NORTHWEST WELL AND CITY WELL FIELD
GROUNDWATER MONITORING REPORT
RG-68302, RG-81092, AND
RG-1113 THRU RG-1118 COMBINED
MARCH 2025

prepared for

CITY OF SANTA FE WATER
www.santafenm.gov

and

NEW MEXICO OFFICE OF THE STATE ENGINEER
District VI Office

prepared by

JOHN SHOMAKER & ASSOCIATES, INC.
Water-Resource and Environmental Consultants
www.shomaker.com
505-345-3407

NORTHWEST WELL AND CITY WELL FIELD
GROUNDWATER MONITORING REPORT
RG-68302, RG-81092, AND RG-1113 THRU RG-1118 COMBINED
MARCH 2025

prepared by

Annie McCoy, CPG

Steven T. Finch, Jr., CPG, PG

JOHN SHOMAKER & ASSOCIATES, INC.
Water-Resource and Environmental Consultants
2611 Broadbent Parkway NE
Albuquerque, New Mexico, USA 87107
www.shomaker.com
505-345-3407

prepared for

CITY OF SANTA FE WATER
New Mexico

and

NEW MEXICO OFFICE OF THE STATE ENGINEER
District VI Office
Santa Fe, New Mexico

March 27, 2025

NORTHWEST WELL AND CITY WELL FIELD GROUNDWATER MONITORING REPORT
RG-68302, RG-81092, AND RG-1113 THRU RG-1118 COMBINED
MARCH 2025

EXECUTIVE SUMMARY

The Northwest Well and City Well Field monitoring program document titled *Exhibit 1: Northwest Well and City Well Field Groundwater Monitoring and Reporting Plan,* was adopted by all parties in 2018, as part of New Mexico Office of the State Engineer (NMOSE) Permit RG-68302, RG-81092, and RG-1113 thru RG-1118 Combined issued in 2018. The monitoring report includes the following:

1. Data tables and hydrographs (Appendices A through E) for wells within the monitoring program (Fig. 1), and monthly pumping data for the City of Santa Fe wells within the City.
2. A potentiometric surface map of the monitoring program area representing 2014 conditions (Fig. 2).
3. A potentiometric surface map representing current conditions (Fig. 3) and a map showing changes in the potentiometric surface between 2014 and present (Fig. 4).
4. Summary of data provided in the tables, hydrographs, and maps, and any trends that may be related to pumping.
5. The City's compliance with its permit conditions for the Northwest Well.

Data collection efforts were performed by City of Santa Fe Water (Source of Supply), USGS, and John Shomaker & Associates, Inc. (JSAI). Data compilation and QA/QC were performed by JSAI. There are three periods of data collection: 1) data collected prior to Northwest Well (dating back to 1968), 2) data collected during the Northwest Well temporary permit and prior to the monitoring program (2000 to 2018), and 3) data collected as part of the monitoring program (2018 to current).

The groundwater-elevation contours representative of the regional aquifer in 2024 (current conditions) were prepared based on available data, and according to the Monitoring Plan (Fig. 3). Based on available data, no cone of depression is observed at the Northwest Well as a result of reduced pumping.

Water-level decline rates in the area surrounding the Northwest Well range from insignificant (RG-49683; Fig. A3) to 1.2 ft/yr at the Archery Shallow piezometer since 2014 (Fig. D1). Water-level trends for "Group A" active domestic wells range from less than 0.2 ft/yr at RG-49683 (Figs. A3 and A4), to 0.3 ft/yr at RG-78218 (Fig. A7), and 0.7 ft/yr at RG-73001 (Fig. A5). The water-level trend at "Group A" monitoring well Ortiz 1 has been more complicated, but has been rising since 2009 (Figs. A1 and A2).

The average water-level decline rate for the 10-year period from 2014 to 2024 of 1.2 ft/yr at Archery Shallow piezometer is likely due to pumping of the Northwest Well as well as pumping of numerous domestic wells in the area. The rate of water-level decline has slowed at Archery piezometers since 2004. The average decline rates of up to 0.7 ft/yr at active domestic wells are likely due to pumping at these wells in addition to pumping of the Northwest Well and pumping of numerous other domestic wells in the area. There are hundreds of active domestic wells in the monitoring area that likely contribute to regional drawdown (JSAI, 2009).

This monitoring report fulfills the requirement in Section 5 of the Monitoring Plan that the monitoring report be prepared every three years. The first two monitoring reports were prepared in March 2019 and March 2022. This monitoring report has been prepared according to the requirements set forth in Section 6 of the Monitoring Plan, including data tables, hydrographs, maps, and narrative.

Pumping in 2024 under the Northwest Well and City Well Field permit was within the limits specified in the permit conditions (Table 3).

CONTENTS

TABLES

page

ILLUSTRATIONS

(follow text)

APPENDICES

(follow illustrations)

Appendix A. Graphs showing water levels in Group A wells of the Northwest Well and City Well Field Monitoring Program

Appendix B. Graphs showing water levels and monthly pumping for Group B wells of the Northwest Well and City Well Field Monitoring Program

Appendix C. Graphs showing water levels in Group C wells of the Northwest Well and City Well Field Monitoring Program

Appendix D. Graphs showing water levels in Section 6.b wells of the Northwest Well and City Well Field Monitoring Program

Appendix E. Water-level data used for contouring

Appendix F. Jump drive with water-level and pumping data

NORTHWEST WELL AND CITY WELL FIELD GROUNDWATER MONITORING REPORT
RG-68302, RG-81092, AND RG-1113 THRU RG-1118 COMBINED
MARCH 2025

1.0 INTRODUCTION

The Northwest Well and City Well Field monitoring program document titled *Exhibit 1: Northwest Well and City Well Field Groundwater Monitoring and Reporting Plan*, was adopted by all parties in 2018, as part of New Mexico Office of the State Engineer (NMOSE) Permit RG-68302, RG-81092, and RG-1113 thru RG-1118 Combined. The monitoring report includes the following:

1. Data tables and hydrographs for wells within the monitoring program, and monthly pumping data for the City of Santa Fe wells within the City.
2. An updated version of the potentiometric surface map of the monitoring program area representing 2014 conditions.
3. A potentiometric surface map representing current conditions and a map showing changes in the potentiometric surface between 2014 and present.
4. Summary of data provided in the tables, hydrographs, and maps, and any trends that may be related to pumping.
5. The City's compliance with its permit conditions for the Northwest Well.

