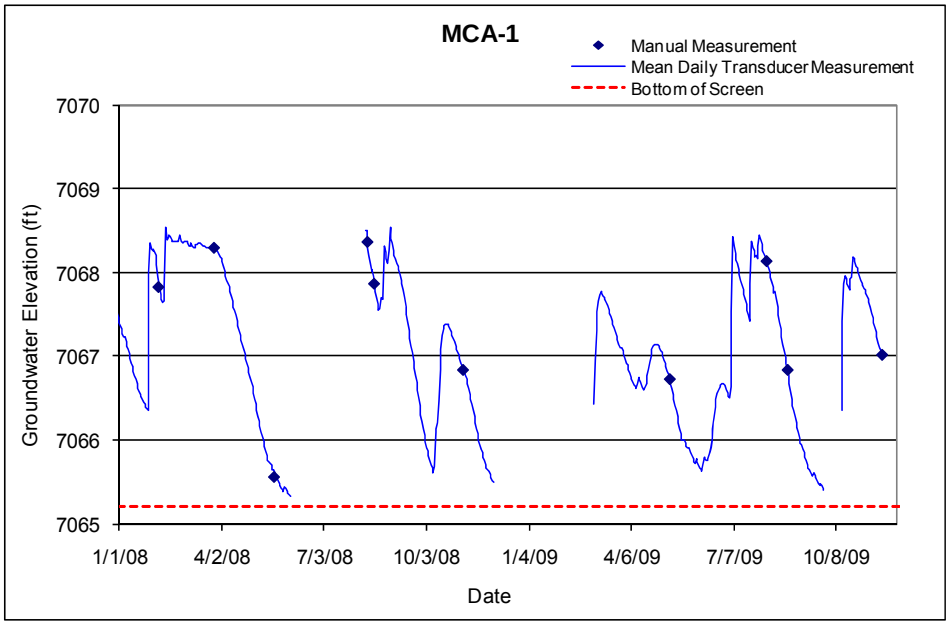
5.47 MCA-1

Location: Upper Mortandad Canyon, approximately 700 ft northeast of the TA-50 outfall.
Period of Record: April 20, 2005, through November 18, 2009.
Remarks: None.

MCA-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.4	5.4	7068.2	7065.2	3.0			5.4	7065.2	5.9	0.5	0.1	Alluvial groundwater

Note: Ground Elevation: 7070.6 ft; all depths are from this elevation



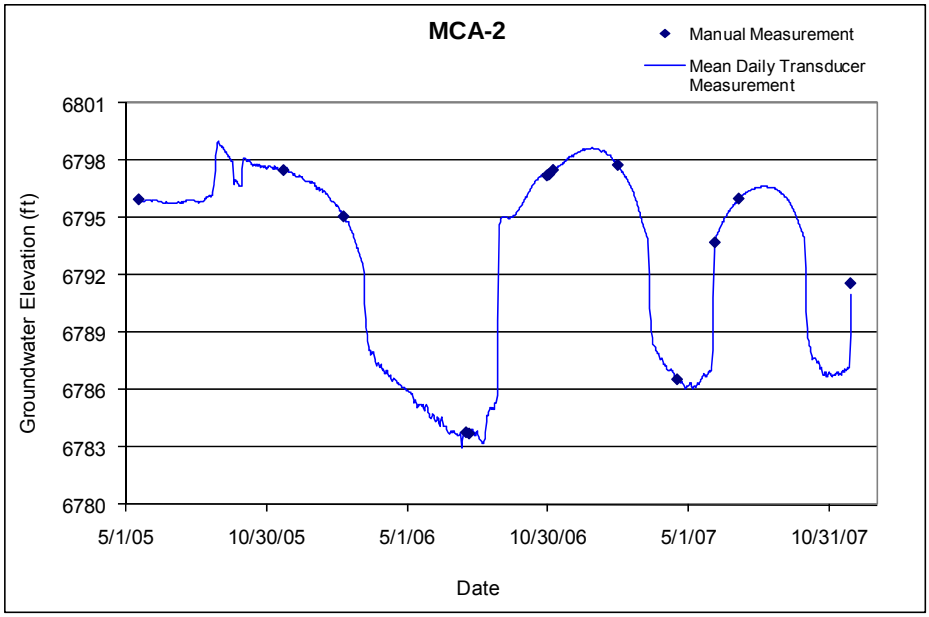


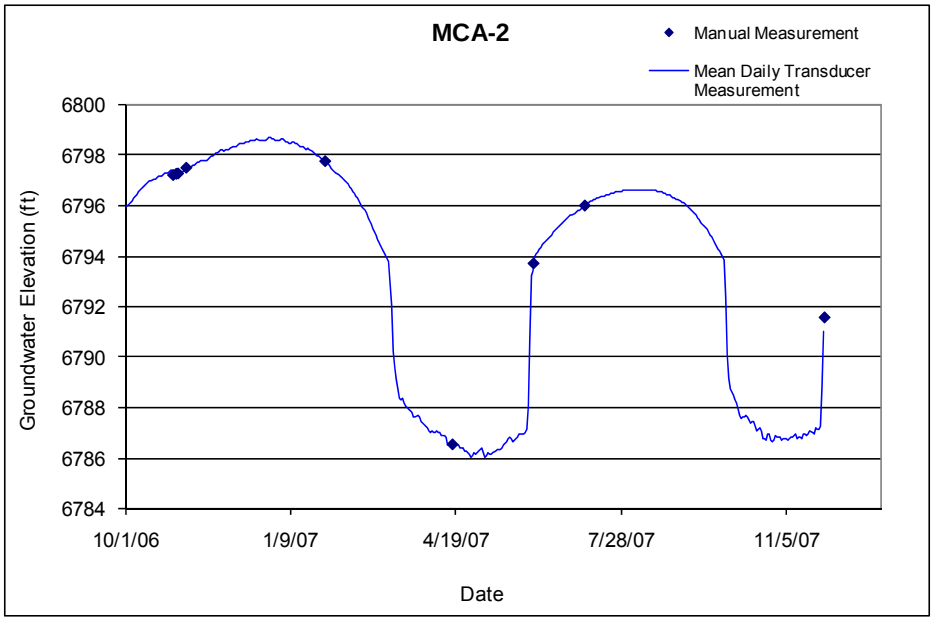
5.48 MCA-2

Location: Mortandad Canyon, approximately 400 ft up canyon of the upper sediment trap.
Period of Record: May 18, 2005, through November 28, 2007.
Remarks: Monitoring of this well was discontinued November 28, 2007.

MCA-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	45.0	60.0	6792.2	6777.2	15.0			60.0	6777.2	65.0	5.0	3.1	Alluvial groundwater

Note: Ground Elevation: 6837.2 ft; all depths are from this elevation



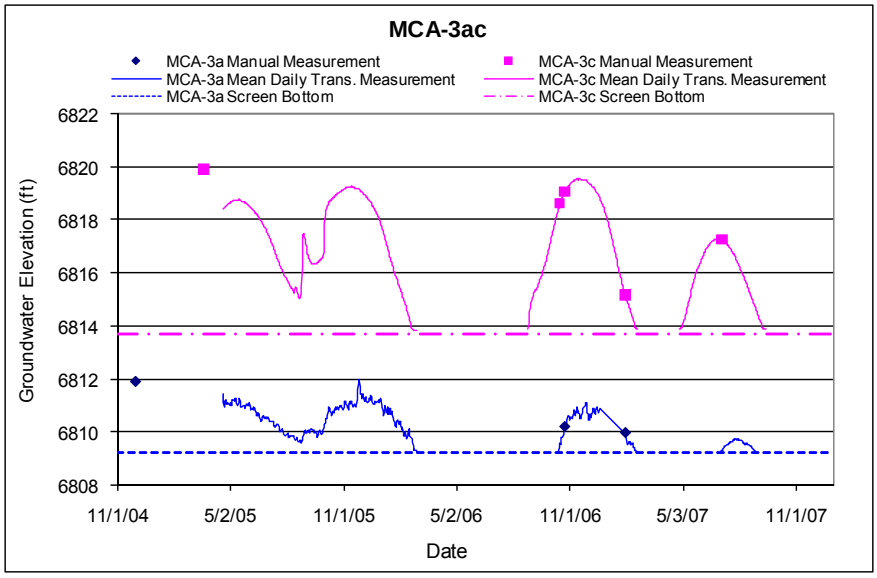


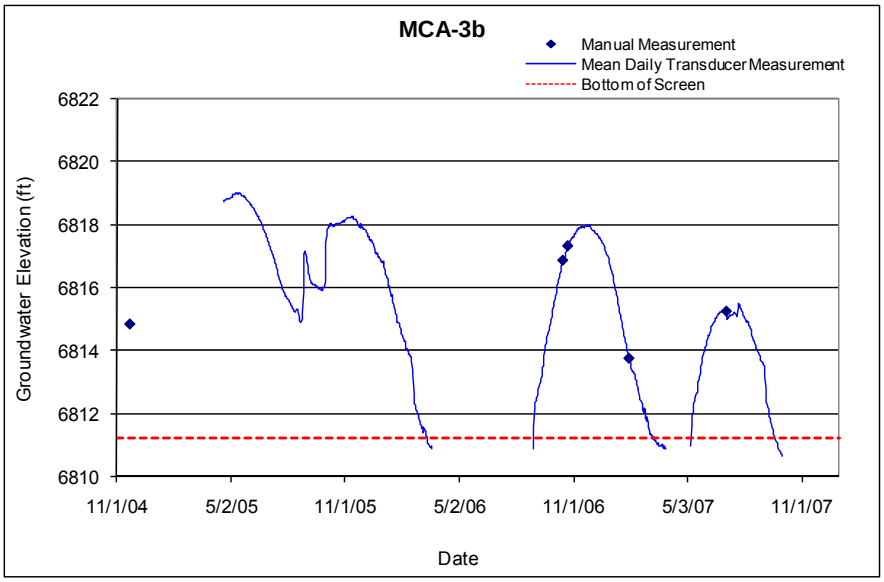
5.49 MCA-3ac & MCA-3b

Location: Middle Mortandad Canyon
Period of Record: MCA-3ac: November 30, 2004, through November 28, 2007.
MCA-3b: November 22, 2004, through November 28, 2007.
Remarks: MCA-3ac was a nested piezometer located about 5 ft south of MCA-3b. Valid manual measurements were not possible to obtain in these wells due to the 1-in. casing and presence of transducers, until 2006 when a small-diameter water level tape was purchased. Monitoring of both wells was discontinued November 28, 2007.

MCA-3abc Construction Information														
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Well T.D. Elevation (ft)	Sump Length (ft)	Sump Volume (L)	Comment
MCA-3a	42.9	43.4	6809.7	6809.2	0.5			43.4	6809.2	44.0	6808.6	0.6	0.23723	Alluvial groundwater
MCA-3b	40.9	41.4	6811.7	6811.2	0.5			41.4	6811.2	42.1	6810.5	0.7	0.27677	Alluvial groundwater
MCA-3c	38.4	38.9	6814.2	6813.7	0.5			38.9	6813.7	39.5	6813.1	0.6	0.23723	Alluvial groundwater

Note: MCA-3ac Brass Cap Ground Elevation: 6853.00 ft; all depths are from this elevation
Note: MCA-3b Brass Cap Ground Elevation: 6852.90 ft; all depths are from this elevation



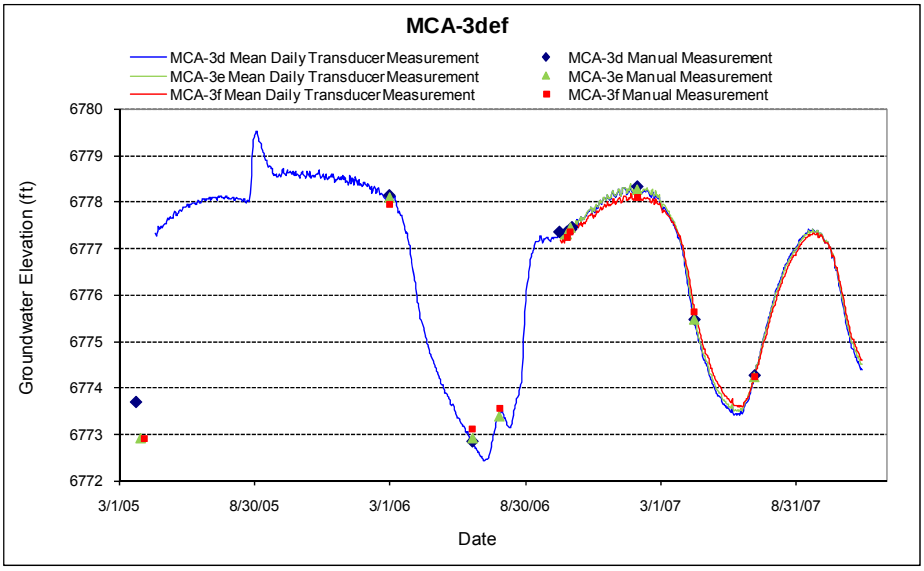


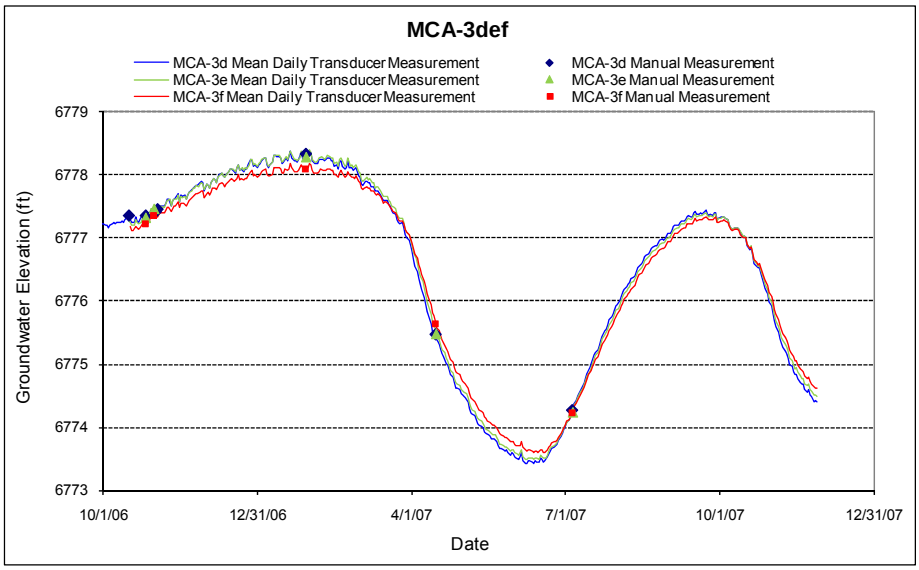
5.50 MCA-3def

Location: Middle Mortandad Canyon, south of the sediment traps.
Period of Record: MCA-3d: March 25, 2005, through November 28, 2007,
MCA-3e: March 30, 2005, through November 28, 2007,
MCA-3f: April 5, 2005, through November 28, 2007.
Remarks: MCA-3def is a nested piezometer. Faulty transducers in MCA-3e and MCA-3f were replaced on October 16, 2006. Monitoring of this well was discontinued November 28, 2007.

MCA-3def Construction Information														
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Well T.D. Elevation (ft)	Sump Length (ft)	Sump Volume (L)	Comment
MCA-3d	54.6	55.1	6764.9	6764.4	0.5			55.1	6764.4	55.8	6763.7	0.7	0.27677	Alluvial groundwater
MCA-3e	51.0	51.5	6768.5	6768.0	0.5			51.5	6768.0	52.2	6767.3	0.7	0.27677	Alluvial groundwater
MCA-3f	47.5	48.0	6772.0	6771.5	0.5			48.0	6771.5	48.7	6770.8	0.7	0.27677	Alluvial groundwater

Note: Brass Cap Ground Elevation: 6819.8 ft; Ground Elevation: 6819.5 ft; all depths are from this elevation



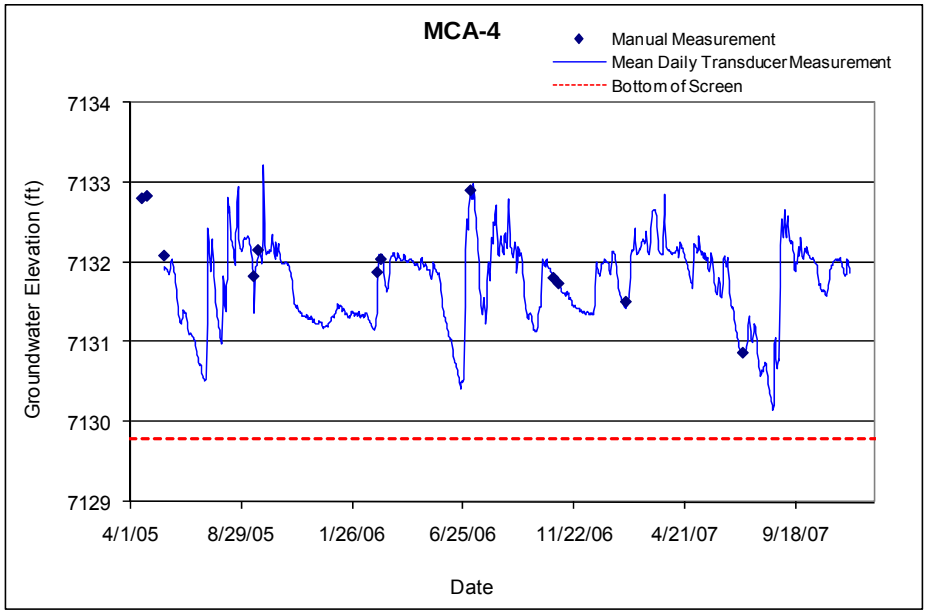


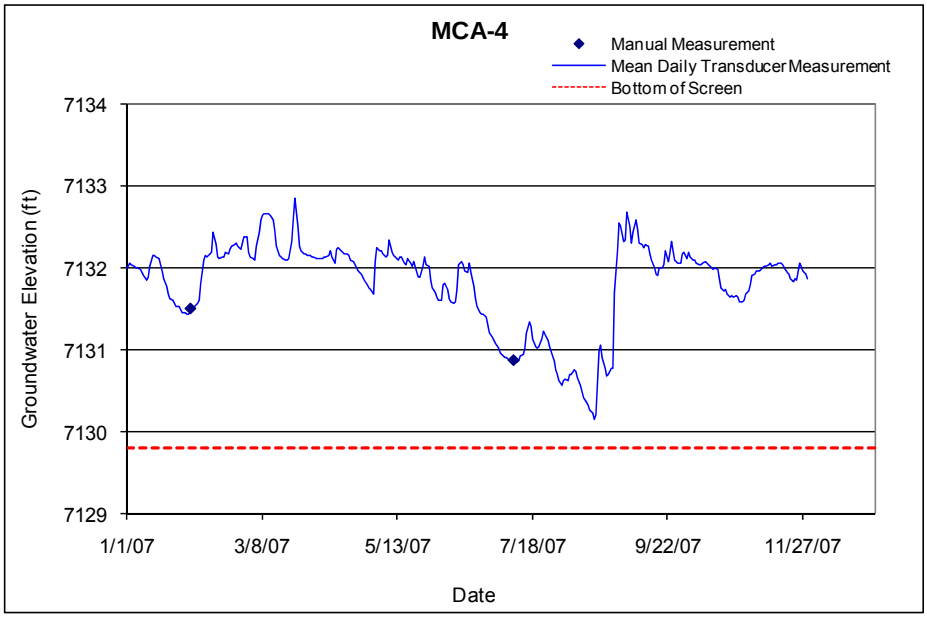
5.51 MCA-4

Location: Upper Effluent Canyon, approximately 200 ft west of TA-50 outfall.
Period of Record: April 18, 2005, through November 29, 2007.
Remarks: Monitoring of this well was discontinued November 29, 2007.

MCA-4 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	3.3	5.3	7131.80	7129.80	2.0			5.3	7129.80	5.4	0.1	0.0	Alluvial groundwater

Note: Ground Elevation: 7135.1 ft; all depths are from this elevation



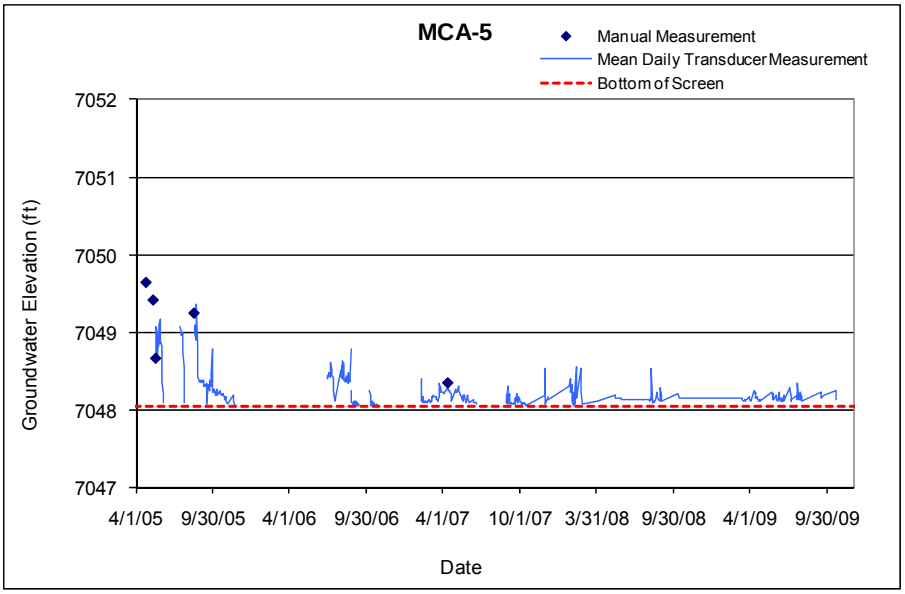


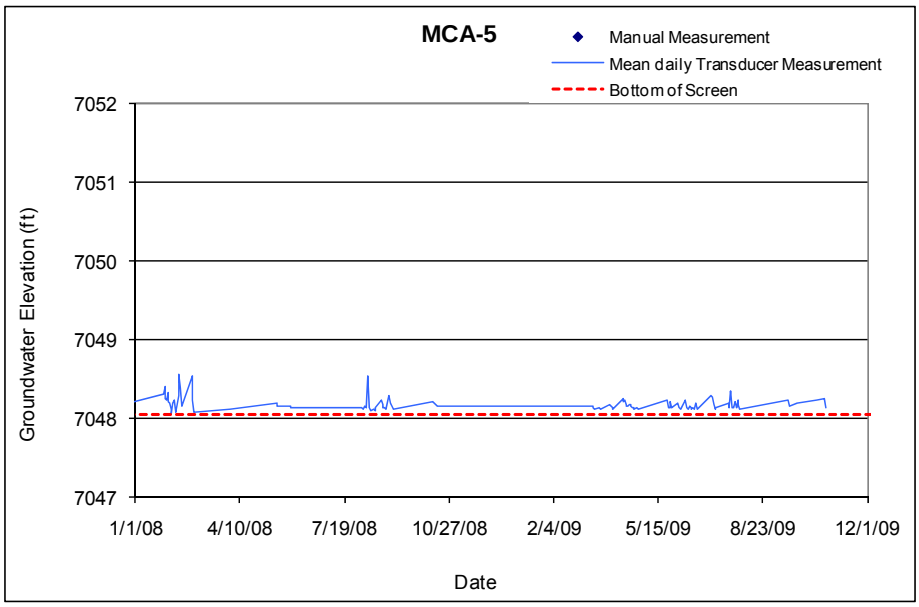
5.52 MCA-5

Location: Upper Mortandad Canyon, approximately 1250 ft downstream of TA-50 outfall.
Period of Record: April 25, 2005, through November 18, 2009.
Remarks: This well is intermittently dry.

MCA-5 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.75	5.75	7052.05	7048.05	4.0			5.75	7048.05	6.0	0.25	0.04	Alluvial groundwater

Note: Ground elevation is 7053.8 ft; all depths are from this elevation





5.53 MCA-8

Location: Lower Mortandad Canyon.
Period of Record: October 3, 2005, through November 18, 2009.
Remarks: No valid water level data exist for this well. Water has occurred only in the sump since completion on September 29, 2004.

MCA-8 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	66	81	6602.7	6587.7	15			81	6587.7	86.3	5.3	14.4	Alluvial groundwater

Note: Brass Cap Ground elevation is 6668.8 ft; all depths are from this elevation

MCA-8 Manual Water Levels		
Date	Water Level (ft)	Comments
10/3/2005	6582.43	Sump water
1/4/2006	6583.52	Sump water
4/13/2006	6584.09	Sump water
7/18/2006	6584.14	Sump water
10/30/2006	6584.17	Sump water
9/5/2006	6584.16	Sump water
1/26/2007	6584.12	Sump water
4/12/2007	6584.11	Sump water
7/3/2007	6584.1	Sump water
11/29/2007	6584.11	Sump water
12/5/2007	6583.94	Sump water
3/26/2008	6583.99	Sump water
6/19/2008	6584.09	Sump water
8/11/2008	6584.1	Sump water
8/19/2008	6584.01	Sump water
2/19/2009	6584.01	Sump water
5/19/2009	6584.13	Sump water
8/25/2009	6584.11	Sump water
11/18/2009	6584.11	Sump water

5.54 MCA-9

Location: Lower Mortandad Canyon.
Period of Record: August 17, 2005, through November 29, 2007.
Remarks: No valid water level data exist for this well. Water has occurred only in the sump since completion on December 4, 2004. Monitoring of this well was discontinued November 29, 2007, but a manual water level was taken August 11, 2008.

MCA-9 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	92.80	107.8	6578.9	6563.9	15.0			107.8	6563.9	113.0	5.2	3.5	Alluvial groundwater

Note: Ground elevation is 6671.7 ft; all depths are from this elevation

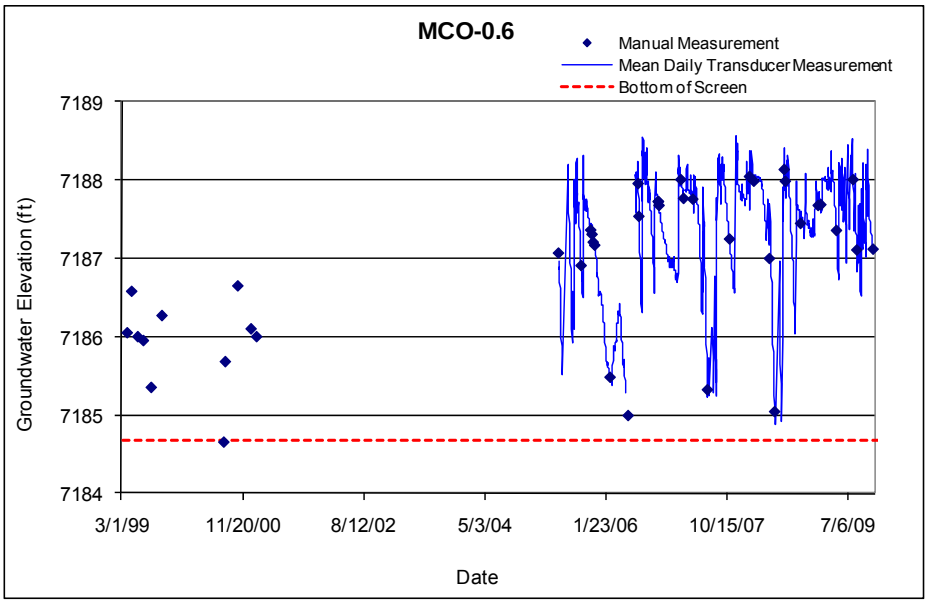
MCA-9 Manual Water Levels		
Date	Water Elevation (ft)	Comments
12/4/2004		Dry
8/17/2005	6558.59	Sump water
2/23/2006	6558.76	Sump water
5/16/2006	6558.74	Sump water
5/16/2006	6558.77	Sump water
7/18/2006	6558.76	Sump water
10/30/2006	6558.95	Sump water
10/31/2006	6558.72	Sump water
1/26/2007	6559.13	Sump water
4/12/2007	6559.42	Sump water
7/3/2007	6559.46	Sump water
11/29/2007	6559.35	Sump water
8/11/2008	6559.36	Sump water

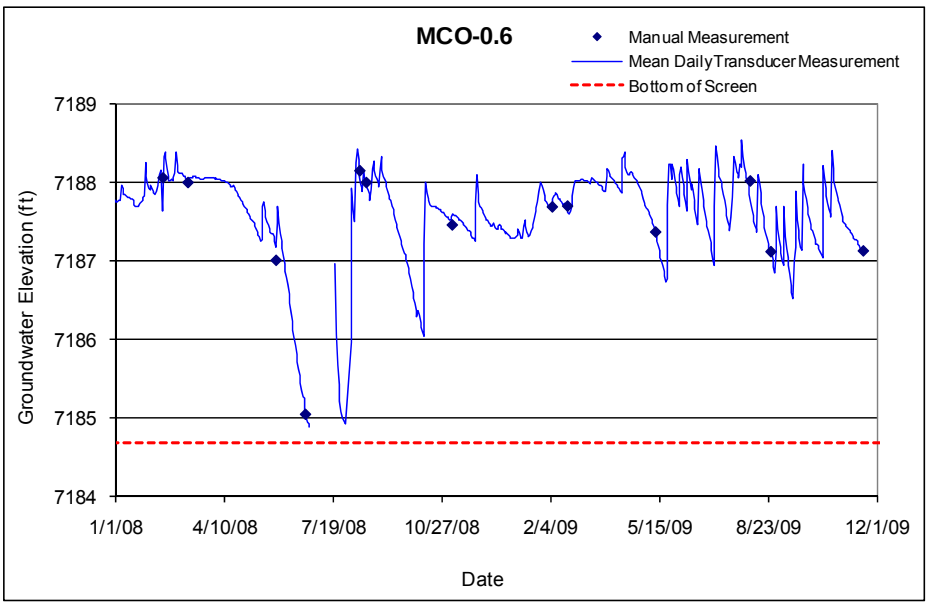
5.55 MCO-0.6

Location: Upper Mortandad Canyon, north of TA-48.
Period of Record: March 31, 1999, through November 18, 2009.
Remarks: None.

MCO-0.6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.05	3.05	7186.68	7184.68	2.00			3.05	7184.68	3.10	0.05	0.04	Alluvial groundwater

Note: Brass Cap Ground elevation: 7188.28 ft; Ground Elevatoin: 7187.73 ft; all depths are from this elevation



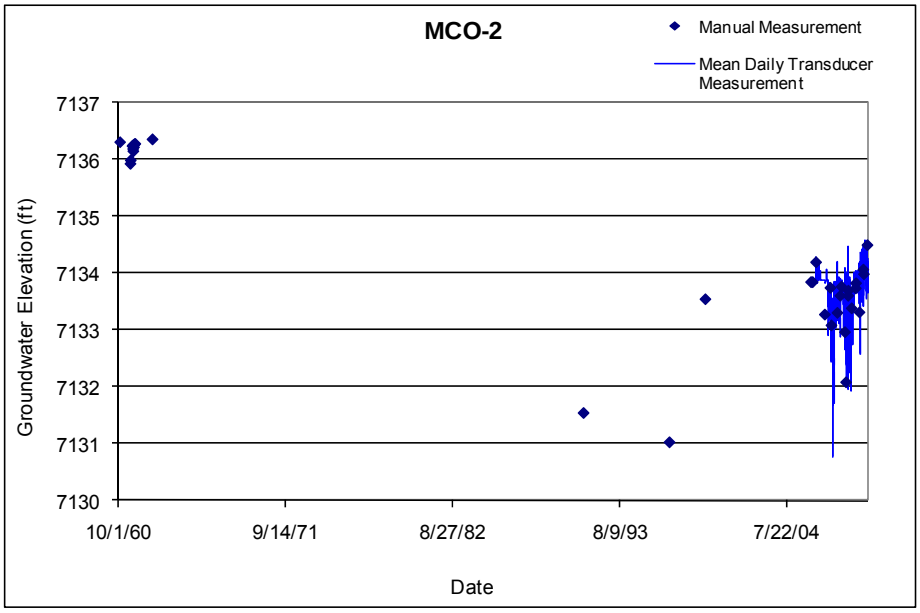


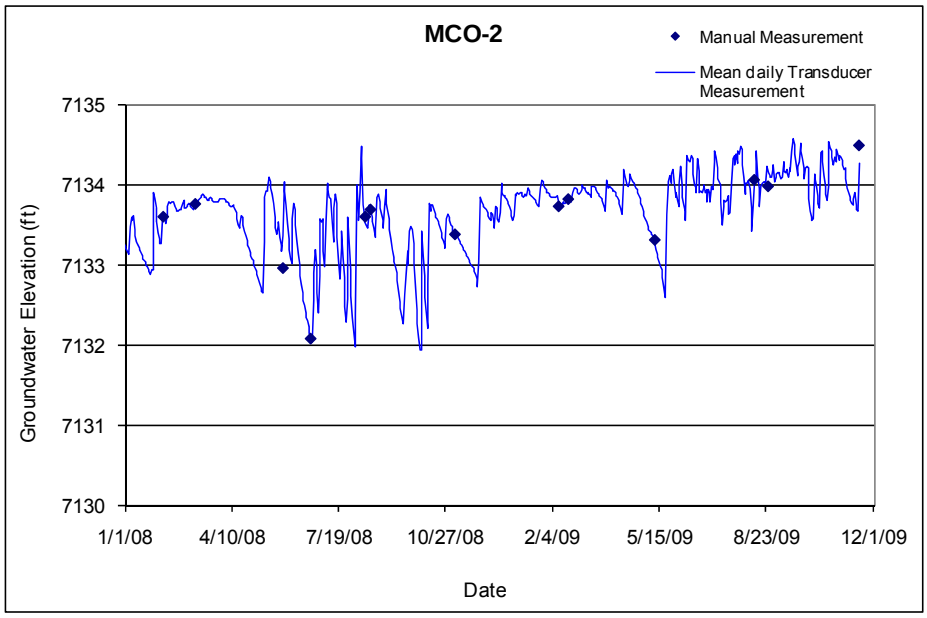
5.56 MCO-2

Location: Upper Effluent Canyon, approximately 200 ft west of TA-50 outfall.
Period of Record: November 1, 1960, through November 11, 2009.
Remarks: The transducer was sitting on top of the bladder pump in a 2-in.-diameter well at an elevation of 7133.8 ft until April 12, 2007. The pump was removed from the well on April 12, 2007, and the transducer was lowered to a more functional level.

MCO-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.0	9.0	7134.6	7127.6	7.0			9.0	7127.6	9.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 7136.6 ft; all depths are from this elevation



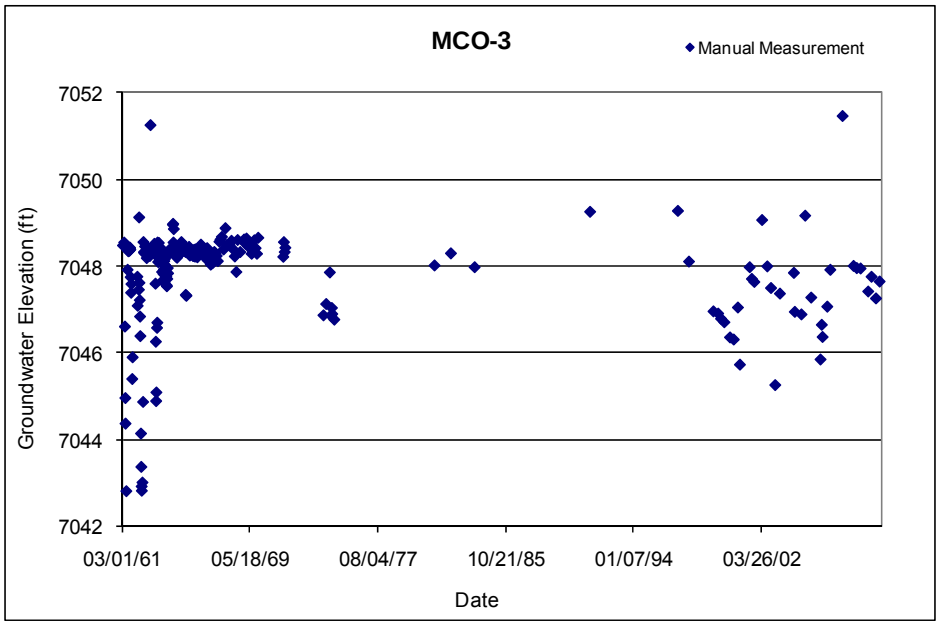


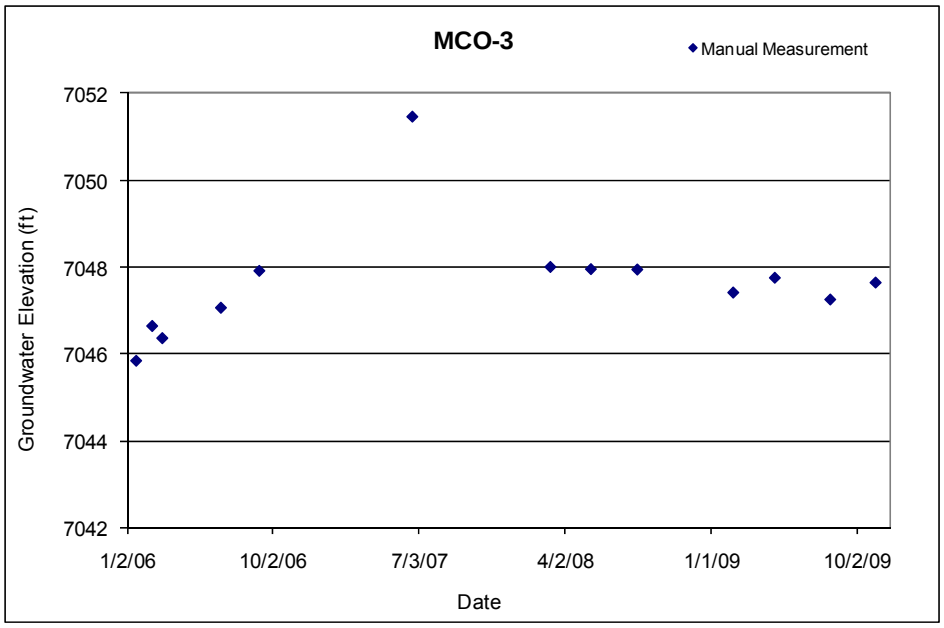
5.57 MCO-3

Location: Upper Mortandad Canyon, approximately 1250 ft downstream of TA-50 outfall.
Period of Record: March 27, 1961, through November 5, 2009.
Remarks: There is no transducer installed in this well.