The monitoring reports and data are available on the City of Santa Fe Water Division's web site, https://santafenm.gov/public-utilities/water/water-resources-1/city-wells/northwest-well-water-level-monitoring-program

1.1 Background

The Northwest Well (NMOSE well No. RG-68302) was drilled and constructed in 1998 to offset the loss of water supply from the Santa Fe Well (impacted in 1988 by volatile organic compounds at the Santa Fe Generating site). The City of Santa Fe filed an application with NMOSE in 1999 to make the Northwest Well supplemental to NMOSE well Nos. RG-1113 through RG-1118 (City Well Field). The application was protested and a settlement was reached among the parties in which a temporary permit was issued in 2002 (emergency authorization to pump the Northwest Well was granted in 2000). The temporary permit allowed a diversion of up to 900 ac-ft/yr from RG-68302, provided that the total diversion from all wells was limited to 3,507 ac-ft/yr during the 10-year temporary permit. Alternatively, the City could pump up to 4,865 ac-ft/yr in 1 year if the City did not use the Northwest Well.

In 2011, before the temporary permit expired, the City filed an application with NMOSE to permanently combine the Northwest Well with the City Well Field and the groundwater remediation well at the Santa Fe Generating site (NMOSE well No. RG-81092). The 2011 application was protested by various individuals and entities, including the Tano Road Association, but settled through mediation with all parties. The NMOSE issued the Northwest Well-City Well Field permit in 2018 with conditions limiting pumping and requiring water-level monitoring as specified in Exhibit 1 of the Permit.

1.2 Monitoring Program Requirements

To manage well field operations and to comply with previous permit requirements, water-level data have been collected in the region for about 70 years. The water-level monitoring program was expanded under the RG-81092, RG-68302, and RG-1113 through 1118 Combined permit in 2018. The current monitoring program area covers about 24.5 square miles as shown in Figure 1. The monitoring program requires water-level monitoring at specified wells in and around the monitoring area at varying frequencies. Northwest Well and City Well Field monitoring program wells are listed in Table 1 and locations are shown on Figure 1. Table 2 presents a summary of well completion information for the monitoring program wells.

The document titled *Exhibit 1: Northwest Well and City Well Field Groundwater Monitoring and Reporting Plan* identifies five domestic wells in the Tano Road neighborhood as candidates for inclusion in the Monitoring Plan. However, only three well owners signed well access agreements, and the Tano Road Association has indicated its satisfaction with proceeding with these three wells, RG-49683, RG-73001, and RG-78218, and has indicated that the Association will not be soliciting any additional well owners in the neighborhood for inclusion of additional wells in the Monitoring Plan. Please note that while the owners of the three domestic Group A wells agreed to well access for water-level measurements and installation of transducers, they did not agree to installation of water meters.

Table 1. Northwest Well and City Well Field Monitoring Program requirements

monitoring group	NMOSE ID	other ID (NMBGMR/ USGS, if any)	name	monitoring frequency	comments and status
A		EB-475	Ortiz 1	hourly	
A	RG-49683	EB-080	RG-49683	hourly	"east" well
A	RG-73001		RG-73001	hourly	"north, intermediate, well;" replaces RG-74921
A	RG-78218	EB-275	RG-78218	hourly	"north, distant, well"
B	RG-1118		Agua Fria	quarterly*	
B	RG-1116		Ferguson	quarterly*	
B	RG-1114	EB-123	Hickox No. 2	quarterly*	
B	RG-1113	EB-276	New Alto	quarterly*	
B	RG-304-S		Osage	quarterly*	
B	RG-1117		Santa Fe	quarterly*	
B	RG-304		St. Michael's	quarterly*	
B	RG-1115		Torreon	quarterly*	
C		EB-279	Alto St MW-3	semi-annual	
C			Alto St MW-5	semi-annual	
C			Alto St MW-7	semi-annual	
C			Alto St MW-9	semi-annual	
C			CSF-1	semi-annual	
C			CSF-2(A)	semi-annual	
C			CSF-2(B)	semi-annual	
C			DBS-1D	semi-annual	
permit well	RG-68302		Northwest Well	quarterly*	
Section 6.b		354321105573701	Archery Deep piez	daily**	
Section 6.b		354321105573702	Archery Middle piez	daily**	
Section 6.b		354321105573703	Archery Shallow piez	daily**	
Section 6.b		353945105574501	SF-1 Deep piez	daily**	
Section 6.b		353945105574502	SF-1 Middle piez	daily**	
Section 6.b		353945105574503	SF-1 Shallow piez	daily**	

* quarterly manual measurements required; wells equipped with transducers recording hourly measurements
**daily measurements available from U.S. Geological Survey database
NMOSE - New Mexico Office of the State Engineer
piez - piezometer
USGS - U.S. Geological Survey
NMBGMR - New Mexico Bureau of Geology and Mineral Resources