MCO-3 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.0	12.0	7050.6	7040.6	10.0			12.0	7040.6	12.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 7052.6 ft; all depths are from this elevation



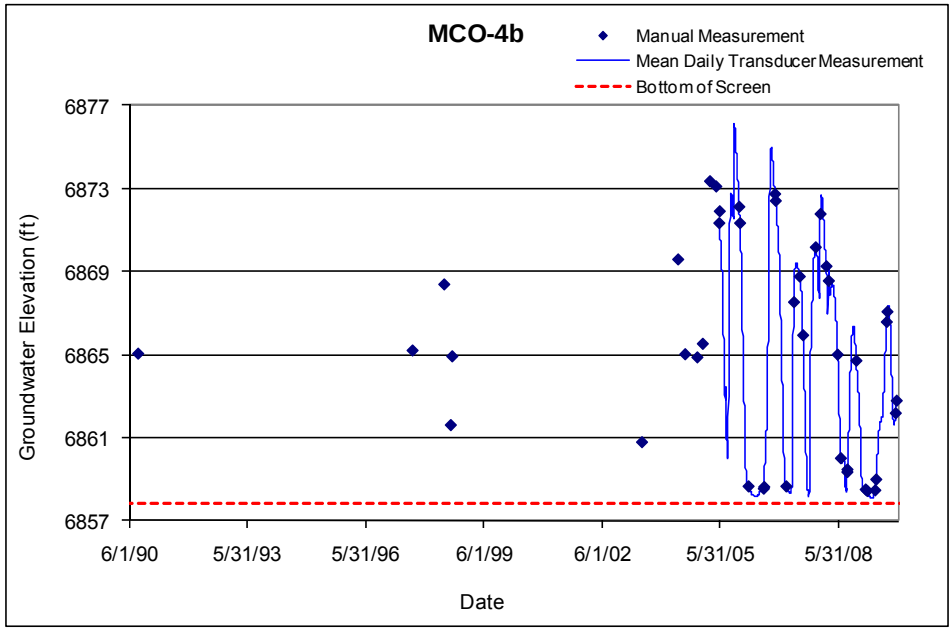


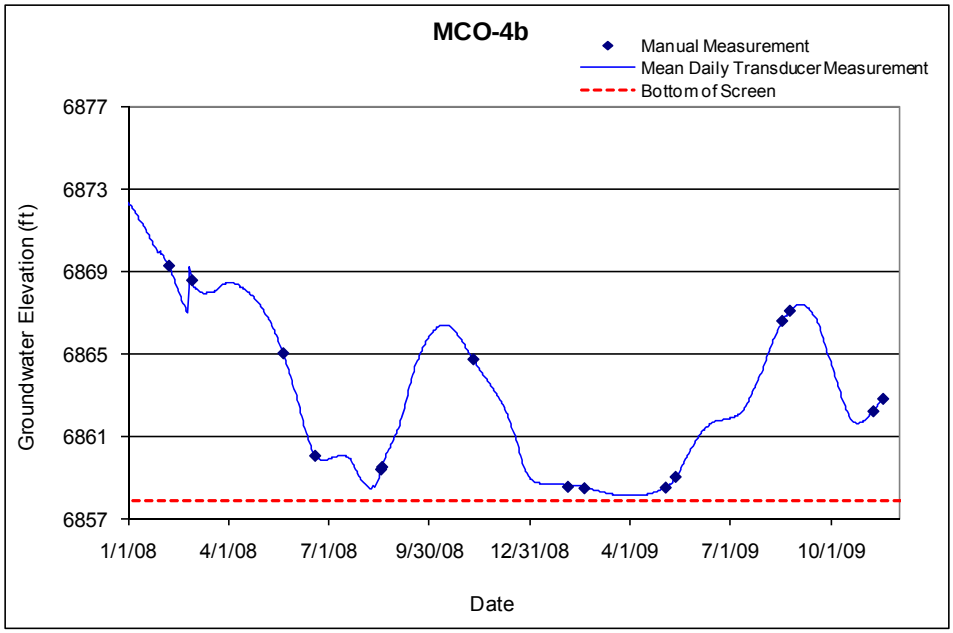
5.58 MCO-4b

Location: Middle Mortandad Canyon, approximately 3000 ft up canyon from sediment traps.
Period of Record: August 21, 1990, through November 18, 2009.
Remarks: None.

MCO-4b Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	8.9	28.9	6877.9	6857.9	20.0			28.9	6857.9	33.9	5.0	3.1	Alluvial groundwater

Note: Ground elevation is 6886.75 ft; all depths are from this elevation



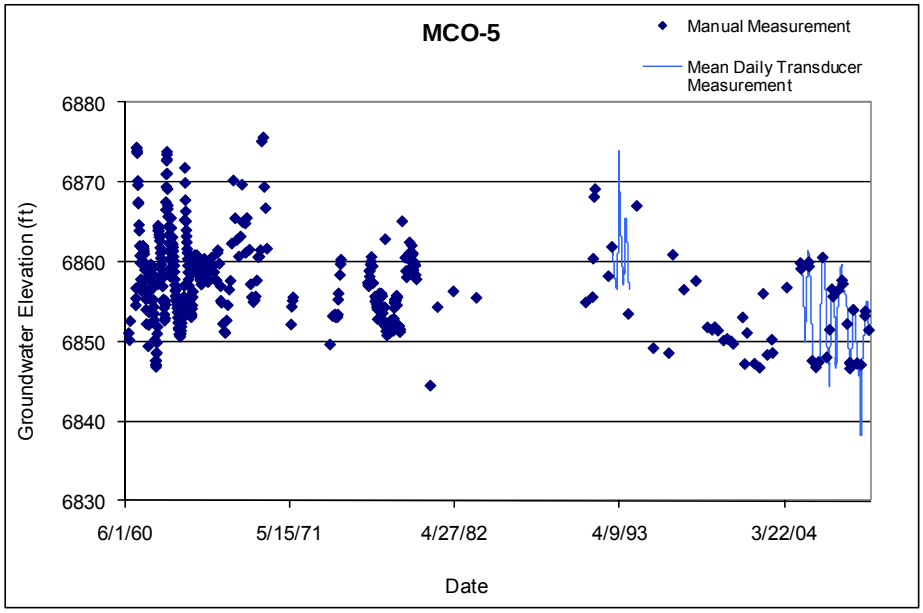


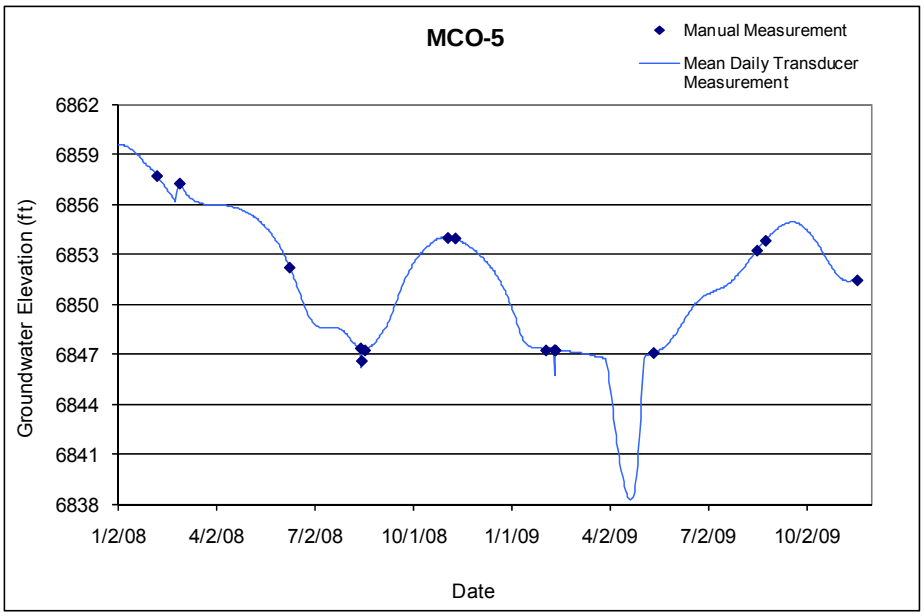
5.59 MCO-5

Location: Middle Mortandad Canyon, approximately 2300 ft up canyon from sediment traps.
Period of Record: October 1, 1960, through November 18, 2009.
Remarks: None.

MCO-5 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	21.0	46.0	6854.66	6829.66	25.0			46.0	6829.66	46.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6875.66 ft; all depths are from this elevation



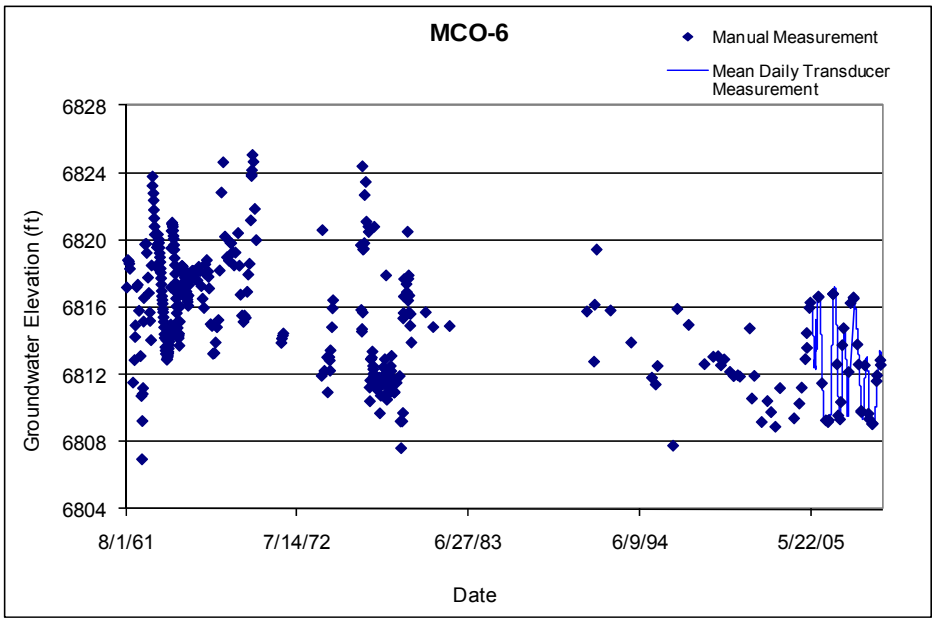


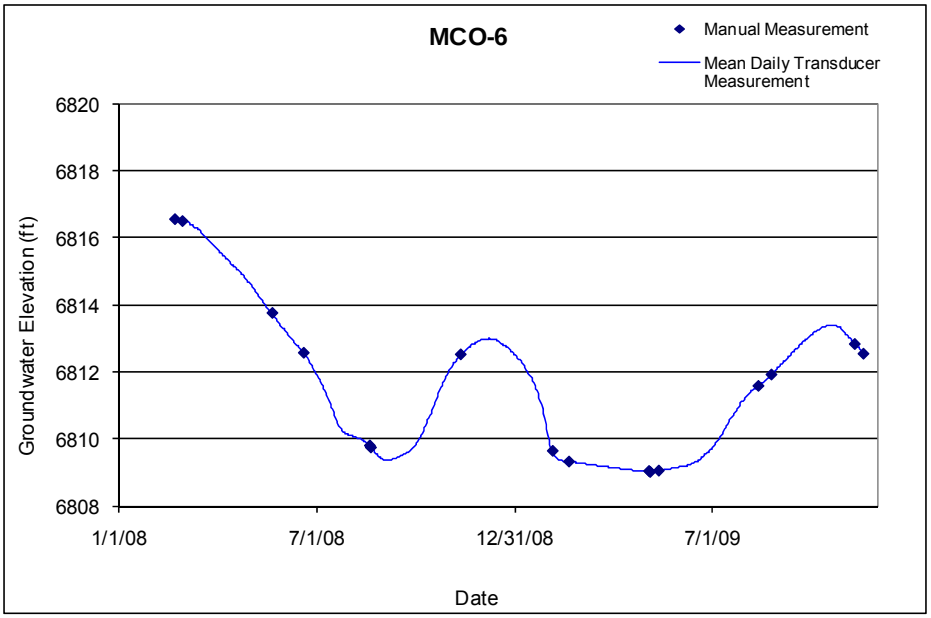
5.60 MCO-6

Location: Middle Mortandad Canyon, approximately 0.25 miles east of MCO-5.
Period of Record: August 25, 1961, through November 18, 2009.
Remarks: The transducer was removed from the well October 30, 2007, and replaced February 28, 2008.

MCO-6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	27.0	47.0	6822.5	6802.5	20.0			47.0	6802.5	47.0	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6849.48 ft; all depths are from this elevation



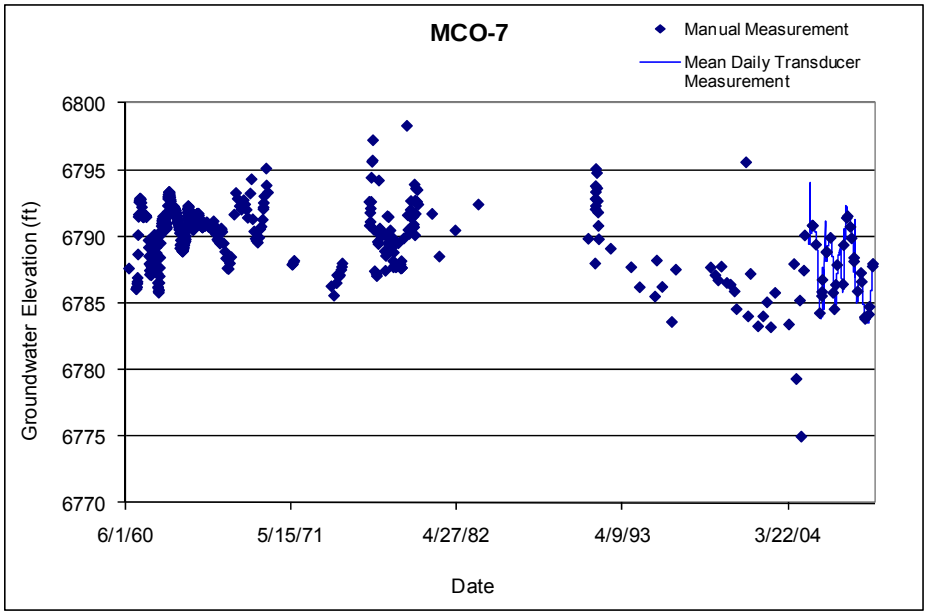


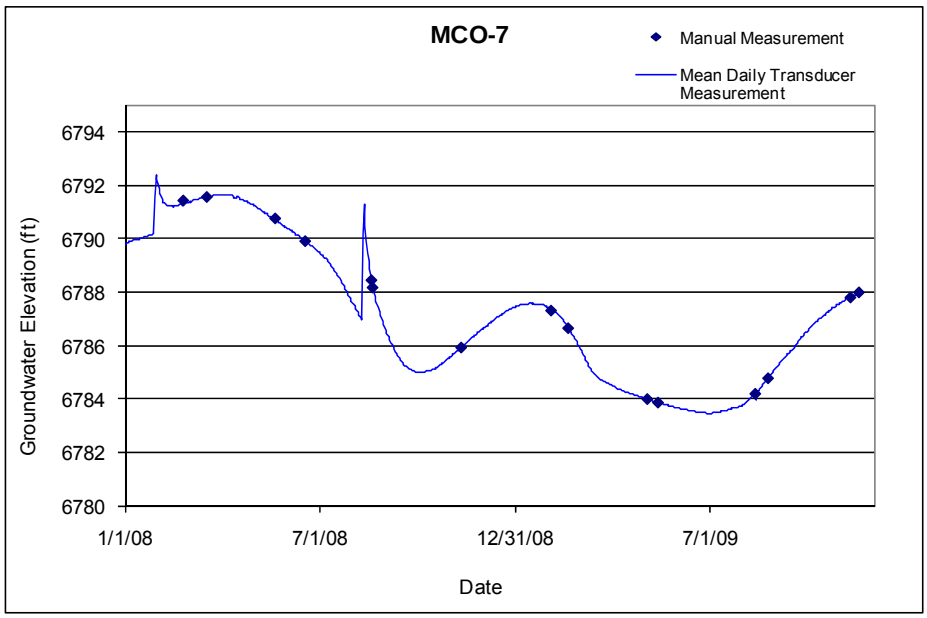
5.61 MCO-7

Location: Middle Mortandad Canyon, approximately 0.2 miles east of MCO-6.
Period of Record: October 1, 1960, through November 18, 2009.
Remarks: None.

MCO-7 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	39	69	6788.31	6758.31	30			69	6758.31	69	0	0	Alluvial groundwater

Note: Ground elevation is 6827.31 ft; all depths are from this elevation



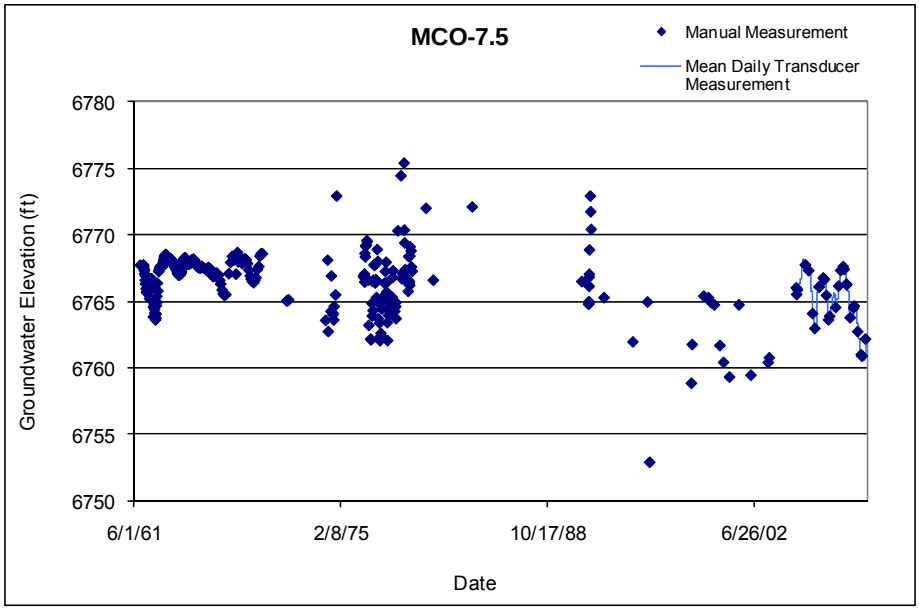


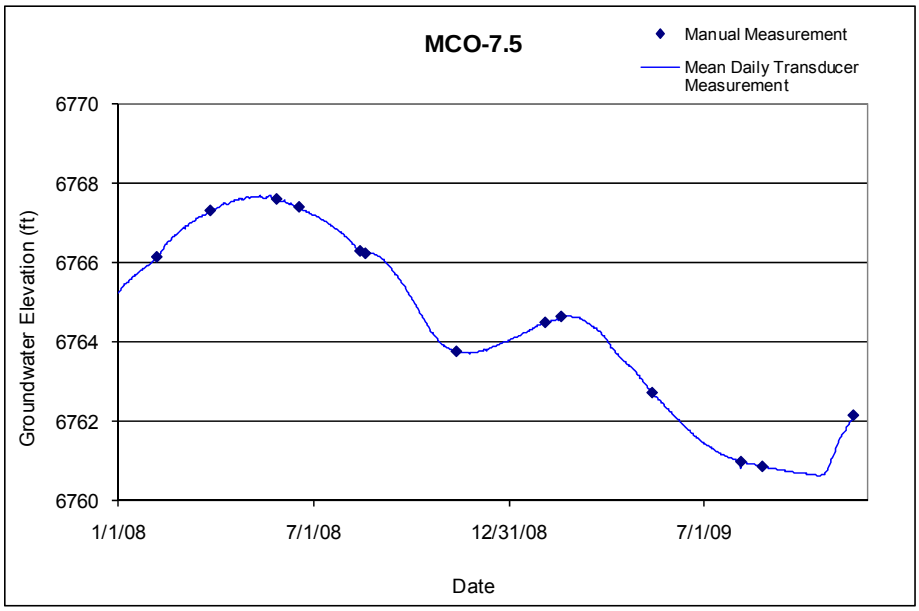
5.62 MCO-7.5

Location: Middle Mortandad Canyon, approximately 0.2 miles east of MCO-7.
Period of Record: November 1, 1961, through November 18, 2009.
Remarks: None.

MCO-7.5 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	35	60	6773.88	6748.88	25			60	6748.88	60	0	0	Alluvial groundwater

Note: Ground Elevation: 6808.881 ft; all depths are from this elevation



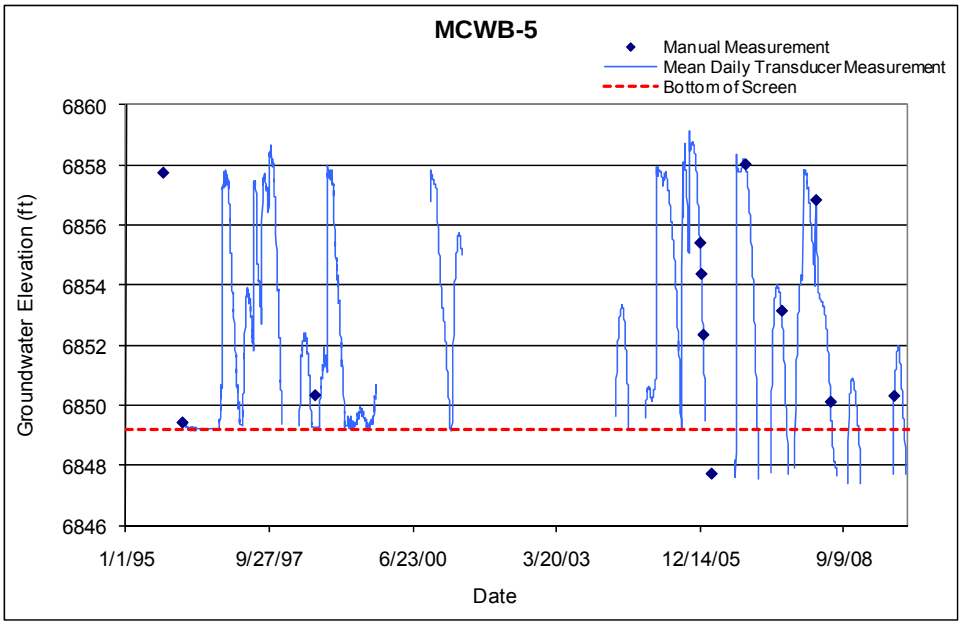


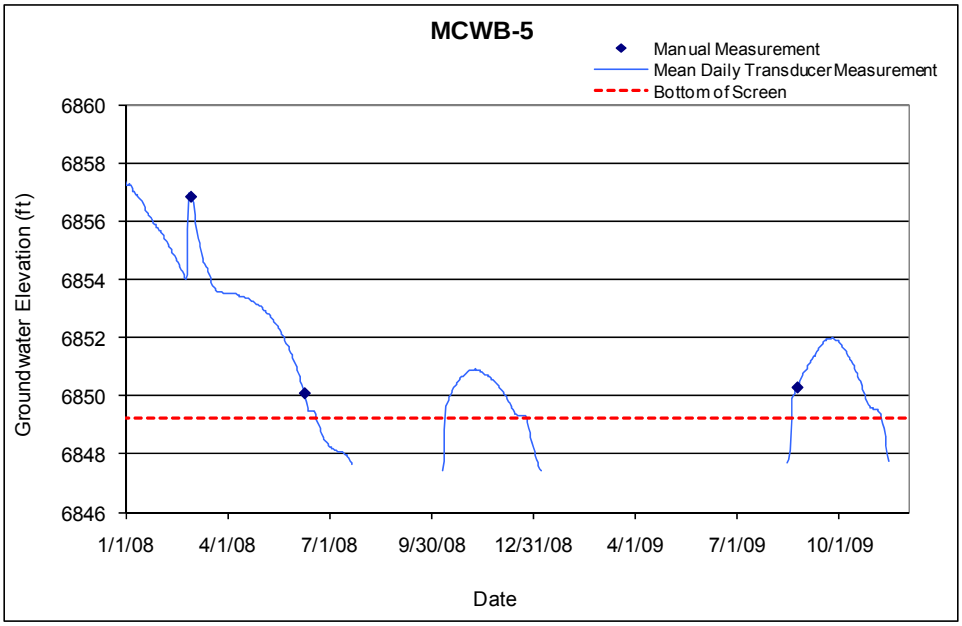
5.63 MCWB-5

Location: Middle Mortandad Canyon, up canyon from the sediment traps.
Period of Record: January 9, 1995, through November 18, 2009.
Remarks: Water in the sump is not considered invalid as it appears to respond to groundwater level fluctuations. Transducer hangs above bottom of well; groundwater elevations below 6847 ft are not recorded by the transducer.

MCWB-5 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	17.0	27.0	6859.2	6849.2	10.0			27.0	6849.2	32.0	5.0	7.0	Alluvial groundwater

Note: Ground elevation is 6876.22 ft; all depths are from this elevation



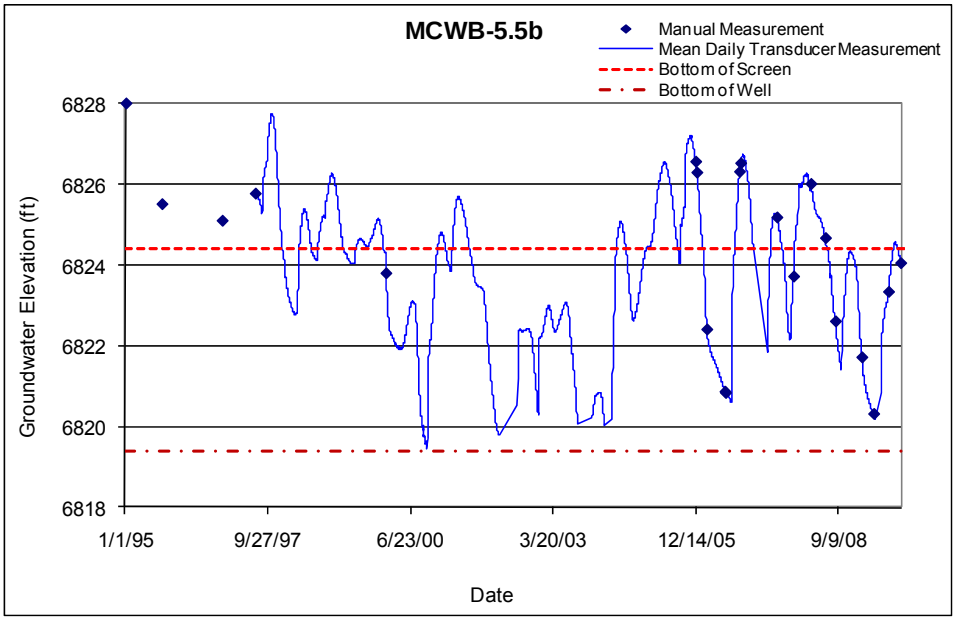


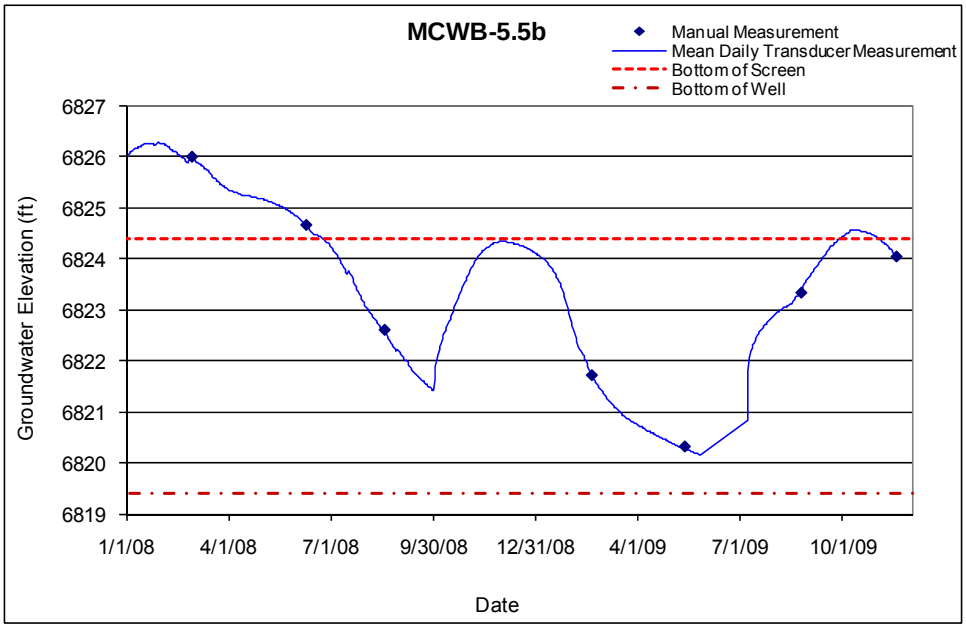
5.64 MCWB-5.5b

Location: Middle Mortandad Canyon, up canyon from sediment traps.
Period of Record: January 9, 1995, through November 18, 2009.
Remarks: Water in sump is not invalidated as it appears to represent formation water.

MCWB-5.5b Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	22.5	32.5	6834.4	6824.4	10.0			32.5	6824.4	37.5	5.0	7.0	Alluvial groundwater

Note: Ground elevation is 6856.89 ft; all depths are from this elevation



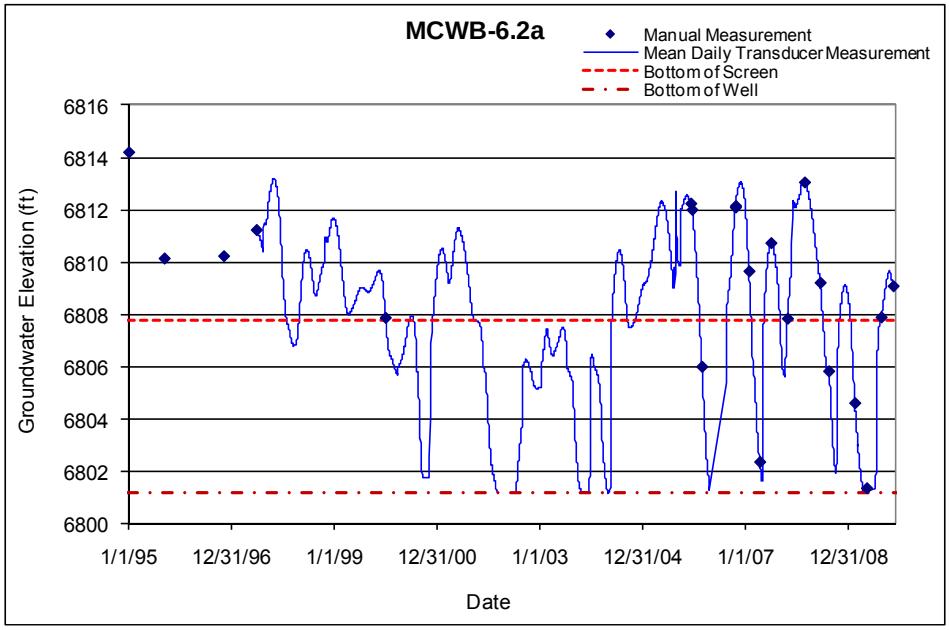


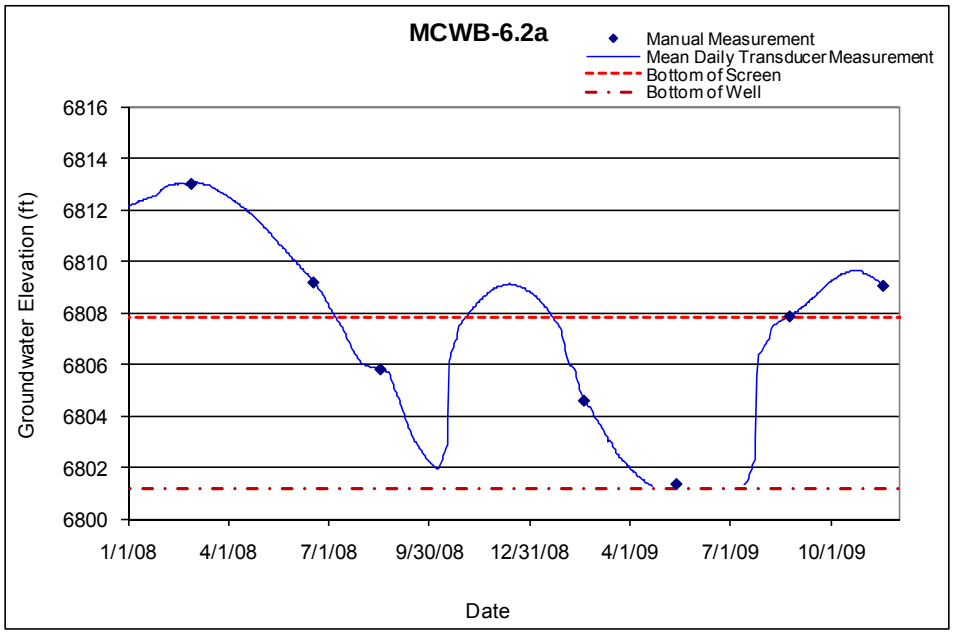
5.65 MCWB-6.2a

Location: Middle Mortandad Canyon, up canyon from sediment traps.
Period of Record: January 9, 1995, through November 18, 2009.
Remarks: Water in the sump is not invalidated, as it appears to respond to groundwater level fluctuations. Transducer data indicate that the bottom of the well is at 6801.2 ft.

MCWB-6.2a Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	30.5	40.5	6817.8	6807.8	10.0			40.5	6807.8	45.5	5.0	7.0	Alluvial groundwater

Note: Ground elevation is 6848.29 ft; all depths are from this elevation



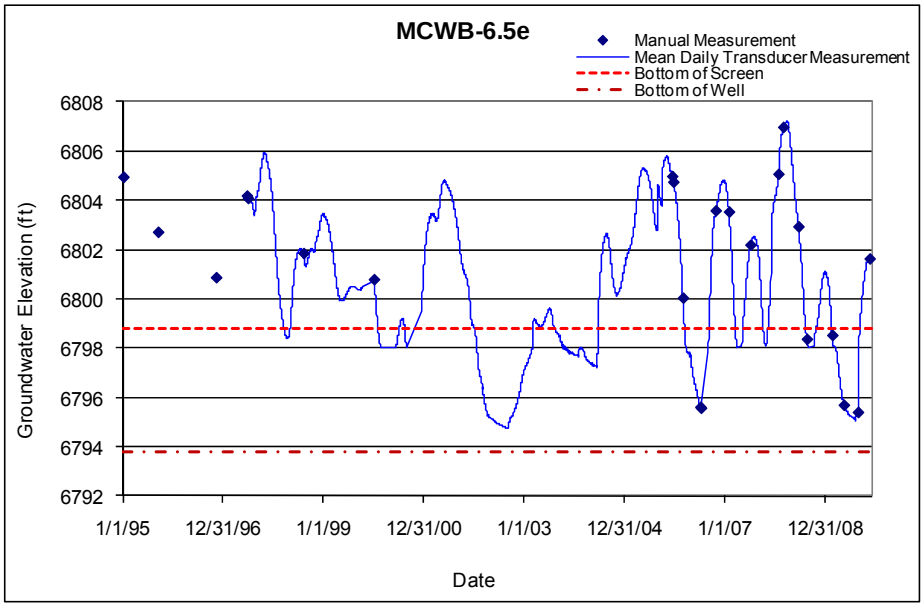


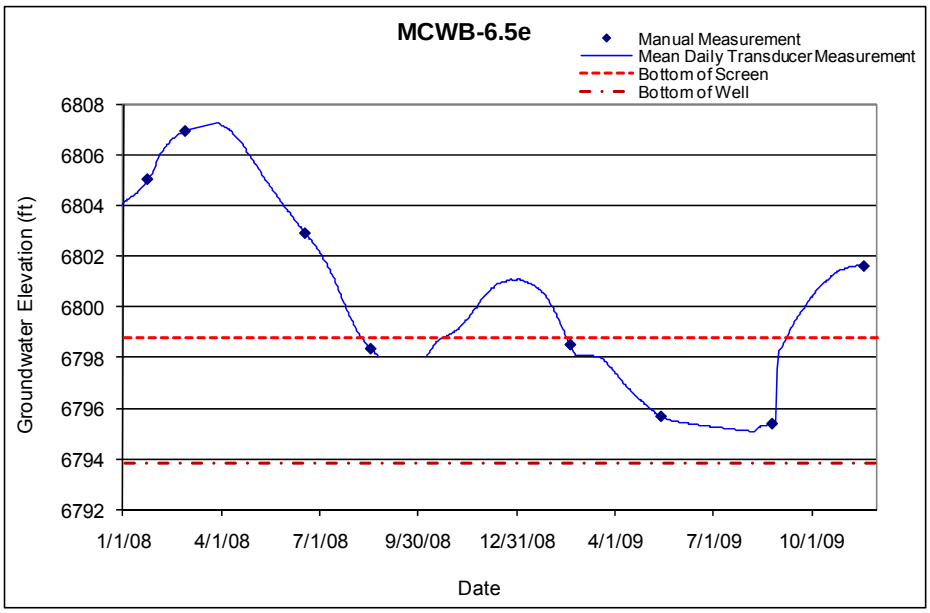
5.66 MCWB-6.5e

Location: Middle Mortandad Canyon, up canyon of the sediment traps.
Period of Record: January 9, 1995, through November 18, 2009.
Remarks: Water in sump is not invalidated, as it appears to respond to groundwater level fluctuations. Water is below transducer from March 23, 2007, to May 4, 2008, and from August 26, 2008, to October 8, 2008.

MCWB-6.5e Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	35.0	45	6808.8	6798.8	10.0			45.0	6798.8	50.0	5.0	7.0	Alluvial groundwater

Note: Ground elevation is 6843.80 ft; all depths are from this elevation



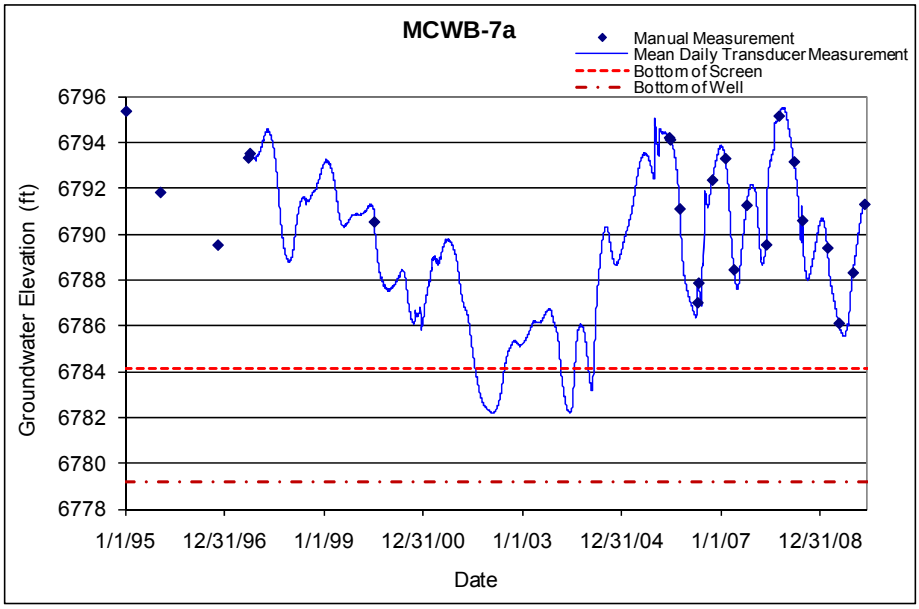


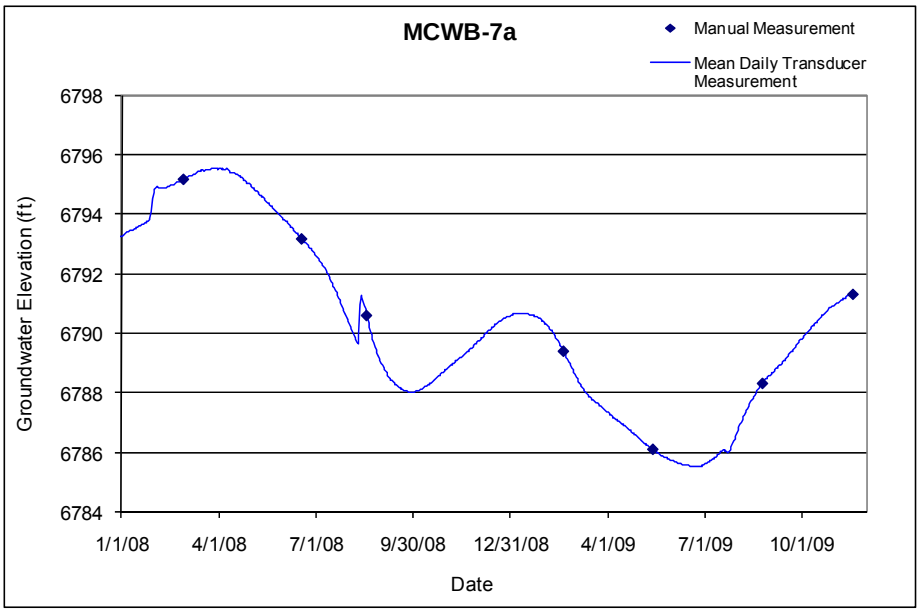
5.67 MCWB-7a

Location: Middle Mortandad Canyon, near sediment traps.
Period of Record: January 9, 1995, through November 18, 2009.
Remarks: Water in sump is not invalidated, as it appears to respond to groundwater level fluctuations.

MCWB-7a Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	37.0	47.0	6794.17	6784.17	10.0			47.0	6784.2	52.0	5.0	7.0	Alluvial groundwater

Note: Ground elevation is 6831.17 ft; all depths are from this elevation



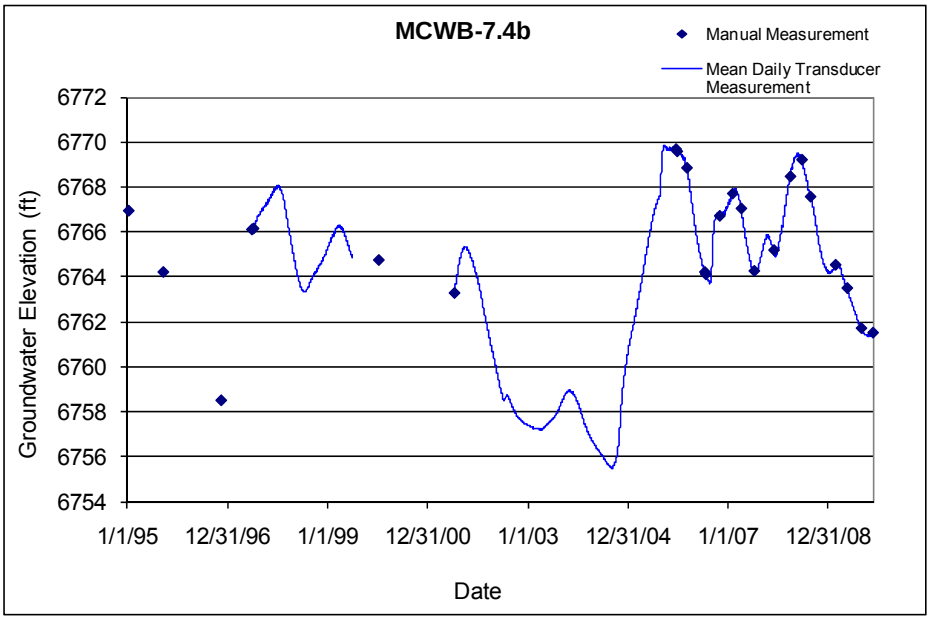


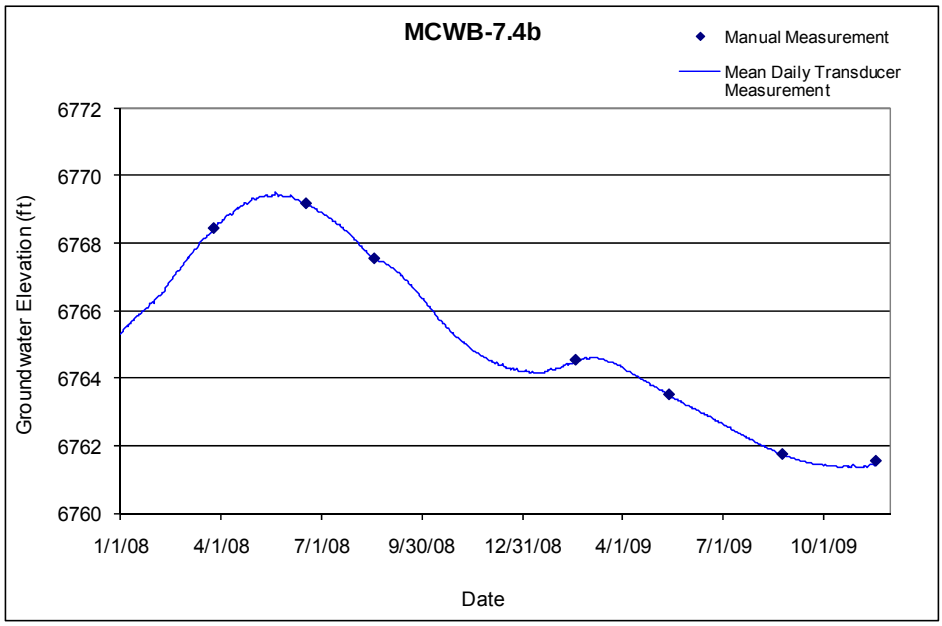
5.68 MCWB-7.4b

Location: Middle Mortandad Canyon, down canyon from sediment traps.
Period of Record: January 9, 1995, through November 18, 2009.
Remarks: None.

MCWB-7.4b Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	45.0	65.0	6768.07	6748.07	20.0			65.0	6748.1	70.0	5.0	7.0	Alluvial groundwater

Note: Ground elevation is 6813.07 ft; all depths are from this elevation



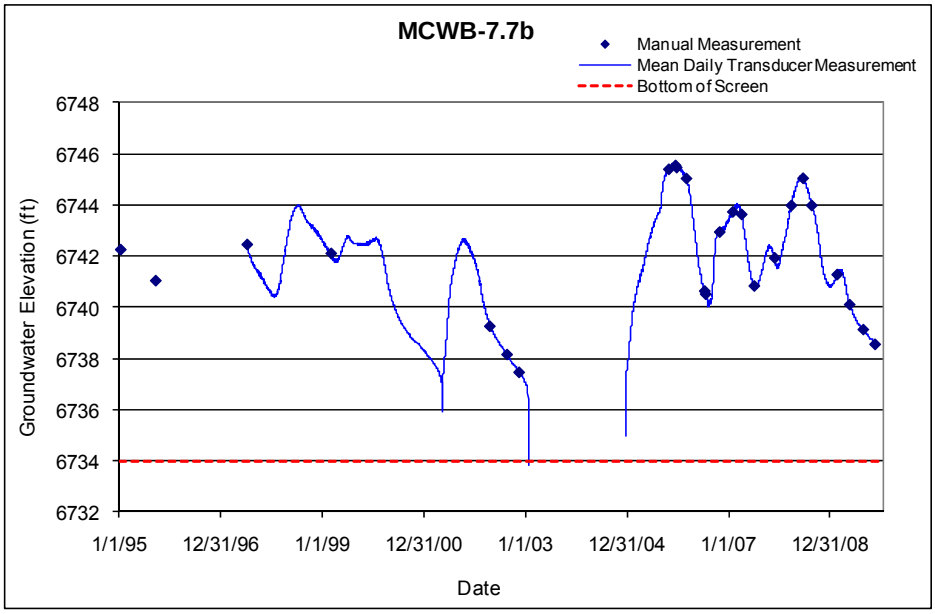


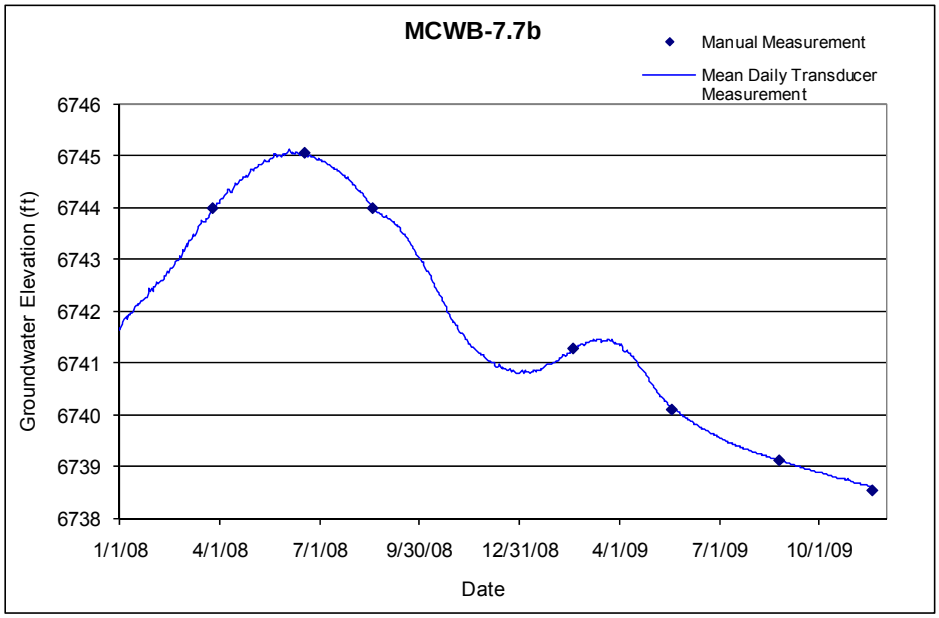
5.69 MCWB-7.7b

Location: Middle Mortandad Canyon, down canyon from sediment traps.
Period of Record: January 9, 1995, through November 18, 2009.
Remarks: None.

MCWB-7.7b Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	55.0	65	6744.0	6734.0	10.0			65.0	6734.0	70	5.0	7.0	Alluvial groundwater

Note: Ground elevation is 6798.97 ft; all depths are from this elevation



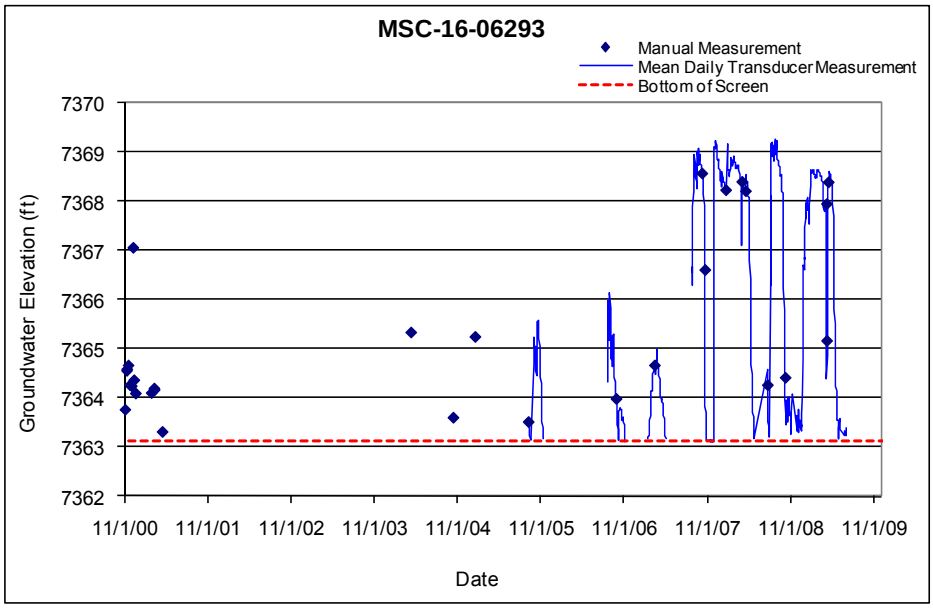


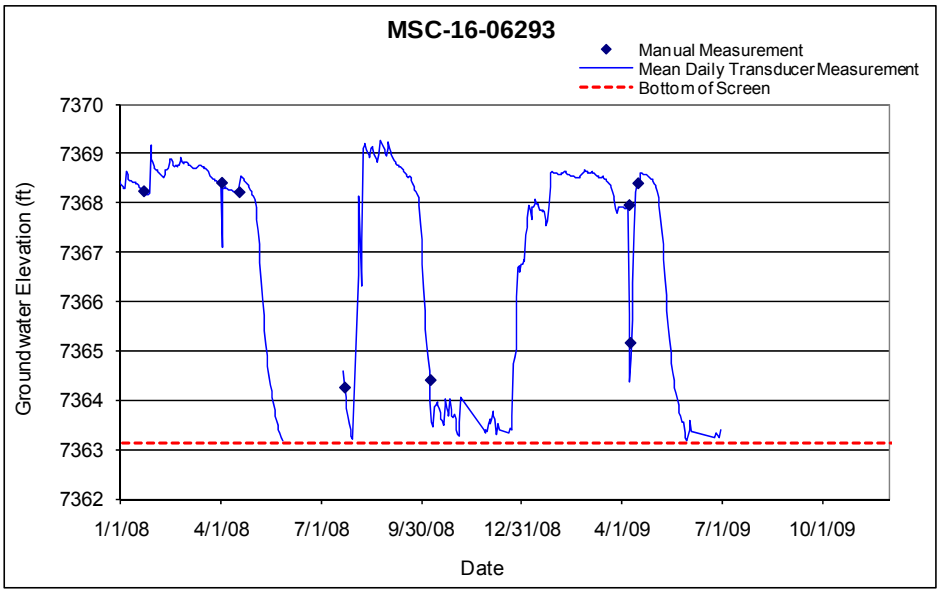
5.70 MSC-16-06293

Location: Martin Spring Canyon, about 1600 ft downstream from the Martin Spring outlet.
Period of Record: November 6, 2000, through October 30, 2009.
Remarks: This well periodically runs dry.

MSC-16-06293 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.3	7.3	7368.14	7363.14	5.0			7.30	7363.14	7.84	0.54	1.33	Alluvial groundwater

Note: Brass Cap Elevation: 7370.79 ft; Ground elevation: 7370.44 ft; all depths are from this elevation



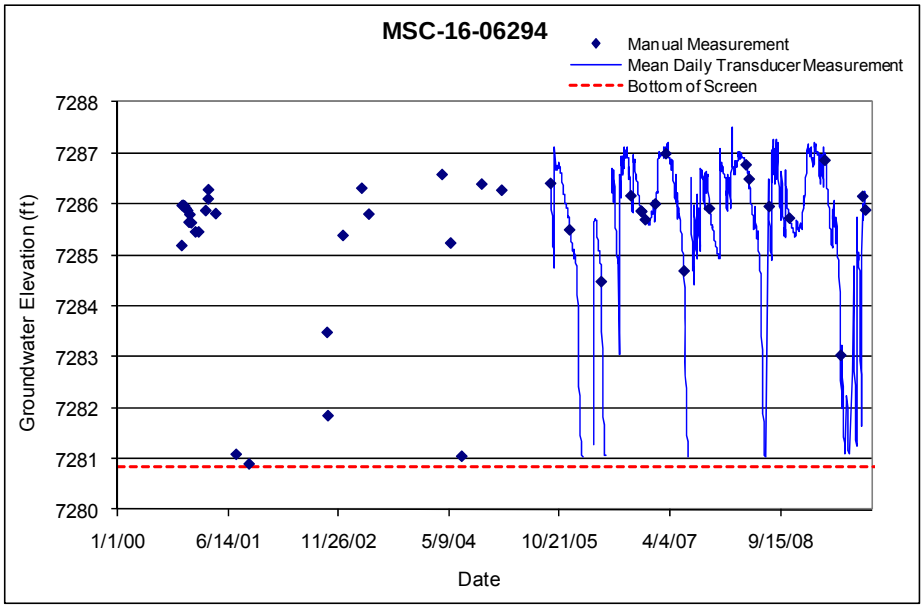


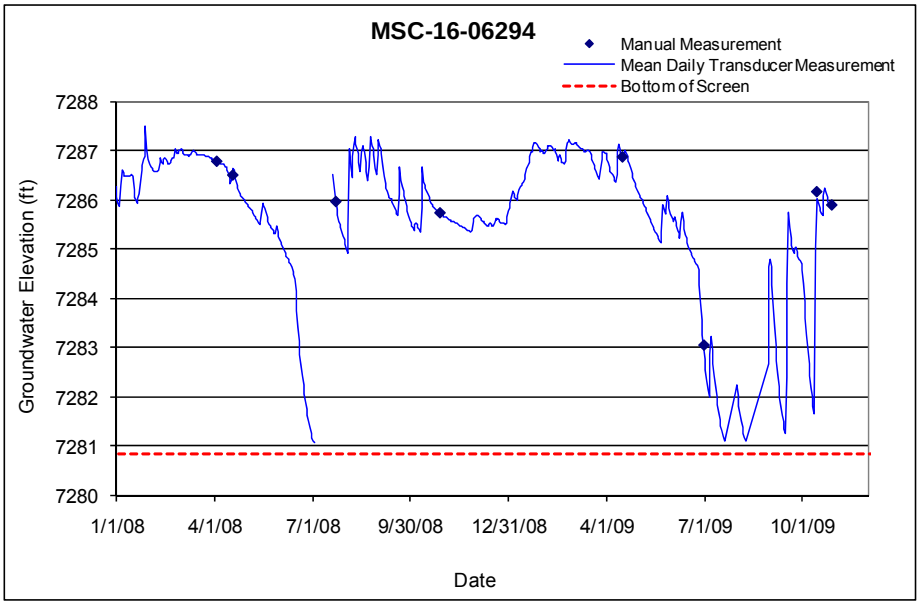
5.71 MSC-16-06294

Location: Martin Spring Canyon, about 1600 ft upstream of the K-site wetlands.
Period of Record: November 6, 2000, through October 28, 2009.
Remarks: None.

MSC-16-06294 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	2.3	7.3	7285.84	7280.84	5.0			7.3	7280.84	7.65	0.35	0.86	Alluvial groundwater

Note: Brass Cap Elevation: 7288.44; Ground elevation: 7288.14 ft; all depths are from this elevation



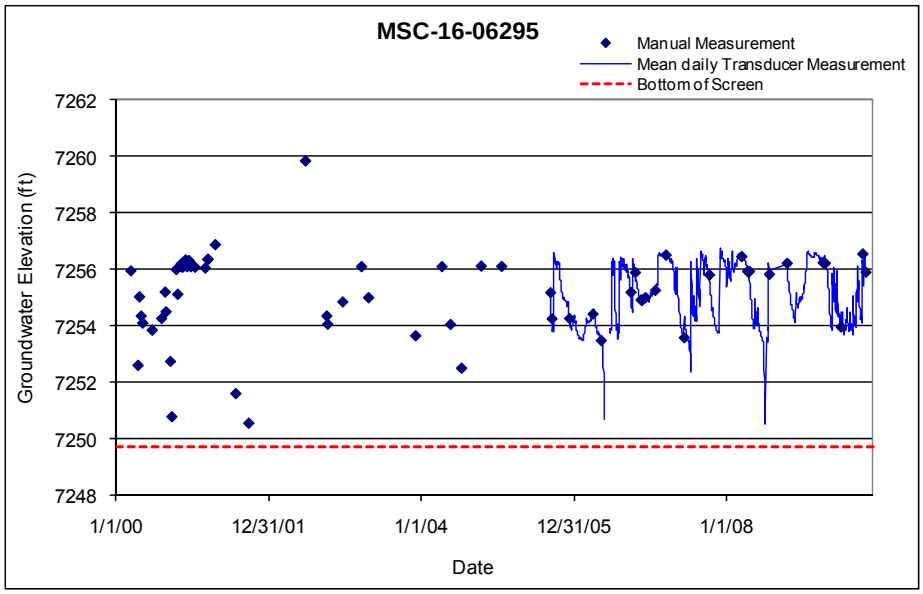


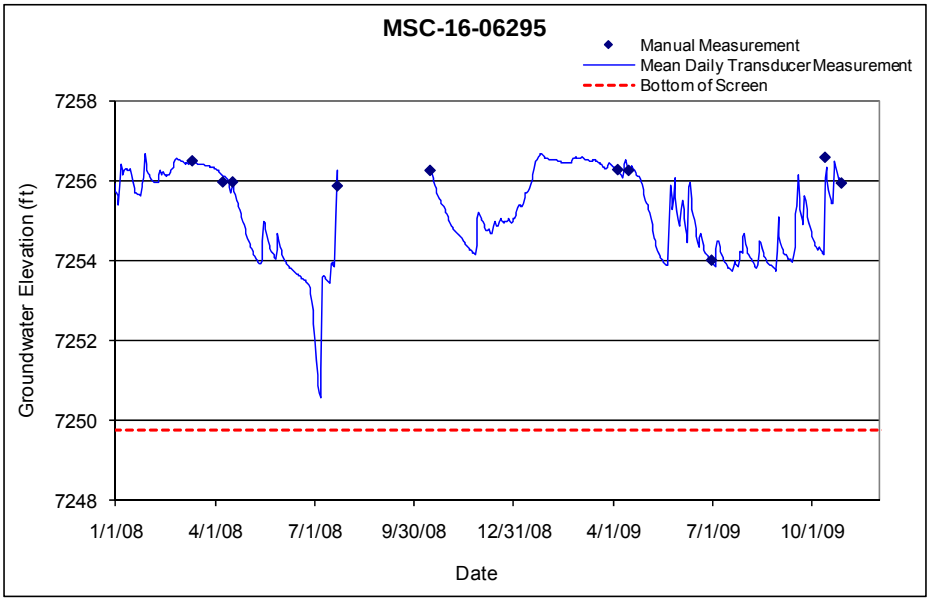
5.72 MSC-16-06295

Location: Martin Spring Canyon, just downstream of the K-site wetlands and north of the TA-11 drop tower.
Period of Record: March 10, 2000, through October 28, 2009.
Remarks: Transducer malfunctioned from July 2008 through October 2008.

MSC-16-06295 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.5	6.5	7254.74	7249.74	5.0			6.50	7249.74	6.85	0.35	0.86	Alluvial groundwater

Note: Brass Cap Elevation: 7257.03 ft; Ground elevation: 7256.24 ft; all depths are from this elevation



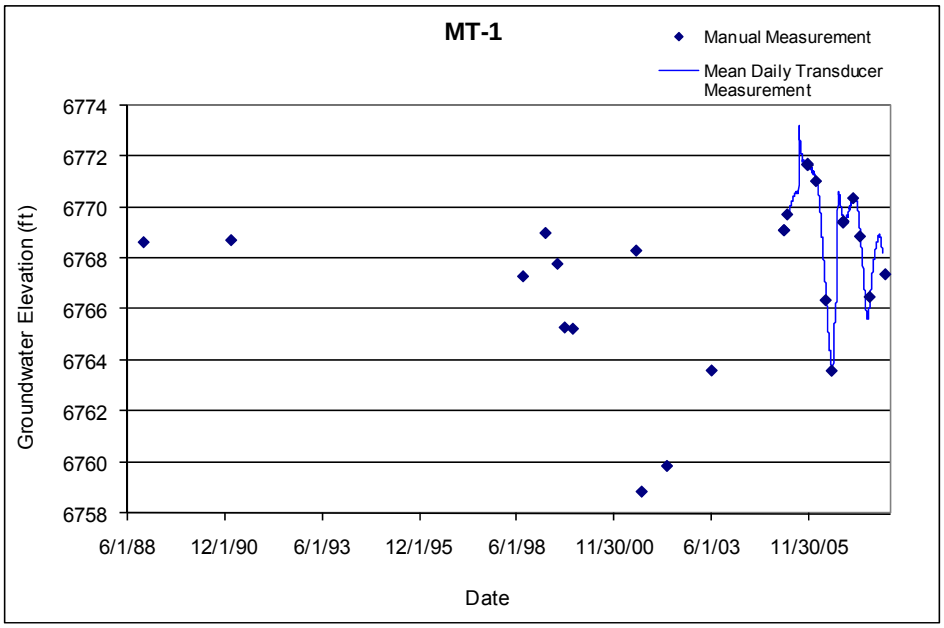


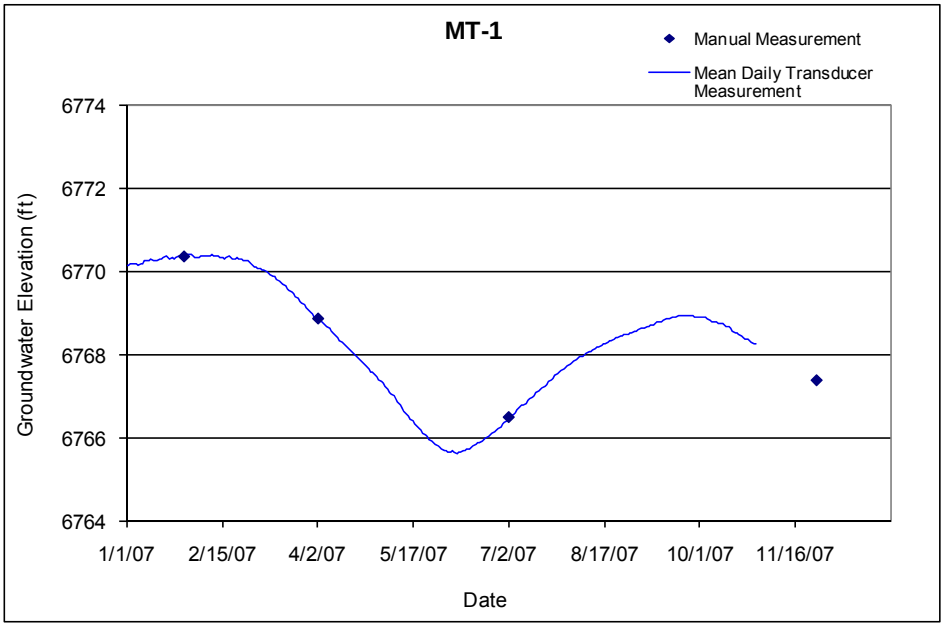
5.73 MT-1

Location: Middle Mortandad Canyon, approximately 0.12 miles east of MCO-7.
Period of Record: November 1, 1988, through November 27, 2007.
Remarks: Monitoring of this well was discontinued November 27, 2007.

MT-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	39.0	59.0	6772.6	6752.6	20.0			59.0	6752.6	69.0	10.0	6.2	Alluvial groundwater

Note: Ground elevation is 6811.63 ft; all depths are from this elevation





5.74 MT-2

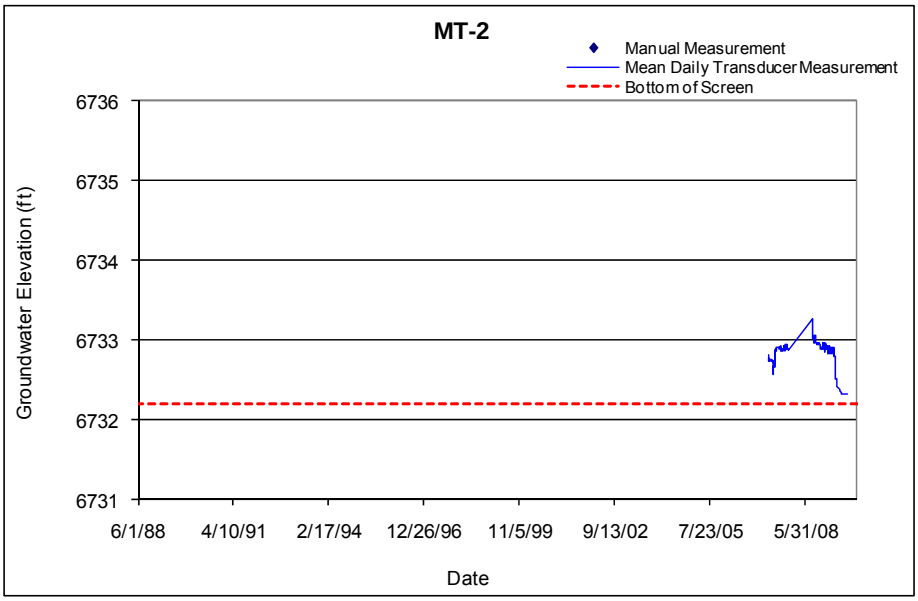
Location: Middle Mortandad Canyon, down canyon of sediment traps, approximately 0.12 miles east of MT-1.

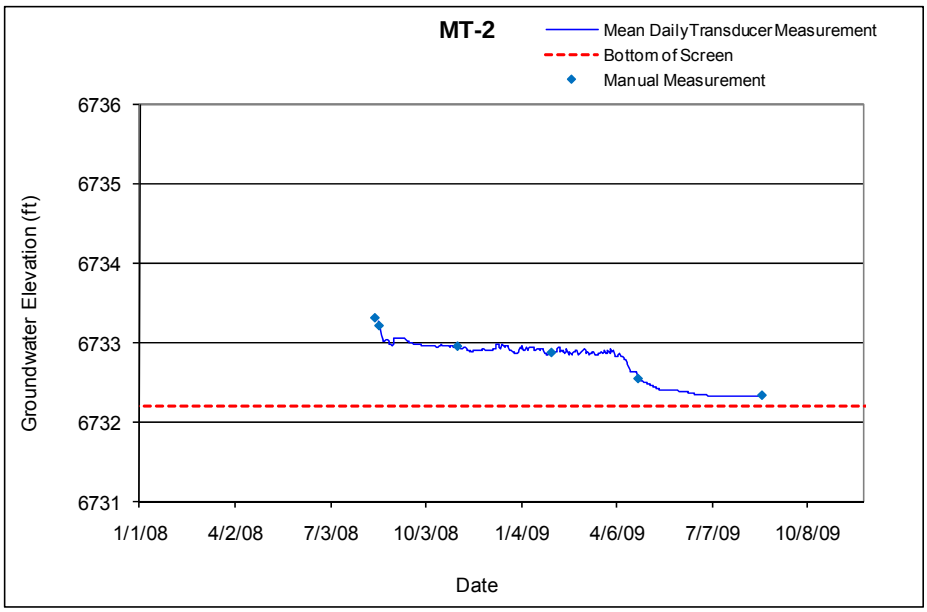
Period of Record: November 1, 1988, through November 18, 2009.

Remarks: The transducer was above the pump until April 17, 2007; transducer data before April 17, 2007, do not represent water levels below 6749.3 ft. Transducer was removed from well from November 28, 2007, through August 19, 2008.

MT-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	44.0	64	6752.2	6732.2	20.0			64.0	6732.2	64.3	0.3	0.2	Alluvial groundwater

Note: Ground elevation is 6796.20 ft; all depths are from this elevation



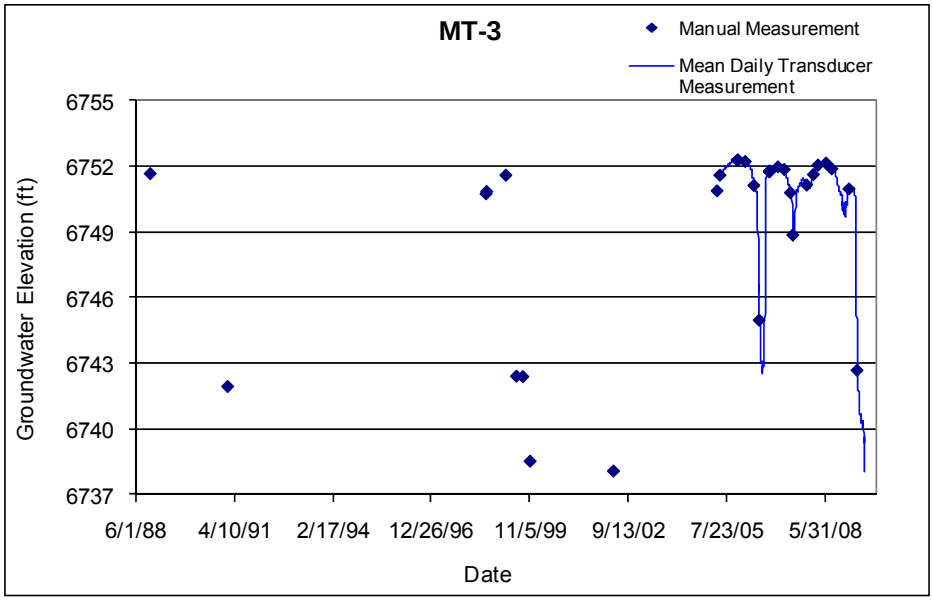


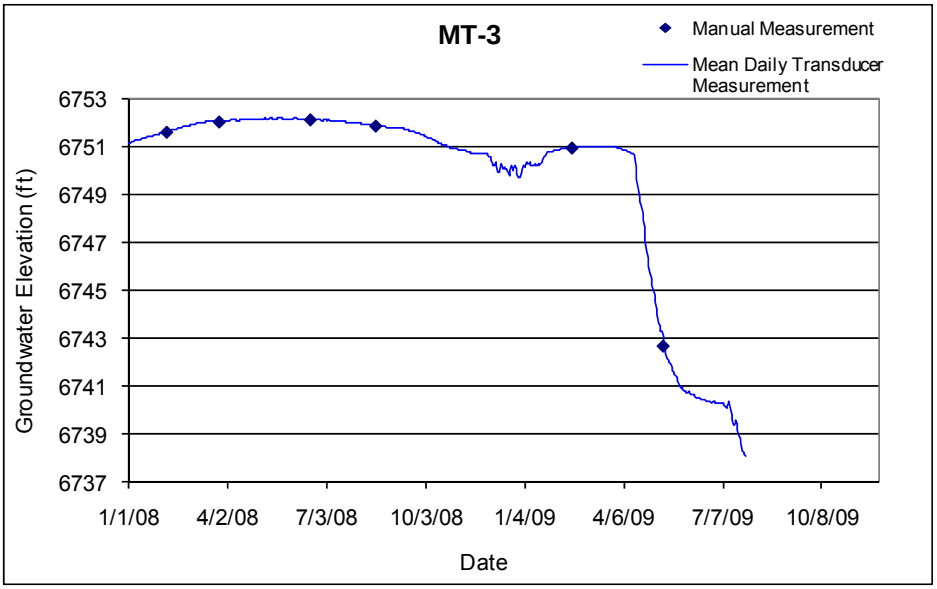
5.75 MT-3

Location: Middle Mortandad Canyon, down canyon of sediment traps, approximately 0.12 miles east of MT-1 and approximately 50 ft north of MT-2.
Period of Record: November 1, 1988, through November 2, 2009.
Remarks: None.

MT-3 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	44.0	64.0	6752.7	6732.7	20.0			64.0	6732.7	74.0	10.0	6.2	Alluvial groundwater

Note: Ground elevation is 6796.65 ft; all depths are from this elevation



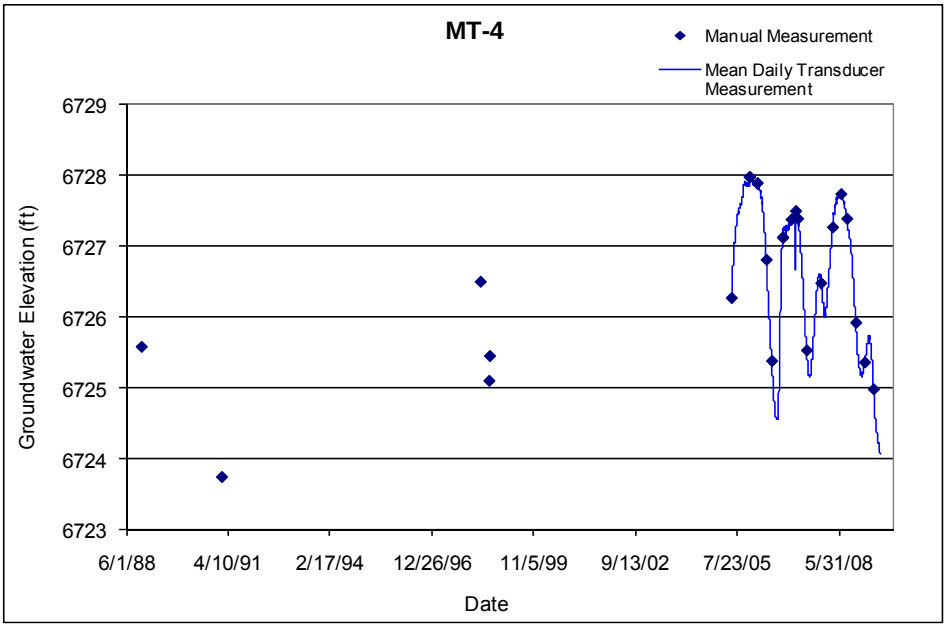


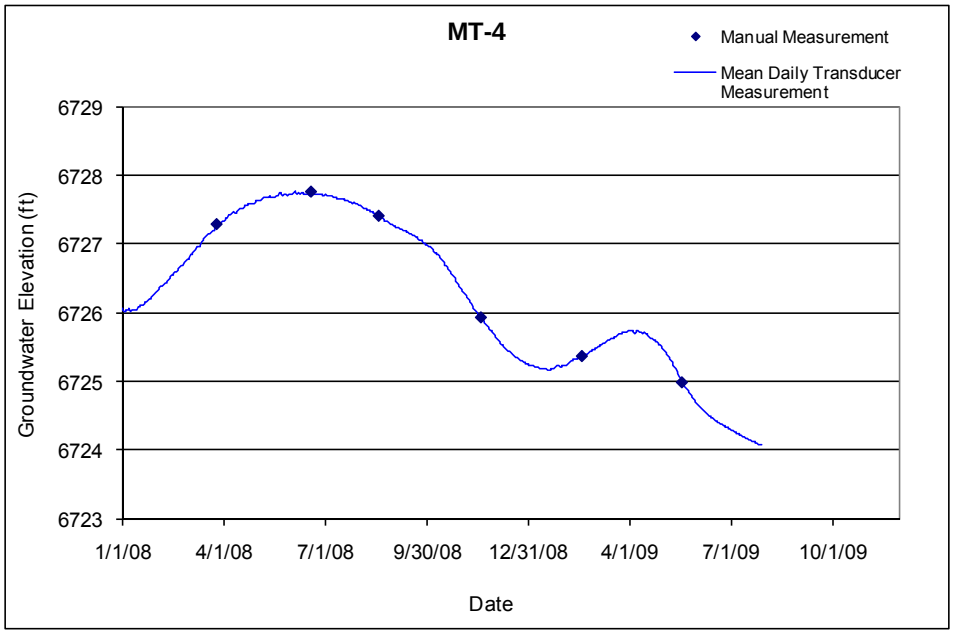
5.76 MT-4

Location: Middle Mortandad Canyon, down canyon of the sediment traps, approximately 525 ft east of MT-3.
Period of Record: November 1, 1988, through November 18, 2009.
Remarks: None.