Table 2. Summary of elevation, total depth, and depth to top and bottom of screen for Northwest Well and City Well Field Monitoring Program wells

monitoring group	well	land surface elevation, ft amsl	total well depth, ft bgl	screen interval(s), ft bgl
A	Ortiz 1	6,999.03	460	350 to 460
A	RG-49683	7,178.50	600	400 to 600
A	RG-73001	7,160.00	805	665 to 685; 705 to 725; 745 to 765; 785 to 805
A	RG-78218	6,810.00	1,000	720 to 740; 780 to 800; 840 to 860; 900 to 920; 960 to 980
B	Agua Fria	6,797.65	740	201 to 740
B	Ferguson	6,877.00	750	175 to 746
B	Hickox No. 2	6,965.00	860	400 to 840
B	New Alto	6,861.40	725	226 to 720
B	Osage	6,750.00	770	210 to 760
B	Santa Fe	6,871.60	725	200 to 723
B	St. Michael's	6,853.45	795	380 to 780
B	Torreon	6,828.00	1,230	365 to 1,230
C	Alto MW-3	6,873.90	415	395 to 415
C	Alto MW-5	6,842.80	235	195 to 235
C	Alto MW-7	6,892.70	520	500 to 520
C	Alto MW-9	6,873.90	160	100 to 160
C	CSF-1	6,913.00	284	259 to 284
C	CSF-2(A)	6,858.00	554	534 to 554
C	CSF-2(B)	6,858.00	668	648 to 658
C	DBS-1D	6,885.73	*282*	267 to 282
permit well	Northwest Well	7,124.00	2,000	500 to 960; 1,000 to 1,980
Section 6.b	Archery Deep piez	7,223.00	1,100	1,080 to 1,090
Section 6.b	Archery Middle piez	7,223.00	920	900 to 910
Section 6.b	Archery Shallow piez	7,223.00	655	505 to 655
Section 6.b	SF-1 Deep piez	6,880.00	1,952	1,917 to 1,922
Section 6.b	SF-1 Middle piez	6,880.00	1,060	1,025 to 1,030
Section 6.b	SF-1 Shallow piez	6,880.00	780	669 to 674

ft amsl - feet above mean sea level
ft bgl - feet below ground level
italics - inferred total depth
piez - piezometer

1.3 Well Field Monitoring Report Requirements

- Data tables and hydrographs with water-level monitoring data for wells within the monitoring program.
- Data tables and hydrographs based on water-level data of good quality that are published in and reasonably available from a recognized monitoring database, and which are for wells within 3 miles of the Alto, Hickox, Torreon, Ferguson, Santa Fe, Agua Fria, and Northwest Wells.
- Monthly pumping data for the City of Santa Fe wells within the City (New Alto, Hickox No. 2, Torreon, Ferguson, Santa Fe, Agua Fria, Northwest, Osage, St. Michael's, and any additional City wells that are drilled in the future).
- Potentiometric surface map of the monitoring program area representing 2014 conditions.
- Potentiometric surface map of monitoring program area representing current conditions.
- Map showing changes in the potentiometric surface between 2014 and present.
- Narrative discussion summarizing the data provided in the tables, hydrographs, and maps.
- Summary of water-level trends in monitored wells that may be related to pumping.
- If graphical and spatial analysis of water-level trends is not conclusive, a more detailed analysis such as groundwater-flow modeling may need to be performed to assess whether the pumping allowed in the Settlement by the Northwest Well or the City Wells is causing water-level declines.
- Documentation of the City's compliance with its permit conditions for the Northwest Well.
- Posting of report, maps, water-level database, and links to U.S. Geological Survey (USGS) well data on-line for public access.

2.0 DATA COLLECTION

Data collection efforts were performed by the City of Santa Fe Water Division (Source of Supply), USGS, and JSAI. Data compilation and QA/QC were performed by JSAI. There are three periods of data collection: 1) data collected prior to Northwest Well, 2) data collected during the Northwest Well temporary permit and prior to the monitoring program (2002 to 2018), and 3) data collected as part of the monitoring program (2018 to current). Numerous graphs presenting the data are provided as Appendices A through D; water-level data used for contouring is provided as Appendix E, and Appendix F is a jump drive containing water-level and pumping data.

2.1 Northwest Well and City Well Field Diversions

All City of Santa Fe municipal wells are equipped with calibrated meters connected to a SCADA system. The metered diversions for each well are recorded monthly. Pumping from St. Michael's and Osage Wells are under separate water right permits, but included as part of the pumping for the monitoring area.

A summary of Northwest Well and City Well Field annual diversions between 1995 and present is presented in Table 3. Figures B1 through B9 in Appendix B present graphs showing historical City Well Field and Northwest Well monthly diversions and water levels. Between 1995 and 2024, total diversions from all City wells in the monitoring area (City Well Field plus Northwest Well plus St. Michael's and Osage Wells) ranged from 243 to 3,968 acre-feet per year (ac-ft/yr; Table 3). In 2024, total diversion from all City wells in the monitoring area was 708 ac-ft/yr. A summary of 2018 to 2024 pumping, and compliance with permitted pumping limits, is presented as Table 4.

2.2 Water-Level Data

The Group A wells have been equipped with transducers that record water levels hourly, and are monitored by JSAI on a semi-annual basis. All JSAI water-level monitoring is performed and verified using established Standard Operating Procedures (SOP). JSAI's SOP includes hand-measuring water levels in all accessible monitoring program wells in Groups A and C to the nearest hundredth of a foot using a calibrated wire-line sounder on a semi-annual basis, and downloading transducer data for Group A wells. Hand measurements are taken from established measuring points at each well (e.g., top of casing or top of sounding tube) and are used together with transducer data for data QA/QC for Group A wells. As part of the QA/QC process, hand measurements are compared to historical data for the monitoring wells while in the field in case re-measurement may be necessary due to an anomalous reading. All water-level data are entered into the water-level database and plotted on graphs; review of the graphed data represents one of the final steps in the QA/QC process.

City of Santa Fe Water staff performs monthly water-level measurements in all City supply wells using a Heron water-level indicator, and has transducers connected to the SCADA system. The USGS maintains transducers in Section 6.b wells and has performed water-level monitoring and data QA/QC for those wells.