MT-4 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	54	64	6729.59	6719.59	10			64	6719.59	74	10	6	Alluvial groundwater

Note: Ground elevation is 6783.59 ft; all depths are from this elevation



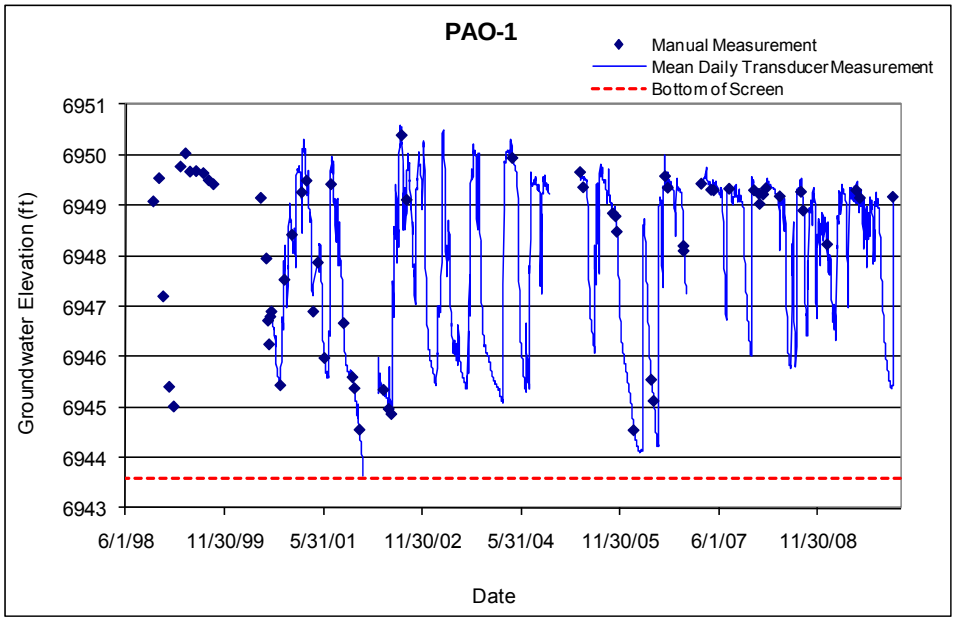


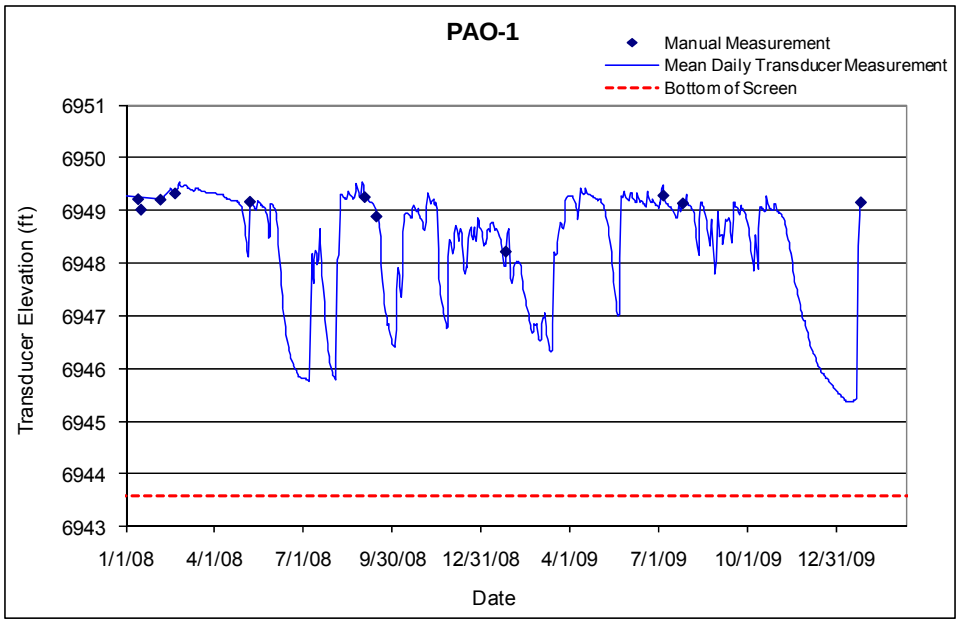
5.77 PAO-1

Location: Upper Pueblo Canyon, approximately 1000 ft west of the confluence with Acid Canyon.
Period of Record: October 29,1998, through January 26, 2010.
Remarks: The transducer batteries failed on December 3, 2006, and were replaced on February 27, 2007.

PAO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	5.89	10.89	6948.58	6943.58	5.00			10.89	6944.08	13.74	2.85	7.04	Alluvial groundwater

Note: Brass Cap Elevation: 6954.97 ft; Ground elevation is 6954.47 ft; all depths are from this elevation



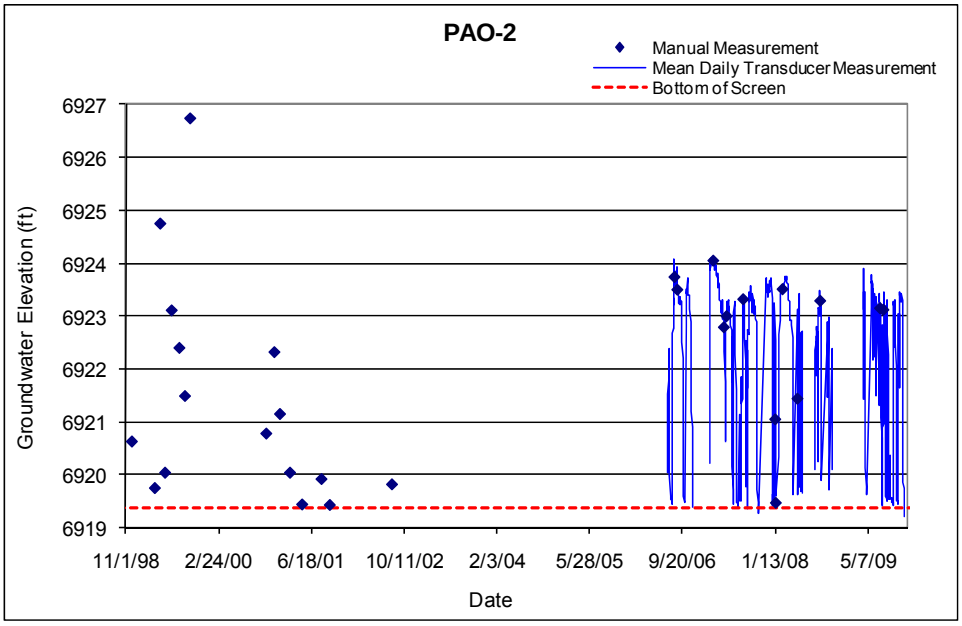


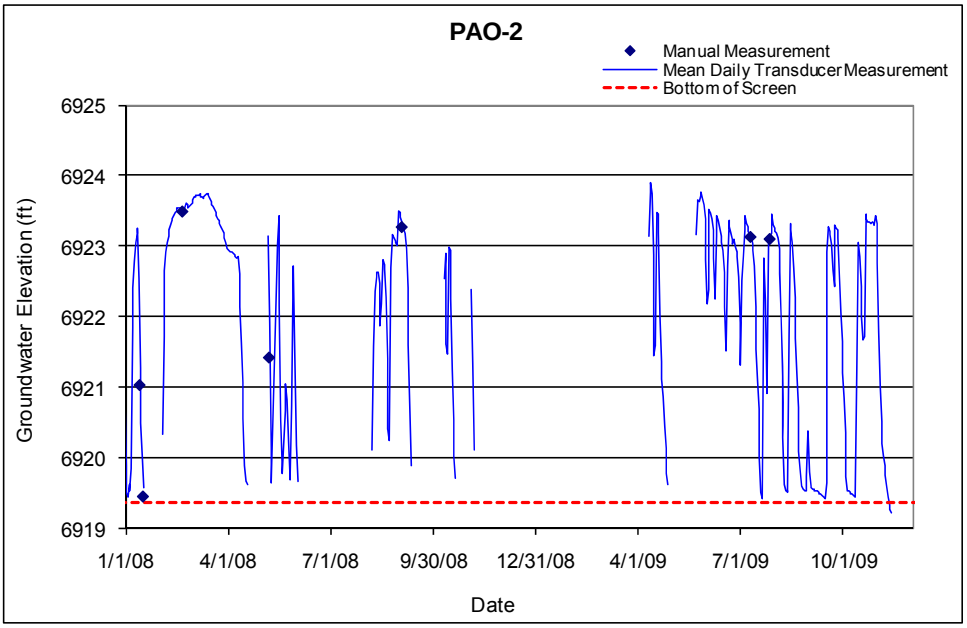
5.78 PAO-2

Location: Upper Pueblo Canyon, approximately 500 ft east of the Acid Canyon confluence.
Period of Record: November 30, 1998, through December 2, 2009.
Remarks: The water level frequently drops below the screen.

PAO-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	6.06	11.06	6914.37	6919.37	5.00			11.06	6919.37	13.91	2.85	7.04	Alluvial groundwater

Note: Ground elevation is 6930.98 ft; all measurements are from this elevation



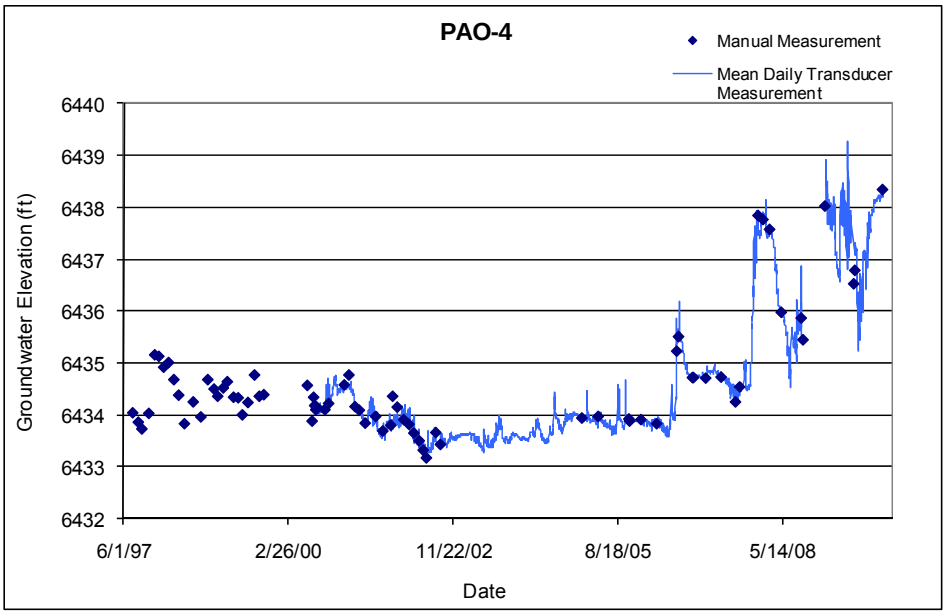


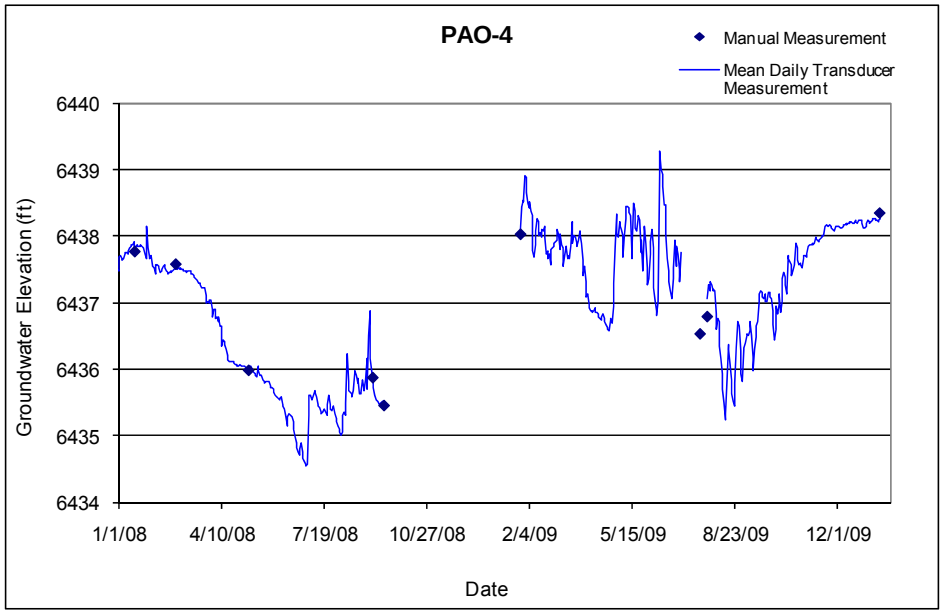
5.79 PAO-4

Location: Lower Pueblo Canyon, approximately 3100 ft southeast of the old LAC Sewage Treatment Plant location.
Period of Record: July 24, 1997, through January 11, 2010.
Remarks: Transducer failed from September 2008 through January 2009, and from June 2009 through July 2009.

PAO-4 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.97	6.97	6435.07	6430.07	5.00			6.97	6430.07	9.82	2.85	7.04	Alluvial groundwater

Note: Brass Cap Elevation: 6437.37 ft; Ground elevation: 6437.04 ft; all depths are from this elevation



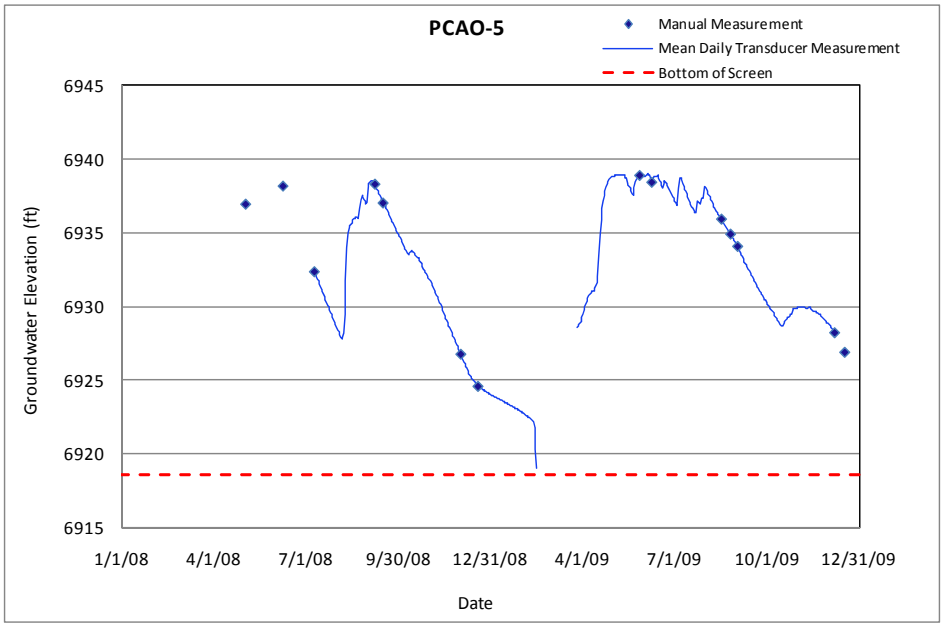


5.80 PCAO-5

Location: Middle Pajarito Canyon, adjacent to and on the north side of the stream channel, approximately 100 ft upstream of the flood retention dam.
Period of Record: May 3, 2008, through December 17, 2009.
Remarks: None.

PCAO-5 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	14.7	24.7	6928.6	6918.6	10.0			24.7	6918.6	30.0	5.3	13.1	Alluvial Groundwater

Note: Ground elevation is 6943.29 ft; all depths from this elevation

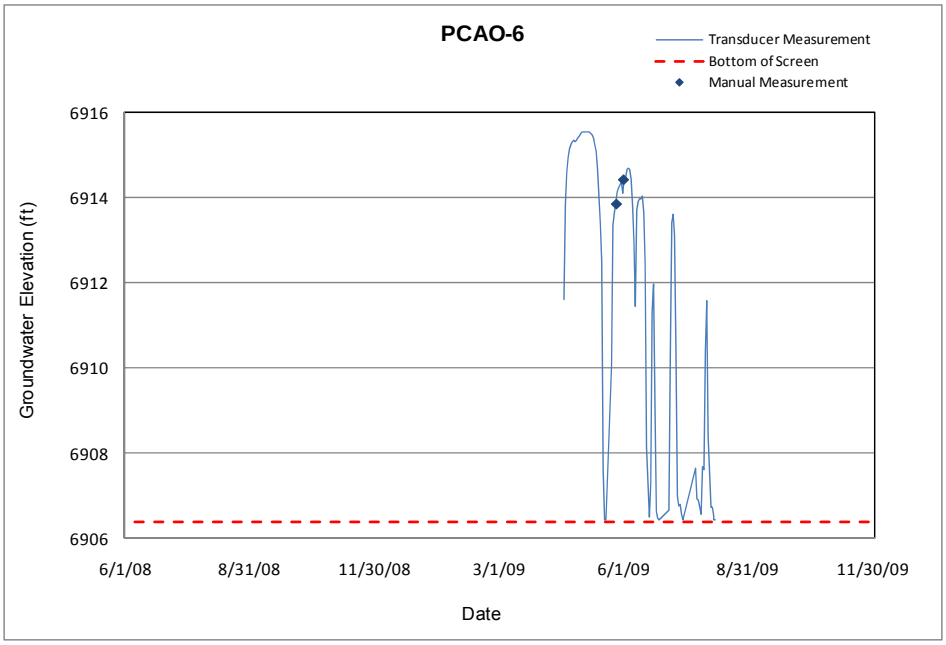


5.81 PCAO-6

Location: Middle Pajarito Canyon, on the south side of the stream channel, approximately 300 ft downstream of the flood retention dam, and approximately 100 ft west of regional well R-17.
Period of Record: June 5, 2008, through December 7, 2009.
Remarks: Well was purged dry during drilling (less than one gallon of water). Until April 2009, water did not rise above the sump. Well remained wet during the summer of 2009.

PCAO-6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	8.0	15.0	6913.4	6906.4	7.0			15.0	6906.4	20.0	5.0	12.4	Alluvial Groundwater

Note: Ground elevation is 6921.40 ft; all depths from this elevation

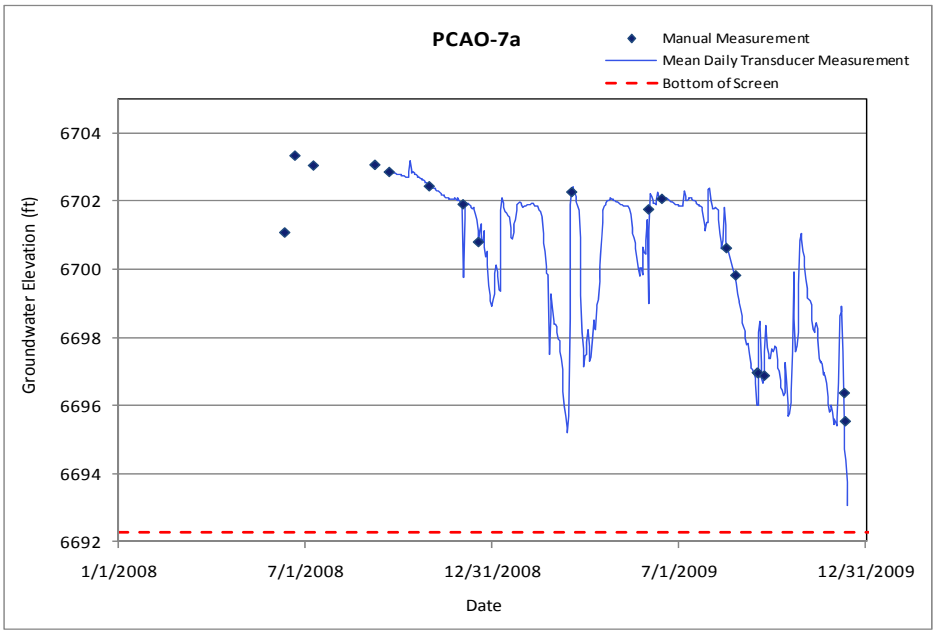


5.82 PCAO-7a

Location: In TA-18 in lower Pajarito Canyon on the north side of Pajarito Road, approximately 100 ft from the TA-18 entrance.
Period of Record: June 12, 2008, through December 17, 2009.
Remarks: None.

PCAO-7a Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	9.7	19.7	6702.3	6692.3	10.0			19.7	6692.3	24.7	5.0	12.4	Alluvial Groundwater

Note: Ground elevation is 6711.97 ft; all depths are from this elevation.



5.83 PCAO-7b1

Location: In lower Pajarito Canyon, in TA-18, on the north side of Pajarito Road directly across from the TA-18 entrance. PCAO-7b1 and PCAO-7b2 are approximately 10 ft apart.
Period of Record: May 21, 2008, through December 17, 2009.
Remarks: Well was bailed dry during drilling, and water has not risen above the sump since.

PCAO-7b(1) Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	44.0	54	6669.6	6659.6	10.0			54.0	6659.6	59.3	5.3	13.1	Alluvial groundwater

Note: Ground elevation is 6713.62 ft; all depths from this elevation

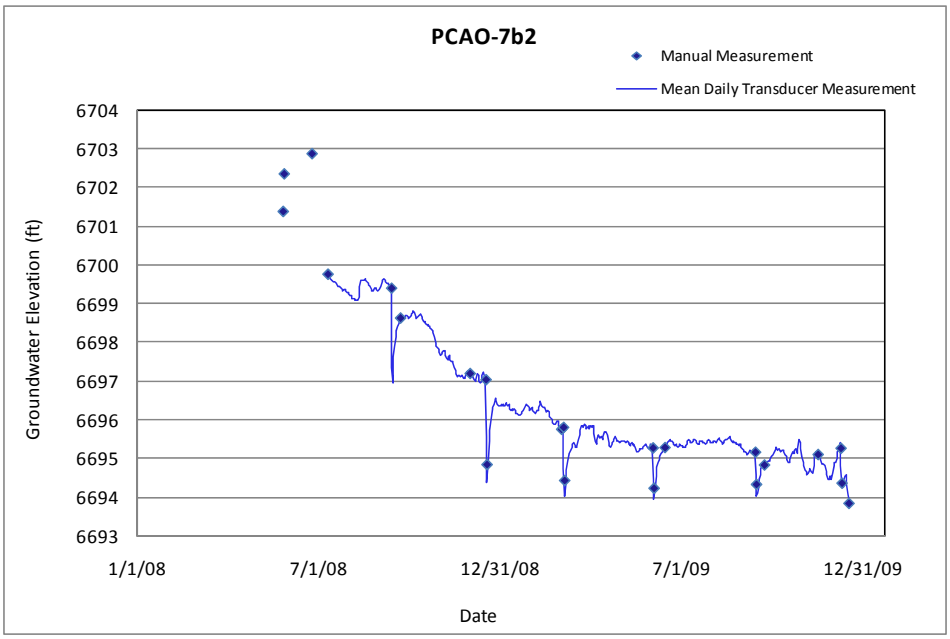
PCAO-7b1 Manual Water Levels		
Date	Water Level (ft)	Comments
5/21/2008	6656.7	Sump water
5/28/2008	6657.34	Sump water
6/13/2008		Dry
6/24/2008		Dry
7/11/2008	6653.82	Sump water
7/11/2008	6653.82	Sump water
9/8/2008	6653.86	Sump water
12/1/2008	6653.85	Sump water
3/3/2009	6653.85	Sump water
5/28/2009	6653.83	Sump water
9/23/2009	6653.85	Sump water
12/17/2009	6653.83	Sump water

5.84 PCAO-7b2

Location: In lower Pajarito Canyon, in TA-18, on the north side of Pajarito Road directly across from the TA-18 entrance. PCAO-7b1 and PCAO-7b2 are approximately 10 ft apart.
Period of Record: May 27, 2008, through December 17, 2009.
Remarks: None.

PCAO-7b(2) Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	10.0	20	6703.4	6693.4	10.0			20.0	6693.4	25.0	5.0	12.4	Alluvial groundwater

Note: Ground elevation is 6713.39 ft; all depths are from this elevation

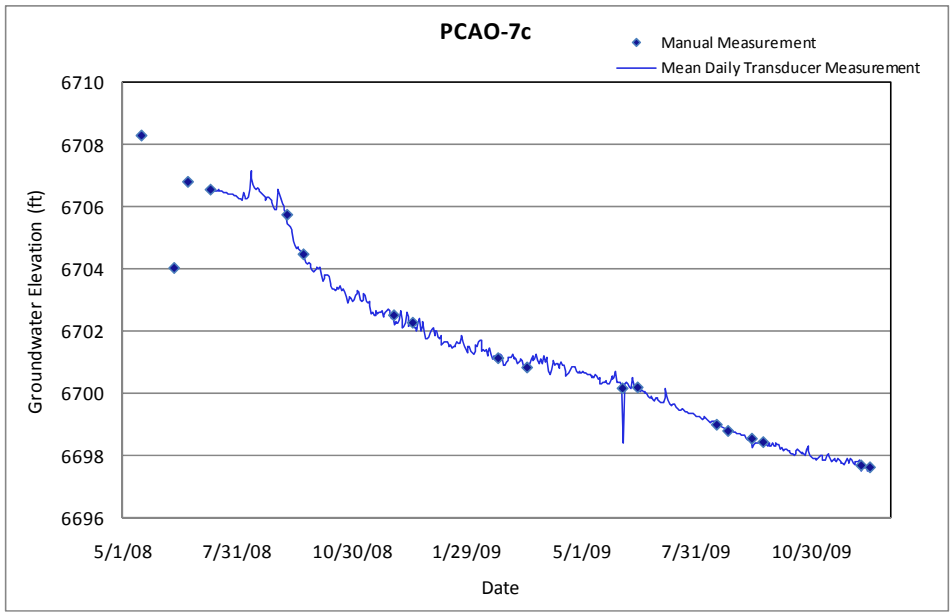


5.85 PCAO-7c

Location: Lower Pajarito Canyon, in TA-18 on the south side of Pajarito Road, approximately 50 ft from the TA-18 entrance.
Period of Record: May 16, 2008, through December 17, 2009.
Remarks: None.

PCAO-7c Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	9.7	19.7	6704.9	6694.9	10.0			19.7	6694.9	25.0	5.3	13.1	Alluvial groundwater

Note: Ground elevation is 6714.57 ft; all depths from this elevation

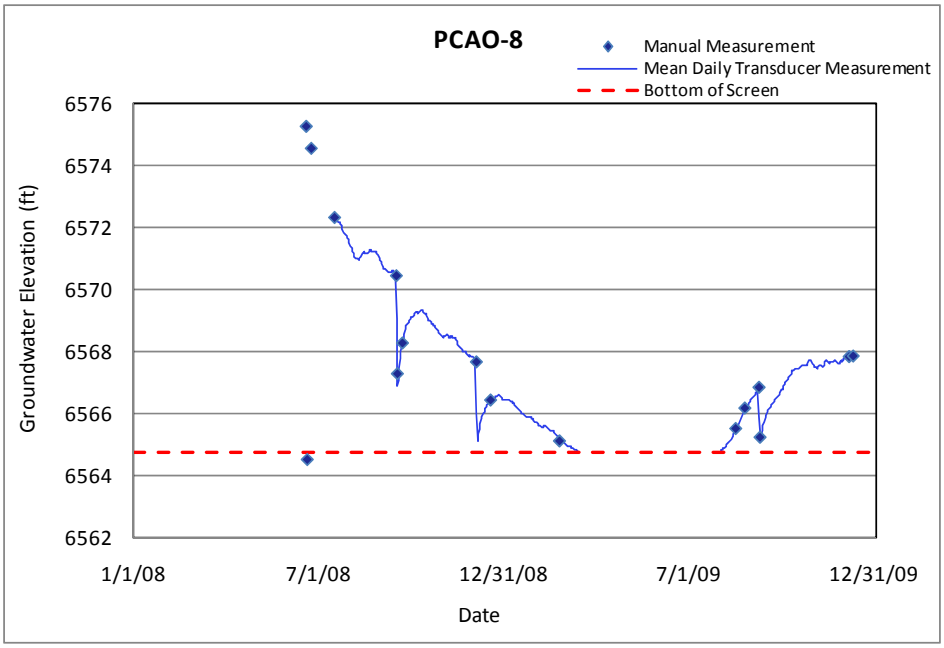


5.86 PCAO-8

Location: In lower Pajarito Canyon, on the south side of Pajarito Road in TA-36, approximately a quarter mile west of PCAO-9.
Period of Record: June 2, 2008, through December 11, 2009.
Remarks: None.

PCAO-8 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	9.7	19.7	6574.8	6564.8	10.0			19.7	6564.8	25.0	5.3	13.1	Alluvial groundwater

Note: Ground elevation is 6584.45 ft; all depths from this elevation

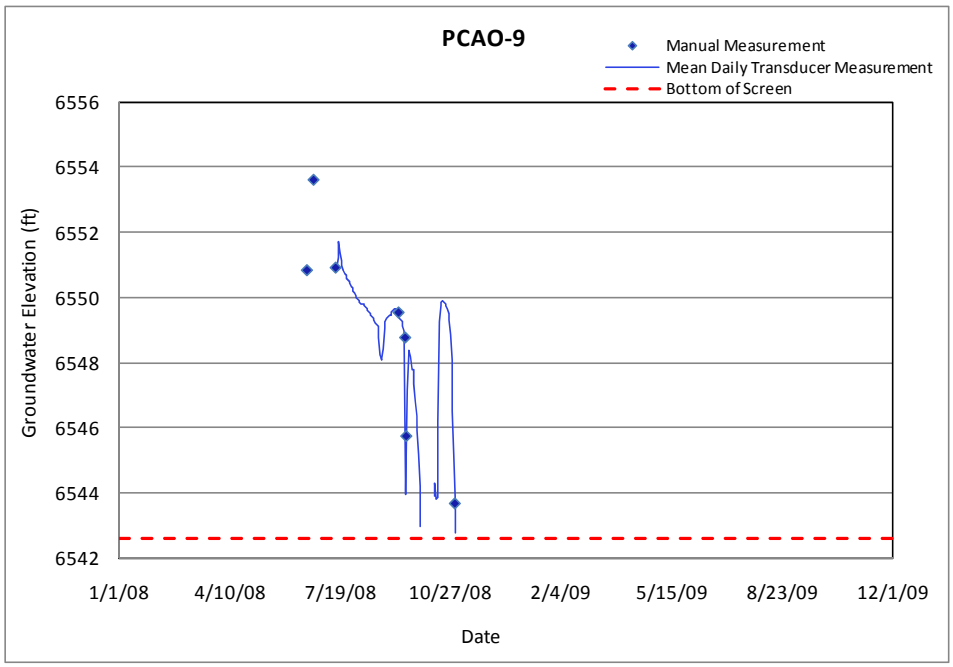


5.87 PCAO-9

Location: In lower Pajarito Canyon on the south side of Pajarito Road in TA-36, approximately a quarter mile west of the security check point, and quarter mile east of PCAO-8.
Period of Record: June 12, 2008, through December 9, 2009.
Remarks: Water level dropped below screen on November 1, 2008 and has not again risen above the screen.

PCAO-9 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	6.0	16.0	6552.6	6542.6	10.0			16.0	6542.6	21.0	5.0	12.4	Alluvial groundwater

Note: Ground elevation is 6558.60 ft; all depths from this elevation

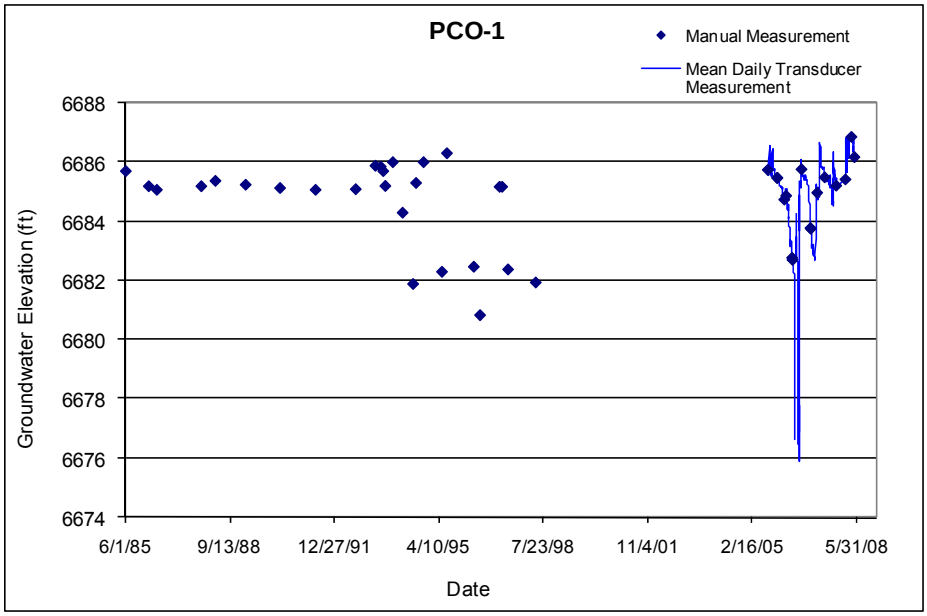


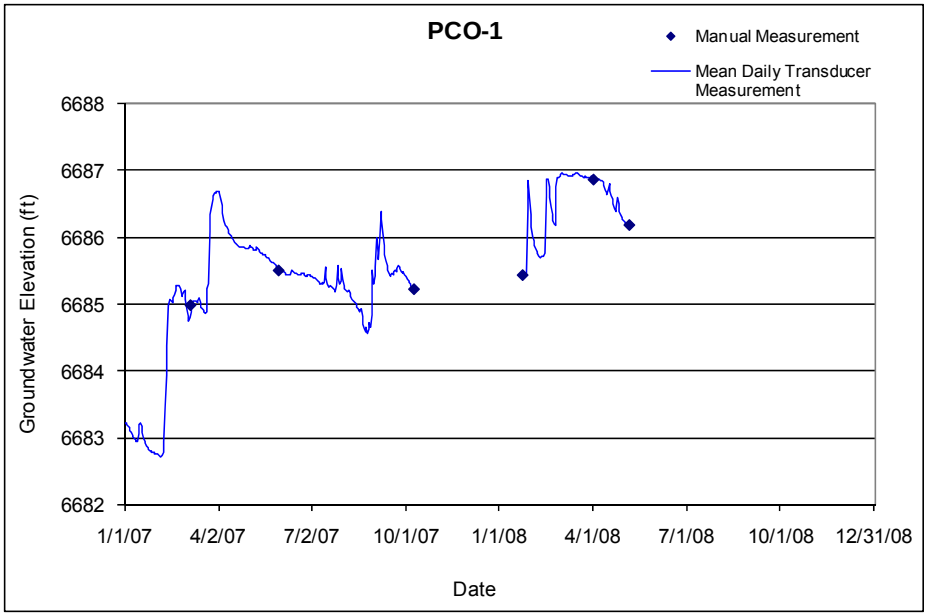
5.88 PCO-1

Location: Pajarito Canyon, approximately 200 ft north of R-20.
Period of Record: June 11, 1985, through May 7, 2008.
Remarks: Monitoring of this well was discontinued May 7, 2008.

PCO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	4.3	12.3	6682.7	6674.7	8.0			12.3	6674.7	12.3	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6687.0 ft; all depths are from this elevation



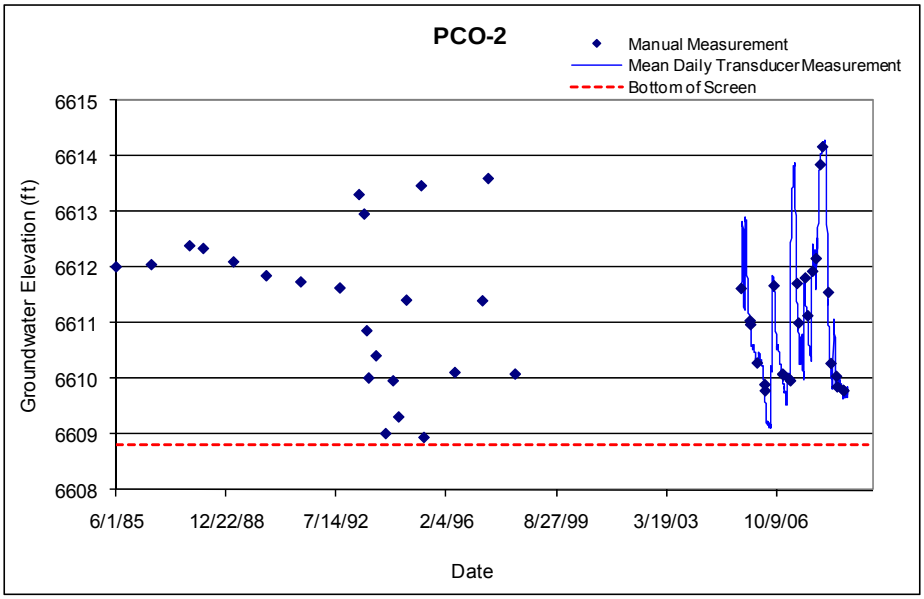


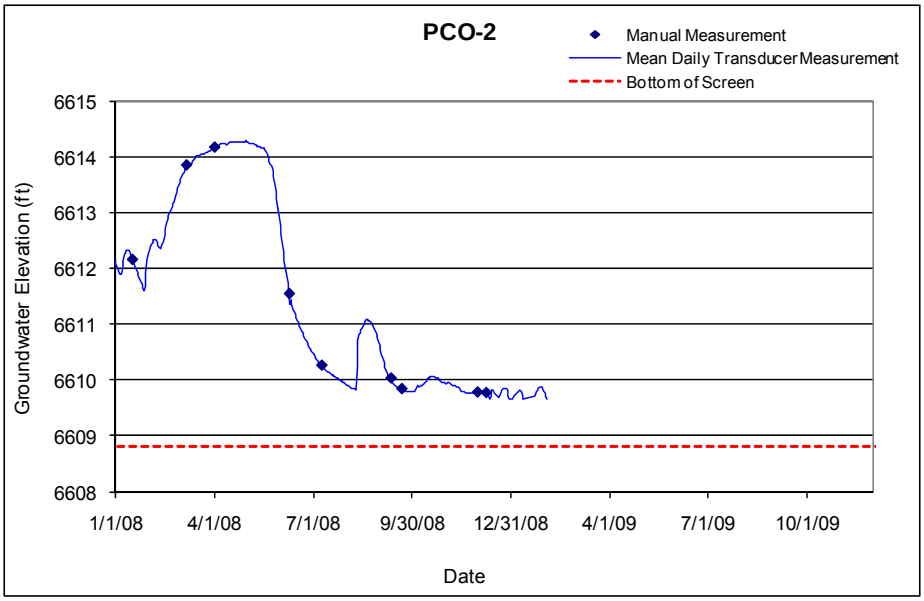
5.89 PCO-2

Location: In lower Pajarito Canyon on the north side of Pajarito Road, approximately 0.1 miles east of R-32.
Period of Record: June 11, 1985, through December 7, 2009.
Remarks: Well has been dry since February 2009.

PCO-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.5	9.5	6616.8	6608.8	8			9.5	6608.8	9.5	0	0	Alluvial groundwater

Note: Ground Elevation: 6618.3 ft; all depths are from this elevation



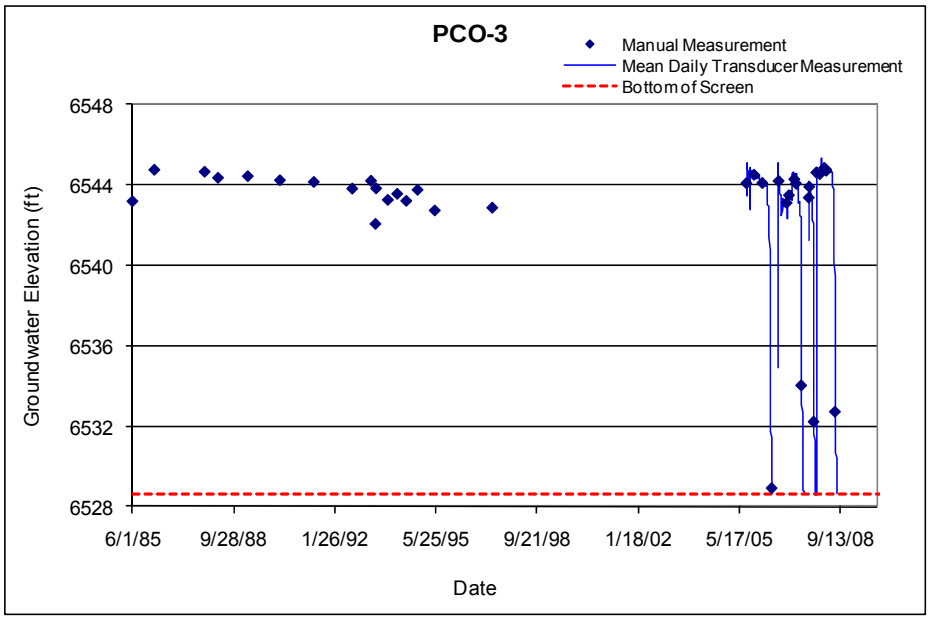


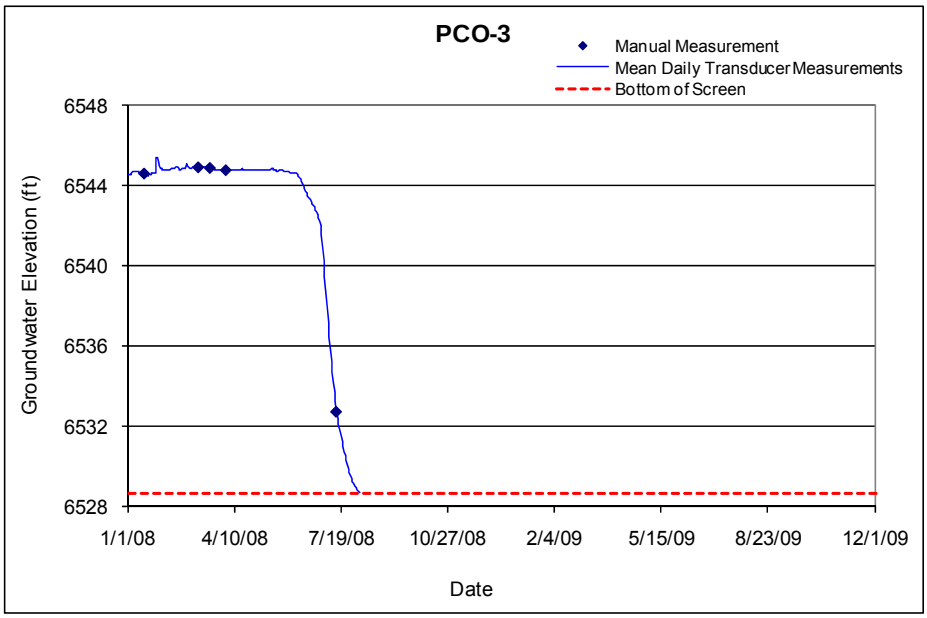
5.90 PCO-3

Location: Lower Pajarito Canyon, approximately 1 mile east of R-32, in wetlands on the south side of Pajarito Road.
Period of Record: June 11, 1985, through December 9, 2009.
Remarks: The water level was below the bottom of the screen from July 2, 2007, to September 3, 2007, and since July 2008.

PCO-3 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	5.7	17.7	6540.6	6528.6	12.0			17.7	6528.6	17.7	0.0	0.0	Alluvial groundwater

Note: Ground Elevation: 6546.30 ft; all depths are from this elevation





5.91 SCA-1 and SCA-1-DP

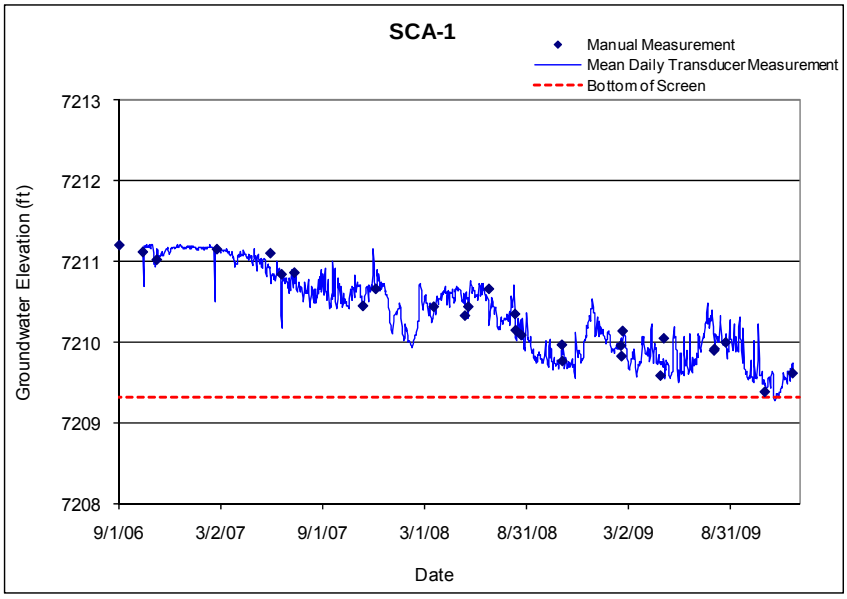
Location: In upper Sandia Canyon, in the wetlands approximately 350 ft upstream from gaging station E123. SCA-1-DP is located approximately 15 ft west of SCA-1.

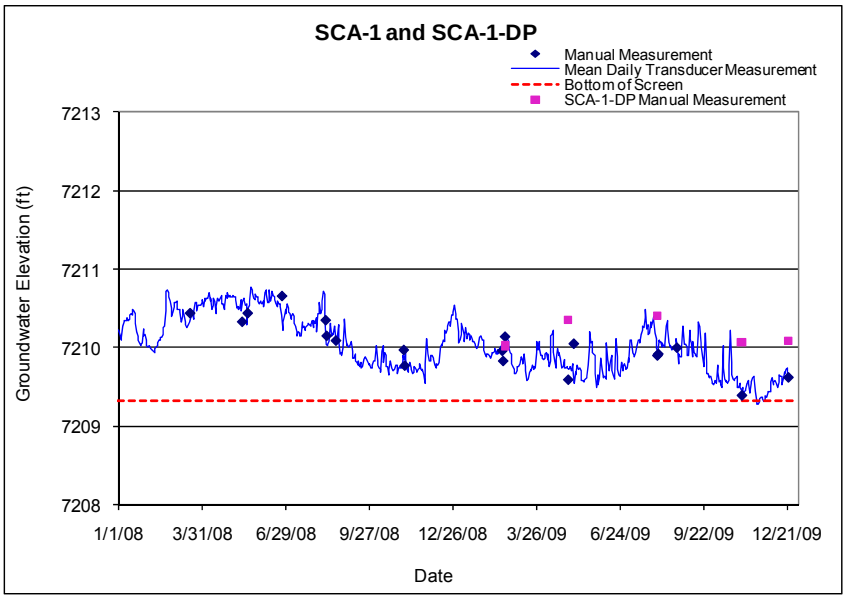
Period of Record: October 13, 2006, through December 22, 2009.

Remarks: SCA-1 is a shallow alluvial well located in a wetland. Recent sampling events have moved to temporary drive point well SCA-1-DP due to silting-in of the screen in SCA-1. Continuous water levels are monitored at SCA-1, and manual measurements are taken in conjunction at SCA-1-DP.

SCA-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	1.3	1.9	7209.9	7209.3	0.6			1.9	7209.3	2.1	0.2	0.1	Alluvial groundwater

Note: Ground elevation is 7211.22 ft; all depths are from this elevation



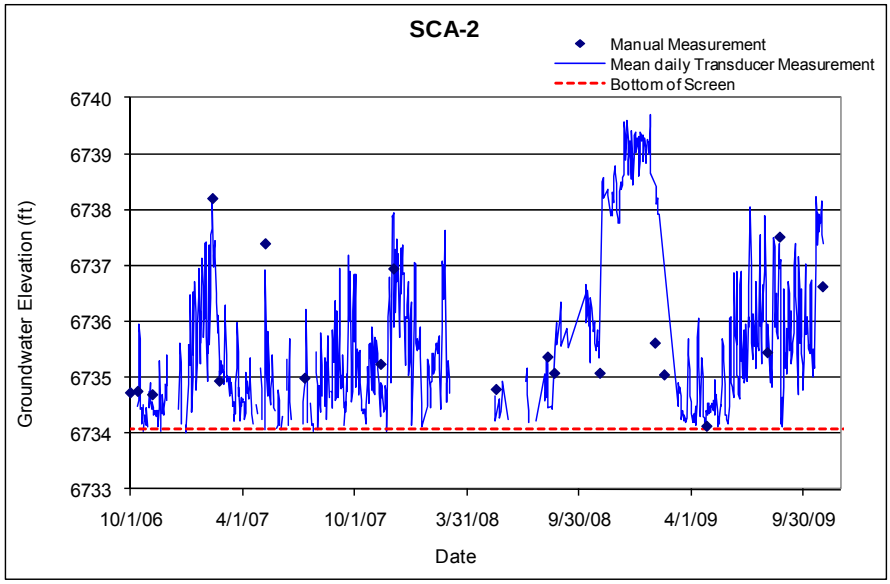


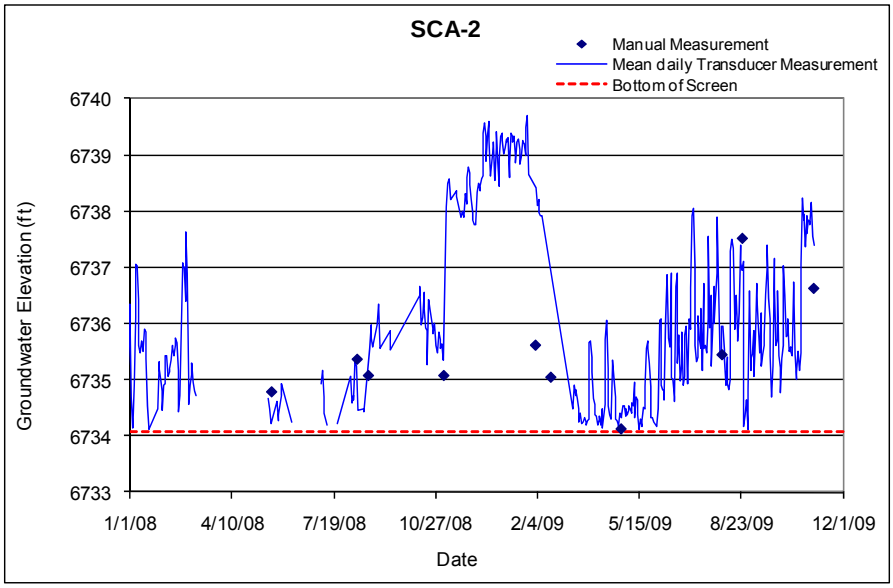
5.92 SCA-2

Location: Middle Sandia Canyon, approximately 700 ft upstream of gaging station E124.
Period of Record: October 13, 2006, through November 2, 2009.
Remarks: SCA-2 responds to the sewer treatment plant discharge in upper Sandia Canyon. Water levels frequently drop below the screen. From August 22, 2008, though March 11, 2009, the transducer was set too high in the well, not recording water levels below 6735.7 ft, and not matching manual measurements. Transducer has since been lowered to record all water level data.

SCA-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	10.3	15.0	6738.8	6734.1	4.7			15.0	6733.8	15.6	0.6	0.4	Alluvial groundwater

Note: Groundwater elevation is 6749.08 ft; all depths are from this elevation



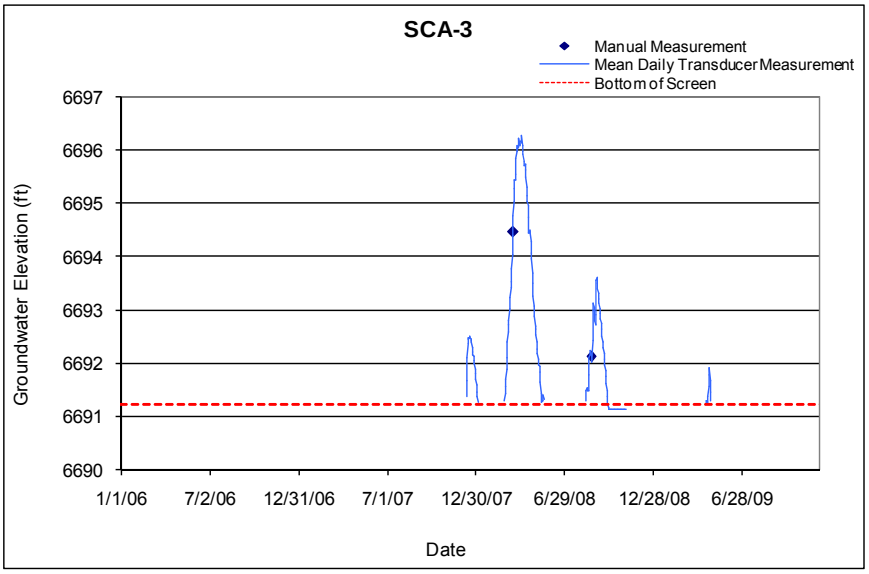


5.93 SCA-3

Location: Middle Sandia Canyon, approximately 700 ft downstream of gaging station E124.
Period of Record: October 13, 2006, through November 2, 2009.
Remarks: Water rose above the sump for the first time on December 10, 2007. Since then the well has periodically run dry.

SCA-3 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	27.6	32.0	6695.6	6691.2	4.4			32.0	6691.2	32.6	0.6	4.4	Alluvial groundwater

Note: Ground elevation is 6723.22 ft; all depths are from this elevation

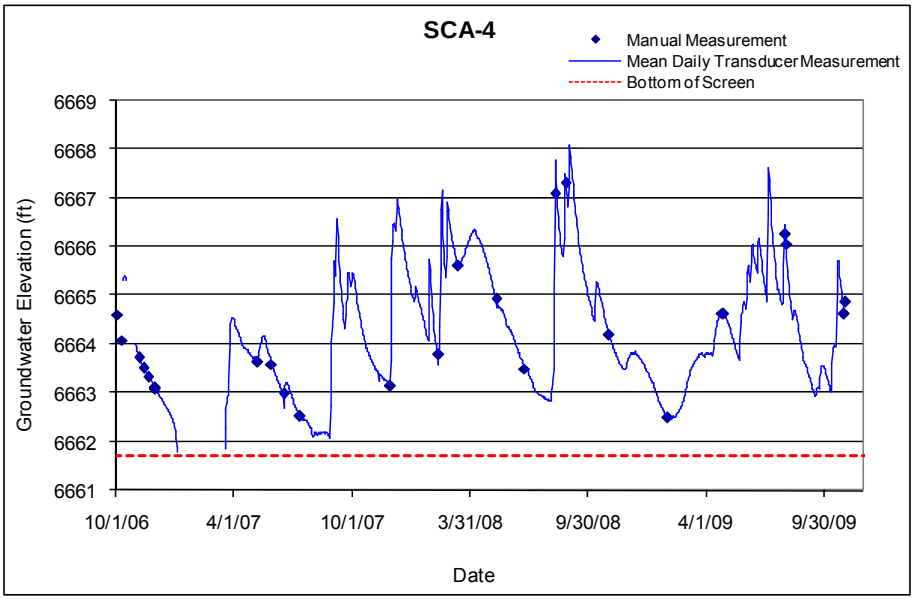


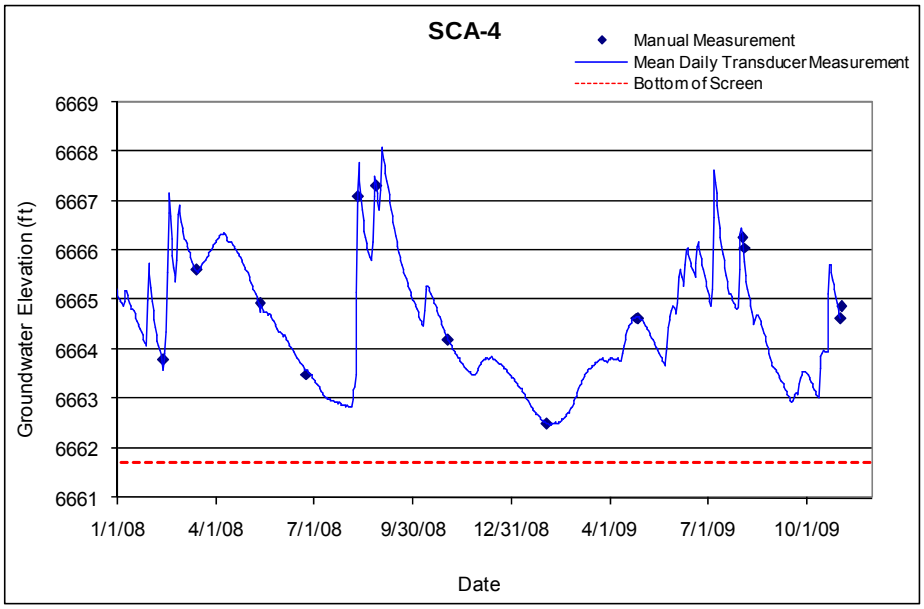
5.94 SCA-4

Location: Middle Sandia Canyon, approximately 700 ft downstream from SCA-3.
Period of Record: October 3, 2006, through November 2, 2009.
Remarks: The transducer was installed on October 3, 2006, above the top of the pump at an elevation of 6665.28 ft. The pump was removed on October 31, 2006, to allow for complete water level monitoring.

SCA-4 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	37.0	41.5	6666.2	6661.7	4.5			41.5	6661.7	42.0	0.5	3.7	Alluvial groundwater

Note: Brass Cap Elevation: 6703.58 ft; Ground elevation: 6703.20 ft; all depths are from this elevation



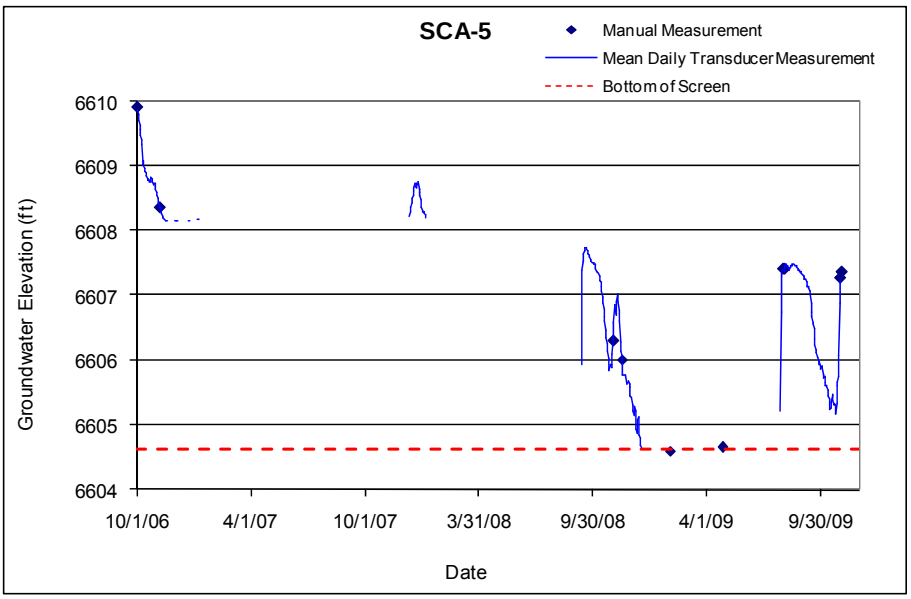


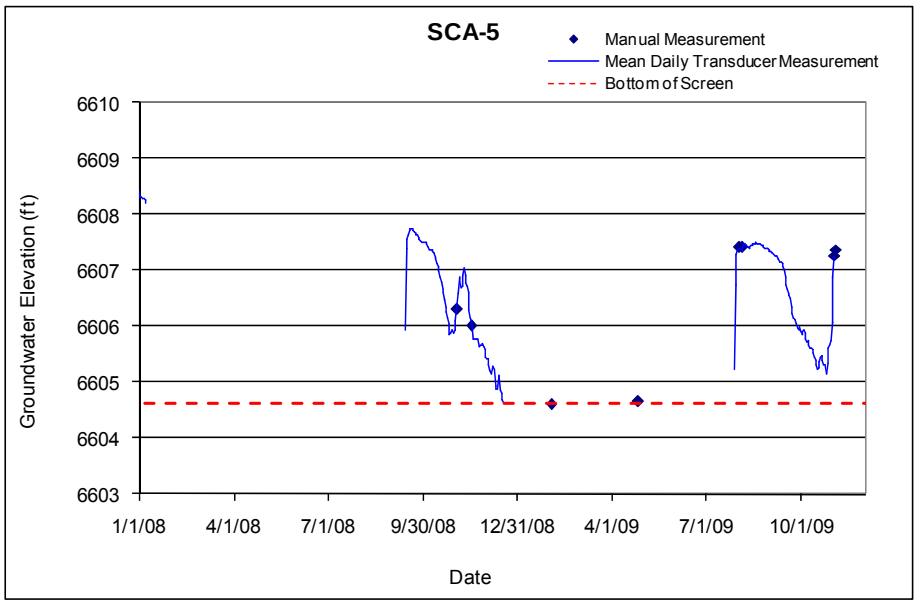
5.95 SCA-5

Location: Middle Sandia Canyon, approximately 650 ft upstream from the firing range at TA-72 and about 325 ft north of R-11.
Period of Record: October 3, 2006, through November 2, 2009.
Remarks: Until spring 2008, the transducer was installed above the pump in the 2-in. casing and the transducer data did not represent water levels below 6608.1 ft. Since spring 2008, the transducer has recorded all water in the well. This well has run dry frequently since installation of the pressure transducer.

SCA-5 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	55.00	64.4	6614.0	6604.6	9.4			64.4	6604.6	64.9	0.5	0.3	Alluvial groundwater

Note: Ground elevation is 6669.02 ft; all depths from this elevation





5.96 SCO-1

Location: Sandia Canyon, approximately 0.1 miles east of R-11.
Period of Record: June 7, 1997, through August 24, 2009.
Remarks: No valid data; well has been dry for every measurement event. There is no transducer installed in this well. Monitoring ceased in August 2009.

SCO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	9.3	19.3	6609.4	6599.4	10.0			19.3	6599.4	19.3	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6618.67 ft; all depths are from this elevation

SCO-1 Manual Water Levels			
Date	Comments	Date	Comments
8/14/1989	Dry	10/18/2005	Dry
6/9/1997	Dry	12/8/2005	Dry
10/13/1997	Dry	3/7/2006	Dry
3/25/1998	Dry	6/13/2006	Dry
5/29/1998	Dry	8/28/2006	Dry
7/28/1998	Dry	9/7/2006	Dry
3/3/1999	Dry	10/3/2006	Dry
6/23/1999	Dry	12/8/2006	Dry
8/30/1999	Dry	2/12/2007	Dry
11/15/1999	Dry	3/13/2007	Dry
3/26/2000	Dry	6/7/2007	Dry
5/16/2000	Dry	6/12/2007	Dry
8/30/2000	Dry	9/5/2007	Dry
10/8/2000	Dry	11/12/2007	Dry
7/2/2001	Dry	1/24/2008	Dry
8/22/2001	Dry	2/12/2008	Dry
10/18/2001	Dry	4/3/2008	Dry
1/27/2002	Dry	5/12/2008	Dry
4/19/2002	Dry	7/22/2008	Dry
8/27/2002	Dry	8/11/2008	Dry
2/19/2003	Dry	11/3/2008	Dry
5/18/2003	Dry	2/2/2009	Dry
2/28/2005	Dry	4/27/2009	Dry
6/7/2005	Dry	8/24/2009	Dry
6/14/2005	Dry		

5.97 SCO-2

Location: Sandia Canyon, approximately 300 ft west of R-12.
Period of Record: June 9, 1997, through August 24, 2009.
Remarks: No valid data; well has been dry for every measurement event. There is no transducer installed in this well. Monitoring ceased in August 2009.

SCO-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	9.4	19.4	6491.3	6481.3	10.0			19.4	6481.3	19.4	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6500.67 ft; all depths are from this elevation

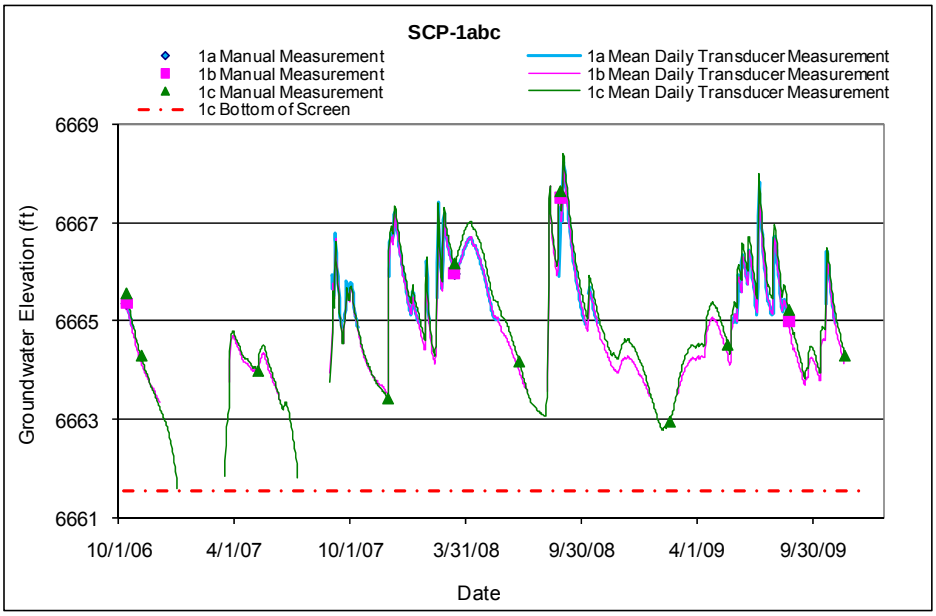
SCO-2 Manual Water Levels				
Date	Comments		Date	Comments
8/16/1989	Dry		10/18/2005	Dry
6/9/1997	Dry		12/8/2005	Dry
10/13/1997	Dry		3/7/2006	Dry
3/25/1998	Dry		6/13/2006	Dry
5/29/1998	Dry		8/28/2006	Dry
7/28/1998	Dry		9/7/2006	Dry
3/3/1999	Dry		10/3/2006	Dry
6/23/1999	Dry		12/8/2006	Dry
8/30/1999	Dry		2/12/2007	Dry
11/15/1999	Dry		3/13/2007	Dry
3/26/2000	Dry		6/7/2007	Dry
5/16/2000	Dry		6/12/2007	Dry
8/30/2000	Dry		9/5/2007	Dry
10/8/2000	Dry		11/12/2007	Dry
7/2/2001	Dry		1/24/2008	Dry
8/22/2001	Dry		2/12/2008	Dry
10/18/2001	Dry		4/3/2008	Dry
4/19/2002	Dry		5/12/2008	Dry
8/27/2002	Dry		7/22/2008	Dry
10/27/2002	Dry		8/11/2008	Dry
2/19/2003	Dry		11/3/2008	Dry
5/18/2003	Dry		2/2/2009	Dry
6/7/2005	Dry		4/27/2009	Dry
6/14/2005	Dry		8/24/2009	Dry

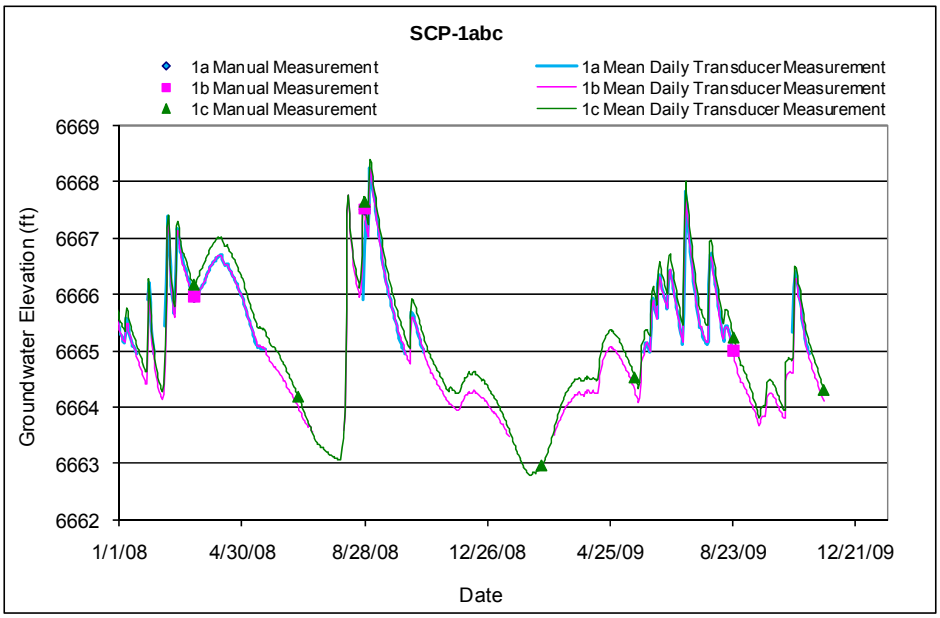
5.98 SCP-1abc

Location: Middle Sandia Canyon, approximately 5 ft west of SCA-4.
Period of Record: October 13, 2006, through November 20, 2009.
Remarks: SCP-1abc is a triple-nested piezometer.

SCP-1abc Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
a	37.80	38.3	6665.44	6664.94	0.5			38.3	6664.9	38.4	0.1	0.004	Alluvial groundwater
b	39.4	39.9	6663.84	6663.34	0.5			39.9	6663.34	40.0	0.1	0.004	Alluvial groundwater
c	41.2	41.7	6662.04	6661.54	0.5			41.7	6661.54	41.8	0.1	0.004	Alluvial groundwater

Note: Brass Cap Elevation: 6703.65 ft; Ground elevation: 6703.24 ft; all depths are from this elevation



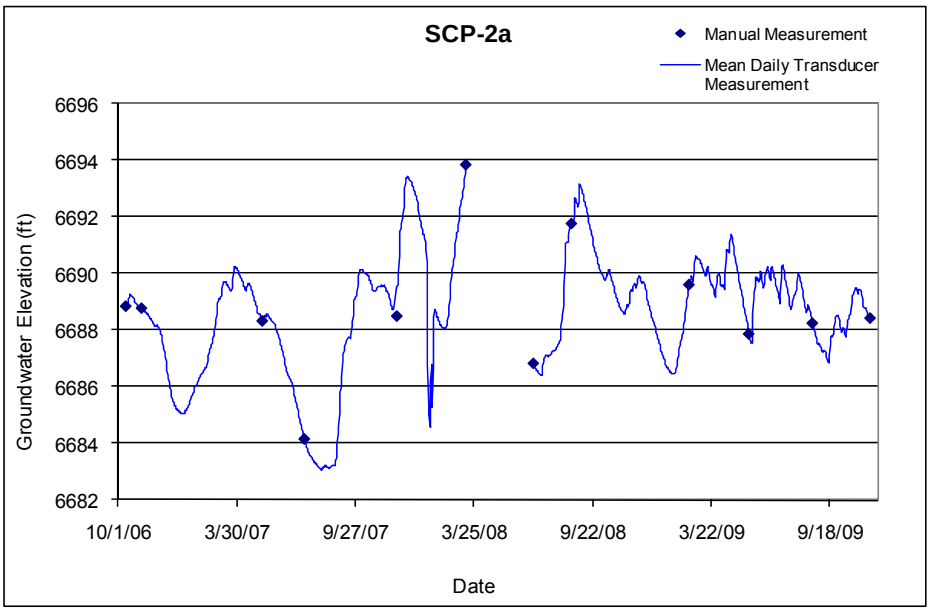


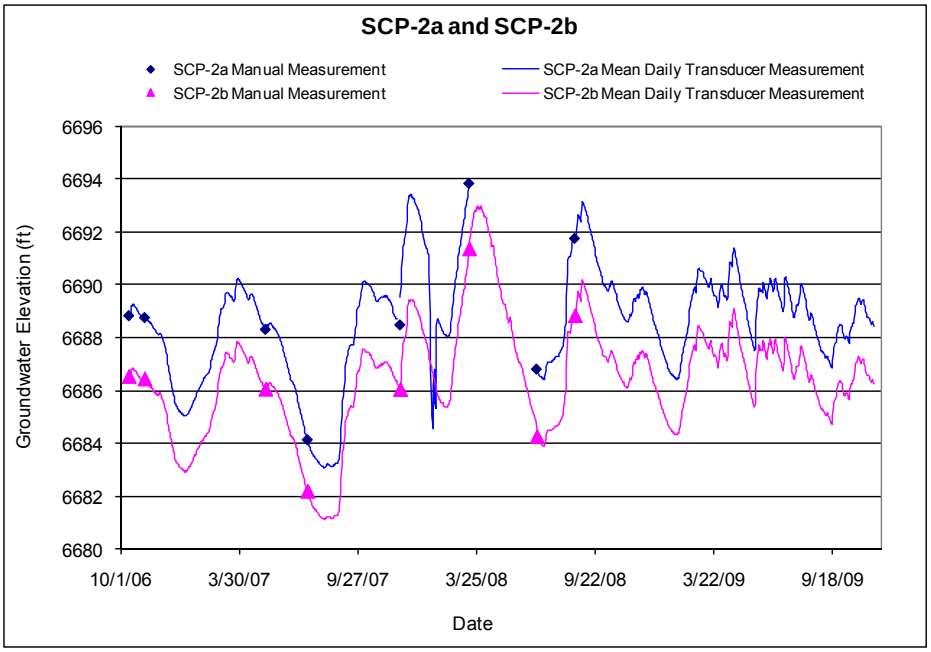
5.99 SCP-2a

Location: Middle Sandia Canyon, approximately 10 ft east of SCA-3 and 5 ft east of SCP-2b.
Period of Record: October 13, 2006, through November 20, 2009.
Remarks: None.

SCP-2a Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
2a	44.5	45.0	6678.1	6677.6	0.5			45.0	6678.0	45.1	0.1	0.02	Alluvial groundwater

Note: Brass Cap Elevation: 6722.95 ft; Ground elevation: 6722.57 ft; all depths are from this elevation



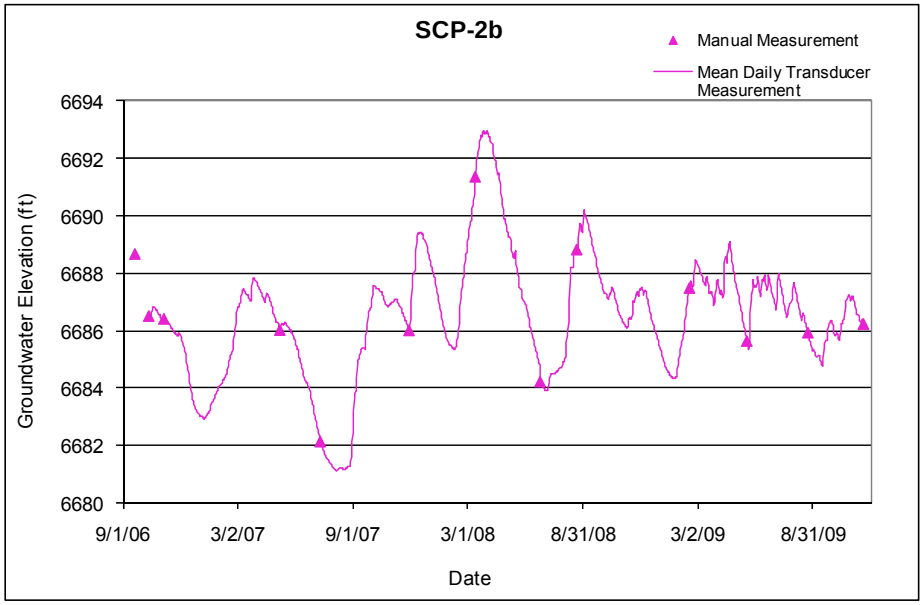


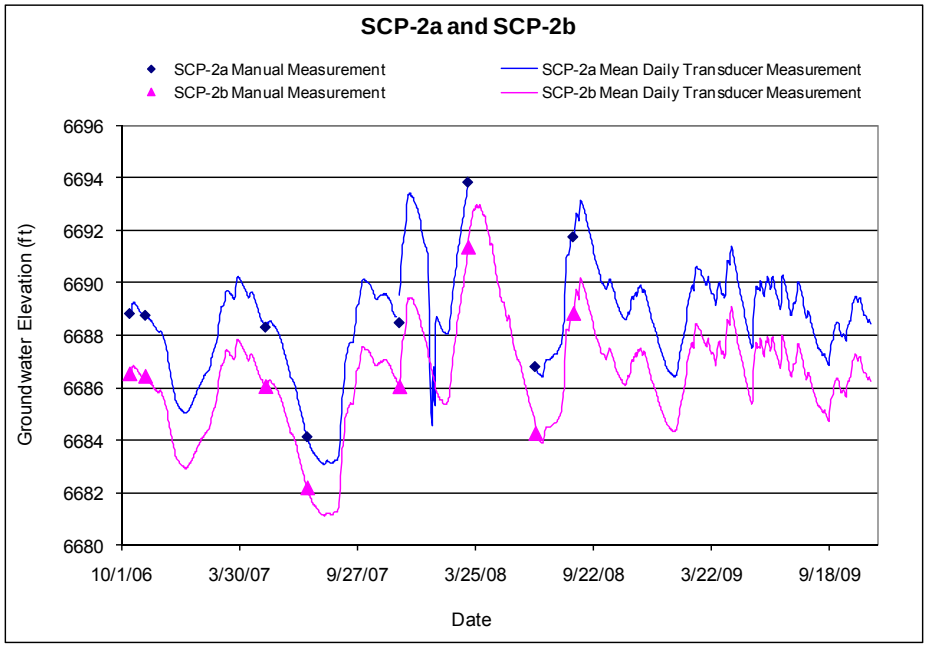
5.100 SCP-2b

Location: Middle Sandia Canyon, approximately 5 ft east of SCA-3 and 5 ft west of SCP-2a.
Period of Record: October 13, 2006, through November 20, 2009.
Remarks: None.

SCP-2b Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
2b	49.5	50.0	6673.1	6672.6	0.5			50.0	6673.1	50.1	0.1	0.02	Alluvial groundwater

Note: Brass Cap Elevation: 6723.11, Ground Elevation: 6722.57 ft; all depths are from this elevation



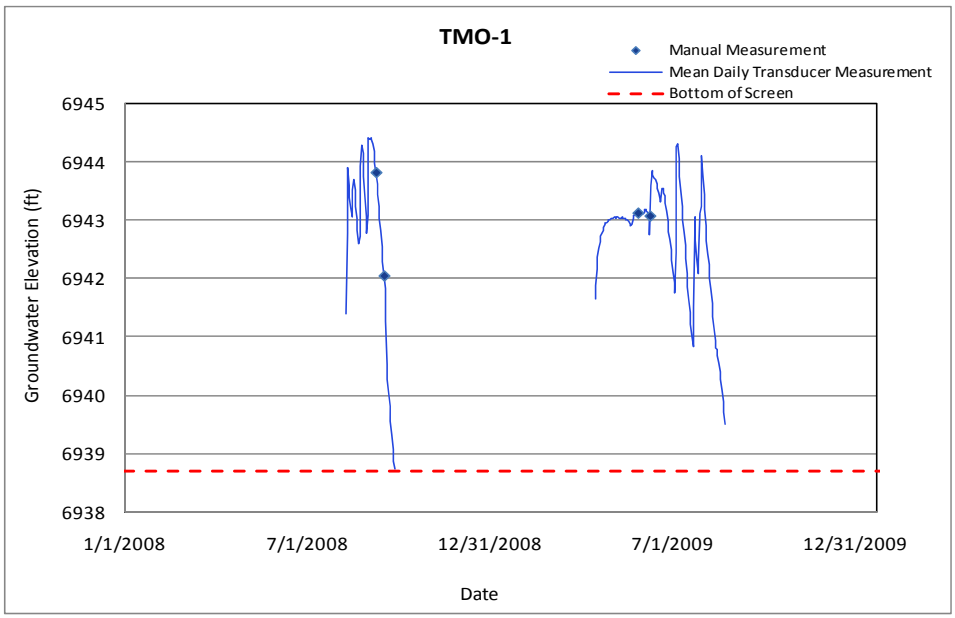


5.101 TMO-1

Location: In lower Two Mile Canyon, just above the confluence with Pajarito Canyon; approximately 500 ft upstream of PCAO-5 and the flood retention dam.
Period of Record: July 17, 2008, through December 12, 2009.
Remarks: Data from July 17, 2008, through August 9, 2008, were invalidated because transducer was hanging above level of water. The transducer was lowered to the bottom of the well on December 12, 2009.