Table 3. Summary of City Well Field and Northwest Well diversions between 1995 and present

year	RG-304 St. Michael's	RG-304-S Osage	RG-1113 New Alto	RG-1114 Hickox	RG-1115 Torreon	RG-1116 Ferguson	RG-1117 Santa Fe	RG-1118 Agua Fria	City Well Field (RG-1113 thru RG-1118) Total	RG-68302 Northwest Well	RG-81092 SFGS Remediation Well	total for all City wells in monitoring area
	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft	ac-ft
1995	102	15	0	0	0	407	0	1,298	1,705	0	0	1,822
1996	677	25	0	0	0	348	42	1,301	1,691	0	0	2,393
1997	218	25	0	0	0	293	0	705	998	0	0	1,241
1998	197	22	0	0	510	244	87	1,211	2,052	0	0	2,271
1999	252	25	122	0	670	118	380	1,234	2,524	0	0	2,801
2000	264	25	337	0	628	329	336	1,233	2,863	675	0	3,827
2001	111	25	309	0	565	317	331	1,208	2,730	123	0	2,989
2002	266	79	297	0	649	319	301	1,155	2,721	902	0	3,968
2003	239	19	240	0	557	254	286	858	2,195	679	0	3,132
2004	320	31	92	0	446	121	289	320	1,268	168	1.39	1,788
2005	446	71	31	0	141	0	295	436	903	240	1.94	1,662
2006	457	0	128	0	449	132	277	949	1,935	434	1.56	2,828
2007	55	0	57	0	260	19	303	482	1,121	90	1.63	1,268
2008	32	0	41	0	267	31	307	254	900	466	1.43	1,399
2009	61	0	34	0	164	50	207	271	726	350	0.89	1,138
2010	157	26	129	0	194	168	219	388	1,098	778	1.16	2,060
2011	262	24	183	0	150	169	334	386	1,222	411	1.37	1,920
2012	124	0	77	0	229	77	347	159	889	142	1.58	1,157
2013	110	11	97	0	182	101	205	69	654	480	0.23	1,255
2014	167	0	109	0	193	89	0	35	426	395	0	988
2015	163	0	34	0	37	30	0	22	123	360	0	646
2016	175	23	3	0	161	16	0	94	274	387	0	859
2017	143	2	4	0	138	18	0	25	185	252	0	582
2018	321	17	98	0	196	159	0	556	1,009	463	0	1,811
2019	30	0	0	0	20	1	0	79	101	112	0	243
2020	27	0	0	0	81	41	0	226	348	142	0	518
2021	97	74	0	0	174	76	0	351	601	429	0	1,201
2022	96	62	0	0	102	55	0	169	326	310	0	794
2023	1	16	0	0	34	15	0	97	145	255	0	417
2024	15	78	0	0	155	108	0	26	288	327	0	708

ac-ft - acre-feet

Table 4. Summary of 2018 to 2024 pumping, and pumping limits specified in RG-81092, RG-68302, and RG-1113 through 1118 Combined

year	City Well Field (ac-ft)	Northwest Well (ac-ft)	NW/CWF combined (ac-ft)	percent of annual permit limit NW/CWF combined [1]	percent of annual permit limit Northwest Well [2]
2018	1,009	463	1,472	30%	51%
2019	101	112	213	4%	12%
2020	348	142	490	10%	16%
2021	601	429	1,030	21%	48%
2022	326	310	636	13%	34%
2023	145	255	400	8%	28%
2024	288	327	615	13%	36%
2025					
2026					
2027					
10-yr total		2,038	4,856		
10-yr permit limit [3]		6,000	35,072		

[1] maximum annual pumping limit for NW and CWF combined is 4,865 ac-ft
[2] maximum annual pumping limit for Northwest Well is 900 ac-ft
[3] based on any consecutive 10-year pumping period after permit issued in 2018
NW/CWF - Northwest Well and City Well Field

3.0 ANALYSIS OF WATER-LEVEL DATA

3.1 Groundwater-Elevation Contours

Groundwater-elevation (also referred to as potentiometric surface) contours representative of the regional aquifer in the monitoring area were prepared for years 2014 (Fig. 2) and present (Fig. 3). Water-level data used for contouring are presented in Appendix E.

Direction of regional groundwater flow in the monitoring area has generally been westward away from the Sangre de Cristo mountain front and toward the Rio Grande. The observed differences between the 2014 and present flow fields are minimal; one notable difference is the recovery of water levels between St. Michael's Well and Santa Fe Well (Fig. 4).

3.1.1 Groundwater-Elevation Contours Representative of 2014 Conditions

The groundwater-elevation contours representative of the regional aquifer in 2014 were prepared based on available data, and according to the Monitoring Plan (Fig. 2). Development of the 2014 groundwater-elevation contour map is discussed in JSAI (2019a). Because well depths vary (see Table 2), and vertical groundwater gradients have been documented within the Tesuque Formation, preparing representative groundwater-elevation contours involves reconciliation of a relatively sparse dataset for a complex hydraulic system.

Groundwater elevation at the Northwest Well of 6,644 ft above mean sea level (ft amsl; February 2014 measurement) represents the average non-pumping water level in 2014 (see Fig. B9). This is an update from the groundwater elevation at the Northwest Well reported in JSAI (2019a), based on improved data QA/QC. The pattern of groundwater-elevation contours in the vicinity of the Northwest Well indicates a flatter hydraulic gradient than areas to the north, east, and west, reflective of a higher-transmissivity aquifer zone or flattening of the hydraulic gradient from pumping between fault zones. The pattern of groundwater-elevation contours west of the Northwest Well is based on previous efforts to contour groundwater elevations for the regional aquifer (NMBGMR, 2009) and integration of geologic mapping and geophysical surveys, which have identified locations of faults (Grauch et al., 2009; Hudson and Grauch, 2013; Koning and Read, 2010).