TMO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elevation (ft)	Screen Bottom Elevation (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comments
1	3.5	6.5	6941.7	6938.7	3.0			6.5	6938.7	6.5	0.0	0.0	Hand-augered well

Note: Ground elevation is 6945.20 ft; all depths from this elevation

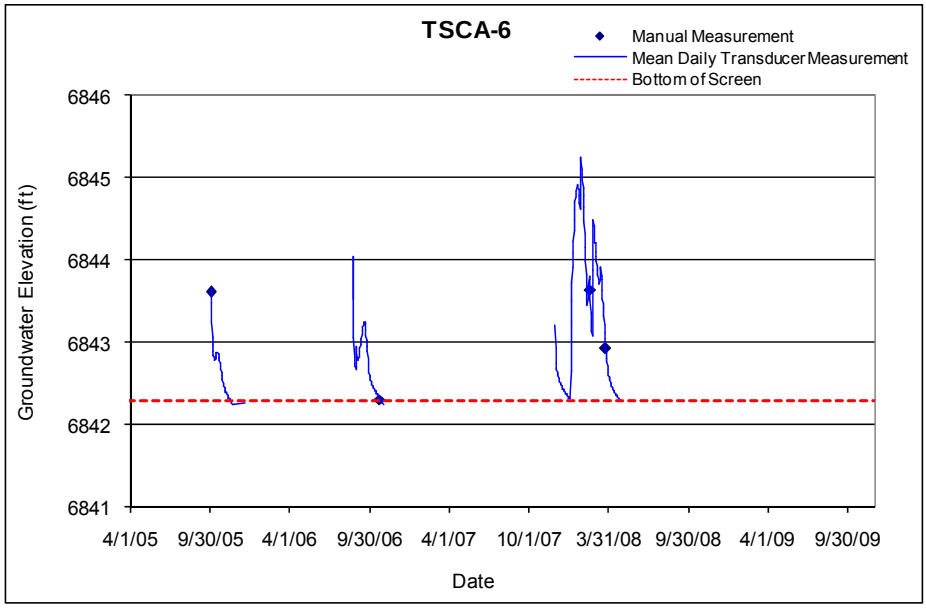


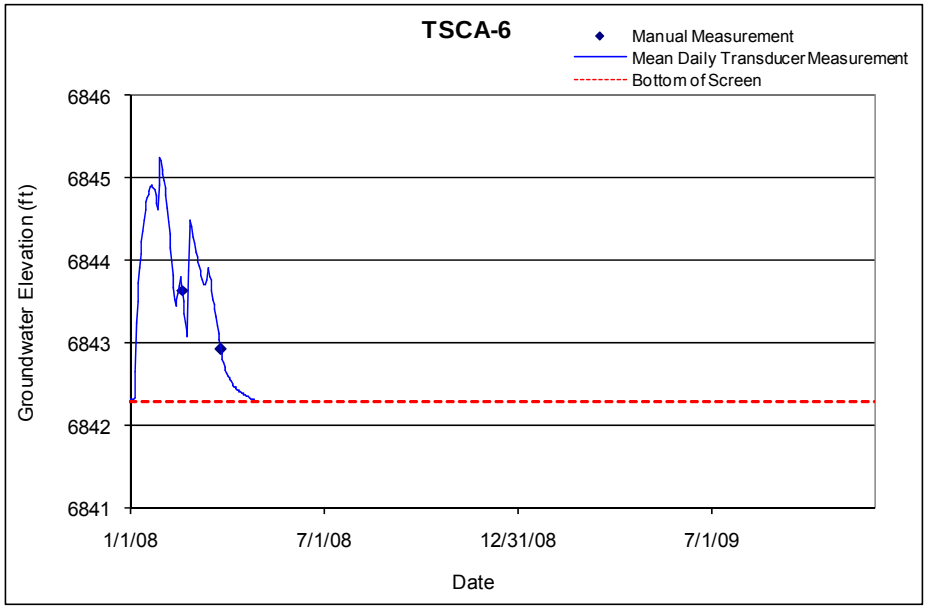
5.102 TSCA-6

Location: Ten Site Canyon, approximately 600 ft west of Mortandad Canyon confluence.
Period of Record: April 18, 2005, through November 2, 2009.
Remarks: This well tends to run dry seasonally, and has been dry since May 2009.

TSCA-6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	16.20	20.9	6847.0	6842.3	4.7			20.9	6842.3	21.3	0.4	0.2	Alluvial groundwater

Note: Ground elevation is 6863.2 ft; all depths are from this elevation





5.103 TSWB-6

Location: Ten Site Canyon, approximately 300 ft west of confluence with Mortandad Canyon.
Period of Record: January 9, 1995, through February 7, 2008.
Remarks: No valid groundwater level data exist for TSWB-6. Well has been dry during every measurement event. A transducer was installed July 5, 2006, and removed on January 24, 2008; the transducer never recorded water in the well. Monitoring ceased when the transducer was removed.

TSWB-6 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	25.0	35.0	6828.21	6818.21	10.0			35.0	6818.2	40.0	5.0	7.0	Alluvial groundwater

Note: Ground elevation is 6853.21 ft; all depths are from this elevation

TSWB-6 Manual Water Levels				
Date	Comment		Date	Comment
1/9/1995	Dry		11/14/2002	Dry
9/18/1995	Dry		2/21/2003	Dry
11/13/1996	Dry		6/11/2003	Dry
6/25/1997	Dry		12/14/2005	Dry
7/7/1997	Dry		7/5/2006	Dry
2/9/2000	Dry		7/10/2006	Dry
3/27/2000	Dry		9/26/2006	Dry
6/23/2000	Dry		10/26/2006	Dry
9/28/2000	Dry		10/30/2006	Dry
11/15/2000	Dry		11/1/2006	Dry
12/11/2000	Dry		1/30/2007	Dry
6/11/2001	Dry		3/7/2007	Dry
7/2/2001	Dry		4/16/2007	Dry
8/22/2001	Dry		7/5/2007	Dry
10/18/2001	Dry		11/1/2007	Dry
4/17/2002	Dry		1/24/2008	Dry
7/2/2002	Dry		2/7/2008	Dry
8/19/2002	Dry			

5.104 WCO-1

Location: Water Canyon, near western border of TA-68.
Period of Record: October 31,1989, through October 7, 2009.
Remarks: This well is usually dry. There are only two records indicating water in well. This well was plugged and abandoned in December 2009. Monitoring will move to WCO-1a.

WCO-1 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	24.4	34.4	6592.0	6582.0	10.0			34.4	6582.0	34.4	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6616.41 ft; all depths are from this elevation

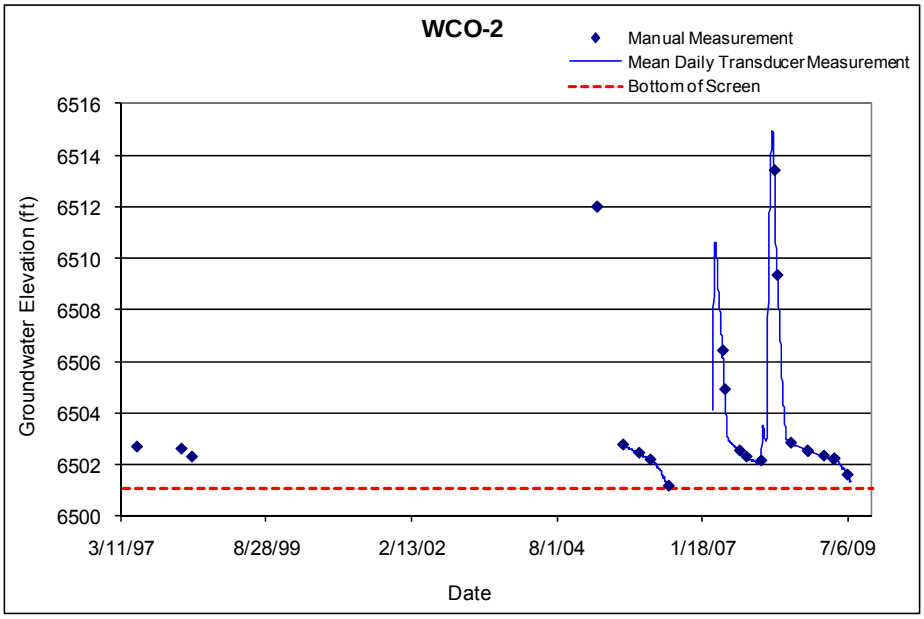
WCO-1 Manual Water Levels				
Date	Groundwater Elevation (ft)		Date	Groundwater Elevation (ft)
10/31/1989	Dry		6/19/2003	Dry
11/1/1989	Dry		9/14/2005	Dry
8/24/1990	Dry		12/22/2005	Dry
6/23/1997	6582.75		3/13/2006	Dry
10/13/1997	Dry		6/23/2006	Dry
3/25/1998	Dry		9/13/2006	Dry
5/29/1998	6582.75		12/15/2006	Dry
7/28/1998	Dry		1/24/2007	Dry
3/3/1999	Dry		3/15/2007	Dry
6/23/1999	Dry		5/24/2007	Dry
8/30/1999	Dry		6/6/2007	Dry
11/15/1999	Dry		9/5/2007	Dry
3/26/2000	Dry		10/17/2007	Dry
5/16/2000	Dry		1/16/2008	Dry
8/30/2000	Dry		4/8/2008	Dry
10/8/2000	Dry		4/25/2008	Dry
7/2/2001	Dry		7/18/2008	Dry
8/22/2001	Dry		10/7/2008	Dry
10/18/2001	Dry		2/6/2009	Dry
4/19/2002	Dry		3/23/2009	Dry
8/19/2002	Dry		7/2/2009	Dry
11/13/2002	Dry		10/7/2009	Dry
2/18/2003	Dry			

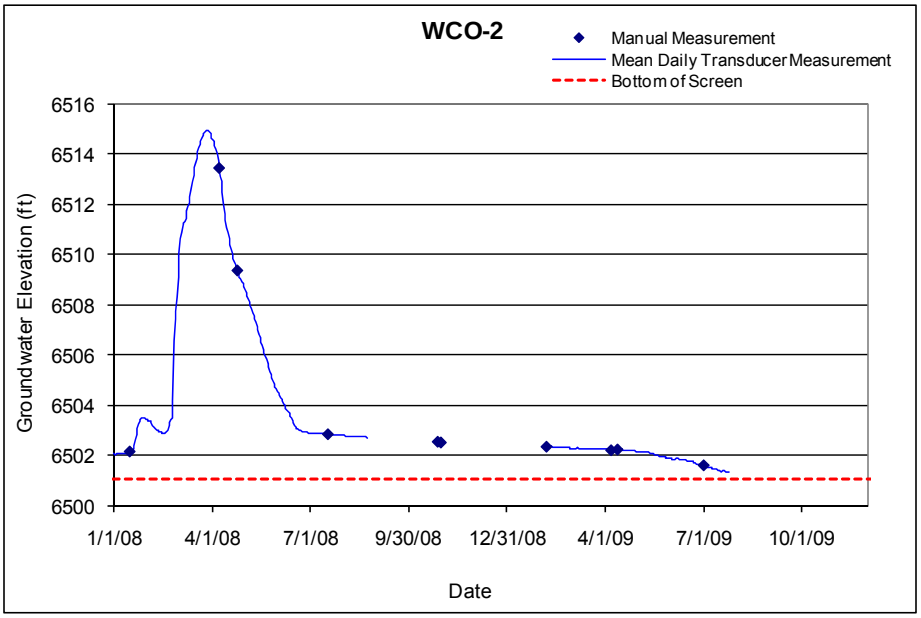
5.105 WCO-2

Location: Water Canyon, about 0.9 miles west of gate 9 on SR-4.
Period of Record: October 26, 1989, through October 7, 2009.
Remarks: The transducer malfunctioned on August 23, 2008, and was fixed February 6, 2009.

WCO-2 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	13.5	23.5	6511.1	6501.1	10.0			23.5	6501.1	23.5	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6524.57 ft; all measurements are from this elevation





5.106 WCO-3

Location: Water Canyon, approximately 0.1 miles west of gate 9 on SR-4.
Period of Record: October 25, 1989, through October 7, 2009.
Remarks: Well is typically dry. A transducer was installed January 16, 2008, and never recorded any water in the well. This well was plugged and abandoned in December 2009. Monitoring will move to WCO-3a.

WCO-3 Construction Information													
Zone	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elevation (ft)	Depth to Top of Sump (ft)	Top of Sump Elevation (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Comment
1	7.4	12.4	6429.0	6424.0	5.0			12.4	6424.0	12.4	0.0	0.0	Alluvial groundwater

Note: Ground elevation is 6436.43 ft; all depths are from this elevation

WCO-3 Manual Water Levels				
Date	Water level (ft)		Date	Water level (ft)
10/25/1989	Dry		6/19/2003	Dry
8/24/1990	Dry		9/14/2004	Dry
6/23/1997	6424.6		12/22/2005	Dry
3/25/1998	Dry		3/13/2006	Dry
5/29/1998	Dry		6/23/2006	Dry
7/28/1998	Dry		9/13/2006	Dry
3/3/1999	Dry		12/15/2006	Dry
6/23/1999	Dry		1/24/2007	Dry
8/30/1999	Dry		3/15/2007	Dry
11/15/1999	Dry		5/24/2007	Dry
3/26/2000	Dry		6/6/2007	Dry
5/16/2000	Dry		9/5/2007	Dry
8/30/2000	Dry		10/17/2007	Dry
10/8/2000	Dry		1/16/2008	Dry
7/2/2001	Dry		4/8/2008	Dry
8/22/2001	Dry		7/18/2008	Dry
10/18/2001	Dry		10/7/2008	Dry
4/19/2002	Dry		2/6/2009	Dry
8/19/2002	Dry		3/23/2009	Dry
11/13/2002	Dry		7/2/2009	Dry
2/18/2003	Dry		10/7/2009	Dry

6.0 Groundwater Level Data from Water Supply Wells

Table 6-1 lists the LAC water supply wells; all supply wells were monitored for groundwater levels in 2009 after transducers were installed at G-1A and O-4. The table provides the well name, date of completion, well depth, surveyed location coordinates, ground surface elevation, and the screen top and bottom depths for each well. See Figure 3-1 for the locations of the wells.

The LANL GWLM Project integrated the water supply wells in the monitoring project beginning in 2007 with the cooperation of LAC Utility personnel. Recently obtained groundwater level data for the supply wells are provided in the following sections. Historical groundwater level data for the supply wells were summarized by Koch and Rogers (2003) and other preceding Water Supply Reports for Los Alamos.

Table 6-1. General Information for Los Alamos County Water Supply Wells

Well Name	Date Completed	Completed Depth (ft)	Easting (ft)	Northing (ft)	Surface Elevation (ft)	Screen Top Depth (ft)	Screen Bottom Depth (ft)
G-1A	12/15/1954	1519	1655240.9	1784353.3	6014	272	1513
G-2A	3/21/1998	2000	1651973.8	1786166.3	6138	565	1980
G-3	8/25/1999	1800	1651676.4	1786218.3	6139	441	1100
G-3A	5/9/1998	2000	1649661.5	1786585.3	6212	590	1980
G-4A	4/1/1998	2000	1647318.2	1787112.9	6299	655	1980
G-5A	5/20/1998	2000	1644877.2	1789636.0	6414	765	1980
O-1	8/1/1990	2497	1649396.3	1772232.1	6396	1017	2477
O-4	3/1/1990	2617	1637337.4	1772995.1	6627	1115	2596
PM-1	2/1/1965	2499	1647734.3	1768112.1	6520	945	2479
PM-2	7/15/1965	2300	1636697.5	1760406.4	6715	1004	2280
PM-3	11/1/1966	2552	1642590.0	1769530.0	6610	956	2532
PM-4	8/15/1981	2874	1635623.0	1764740.0	6920	1260	2854
PM-5	9/1/1982	3092	1632110.0	1767790.0	7095	1440	3072

All LAC water supply wells are powered by electric motors except for PM-4, which has a natural-gas-powered motor. The electric-powered wells are typically operated at night and on weekends when electricity rates are lower. Thus these wells usually cycle on and off daily, in contrast to PM-4, which usually runs continuously when in use, which is usually just during the summer months when water demand is highest. Thus, due to the operational characteristics of the electric-powered wells, the data displayed in the following sections for these wells are the maximum daily water level, or the “non-pumping” water level, and the minimum daily or “pumping” water level. The difference between the non-pumping and the pumping water level is the drawdown for each well. The data shown for the wells that aren’t operated cyclically, which are PM-4 and O-1 (which hasn’t been used in recent years), are mean daily water levels. Because of the short period of transducer data for G-1A and O-4, the hourly transducer data are shown for these wells.

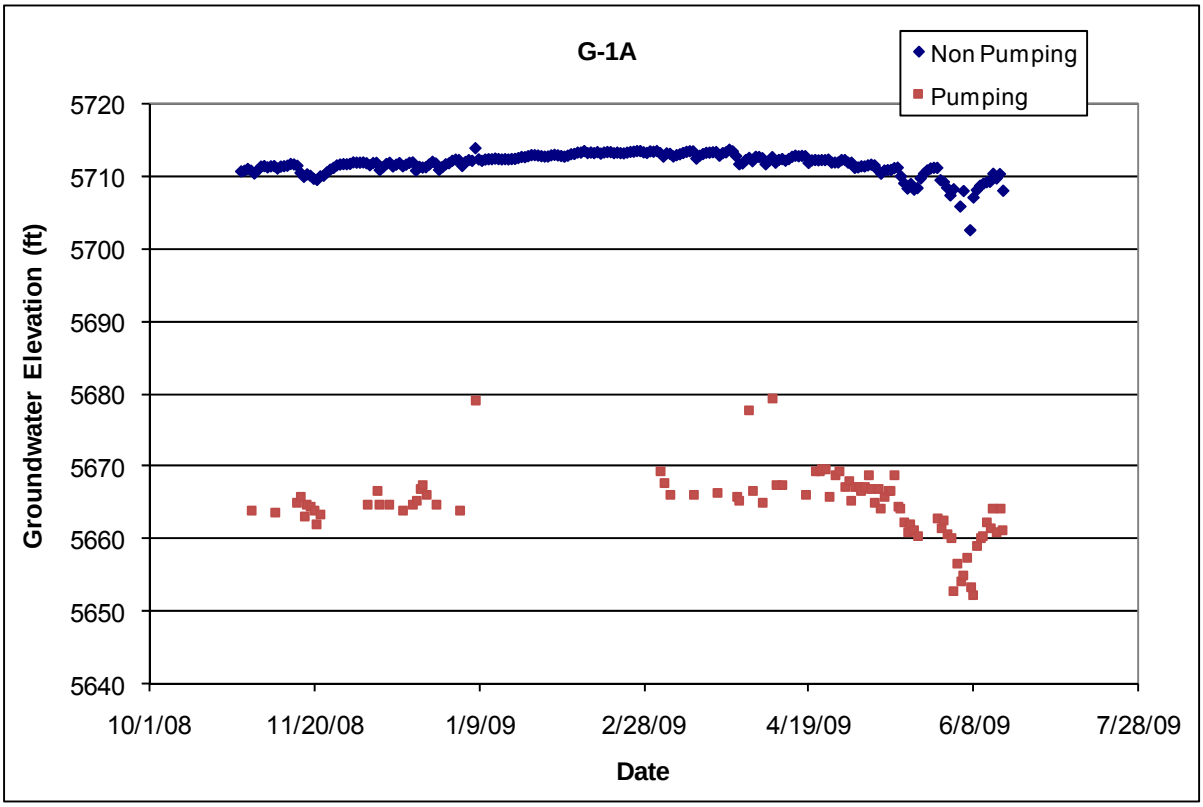
6.1 G-1A

Location: G-1A is located in Guaje Canyon and is the easternmost well in the Guaje well field.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well completed in 1954, periodic manual measurements (Koch and Rogers 2003). Transducer installed in bubbler pressure line October 29, 2008; data through June 2009.
Remarks: G-1A was constructed without gage lines so manual measurements are not possible while the pump is installed. Drawdown during pumping is about 45 ft.

G-1A Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	272	1513	5742	4501	1241	496	5518	1513	4501	1519	6	93	RT	Tsf

Note: Ground Elevation: 6014.0 ft; all measurements from this elevation

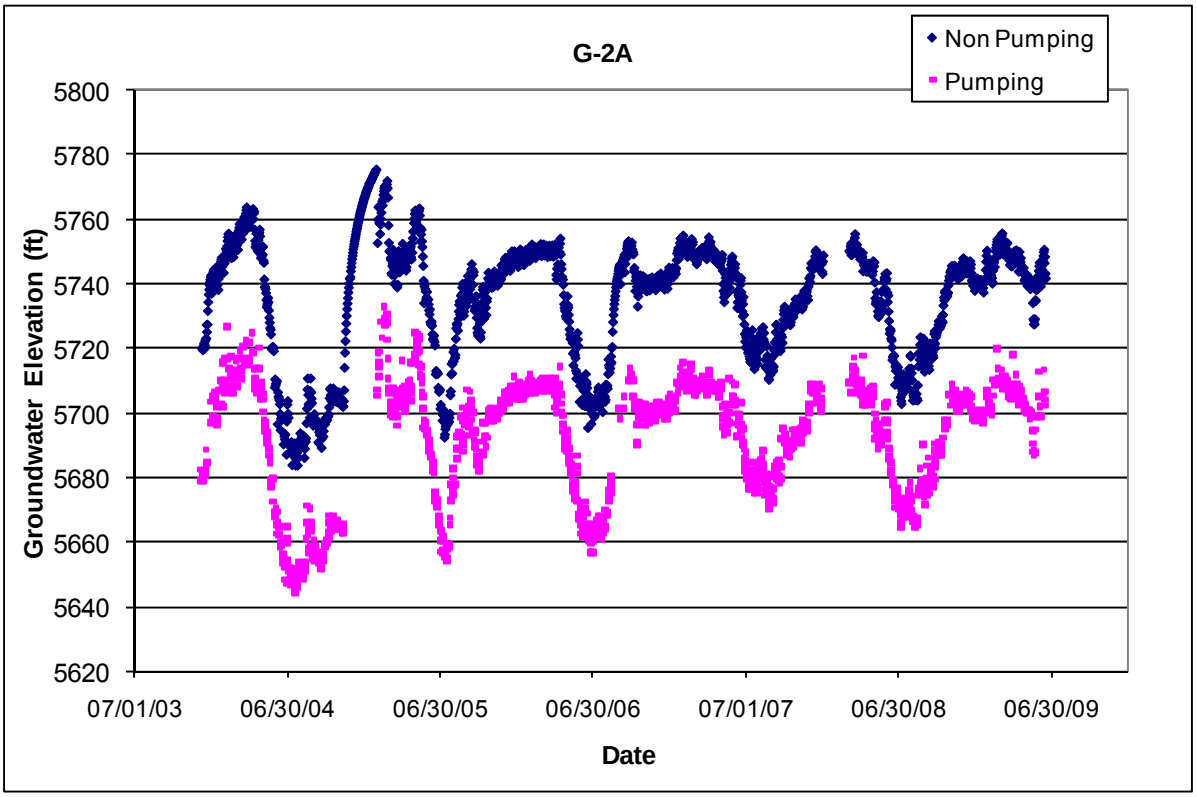


6.2 G-2A

Location: G-2A is located in Guaje Canyon about 300 ft east of monitoring well G-3.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well completed in 1998, transducer installed December 2003; data through June 2009.
Remarks: The pumping and non-pumping water levels overlap depending on pumping stress to the aquifer. The drawdown is about 40 ft.

G-2A Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	565	1980	5573	4158	1415	540	5598	1980	4158	2000	20	444.8	RT	Tsf

Note: Ground Elevation: 6138.0 ft; all depths are from this elevation



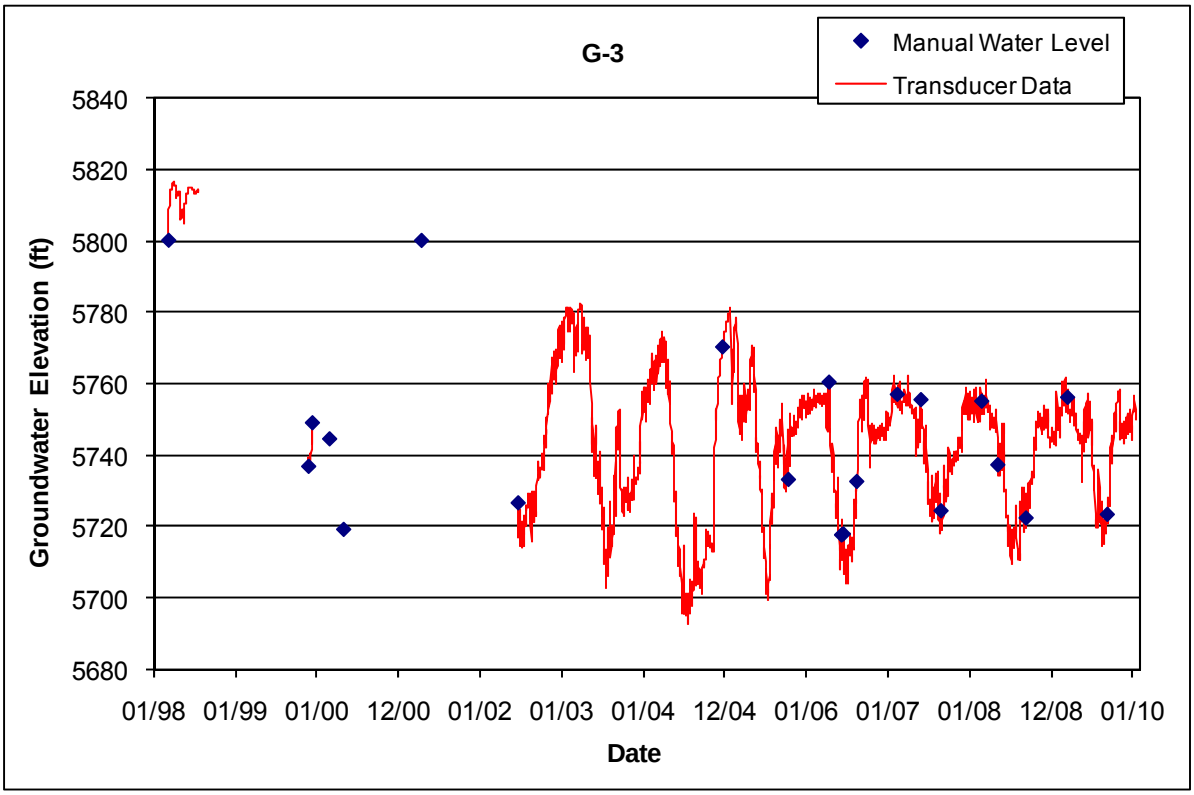
6.3 G-3

Location: G-3 is located in Guaje Canyon about 300 ft west of supply well G-2A.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well originally completed as a supply well in July 1951; plugged back to 1103 ft and converted to a monitoring well in 1998, transducer installed June 2002; data through 2009.
Remarks: G-3 responds primarily to pumping at supply well G-2A; daily water level fluctuation is about 8 ft. The aquifer in the Guaje well field fluctuates seasonally 40 to 70 ft depending on pumping stresses.

G-3 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	441	1100	5698	5039	659	None	None	1100	5039	1103	3	66.7	RT	Tsf

Note: Ground Elevation: 6139.0 ft; all depths are from this elevation



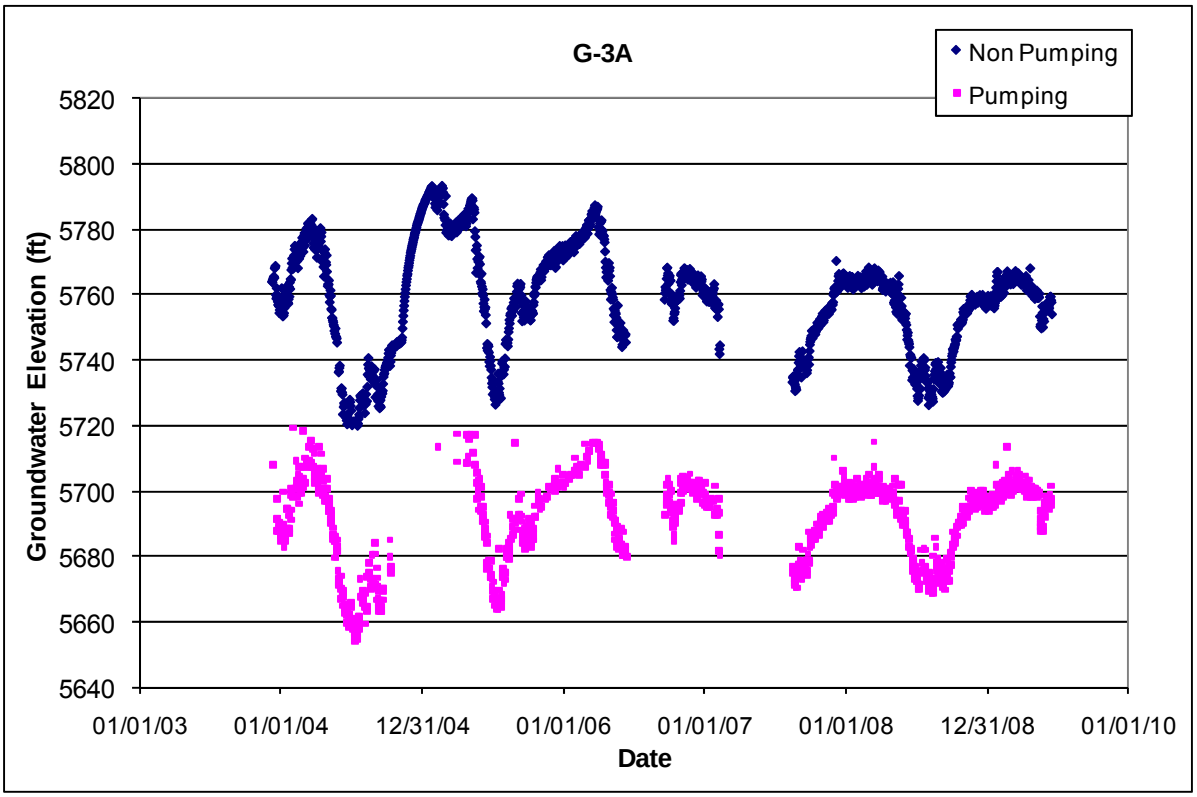
Note: mean daily water level values displayed

6.4 G-3A

Location: G-3A is located in Guaje Canyon about 1.5 miles west of monitoring well G-3.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well completed as a supply well in May 1998; transducer installed December 2003; intermittent data through June 2009.
Remarks: Drawdown is 60 to 65 ft.

G-3A Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	590	1980	5622	4232	1390	560	5652	1980	4232	2000	20	853.7	RT	Tsf

Note: Ground Elevation: 6212.0 ft; all measurements are from this elevation

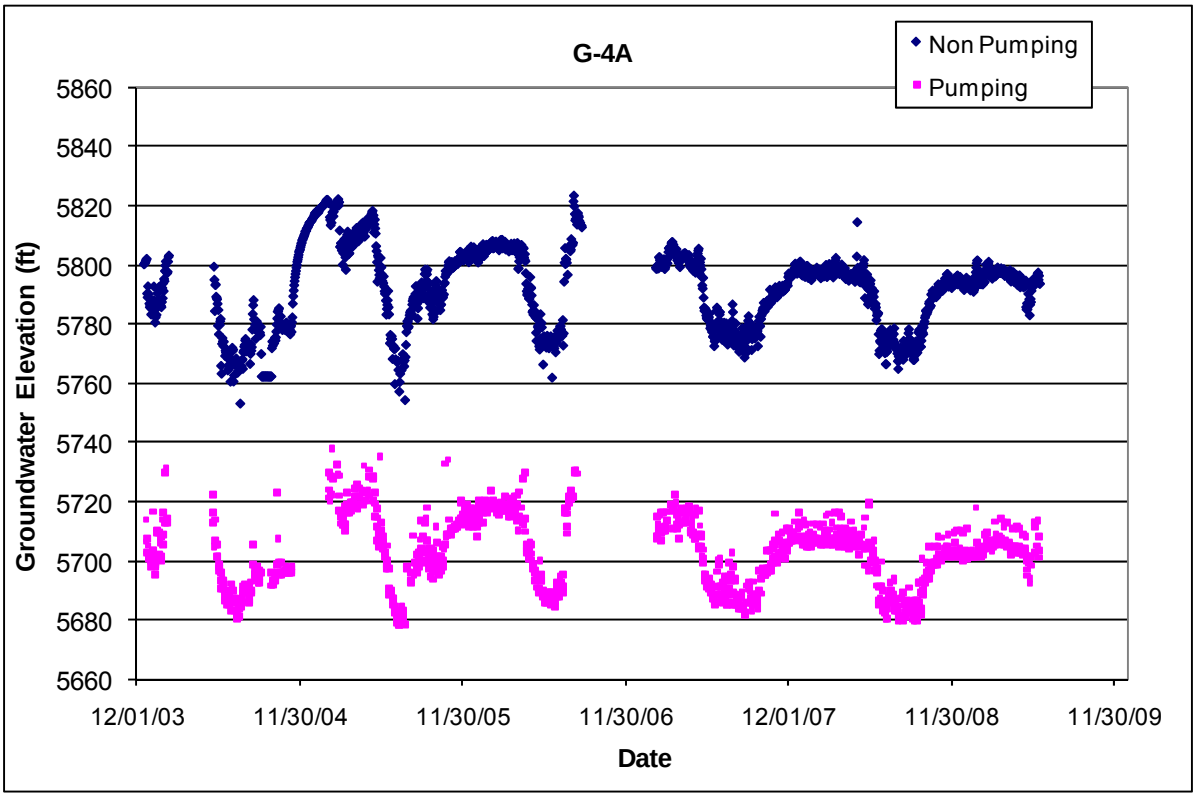


6.5 G-4A

Location: G-4A is located in lower Rendija Canyon near the confluence with Guaje Canyon and about 0.5 miles west of supply well G-3A.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well completed as a supply well in April 1998; transducer installed December 2003; intermittent data through June 2009.
Remarks: Drawdown is 80 to 85 ft.

G-4A Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	655	1980	5644	4319	1325	630	5669	1980	4319	2000	20.0	853.7	RT	Tsf

Note: Ground Elevation: 6299.0 ft; all measurements are from this elevation



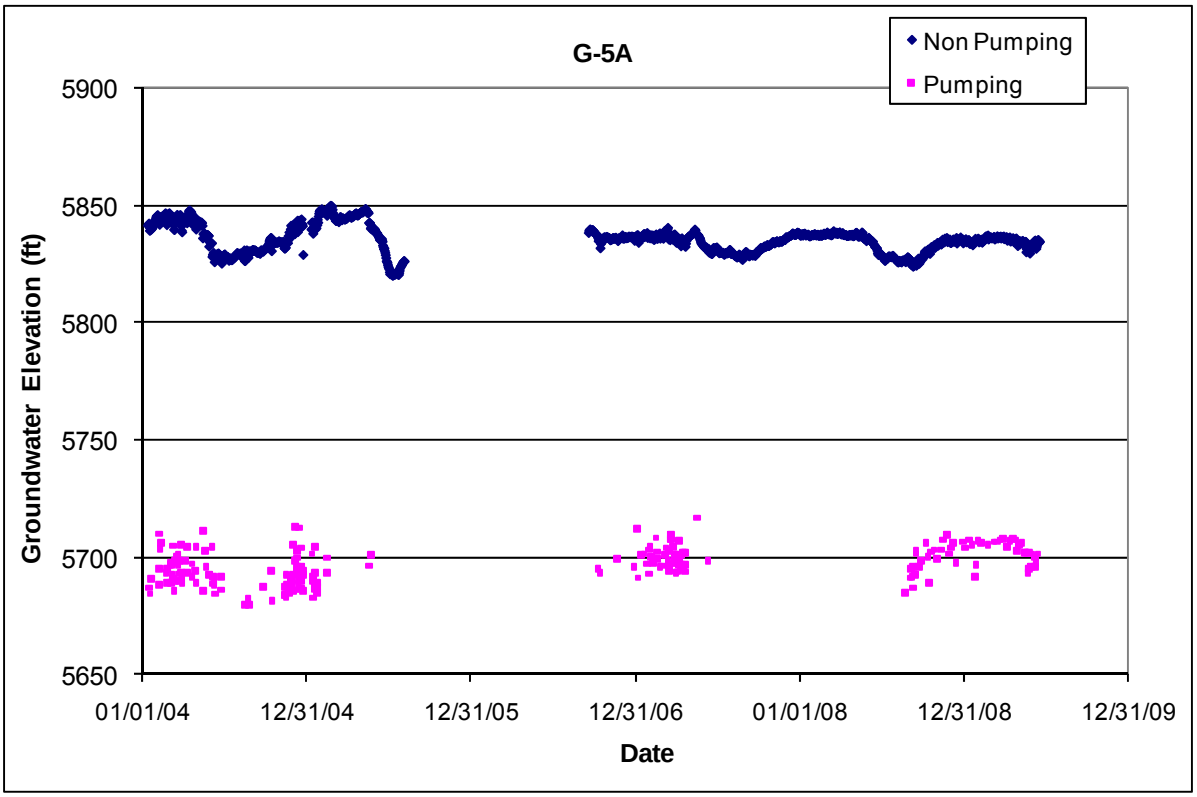
6.6 G-5A

Location: G-5A is located in Guaje Canyon upstream of Rendija Canyon and about 1.9 miles northwest of supply well G-4A.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well completed as a supply well in May 1998; transducer installed January 2004; intermittent data through June 2009.
Remarks: G-5A is not used on a regular basis. Drawdown is 140 to 150 ft.

G-5A Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code	Comment
1	765	1980	5649	4434	1215	740	5674	1980	4434	2000	20	853.7	RT	Tsf	Supply Well

Note: Ground Elevation: 6414.0 ft; all measurements are from this elevation



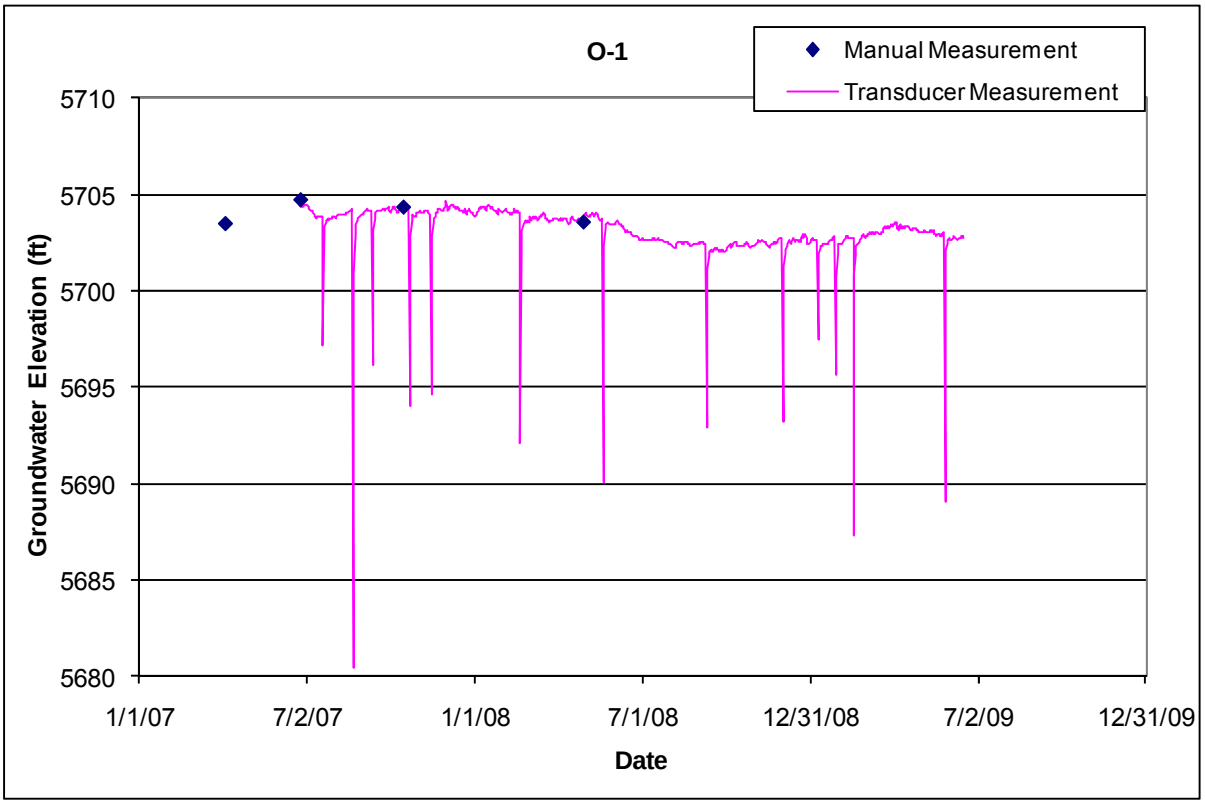
6.7 O-1

Location: O-1 is located in lower Pueblo Canyon about 0.5 miles downstream of monitoring well R-5.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well completed as a supply well in August 1990; transducer installed June 2007; data through June 2009.
Remarks: O-1 has not been used on a regular basis except for periodic groundwater sampling. Drawdown is about 100 ft. O-1 responds to pumping of supply well PM-1.

O-1 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1017	2477	5379	3919	1460	877	5519	2477	2477	2497	20	790.8	RT	Tsf

Note: Ground Elevation: 6396 ft; all measurements are from this elevation



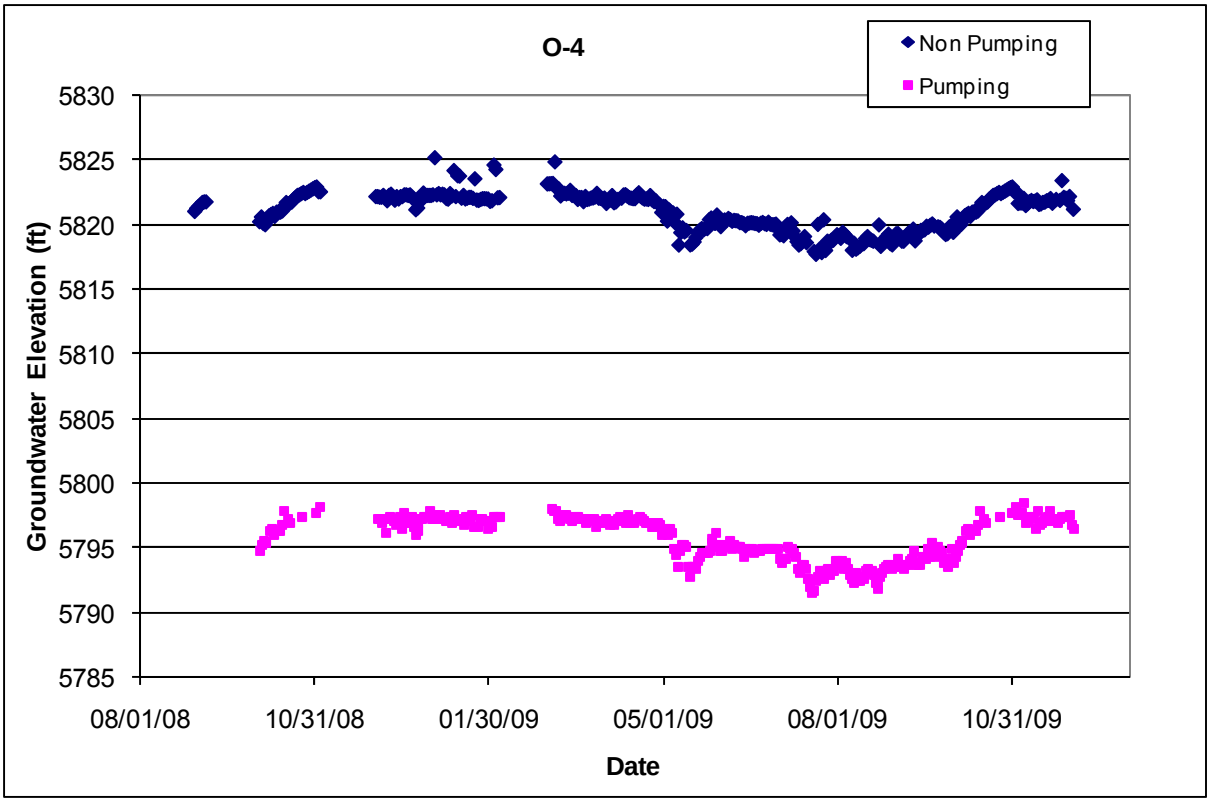
Note: Hydrograph shows mean daily values

6.8 O-4

Location: O-4 is located in Los Alamos Canyon above the confluence with DP Canyon and about 1500 ft southeast of monitoring well R-6.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well completed as a supply well in March 1990; transducer installed August 2008, intermittent data through 2009.
Remarks: O-4 drawdown is about 25 ft.

O-4 Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1115	2575	5512	4052	1460	928	5699	2575	4052	2575	0	0	RT	Tsf

Note: Ground Elevation: 6627 ft; all Measurements are from this elevation

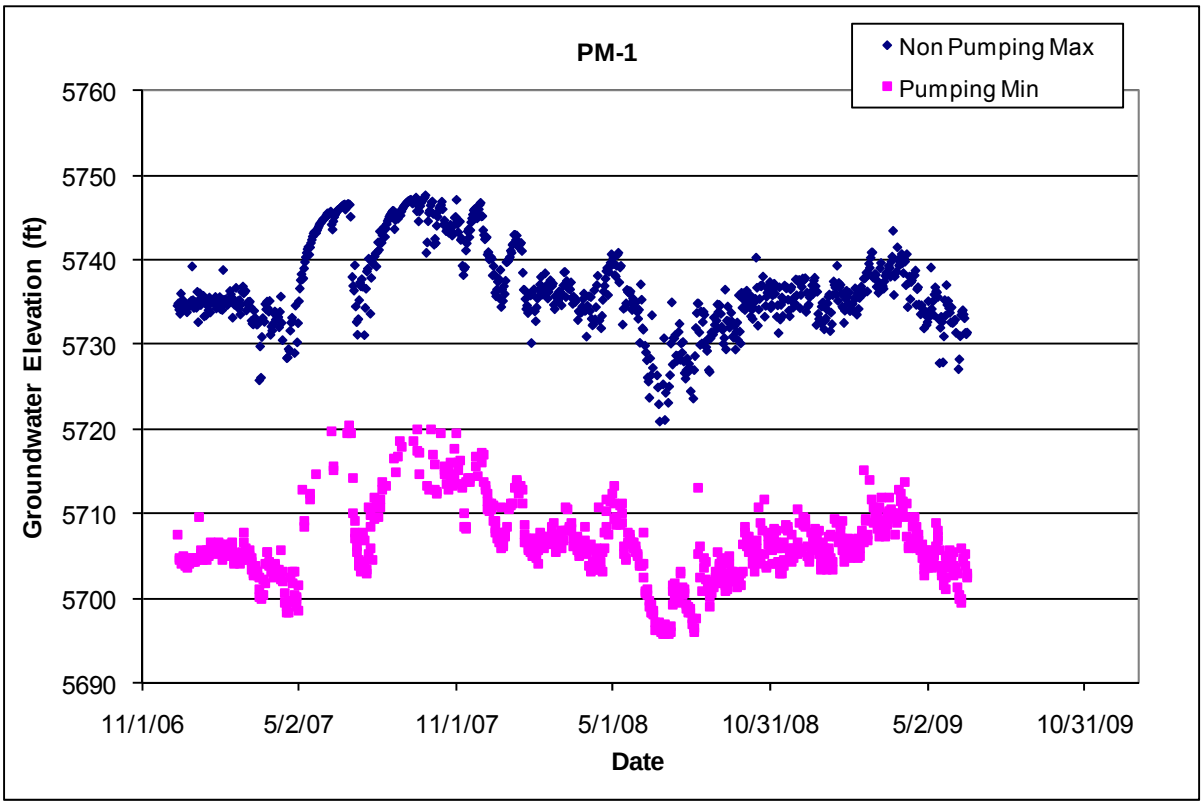


6.9 PM-1

Location: PM-1 is located in lower Sandia Canyon near the eastern Laboratory boundary and about 360 ft northeast of monitoring well R-12.
Completion Type: Single completion in the Santa Fe Group.
Period of Record: Well completed as a supply well in February 1965; transducer installed December 2006; data through June 2009.
Remarks: Drawdown is about 30 ft.

PM-1 Construction Information														
Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	945	2479	5575	4041	1534	877	5643	2479	2479	2499	20.0	790.8	RT	Tsf

Note: Ground Elevation: 6520 ft; all measurements are from this elevation



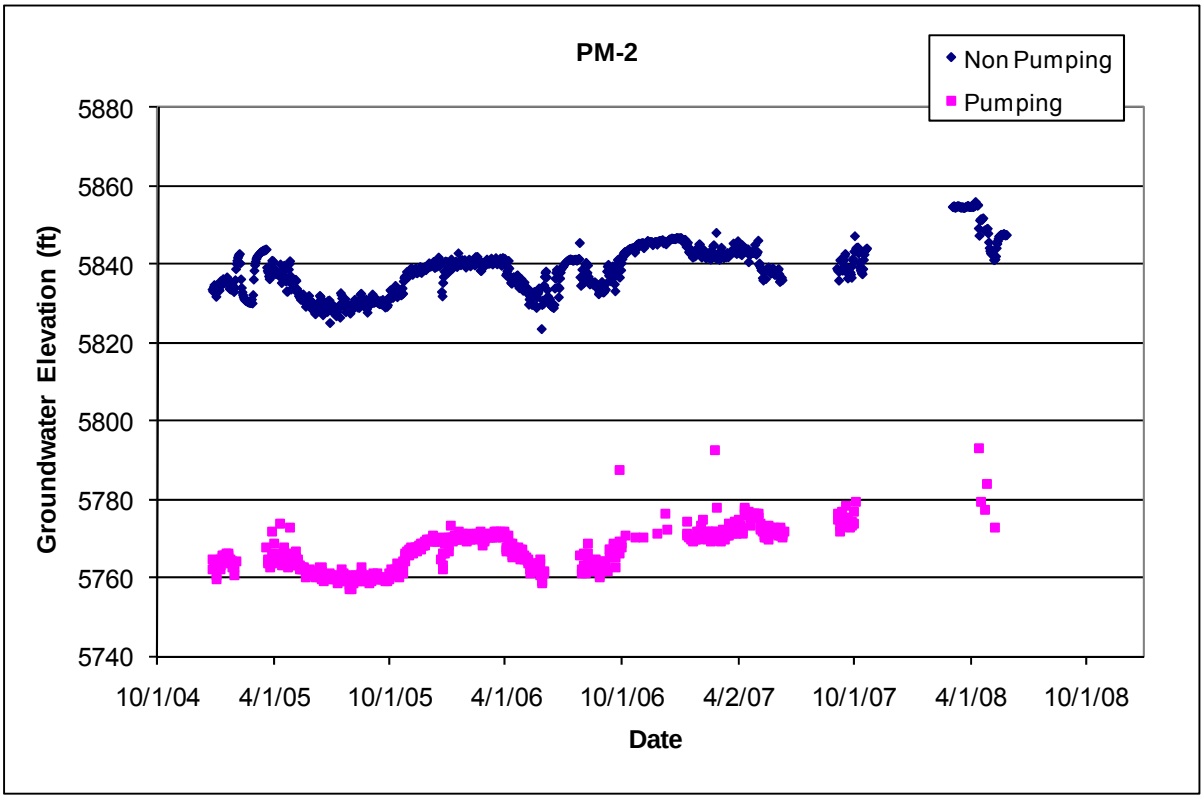
6.10 PM-2

Location: PM-2 is located in Pajarito Canyon about 0.25 miles west of monitoring well R-20 and about 220 ft southwest of recently installed monitoring well R-40.
Completion Type: Single completion in the Puye Formation and Santa Fe Group.
Period of Record: Well completed as a supply well in July 1965; transducer installed December 2004; data to October 23, 2007. The transducer was removed in October 2007 during pump removal and well rehabilitation. Data during April and May 2008 during pump testing. Transducer removed May 30, 2008, for well repairs.
Remarks: Drawdown is about 70 ft. PM-2 responds to pumping at PM-4 (McLin 2006). PM-2 was not operated for most of 2008 and 2009 because of well maintenance and repairs.

PM-2 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1004	2280	5711	4435	1276	980	5735	2280	4435	2300	20.0	790.8	RT	Tp

Note: Ground Elevation: 6715 ft; all measurements are from this elevation



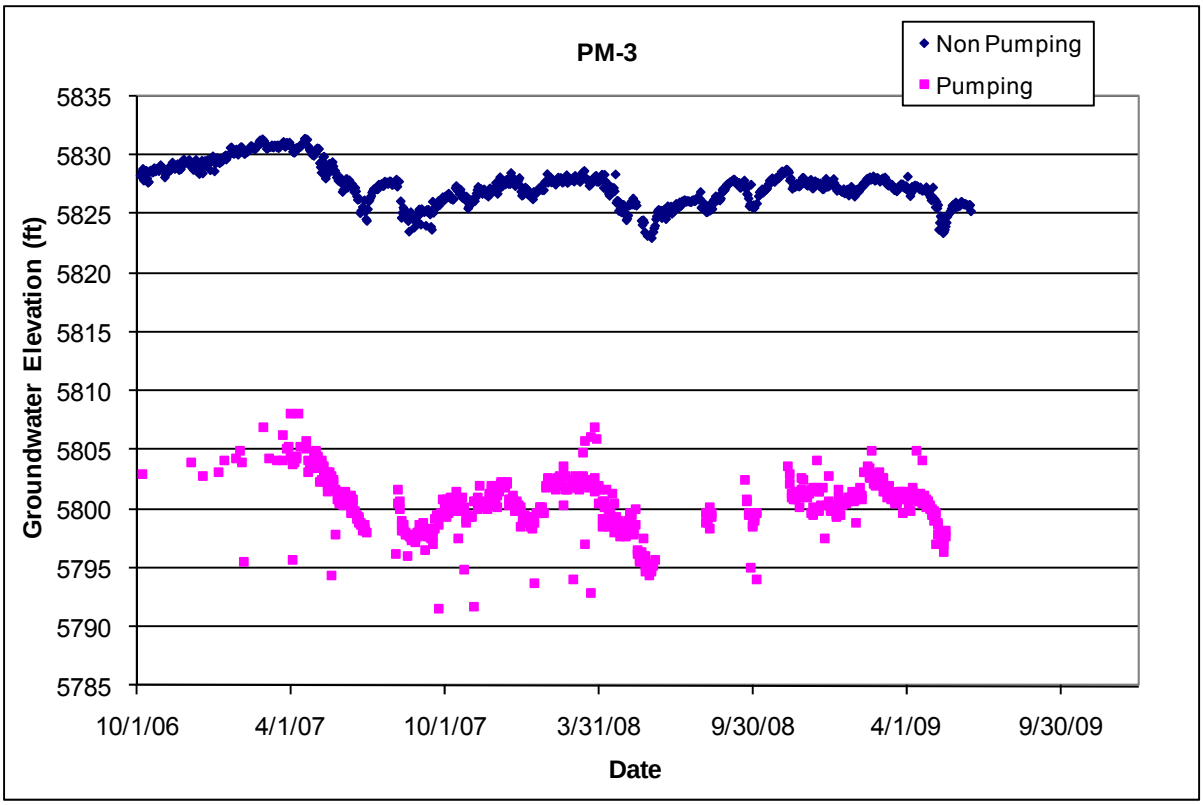
6.11 PM-3

Location: PM-3 is located in Sandia Canyon about 1 mile west of PM-1 and about 330 ft northeast of monitoring well R-35a.
Completion Type: Single completion in Santa Fe Group.
Period of Record: Well completed as a supply well in November 1966; transducer installed October 2006; data through June 2009.
Remarks: Drawdown is about 27 ft. PM-3 responds to pumping at O-4.

PM-3 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	956	2532	5654	4078	1576	830	5780	2532	4078	2552	20	605.4	RT	Tsf

Note: Ground Elevation: 6610 ft; all measurements are from this elevation



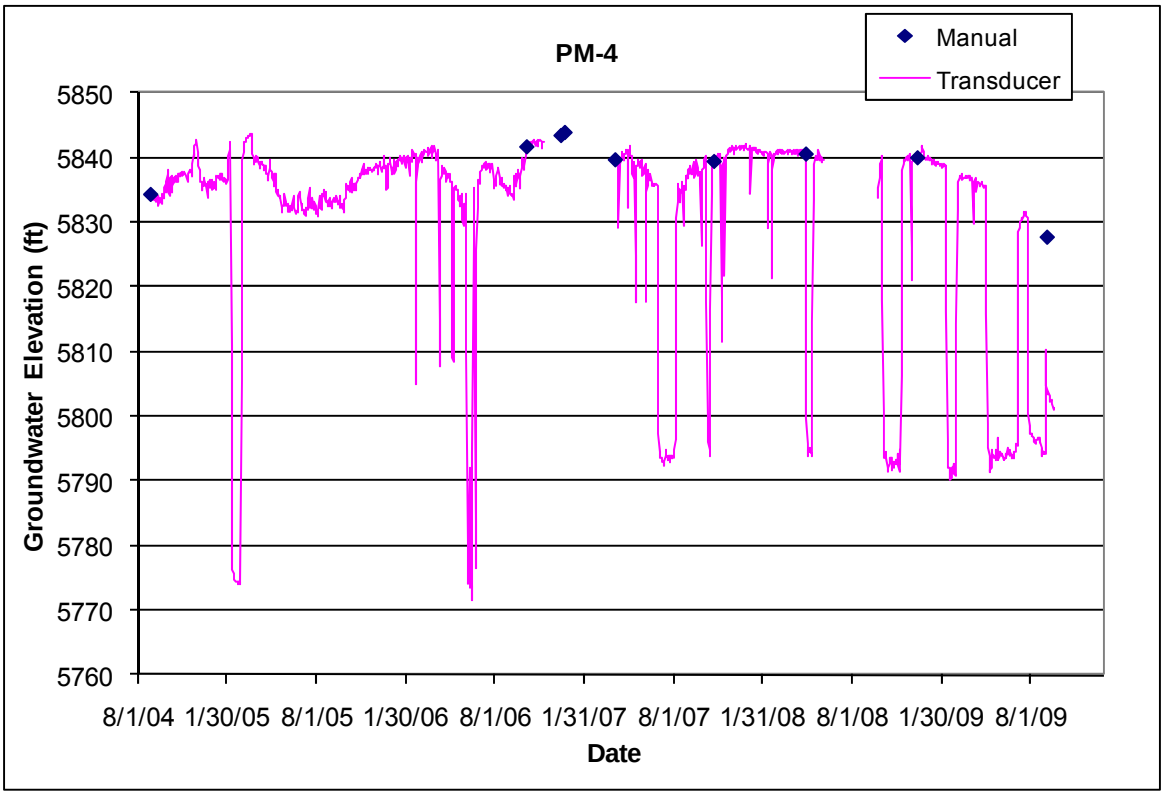
6.12 PM-4

Location: PM-4 is located on Mesita del Buey about midway between supply wells PM-2 and PM-5. The nearest monitoring well is R-15 in Mortandad Canyon, about 0.67 miles to the north.
Completion Type: Single completion in the Puye Formation and Santa Fe Group.
Period of Record: Well completed as a supply well in August 1981; transducer installed August 2004. The transducer failed in November 2006 and was replaced in April 2007, failed again June 2008, replaced September 2008; intermittent data through 2009.
Remarks: Well is powered by a natural gas motor and when used is operated continuously. Drawdown in 2008 was about 48 ft. PM-4 responds to pumping at PM-2.

PM-4 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1260	2854	5660	4066	1594	1210	5710	2854	4066	2874	20	790.8	RT	Tp

Note: Ground Elevation: 6920 ft; all measurements are from this elevation



Note: mean daily water level values shown

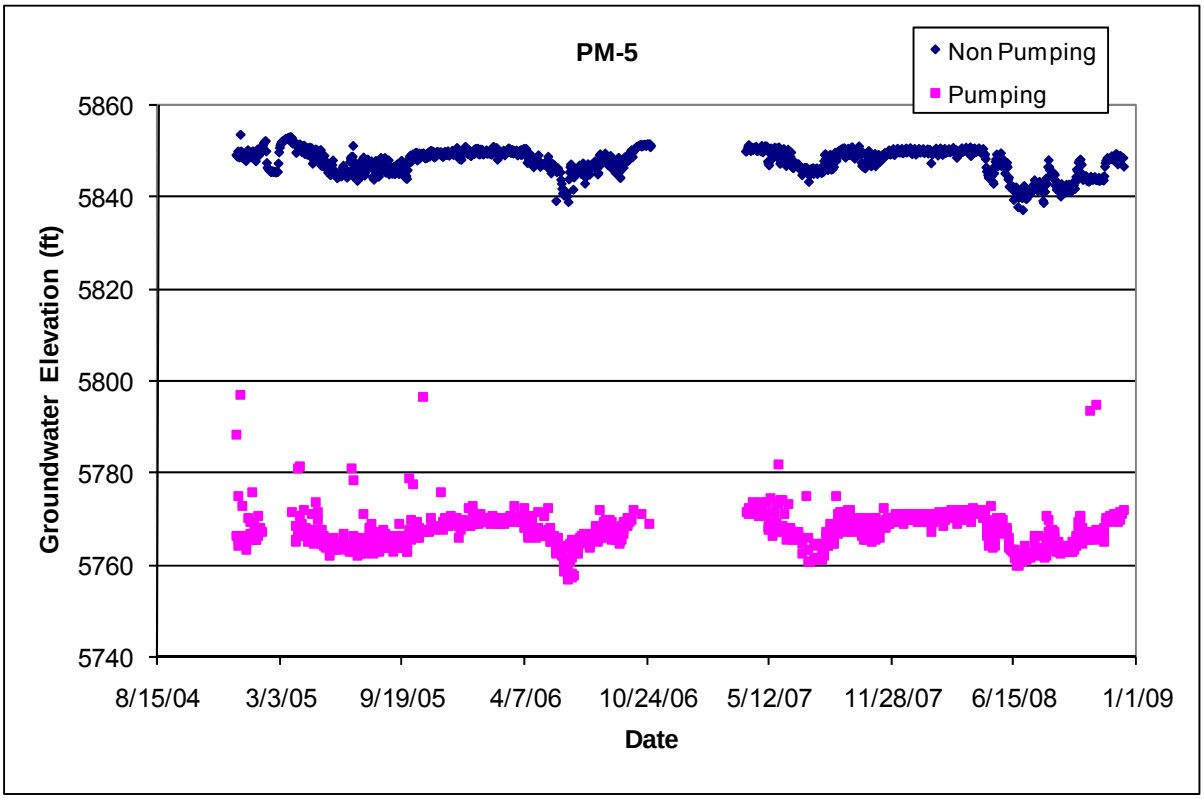
6.13 PM-5

Location: PM-5 is located on a mesa south of Ten Site and Mortandad canyons. The nearest monitoring well is R-33 in Ten Site Canyon about 1500 ft to the northeast.
Completion Type: Single completion in the Puye Formation and Santa Fe Group.
Period of Record: Well completed as a supply well in September 1982; transducer installed December 2004. The transducer failed in October 2006 and was replaced in April 2007; data through 2008.
Remarks: PM-5 responds to pumping PM-4. Drawdown is about 80 ft. Transducer equipment problems prevented data collection in 2009.

PM-5 Construction Information

Screen	Screen Top Depth (ft)	Screen Bottom Depth (ft)	Screen Top Elev (ft)	Screen Bottom Elev (ft)	Screen Length (ft)	Pump Intake Depth (ft)	Pump Intake Elev (ft)	Depth to Top of Sump (ft)	Top of Sump Elev (ft)	Depth to Sump Bottom (ft)	Sump Length (ft)	Sump Volume (L)	Hydro Zone Code	Geo Unit Code
1	1440	3072	5655	4023	1632		7095	3072	3072	3092	20	790.8	RT	Tp

Note: Ground Elevation: 7095 ft; all measurements are from this elevation



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Appendix A. Geologic Unit Codes

Table A-1. Geologic Unit Codes

Geologic Unit Code	Geologic Unit Description
P	Polvadera Group
Qal	Quaternary alluvium
Qb	Bandelier Tuff, undivided
Qbo	Otowi Member of the Bandelier Tuff, undivided
Qbof	Otowi Member of the Bandelier Tuff, ash flows
Qbog	Otowi Member of the Bandelier Tuff, Guaje Pumice Bed
Qbt	Tshirege Member of the Bandelier Tuff, undivided
Qbt1	Tshirege Member of the Bandelier Tuff, Unit 1, undivided
Qbt1g	Tshirege Member of the Bandelier Tuff, Unit 1, glassy
Qbt1v	Tshirege Member of the Bandelier Tuff, Unit 1, vapor phase
Qbt2	Tshirege Member of the Bandelier Tuff, Unit 2
Qbt3	Tshirege Member of the Bandelier Tuff, Unit 3
Qbt3nw	Tshirege Member of the Bandelier Tuff, Unit 3, nonwelded
Qbt3t	Tshirege Member of the Bandelier Tuff, Unit 3, transitional
Qbt4	Tshierge Member of the Bandelier Tuff , Unit 4
Qbt5	Tshierge Member of the Bandelier Tuff , Unit 5
Qbtt	Tshierge Member of the Bandelier Tuff, Tsankawi Pumice Bed
Qct	Cerro Toledo Interval
T	Tewa Group
Tb	Tertiary Basalts
Tb1	Middle Miocene Basalts, ~12.8 - 12.9 Ma
Tb2	Late Miocene Basalts, ~8.4 - 11.4 Ma
Tb4	Cerros del Rio Basaltic Rocks, Pliocene Lavas and associated tephra of the Cerro
Tf	Puye Formation, Older fanglomerate
Tk	Keres Group, undivided
Tp	Puye Formation, undivided
Tpf	Puye Formation, fanglomerates
Tpp	Puye Formation, pumiceous fanglomerates
Tpt	Puye Formation, Totavi river gravels
Tsf	Santa Fe Group, undivided
Tsfb	Santa Fe Group basalt
Tsfu	Santa Fe Group, excluding Tsfuv
Tsfuv	Santa Fe Group, upper unit with volcanic detritus
Tt	Tschicoma Formation, undivided
Tt1	Tschicoma Formation, older flows
Tt2	Tschicoma Formation, younger flows

Appendix B. Mean Annual Water Level Data

Table B-1. Mean Annual Groundwater Levels at the Top of the Regional Aquifer in 2009

Well Name	Top of Regional Aquifer (ft)	No. of Data Values	Std. Dev. (ft)	Last Data Date
CDV-R-15-3	6019.4	3194	0.02	10/23/09
CDV-R-37-2	6136.9	6804	0.05	10/14/09
G-3	5743.8	8759	11.66	12/31/09
R-1	5877.7	11698	0.34	11/18/09
R-10a	5740.0	8384	0.50	12/16/09
R-11	5836.8	9493	0.29	11/20/09
R-13	5835.0	7377	0.46	11/20/09
R-14	5879.2	7761	0.30	11/20/09
R-15	5848.4	7718	0.72	11/18/09
R-16r	5692.3	7761	0.17	11/20/09
R-17	5884.5	8412	0.25	12/17/09
R-18	6116.9	8505	0.22	12/21/09
R-19	5887.4	5749	0.02	12/21/09
R-2	5869.8	8756	0.32	12/31/09
R-20	5864.3	8169	1.16	12/31/09
R-21	5854.1	8435	0.40	12/18/09
R-22	5761.6	3403	0.18	04/13/09
R-23	5696.9	8409	0.17	12/17/09
R-24	5828.3	8758	1.39	12/31/09
R-25	6231.7	7175	1.08	10/21/09
R-26	6533.5	6106	0.71	10/19/09
R-27	5898.3	7260	0.20	10/30/09
R-28	5837.2	9491	0.31	11/20/09
R-31	5827.3	6953	0.13	10/27/09
R-32	5852.6	14797	0.93	12/18/09
R-33	5870.9	9361	0.37	11/18/09
R-34	5833.7	8384	0.28	12/16/09
R-35b	5836.1	7762	0.25	11/20/09
R-36	5840.2	7762	0.22	11/20/09
R-37	5855.9	11117	0.82	12/17/09
R-38	5857.7	6431	0.12	12/18/09
R-39	5753.7	7046	0.36	12/17/09
R-4	5829.7	8758	0.75	12/31/09
R-40	5864.7	7118	1.01	12/17/09
R-41	5699.5	4268	0.16	11/20/09
R-42	5838.8	7150	0.28	11/20/09
R-43	5838.1	5936	0.28	11/20/09
R-44	5835.5	7057	0.14	12/18/09
R-45	5835.3	7332	0.15	12/18/09
R-46	5884.7	4017	0.30	11/20/09
R-48	6130.9	9093	10.01	12/04/09
R-49	5770.1	6321	10.84	12/17/09
R-5	5766.0	8268	0.16	12/31/09
R-6	5837.2	8758	0.43	12/31/09
R-7	5876.7	4742	0.10	07/28/09
R-8	5852.6	7879	0.43	12/31/09
R-9	5691.2	8750	0.16	12/31/09
Test Well DT-10	5918.4	8385	0.11	12/16/09
Test Well DT-5A	5957.7	8387	0.19	12/16/09
Test Well DT-9	5914.8	5951	0.12	12/16/09

Table B-2. Mean Annual Groundwater Levels in Intermediate Wells in 2009

Well Name	Screen	Average 2009 Water Level (ft)	No. Data Points	Std. Dev. (ft)	Date Last Data
16-26644	Single	7456.7	1		10/13/09
90LP-SE-16-02669	Single	Dry	1		03/23/09
CdV-16-1(i)	Single	6804.1	8758	1.09	12/31/09
CdV-16-2(i)r	Single	6618.5	7185	0.45	10/27/09
LADP-3	Single	6434.5	6618	0.67	12/31/09
LAOI(A)-1.1	Single	6542.3	11452	0.30	12/31/09
LAOI-3.2	Single	6498.1	8758	0.21	12/31/09
LAOI-3.2a	Single	6440.8	8759	0.26	12/31/09
LAOI-7	Single	6241.1	6059	0.76	09/10/09
MCOI-4	Single	6316.6	7656	0.40	11/18/09
MCOI-5	Single	6138.6	7717	0.77	11/18/09
MCOI-6	Single	6156.6	7718	1.05	11/18/09
MSC-16-02665	Single	Dry	1		03/23/09
PCI-2	Single	6408.0	4200	0.17	12/17/09
POI-4	Single	6213.2	8759	0.36	12/31/09
R-12	1	6072.5	8431	0.49	12/18/09
R-12	2	6072.7	8430	0.42	12/18/09
R-19	2	6169.6	5316	0.10	12/21/09
R-23i	1	6121.8	6180	0.15	12/07/09
R-23i	2	6079.1	5213	0.46	12/07/09
R-23i	3	6071.1	4708	0.61	12/02/09
R-25	1	6781.6	7175	0.46	10/21/09
R-25	2	6743.5	7175	0.28	10/21/09
R-25	4	6345.2	7175	0.11	10/21/09
R-25b	Single	6767.1	9	1.45	10/09/09
R-25c	Single	Dry	4		12/16/09
R-26	1	7034.1	6598	0.07	10/19/09
R-37	1	5961.5	10434	1.42	12/17/09
R-3i	Single	6204.7	8758	1.56	12/31/09
R-40	R-40i	6079.7	2693	0.17	12/17/09
R-40	1	5950.7	8515	6.57	12/17/09
R-5	2	6134.4	8268	0.56	12/31/09
R-6i	Single	6403.4	8758	0.17	12/31/09
R-9i	1	6240.6	6707	0.94	12/31/09
R-9i	2	6131.3	6707	0.32	12/31/09
SCI-1	Single	6369.6	7766	0.34	11/20/09
SCI-2	Single	6205.3	6788	0.50	11/20/09
TA-53i	Single	6386.6	5077	0.17	12/31/09
Test Well 2A	Single	6545.0	8288	0.82	12/12/09

Appendix C. Summary of Transient Responses

Table C-1. Summary of Transient Responses to Supply Well Pumping in LANL Monitoring Wells

Well	Screen	Seasonal Response	Guaje	O-1	O-4	PM-1	PM-2	PM-3	PM-4	PM-5	Comment
CdV-R-15-3	4	Yes	NE	NE	NE	NE	No	NE	No	No	Seasonal response not related to pumping
CdV-R-15-3	5	Yes	NE	NE	NE	NE	No	NE	No	No	Seasonal response not related to pumping
CdV-R-15-3	6	Yes	NE	NE	NE	NE	No	NE	No	Possible	Seasonal response not related to pumping
CdV-R-37-2	2	Yes	NE	NE	NE	NE	No	NE	No	No	Seasonal response not related to pumping
CdV-R-37-2	3	Yes	NE	NE	NE	NE	No	NE	No	No	Seasonal response not related to pumping
CdV-R-37-2	4	Yes	NE	NE	NE	NE	No	NE	No	No	Seasonal response not related to pumping
G-3	Single	Yes	Yes	NE	NE	NE	NE	NE	NE	NE	Guaje well field monitoring well
R-1	Single	Yes	NE	NE	Possible	NE	No	No	Possible	Yes	Primarily responds to PM-5
R-2	Single	No	No	NE	No	NE	NE	NE	NE	NE	Gradual decline of about 0.5 ft/yr
R-4	Single	Yes	Possible	No	Possible	NE	NE	Yes	NE	NE	Seasonal response but not to a specific well
R-5	3	No	No	No	No	No	NE	No	NE	NE	Gradual decline of about 0.6 ft/yr
R-5	4	Yes	No	Possible	No	Yes	NE	No	NE	NE	Seasonal response but not to a specific well
R-6	Single	Yes	No	No	Possible	NE	NE	Yes	NE	No	Seasonal response but not to a specific well
R-7	3	No	No	No	No	NE	NE	No	NE	NE	Gradual decline of about 0.5 ft/yr
R-8	1	Yes	No	NE	Possible	No	NE	Yes	NE	NE	Responds primarily to pumping at PM-3
R-8	2	Yes	No	NE	Possible	No	NE	Yes	NE	NE	Responds primarily to pumping at PM-3
R-9	Single	Yes	No	No	NE	No	NE	No	NE	NE	Gradual decline of about 0.4 ft/yr
R-10	1	ID	NE	NE	NE	Yes	NE	NE	NE	NE	Responds primarily to PM-1
R-10	2	ID	ID	ID	ID	ID	ID	ID	ID	ID	No water level data as of 01/08
R-10a	Single	No	NE	NE	NE	No	NE	No	NE	NE	No apparent response to pumping
R-11	Single	Yes	NE	NE	No	NE	Possible	No	No	Possible	Seasonal response but not to a specific well
R-12	3	No	No	No	No	No	NE	No	No	No	No apparent response to nearby well PM-1
R-13	Single	Yes	NE	NE	No	No	Possible	No	Yes	Possible	Seasonal response but not to a specific well
R-14	1	Yes	NE	NE	Possible	NE	Possible	NE	No	Yes	Responds primarily to PM-5
R-14	2	Yes	NE	NE	Possible	NE	Possible	NE	No	Yes	Responds primarily to PM-5
R-15	Single	Yes	NE	NE	Possible	NE	No	No	Yes	Yes	Responds primarily to pumping at PM-4 and PM-5
R-16	2	No	NE	NE	NE	No	No	NE	NE	NE	No apparent response to Buckman pumping
R-16	3	No	NE	NE	NE	No	No	NE	NE	NE	No apparent response to Buckman pumping
R-16	4	No	NE	NE	NE	No	No	NE	NE	NE	No apparent response to Buckman pumping
R-16r	Single	No	No	No	No	No	No	No	No	No	No apparent response to Buckman pumping
R-17	1	Yes	NE	NE	NE	NE	No	NE	No	No	Seasonal response but not to a specific well
R-17	2	Yes	NE	NE	NE	NE	Possible	NE	Possible	Yes	Responds primarily to pumping at PM-5
R-18	Single	No	NE	NE	NE	NE	No	NE	No	No	No apparent response to pumping
R-19	3	Yes	NE	NE	NE	NE	Possible	NE	No	Possible	Muted response
R-19	4	Yes	NE	NE	NE	NE	Yes	NE	Yes	Possible	Responds primarily to PM-2
R-19	5	Yes	NE	NE	NE	NE	Yes	NE	Yes	Possible	Responds primarily to PM-2
R-19	6	Yes	NE	NE	NE	NE	Yes	NE	Yes	Possible	Responds primarily to PM-2
R-19	7	Yes	NE	NE	NE	NE	Yes	NE	Yes	Possible	Responds primarily to PM-2
R-20	1	Yes	NE	NE	NE	NE	Yes	NE	Yes	NE	Highly muted response
R-20	2	Yes	NE	NE	NE	NE	Yes	NE	Yes	NE	Muted response
R-20	3	Yes	NE	NE	NE	NE	Yes	NE	Yes	NE	Responds primarily to PM-2 but also to PM-4
R-21	Single	Yes	NE	NE	NE	No	Yes	No	Possible	NE	Seasonal response but not to a specific well

NE = not evaluated; ID = insufficient Data

Table C-1. Summary of Transient Responses to Supply Well Pumping in LANL Monitoring Wells (Continued)

Well	Screen	Seasonal Response	Guaje	O-1	O-4	PM-1	PM-2	PM-3	PM-4	PM-5	Comment
R-22	1	Yes	NE	NE	NE	No	No	No	No	NE	Seasonal response but not to a specific well
R-22	2	Yes	NE	NE	NE	No	No	No	No	NE	Seasonal response but not to a specific well
R-22	3	Yes	NE	NE	NE	No	No	No	No	NE	Seasonal response but not to a specific well
R-22	4	Yes	NE	NE	NE	No	No	No	No	NE	Seasonal response but not to a specific well
R-22	5	Yes	NE	NE	NE	No	No	No	No	NE	Seasonal response but not to a specific well
R-23	Single	No	NE	NE	NE	No	No	NE	NE	NE	No apparent response to pumping
R-24	Single	Yes	Possible	No	Possible	No	NE	Yes	NE	NE	Responds primarily to pumping at PM-3
R-25	5	No	NE	NE	NE	NE	No	No	No	No	No apparent response to pumping
R-25	6	No	NE	NE	NE	NE	No	No	No	No	No apparent response to pumping
R-25	7	No	NE	NE	NE	NE	No	No	No	No	No apparent response to pumping
R-25	8	No	NE	NE	NE	NE	No	No	No	No	No apparent response to pumping
R-26	2	No	NE	NE	NE	NE	No	No	No	No	No apparent response to pumping
R-27	Single	Yes	NE	NE	NE	NE	NE	NE	NE	NE	Seasonal response but not to a specific well
R-28	Single	Yes	NE	NE	NE	NE	Possible	No	Yes	Possible	Seasonal response but not to a specific well
R-31	2	No	NE	NE	NE	No	No	No	No	NE	No apparent response to pumping
R-31	3	No	NE	NE	NE	No	No	No	No	NE	No apparent response to pumping
R-31	4	No	NE	NE	NE	No	Possible	No	No	NE	Limited data for evaluation
R-31	5	Yes	NE	NE	NE	No	Yes	No	Possible	NE	Appears to respond seasonally like PM-2
R-32	1	No	NE	NE	NE	NE	No	No	No	NE	No apparent response to pumping
R-32	2	Yes	NE	NE	NE	No	Yes	No	Yes	NE	Responds primarily to pumping at PM-2 and PM-4
R-32	3	Yes	NE	NE	NE	No	Yes	No	Yes	NE	Responds primarily to pumping at PM-2 and PM-4
R-33	1	No	NE	NE	NE	NE	NE	NE	NE	No	No apparent response to PM-5
R-33	2	Yes	NE	NE	NE	NE	NE	No	Yes	Yes	Responds primarily to pumping at PM-5
R-34	Single	Yes	NE	NE	NE	No	No	No	No	NE	Seasonal response but not to a specific well
R-35a	Single	Yes	NE	NE	Yes	NE	NE	Yes	NE	NE	Responds primarily to nearby supply well PM-3
R-35b	Single	Yes	NE	NE	NE	NE	NE	No	NE	NE	Gradual decline of about 0.6 ft/yr
R-36	Single	No	NE	NE	NE	NE	NE	NE	NE	NE	Gradual decline of about 0.5 ft/yr
R-37	1	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-38	Single	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-39	Single	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-40	2	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-41	1	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-42	1	Yes	NE	NE	ID	NE	ID	ID	Possible	Possible	Insufficient data for analysis
R-43	1	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-43	2	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-44	1	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-44	2	ID	ID	ID	ID	ID	ID	ID	Possible	ID	Insufficient data for analysis
R-45	1	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-45	2	ID	ID	ID	ID	ID	ID	ID	Possible	ID	Insufficient data for analysis
R-46	Single	ID	ID	ID	ID	ID	ID	ID	ID	Possible	Insufficient data for analysis
R-48	Single	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-49	1	ID	ID	ID	ID	ID	ID	ID	ID	ID	Insufficient data for analysis
R-49	2	ID	ID	ID	ID	ID	ID	ID	Possible	ID	Insufficient data for analysis
TW-1	Single	No	No	No	NE	No	NE	NE	NE	NE	Water level impacted by surface water near well
TW-2	Single	Yes	NE	NE	NE	NE	NE	NE	NE	NE	No recent valid water level data
TW-3	Single	Yes	No	NE	No	NE	NE	No	NE	NE	Gradual decline of about 0.8 ft/yr
TW-4	Single	Yes	No	NE	No	NE	NE	NE	NE	NE	Seasonal fluctuations not related to pumping

NE = not evaluated; ID = insufficient Data

Appendix D. Summary of Intermediate Groundwater Level Responses to Runoff

D.1. Intermediate Groundwater Responses in Cerros del Rio Basalt (Tb4)

Figure D-1 shows the intermediate groundwater hydrographs for wells completed in the Cerros del Rio basalt. These wells are located in lower Los Alamos Canyon, lower Pueblo Canyon, middle Mortandad Canyon, and lower Pajarito Canyon (see Figure 4-1). Note the water levels in R-12 and R-23i are lower than in the other wells (scale on the right side of the hydrograph). Perched intermediate groundwater levels in the Cerros del Rio basalt in some wells show seasonal variations that are evaluated as possible response to large runoff events in Los Alamos Canyon.