Water-level measurements collected at Paseo de Vista Landfill monitoring wells MW-3 and MW-7 suggest a groundwater mound beneath the footprint of the landfill, located between the Northwest Well and City Well Field (Parkhill, 2024). The groundwater mound may be due in part to the fault zone to the west acting as a barrier to westward flow, and potential recharge from the arroyo on the northwest side of Paseo de Vista Landfill (JSAI, 2021).

3.1.2 Groundwater-Elevation Contours Representative of Current Conditions

The groundwater-elevation contours representative of the regional aquifer in 2024 (current conditions) were prepared based on available data, and according to the Monitoring Plan (Fig. 3). No cone of depression is observed at the Northwest Well based on available data. The 6,600-ft closed contour interval that defined the remaining cone-of-depression between St. Michael's Well and Santa Fe Well in 2014 is no longer present due to recovery of water levels. The apparent groundwater mound at Paseo de Vista Landfill noted in 2014 is still present (Parkhill, 2024).

3.2 Monitoring Network Water-Level Trends

3.2.1 Group A Wells

Water-level data for Group A wells are presented on the hydrographs in Appendix A. Group A wells have been equipped with transducers recording water-level measurements on an hourly basis since 2019. Some historical hand-measured water level data exist for Ortiz 1 (Fig. A1), RG-49683 (Fig. A3), and RG-78218 (Fig. A6) for when the Northwest Well was pumping.

- Water levels in Ortiz 1 declined by about 8 ft between 2004 and 2009, and have risen by about 6 ft between 2009 and present (Fig. A1). Water levels at Ortiz 1 showed shorter-term fluctuations of 2 ft or less (Fig. A2). Shorter-term water-level declines at Ortiz 1 in June 2021, June 2022, and August 2024 appear to have coincided with increased pumping at the Northwest Well.

- Figure A3 presents historical water-level data for RG-49683, indicating a flat trend since 1988. Figure A4 presents transducer-measured water-level data for RG-49683. Water levels show a seasonal trend, with non-pumping water levels that are 1 to 2 ft deeper in summer than in winter. Pumping water levels were about 7 ft deeper in summer than in winter between 2019 and 2022, and pumping water levels were about 2 ft deeper in summer in 2023 and 2024. This likely reflects higher water use at RG-49683 in the summer between 2019 and 2022.

  RG-49683 is also within relatively close proximity to Santa Fe Opera and Tesuque Casino water-supply wells (about 2.3 miles). Although Santa Fe Opera permitted allowable diversions amount to about 50 acre-feet per year (ac-ft/yr), their water use is likely concentrated during the summer months. Current use from the supply well for the Tesuque Casino is not known.

- Figure A5 presents transducer-measured water-level data for RG-73001. Water levels show a seasonal trend, with non-pumping water levels that are 3 to 4 ft deeper in summer than in winter, and pumping water levels that are 5 to 8 ft deeper in summer. There appears to be an average decline rate of 0.7 ft/yr since the transducer was installed in 2019.

- Figure A6 presents historical water-level data for RG-78218, indicating a long-term average decline rate of 0.5 ft/yr since 2005. Figure A7 presents transducer-measured water-level data for RG-78218. Water levels show a seasonal trend, with non-pumping water levels that are about 0.5 ft deeper in summer than in winter, and pumping water levels that are about 2 ft deeper in summer. There appears to be an average decline rate of 0.3 ft/yr since the transducer was installed in 2019.

3.2.2 Group B Wells

Historical water levels at Group B supply wells of the City Well Field have varying long-term trends primarily influenced by pumping at each well, regional pumping by others, and recharge from the Living River flows:

- Non-pumping water levels at Agua Fria Well declined by over 100 ft between 1959 and 2007, then recovered somewhat due to lower pumping, and have been relatively stable in the past eight years (Fig. B1). Non-pumping water levels at Agua Fria Well rose by 20 ft between 2014 and present (see Appendix E).
- Non-pumping water levels at Ferguson Well have declined by about 100 ft overall since 1970 (Fig. B2). Non-pumping water levels at Ferguson rose by 14 ft between 2014 and present (see Appendix E).
- Non-pumping water levels at Hickox 2 Well have declined by about 84 ft since 1999 (Fig. B3). The well has not been pumping and water-level declines are thought to be related to downward flow from the shallower aquifer zone through a low-permeability layer to a more-permeable deeper zone. Non-pumping water levels at Hickox 2 appear to have been relatively stable between 2014 and present (see Appendix E).
- Non-pumping water levels at New Alto Well declined by 90 ft between 1969 and 1999 and have recovered somewhat due to lower pumping since then (Fig. B4). Non-pumping water levels at New Alto rose by almost 13 ft between 2014 and present (see Appendix E). The well has not been pumped since 2018.
- Non-pumping water levels at Osage Well declined by about 50 ft between 1972 and 2003 and have stabilized since then; the well was pumped very little between 2006 and 2020 (Fig. B5). Non-pumping water levels at Osage rose by 7 ft between 2014 and present (see Appendix E).
- Non-pumping water levels at Santa Fe Well have declined by about 100 ft since 1959 and appear to have recovered since the well was turned off in late 2013 (Fig. B6). Non-pumping water levels at Santa Fe Well rose by 76 ft between 2014 and present (see Appendix E).
- Non-pumping water levels at St. Michael's Well declined by about 30 ft between 1983 and 2009, and have recovered since then due to lower pumping (maximum monthly pumping of about 40 ac-ft, and annual pumping typically below 200 ac-ft; Fig. B7). Non-pumping water levels at St. Michael's rose by 48 ft between 2014 and present (see Appendix E).
- Non-pumping water levels at Torreon Well appear to have remained relatively stable between 1998 (Fig. B8). Non-pumping water levels at Torreon rose by about 19 ft between 2014 and present (see Appendix E). There have historically been some QA/QC issues with water-level data collected at Torreon, which the City worked to resolve in 2020.

3.2.3 Group C Wells

Water levels at Group C monitoring wells have varying long-term trends primarily influenced by pumping at nearby wells:

- The shallowest of the Alto Street monitoring wells, MW-9 has had a water column of about 0.4 ft with negligible change since 1995, and MW-5, slightly deeper than MW-9, has had relatively stable water levels (Fig. C1). Water levels at Alto MW-3 and MW-7 declined by about 80 ft between 1998 and 2002 due to high pumping in the City Well Field, and have recovered since then.
- Water levels in CSF-2(A) and CSF-2(B) declined between 1998 and 2002 due to high pumping in the City Well Field, and have recovered since then (Fig. C2). Well CSF-1 went dry during the Santa Fe Well remediation pumping (2000 to 2013); however, the aquifer has recently recovered enough for water-level measurements at CSF-1.
- Water levels in DBS-1D rose by 41 ft between 2002 and present due to lower pumping in the City Well Field (Fig. C3) and recharge from Living River flows. Water levels in DBS-1D rose by 29 ft between 2014 and present (see Appendix E).

3.2.4 Northwest Well

Non-pumping water levels at the Northwest Well have remained relatively stable since 2001 (Fig. B9). Pumping water levels are generally about 150 ft deeper than non-pumping water levels. Some variability in the dataset was found to be due to a change in water-level measurement instruments (stretched Powers wireline sounder to Heron cable sounder; JSAI, 2019a). Improved data QA/QC implemented with the monitoring plan after 2016 brings a higher level of confidence to the water-level dataset for the Northwest Well from 2017 to present. Non-pumping water levels at the Northwest Well between 2014 and present have been relatively stable (see Appendix E).

3.2.5 Section 6.b Wells

Water levels at USGS-monitored Archery piezometers declined by about 37 ft between 2003 and present due to pumping at the Northwest Well located about a mile to the southwest, and pumping of domestic wells in the Tano Road area (Fig. D1). A 2009 study found 264 wells and well permits (primarily domestic wells) in the Tano Road area (JSAI, 2009), and it is likely that additional wells have been completed in the area since that time. The Archery Middle and Deep piezometers show short-term fluctuations of about 25 ft in water levels in response to pumping at the Northwest Well. A slight upward head gradient is apparent during periods of water-level recovery (heads in Middle and Deep piezometers higher than in Shallow piezometer). Between 2014 and present, water levels declined at Archery Shallow piezometer by 12 ft, whereas water levels in the Archery Middle and

Deep piezometers appear to have remained relatively stable (see Appendix E). The rate of water-level decline has slowed at Archery piezometers over the period of record 2004 to present; this is particularly apparent in the dataset for the Shallow piezometer.

The long-term decline observed in the shallow aquifer in which the Archery Shallow piezometer is installed is due to Northwest Well pumping as well as pumping of domestic wells in the area that obtain water supply from the shallow aquifer. The screened interval in the Northwest Well is primarily in the deeper aquifer in which the Archery Middle and Deep piezometers are installed; short-term responses to Northwest Well pumping have been observed in the deeper aquifer, but with no significant decline since 2014.

Water levels at USGS-monitored SF-1 piezometers have shown short- and long-term trends influenced by pumping at nearby St. Michael's and Santa Fe Wells (Fig. D2). SF-1 Shallow and Middle piezometers have shown short- and long-term fluctuations in water levels due to pumping at St. Michael's Well, located about 0.25-mile to the south. Water levels at SF-1 Deep piezometer have declined by 89 ft between 1997 and present due to City Well Field pumping. Unlike shallower monitoring wells in the area, water levels have not stabilized or recovered at SF-1 Deep piezometer due to lower City Well Field pumping since the mid-2000s (see Table 3).

SF-1 piezometers showed a variety of water-level changes between 2014 and present, depending on piezometer depth (see Appendix E). SF-1 Shallow piezometer showed a water-level rise of 32 ft representative of continued recovery due to lower pumping in the City Well Field. Water levels have been relatively stable at SF-1 Middle piezometer, and declined by 21 ft at SF-1 Deep piezometer since 2014. Water levels rose by 31 ft during this period at USGS-9 (also known as Well 351), installed to a depth of 989 ft and located between St. Michael's Well and Santa Fe Well (see Appendix E). Water levels remained relatively stable during this period at NMOSE Fairgrounds piezometers, installed to depths ranging from 540 to 1,700 ft and located southwest of SF-1 and St. Michael's Well.

Note that Section 6.b Wells were selected based on review of USGS, NMBGMR, and NMOSE water-level databases. Selection criteria included a time-series dataset spanning from at least 2014 to present, known total well depth, and total depth of at least 150 ft for representation of the regional aquifer (see Appendix E). Note that NMOSE Fairgrounds piezometers were not included as Section 6.b Wells due to distance from the City Well Field (Section 6.b Wells are to be within 3 miles of the City Well Field) and NMOSE Fairgrounds piezometers were outside of the cone-of-depression between St. Michael's Well and Santa Fe Well in 2014 (see Fig. 2). The USGS-9 Well mentioned above had not been included as a Section 6.b Well due to a hiatus in USGS monitoring of the well between 2015 and 2020. USGS appears to have resumed annual monitoring at the well, and if that continues, the well will be added to the monitoring program as a Section 6.b Well.

3.3 Interpretation of Water-Level Trends

Since the installation of the Northwest Well, water-level trends for the Northwest Well area have been different than those observed at the City Well Field area due to differences in pumping quantities, proximity to recharge from the Santa Fe River, geologic conditions, and distribution of regional pumping. Thus, these areas are discussed separately in the sub-sections below.