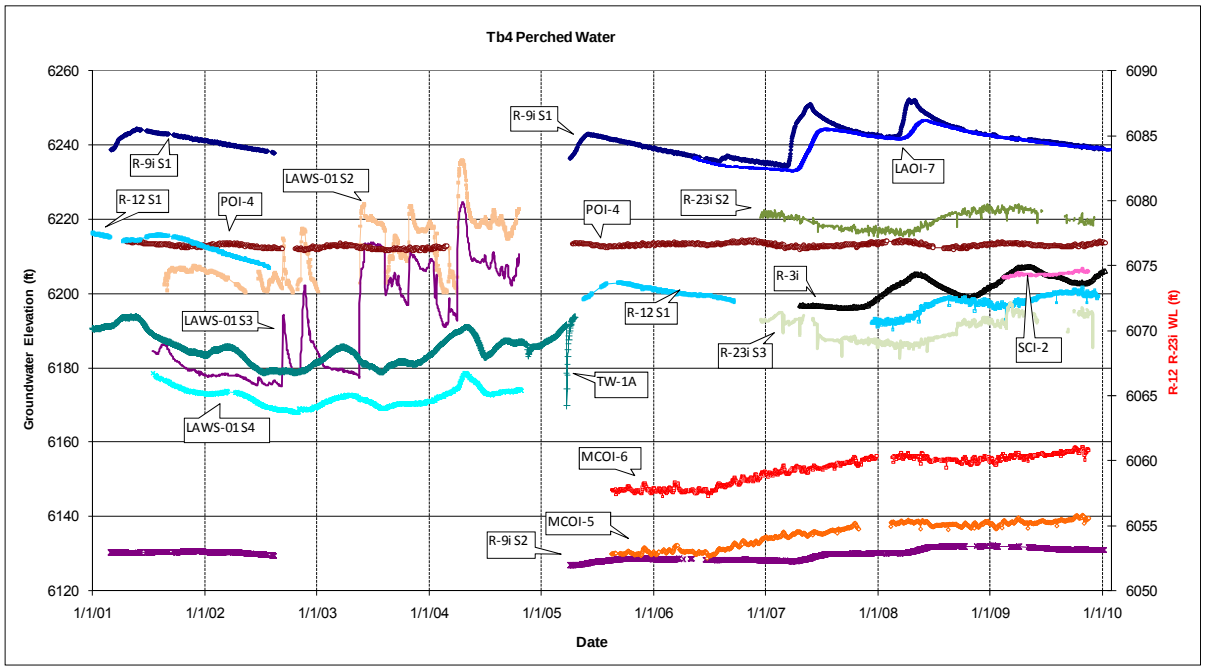

Figure D-1. Intermediate groundwater levels in Cerros del Rio basalt.

Figure D-2 shows the intermediate groundwater level in Cerros del Rio basalt in wells in lower Los Alamos Canyon and lower Pueblo Canyon and the mean daily flow at gaging station E042 in lower Los Alamos Canyon. From 2001 to 2004 screens 2 and 3 in LAWS-01 in lower Los Alamos Canyon (Stone et al. 2004) show responses to small and large runoff events. During this period LAWS-01 screen 4 and nearby well TW-1A in lower Pueblo Canyon show similar responses, generally higher water levels in the winter and lower levels in the summer. From 2006 through 2009, similar seasonal responses are observed in POI-4 and R-3i.

Large snowmelt runoff events occurred in Los Alamos Canyon in the spring of 2001, 2005, 2007, and 2008, as observed in lower Los Alamos Canyon at stream gage E042 (Figure D-2). No significant snowmelt runoff occurred in 2009. Concurrent with the large snowmelt runoff in lower Los Alamos Canyon, intermediate groundwater levels in wells R-9i, R-12, and LAOI-7 show groundwater level rises that appear to be related to the snowmelt runoff events.

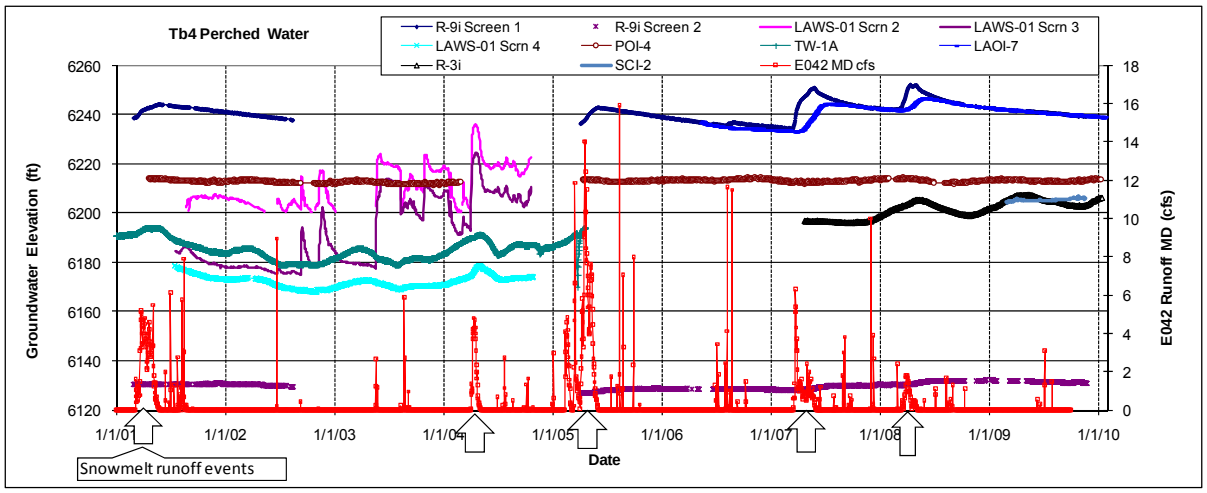

Figure D-2. Intermediate groundwater levels in Cerros del Rio basalt in Los Alamos and Pueblo canyons and mean daily flow at Gaging Station E042.

Figure D-3 shows the runoff at gage E042 during 2007 and 2008 and the water level responses in the Cerros del Rio basalt in wells R-9i screen 1, LAOI-7, and R-12 screen 1. The earliest water level response to snowmelt runoff is at R-9i screen 1, followed by LAOI-7 with a slightly reduced total response, and then followed possibly by a much subdued response at R-12 screen 1; again, note that the groundwater elevation at screen 1 in R-12 is about 170 ft lower than R-9i and LAOI-7. A significantly smaller and delayed response is also observed in R-9i screen 2. Additionally, two large storm runoff events in the summer of 2006 caused a rise in the groundwater level at R-9i screen 1 but little if any response at LAOI-7. With no snowmelt runoff in 2009, the groundwater levels at R-9i and LAOI-7 show a continued decline through 2009. However, the groundwater at R-12 screen 1 showed a rising trend in 2009, suggesting that the groundwater at R-12 is not responding to large runoff events in lower Los Alamos Canyon, or possibly is responding at a lag period greater than a few months. Additional monitoring is needed to understand the groundwater level fluctuations at R-12.

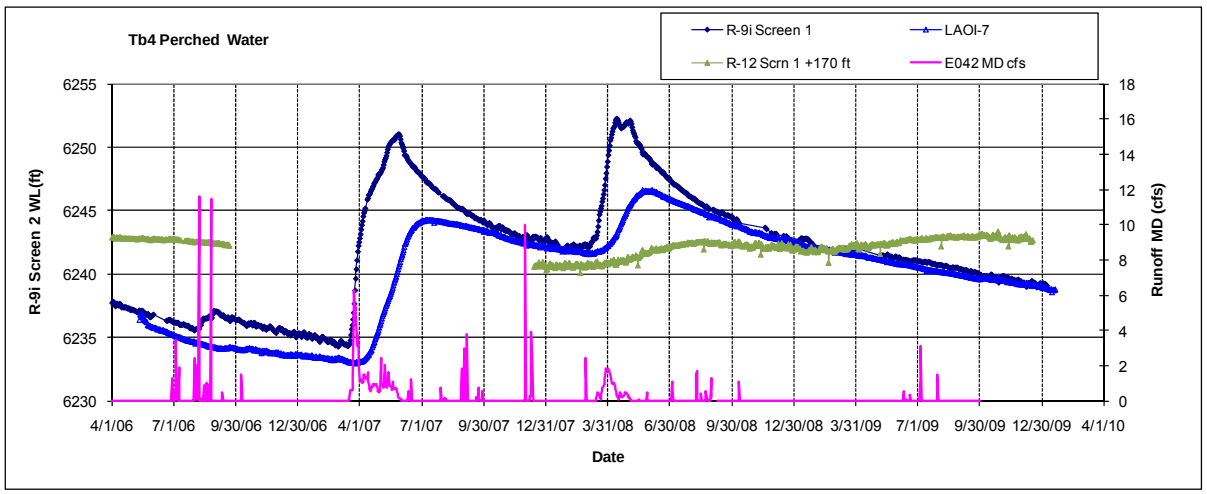

Figure D-3. Intermediate groundwater responses to snowmelt runoff in 2008 and 2009 in Cerros del Rio basalt and mean daily flow at Gaging Station E042.

Figure D-4 shows the hydrographs for intermediate perched groundwater in R-12 and R-23i and the runoff at stream gages E042 in Los Alamos Canyon and E250 in lower Pajarito Canyon. As indicated

above, the groundwater level fluctuations at R-12 may not be the result of snowmelt runoff infiltration below Los Alamos Canyon. The groundwater level rise in R-23i in 2008 follows a large snowmelt runoff period in the spring of 2008 and may similarly be associated with snowmelt runoff in Pajarito Canyon (or possibly with runoff in Los Alamos Canyon). Following no runoff in lower Pajarito Canyon in 2009, the water levels in R-23i showed a declining trend. Additional runoff monitoring in lower Pajarito Canyon and groundwater level data from R-23i are necessary to determine if groundwater at R-23i responds to runoff events.

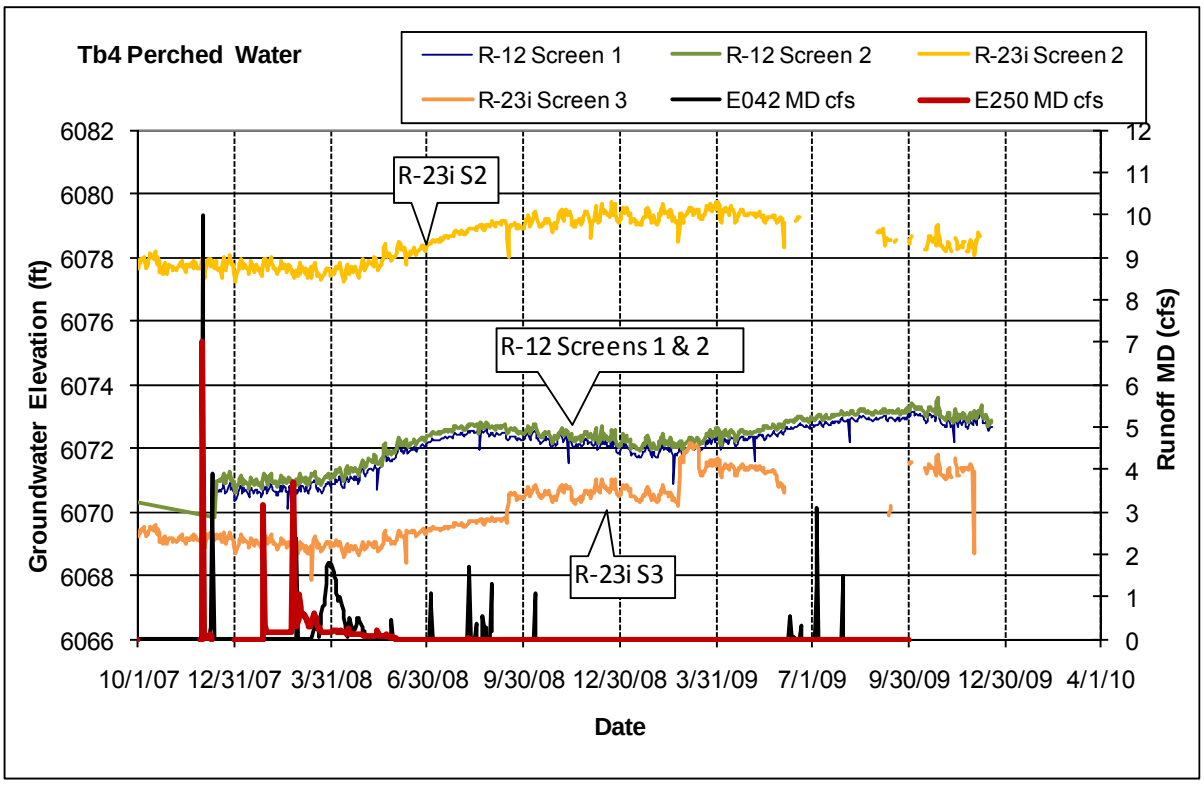

Figure D-4. Intermediate groundwater levels at R-12 and R-23i and mean daily flow at Gaging Stations E042 and E250.

Perched intermediate groundwater in the Cerros del Rio basalt beneath Mortandad Canyon in wells MCOI-5 and MCOI-6 (Figure D-1) shows a rising trend from mid 2006 to early 2008 when the water levels in both wells rose about 10 ft. A small rising trend continued at these wells in 2009. The trends in the groundwater levels in these wells do not appear to be related to specific runoff events; additional monitoring is needed to determine if the intermediate groundwater in these wells is influenced by runoff.

D.2. Intermediate Groundwater in Guaje Pumice Bed (Qbog)

Figure D-5 shows the hydrographs of perched intermediate groundwater in wells screened in the Guaje pumice bed and the mean daily runoff recorded in lower Los Alamos Canyon at stream gage E042. These wells are located in middle Los Alamos Canyon where the intermediate groundwater in the Guaje Pumice bed is 100 to 300 ft below the canyon floor and is stratigraphically higher than the intermediate groundwater in the Puye Formation and Cerros del Rio basalts. The Guaje Pumice bed is about 100 ft above the Cerros del Rio basalt in this area. There is no apparent correlation between trends in the groundwater levels in the Guaje pumice bed and runoff in Los Alamos Canyon.

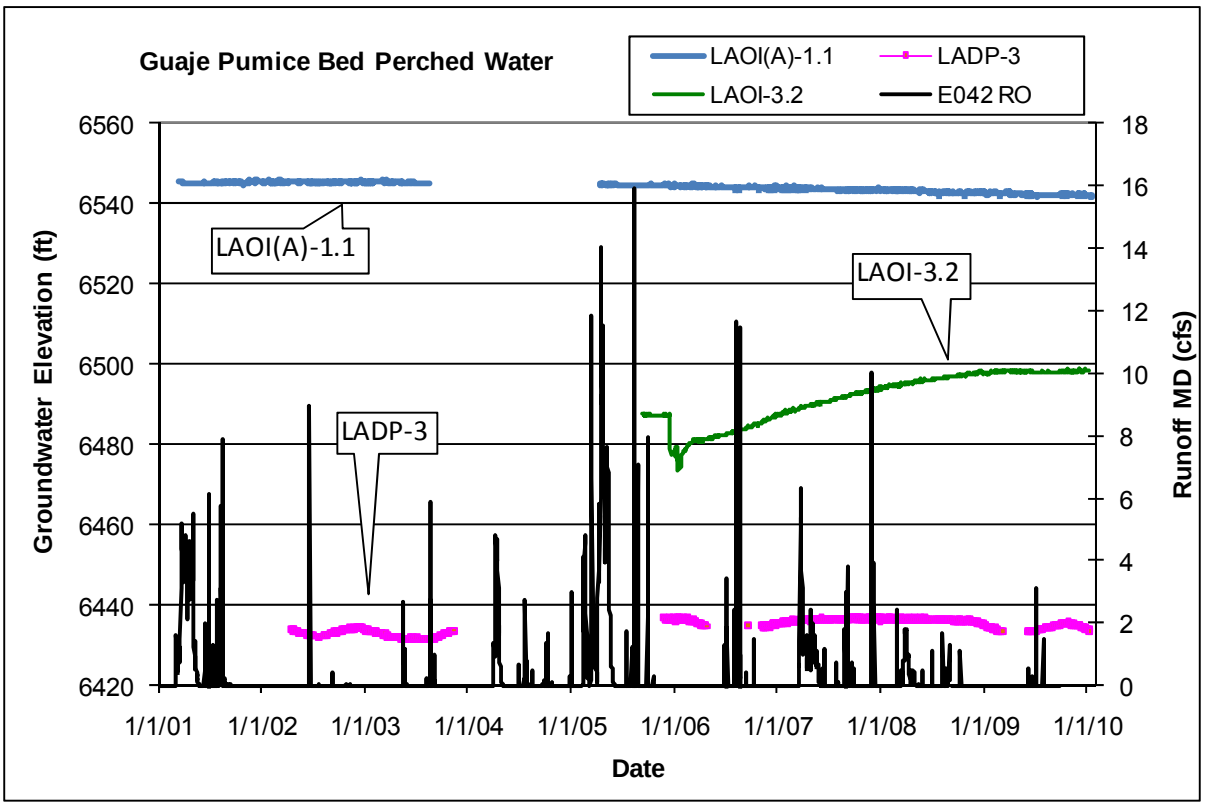

Figure D-5. Intermediate groundwater levels in the Guaje pumice bed at LAOI(A)-1.1, LADP-3, and LAOI-3.2 and mean daily flow at Gaging Station E042.

D.3. Intermediate Groundwater in the Puye Formation (Tp)

Screens in monitoring wells LAOI-3.2a, SCI-1, MCOI-4, MCOBT-4.4, R-5 screen 2, R-6i, and TA-53i monitor perched intermediate groundwater in the Puye Formation (see Section 4). There is no apparent relationship between runoff and groundwater levels in these wells.

D.4. Intermediate Groundwater at TA-16

Intermediate groundwater is monitored in the TA-16 area at wells CdV-16(i)-1, R-25 screens 1, 2, and 4, and CdV-16-2(i)r. Figure D-6 shows the groundwater levels from these wells and the mean daily runoff at gage E252 in upper Water Canyon. Snowmelt runoff occurred at gage E252 in 2005, 2007, and 2008, but significant runoff occurred in 2009. The groundwater in CdV-16-1(i) and R-25 screens 1 and 2 show an apparent response to snowmelt runoff in 2007 and 2008, ranging (in 2007) from a few tenths of a foot at R-25 screen 1 up to about 3 ft at CdV-16-1(i). There is no apparent response to snowmelt runoff at CdV-16-2(i)r in 2007, but there was a possible response in 2008. R-25 screen 4 may have showed a slight response to runoff in 2007, but there was no apparent response in 2008. Note that R-25 screens 1 and 2 and CdV-16-1(i) showed water level responses to drilling and installing monitoring wells R-25b and R-25c in August and September 2008.

The groundwater levels at R-25 screens 1 and 2 and CdV-16-1(i) showed a continued declining trend through 2009, apparently due to the lack of runoff recharge. The groundwater level at CdV-16-2(i)r began to rise after plugging and abandonment of nearby dry well CdV-16-2(i) (see Section 3).

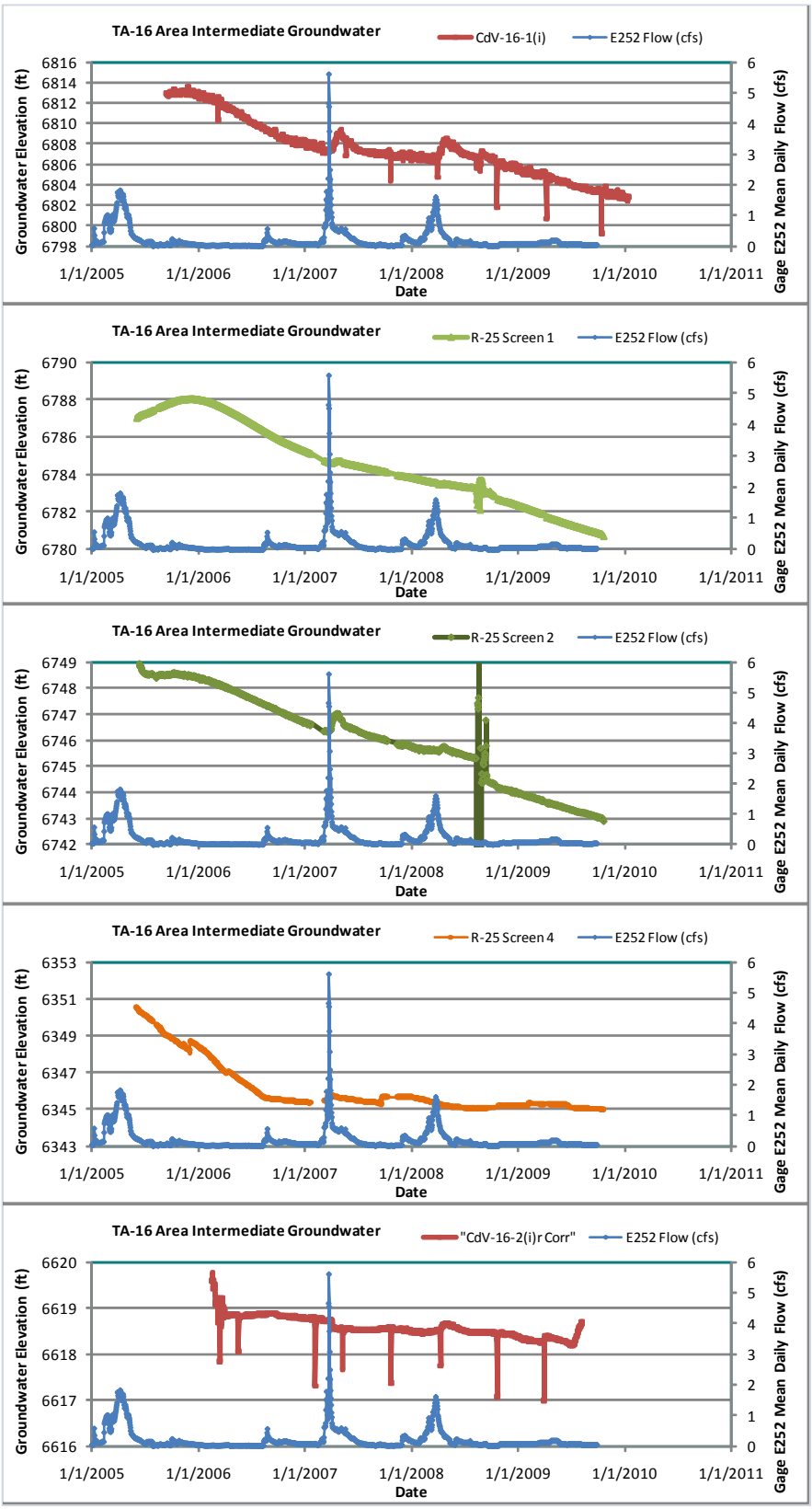

Figure D-6. Intermediate groundwater levels in TA-16 wells and mean daily flow at Gaging Station E252.

D.5. Summary of Runoff Impacts to Intermediate Perched Groundwater

Large snowmelt and storm runoff events in Los Alamos Canyon that extend eastward as far as the LANL boundary appear to infiltrate into subsurface units and impact groundwater levels in wells completed in the Cerros del Rio basalt. Intermediate perched groundwater in other geologic units beneath the middle part of Los Alamos Canyon and the surrounding Pajarito Plateau does not appear to be impacted by runoff events.

Similarly, intermediate perched groundwater at TA-16 appears to respond to large snowmelt runoff events. With no significant runoff events in 2009, the intermediate groundwater levels in the TA-16 area showed a continued decline. Reid et al. (2008) observed that the rapid infiltration to intermediate zones occurred at both the eastern and western side of the plateau in two contrasting hydrogeologic settings: runoff over fractured basalt in lower Los Alamos Canyon and possibly in lower Pajarito Canyon, and runoff crossing the Pajarito fault and associated fractured bedrock in the western part of the Pajarito Plateau. Reid et al. (2008) concluded that the key feature associated with the large runoff events and response in intermediate groundwater zones was persistent runoff and brittle bedrock near the surface that provided a conduit for infiltration.

Appendix E. Summary of Regional and Intermediate Groundwater Temperature

Table E-1. Groundwater Temperature in Regional Aquifer and Intermediate Groundwater Wells

Regional Aquifer Temperature			
Well	Screen	T (C)	Geo Unit
CDV-R-15-3	4	16.5	Tp
CDV-R-15-3	5	17.0	Tp
CDV-R-15-3	6	19.0	Tp
CDV-R-37-2	2	20.1	Tt
CDV-R-37-2	3	20.7	Tt
CDV-R-37-2	4	21.7	Tt
G-2A	Single	27.1	Tsf
G-3	Single	24.8	Tsf
G-3A	Single	26.5	Tsf
O-1	Single	23.0	Tsf
PM-1	Single	27.7	Tsf
PM-2	Single	21.0	Tp
PM-3	Single	25.3	Tsf
PM-4	Single	24.1	Tp
PM-5	Single	23.9	Tp
R-10a	Single	20.4	Tsf
R-10	1	21.3	Tsf
R-10	2	21.2	Tsf
R-11	Single	21.3	Tp
R-12	3	23.5	Tsfb
R-13	Single	19.9	Tp
R-14	1	22.6	Tp
R-14	2	23.0	Tp
R-16r	Single	19.8	Tpt
R-16	2	22.4	Tsf
R-16	3	24.2	Tsf
R-16	4	26.0	Tsf
R-17	1	21.5	Tpf
R-18	Single	14.8	Tpf
R-19	3	20.3	Tpf
R-19	4	21.5	Tpf
R-19	5	21.5	Tpf
R-19	6	25.1	Tpf
R-19	7	26.4	Tpf
R-2	Single	23.6	Tpf
R-20	1	20.7	Tb4
R-20	2	21.2	Tpp
R-20	3	25.0	Tsf
R-21	Single	20.3	Tp
R-22	1	21.7	Tb4
R-22	2	22.1	Tb4
R-22	3	24.2	Tpf
R-22	4	26.4	Tb4
R-22	5	27.1	Tpf
R-23	Single	21.6	Tsf
R-24	Single	28.4	Tsf
R-25	5	12.4	Tpf
R-25	6	13.7	Tpf
R-25	7	16.6	Tpf
R-25	8	20.2	Tpf
R-26	2	26.5	Tp
R-27	Single	17.6	Tpf
R-31	2	19.3	Tb4
R-31	3	20.4	Tb4
R-31	4	20.2	Tbt
R-31	5	23.8	Tbt
R-32	1	19.7	Tb4
R-32	2	20.2	Tpf
R-32	3	20.8	Tpf
R-33	1	21.2	Tpp

Regional Aquifer Temperature			
Well	Screen	T (C)	Geo Unit
R-35a	Single	25.0	Tsfu
R-35b	Single	23.5	Tpf
R-36	Single	22.8	Tsfu
R-37	2	20.4	Tpf
R-38	Single	20.0	Tb4
R-39	Single	21.4	Tb4
R-4	Single	24.5	Tp
R-41	2	22.4	Tpf
R-42	Single	19.6	Tsfuv
R-43	1	20.6	Tsfu
R-44	1	19.2	Tpf
R-45	1	19.6	Tsfu
R-46	Single	22.9	Tpf
R-48	Single	20.3	Tt
R-49	1	21.5	Tb4
R-5	3	22.8	Tsf
R-5	4	25.1	Tsfb
R-6	Single	21.9	Tf
R-7	3	16.1	Tp
R-8	1	20.7	Tp
R-8	2	22.9	Tp
R-9	Single	22.2	Tsfb
DT-10	Single	18.4	Tb4
DT-5A	Single	19.5	Tb4
DT-9	Single	20.6	Tb4

Note: shaded screens are no longer monitored

Intermediate Groundwater Temperature			
Well	Screen	T (C)	Geo Unit
CdV-16-1(i)	Single	10.8	Qbo
CdV-16-2(i)r	Single	11.1	Tpf
LADP-3	Single	9.9	Qbog
LAOI(A)-1.1	Single	9.6	Qbog
LAOI-3.2	Single	11.7	Qbog
LAOI-3.2a	Single	12.1	Tpf
LAOI-7	Single	13.8	Tb4
MCOI-4	Single	14.5	Tpf
MCOI-5	Single	16.0	Tb4
MCOI-6	Single	15.0	Tb4
PCI-2	Single	14.5	Tpf
POI-4	Single	11.6	Tb4
R-12	1	18.7	Tb4
R-12	2	18.7	Tp
R-19	2	18.4	Tp
R-23i	1	15.7	Tb4
R-23i	2	16.4	Tb4
R-25	1	11.2	Qbo
R-25	2	10.7	Tpf
R-25	4	11.1	Tpf
R-26	1	15.5	Qct
R-3i	Single	20.0	Tb4
R-40	R-40i	18.1	Tb4
R-40	1	19.2	Tb4
R-5	2	17.7	Tp
R-6i	Single	16.5	Tpf
R-9i	1	9.6	Tb4
R-9i	2	12.8	Tb4
SCI-1	Single	10.9	Tpf
SCI-2	Single	16.0	Tb4
TA-53i	Single	14.5	Tpf
Test Well 2A	Single	11.4	Tp

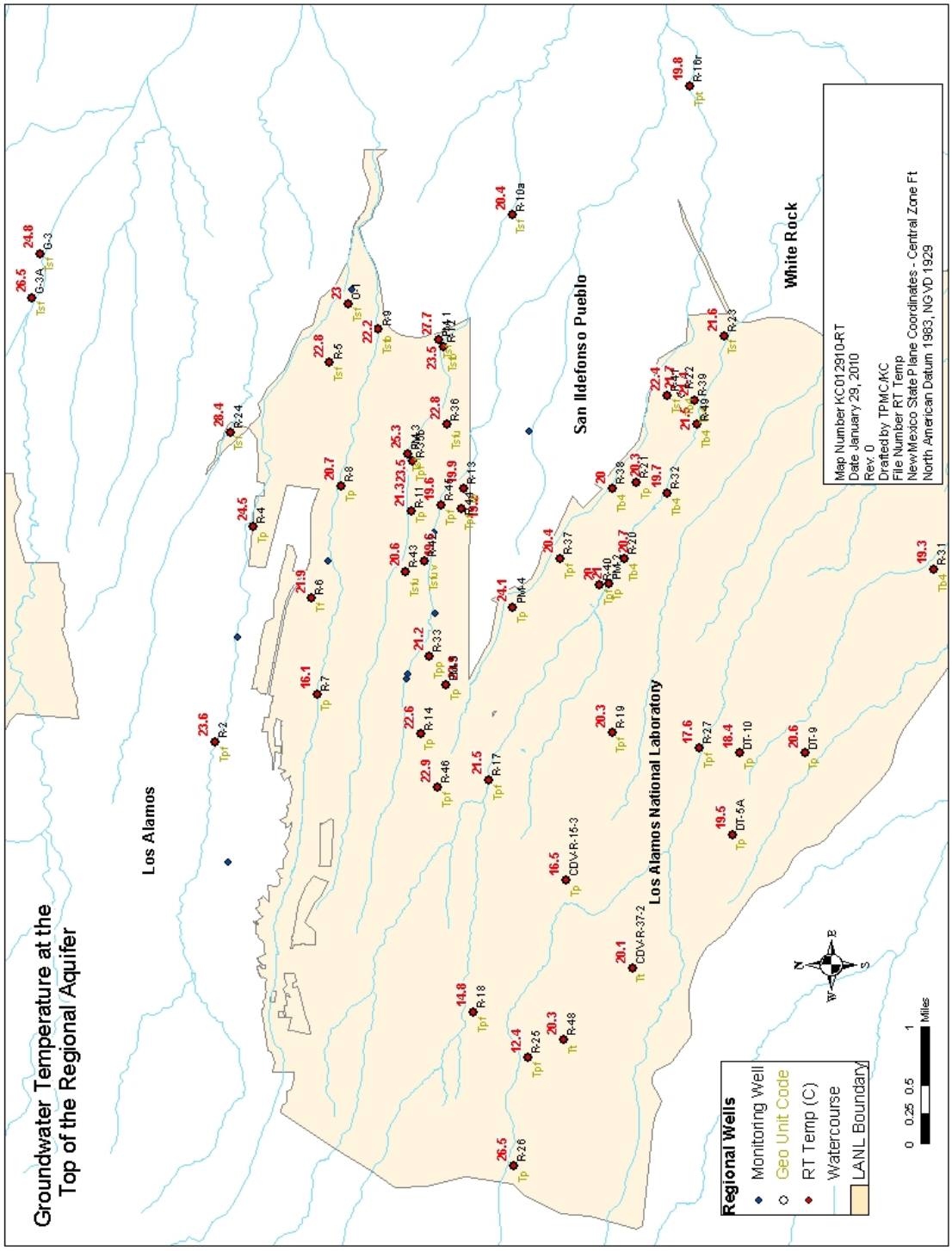

Figure E-1. Temperature of groundwater at the top of the regional aquifer.

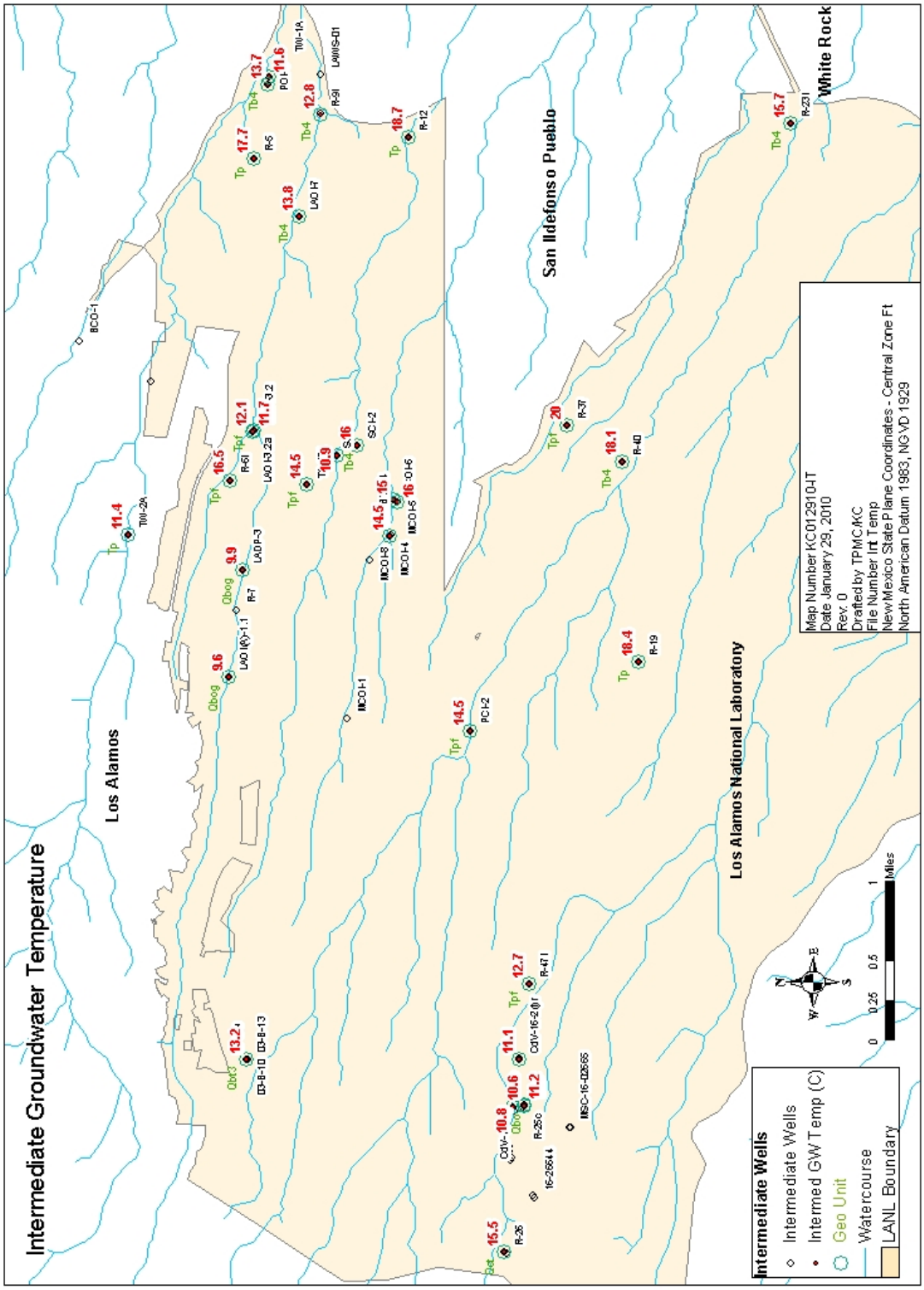

Figure E-2. Temperature of intermediate groundwater.

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