3.3.1 Northwest Well Area

No significant cone-of depression has been identified in the Northwest Well area, based on available data (Figs 2 and 3). Interpretation of Northwest Well non-pumping water levels would indicate a water-level decline of 72 ft since the well was constructed in 1998, with about 33 ft of that decline occurring between 1998 and 2001 (Fig. B9). The Archery Shallow piezometer, located about a mile away from the Northwest Well, has shown a decline of 36 ft since 2004. It may not be appropriate to calculate an average decline rate for Archery Shallow piezometer for the period of record since the rate of decline has clearly slowed (decelerated) over time. Unfortunately, the Archery piezometers were installed after the Northwest Well, so there are no background data for evaluating water-level trends in this area prior to installation of the Northwest Well. In contrast, RG-49683, located approximately 2.3 miles northeast of the Northwest Well, has not shown any significant water-level decline in the sparse historical dataset (Fig. A3). Varying rates of decline in the vicinity of the Northwest Well are likely influenced by varying well depth (see Table 4). Ortiz 1 monitoring well is located between the City Well Field and the Northwest Well, about 0.5 mile north of the City Well Field and about 1.5 miles south of the Northwest Well (see Fig. 1). Water levels in Ortiz 1 declined between 2004 and 2009, and rose between 2009 and present, but have had a slight overall decline of less than 2 ft since 2004 likely in response to pumping of all supply wells in the monitoring area (Fig. A1).

In summary, the long-term water-level decline at Archery Shallow piezometer is likely reflective of pumping effects from pumping the Northwest Well and domestic wells in the area. An average decline rate of 1.2 ft/yr since 2014 has been calculated for Archery Shallow piezometer, although the decline rate is clearly slowing. Average decline rates up to 0.3 ft/yr at active domestic wells are likely due to pumping at these wells in addition to pumping of other domestic wells in the area, outside the area of influence of Northwest Well pumping. This is similar to average decline rates in the Buckman monitoring area that have been attributed to domestic well pumping outside the area of influence of Buckman Well Field pumping (JSAI, 2024). Well RG-73001, located about 1.4 miles north of the Northwest Well, appears to have a higher average decline rate of 0.7 ft/yr, which may be attributed to pumping at the well in addition to pumping of the Northwest Well and other domestic wells in the area.

3.3.2 City Well Field Area

Water levels at the City Well Field have varying long-term trends (see Appendix B). Many of these wells showed water-level declines of 50 to 100 ft due to higher pumping prior to the mid-2000s, and water levels have stabilized or recovered since then. The amount of recovery depends on proximity to the Santa Fe River.

Water levels at Group C monitoring wells indicate that the cone-of depression caused by pumping the City Well Field has shrunk due to reduced pumping since 2011, and increased recharge from Living River flows (see Fig. 3; Table 3; Appendix C). Group C monitoring wells installed to depths less than 250 ft have been less affected by City Well Field pumping (see Table 2 and Fig. C1).

4.0 COMPLIANCE WITH NORTHWEST WELL PERMIT

The City of Santa Fe has taken timely actions to maintain compliance under the Northwest Well water right permit. Water-level monitoring is proceeding according to Sections 3 and 4 of the Monitoring Plan. This monitoring report fulfills the requirement in Section 5 of the Monitoring Plan that the monitoring reports be prepared three years after the first monitoring report (JSAI, 2019a; JSAI, 2019b), and has been prepared according to the requirements set forth in Section 6 of the Monitoring Plan, including data tables, hydrographs, maps, and narrative.

Pumping between 2018 and 2024 under the Northwest Well and City Well Field permit has been within the limits specified in the permit conditions (Table 4).

An evaluation of streamflow depletions and offsets associated with the Northwest Well permit has been submitted to NMOSE to fulfill the requirements of the permit conditions of Approval 5, 6, and 7 (JSAI, 2018).

5.0 RECOMMENDATIONS

It is recommended that monitoring and reporting continue to remain in compliance with the permit conditions of the Northwest Well water right permit. At the current rates of pumping for the City Well Field and Northwest Well, water levels are stable or recovering in many parts of the monitoring area, and higher pumping rates would be required to evaluate stresses on the aquifer.

6.0 REFERENCES

Bandeen, R., 2019, NMOSE File No. RG-81092, RG-68302, and RG-1113 thru 1118 Combined; Comments regarding City of Santa Fe North West Well monitoring program: memo from Reid Bandeen, P.G., for Tano Road Association, to Ramona Martinez, Northern Rio Grande Basin Manager, Water Rights Division, NMOSE, January 24, 2019, 3 p.

Grauch, V.J.S., Phillips, J.D., Koning, D.J., Johnson, P.S., and Bankey, V., 2009, Geophysical Interpretations of the Southern Española Basin, New Mexico, That Contribute to Understanding its Hydrogeologic Framework: U.S. Geological Survey Professional Paper 1761, 88 p.

Hudson, M.R., and Grauch, V.J.S., 2013, Introduction: New Perspectives on Rio Grande Rift Basins: From Tectonics to Groundwater: Geological Society of America Special Papers vol. 494.

[JSAI] John Shomaker & Associates, Inc., 2009, Buckman Monitoring Program well and well permit survey: consultant's letter report to Claudia Borchert, City of Santa Fe Water Division, March 13, 2009, 4 p. plus map and CD containing well and well permit survey, database letter report, and index maps.

[JSAI] John Shomaker & Associates, Inc., 2018, Northwest Well permit streamflow depletions and offsets: consultant's letter to Andrew Erdmann, City of Santa Fe Water Division, September 27, 2018, 6 p. plus figure.

[JSAI] John Shomaker & Associates, Inc., 2019a, Northwest Well and City Well Field groundwater monitoring report, RG-68302, RG-81092, and RG-1113 thru RG-1118 Combined, March 2019: consultant's report prepared for City of Santa Fe Water Division and NMOSE District VI Office, 15 p. plus figures and appendices.

[JSAI] John Shomaker & Associates, Inc., 2019b, Addendum to Northwest Well and City Well Field groundwater monitoring report, RG-68302, RG-81092, and RG-1113 thru RG-1118 Combined, December 2019: consultant's report prepared for City of Santa Fe Water Division and NMOSE District VI Office, 16 p.

[JSAI] John Shomaker & Associates, Inc., 2021, Direction of groundwater flow at Paseo de Vista and Ortiz Landfills, Santa Fe, New Mexico: consultant's technical memorandum prepared for City of Santa Fe Water Division, June 30, 2021, 2 p. plus figures and well record enclosed.

[JSAI] John Shomaker & Associates, Inc., 2022, Northwest Well and City Well Field groundwater monitoring report, RG-68302, RG-81092, and RG-1113 thru RG-1118 Combined, March 2022: report prepared by JSAI for City of Santa Fe Water, 16 p. plus figures and appendices.

[JSAI] John Shomaker & Associates, Inc., 2024, Buckman Wells 10-13 (RG-20516-S-10 through S-13) monitoring program 8th biennial report, February 2024: report prepared by JSAI and City of Santa Fe Water for NMOSE District VI Office, 28 p. plus figures and appendices.

Koning, D.J., and Read, A.S., 2010, Preliminary Draft, Geologic map of the Southern Española Basin, Santa Fe County, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Report 531.

[NMBGMR] New Mexico Bureau of Geology and Mineral Resources, 2009, Water-level contours and ground water flow conditions (2000 to 2005) for the Santa Fe area, southern Espanola Basin, New Mexico: New Mexico Bureau of Geology and Mineral Resources Open-File Report OFR-520.

Parkhill, 2024, City of Santa Fe Paseo de Vista Landfill 2nd semi-annual 2024 groundwater monitoring report: consultant's report prepared for City of Santa Fe, 10 p. plus figures and appendices.

ILLUSTRATIONS

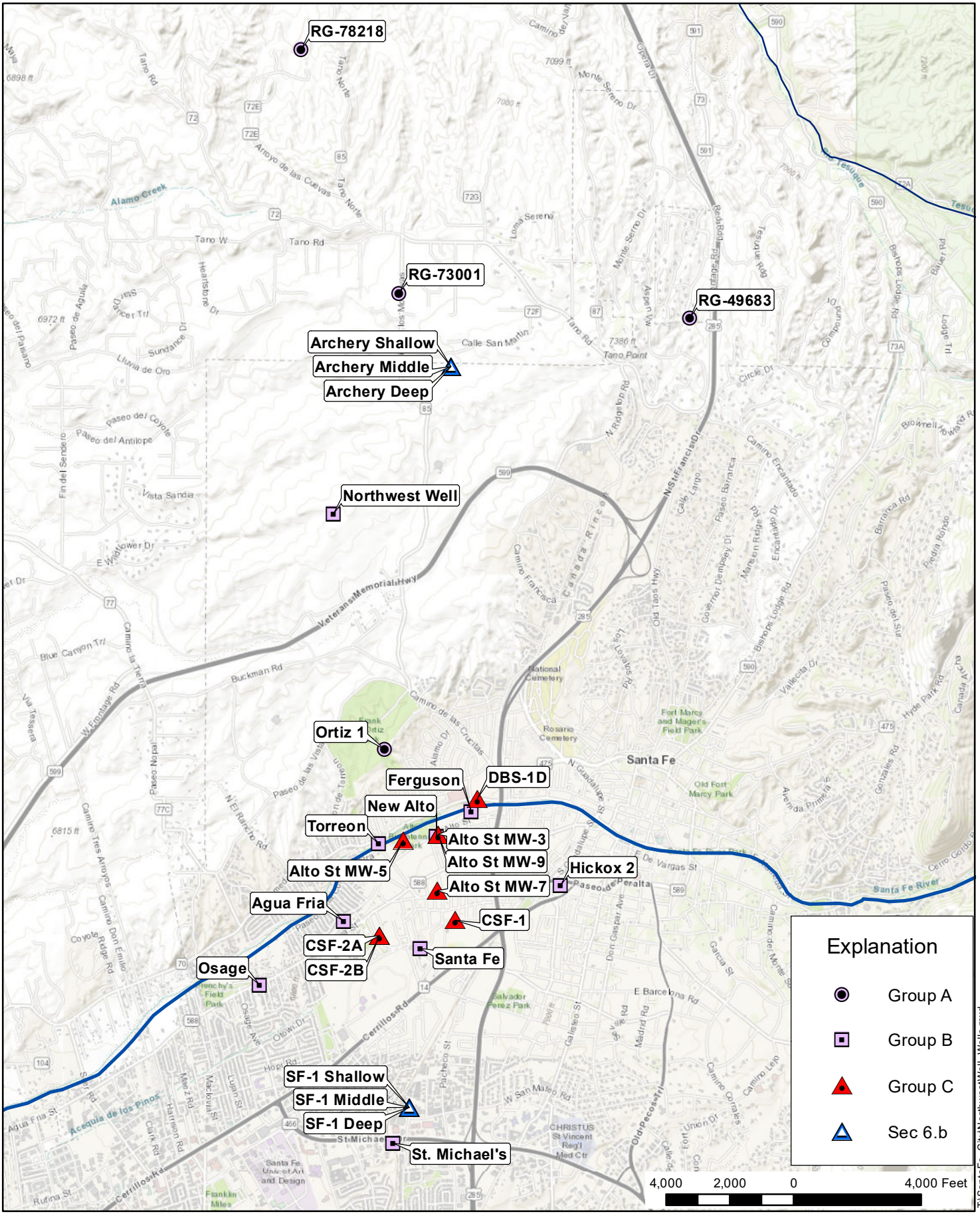

Figure 1. Map showing Northwest Well and City Well Field area water level monitoring network, Santa Fe, New Mexico.

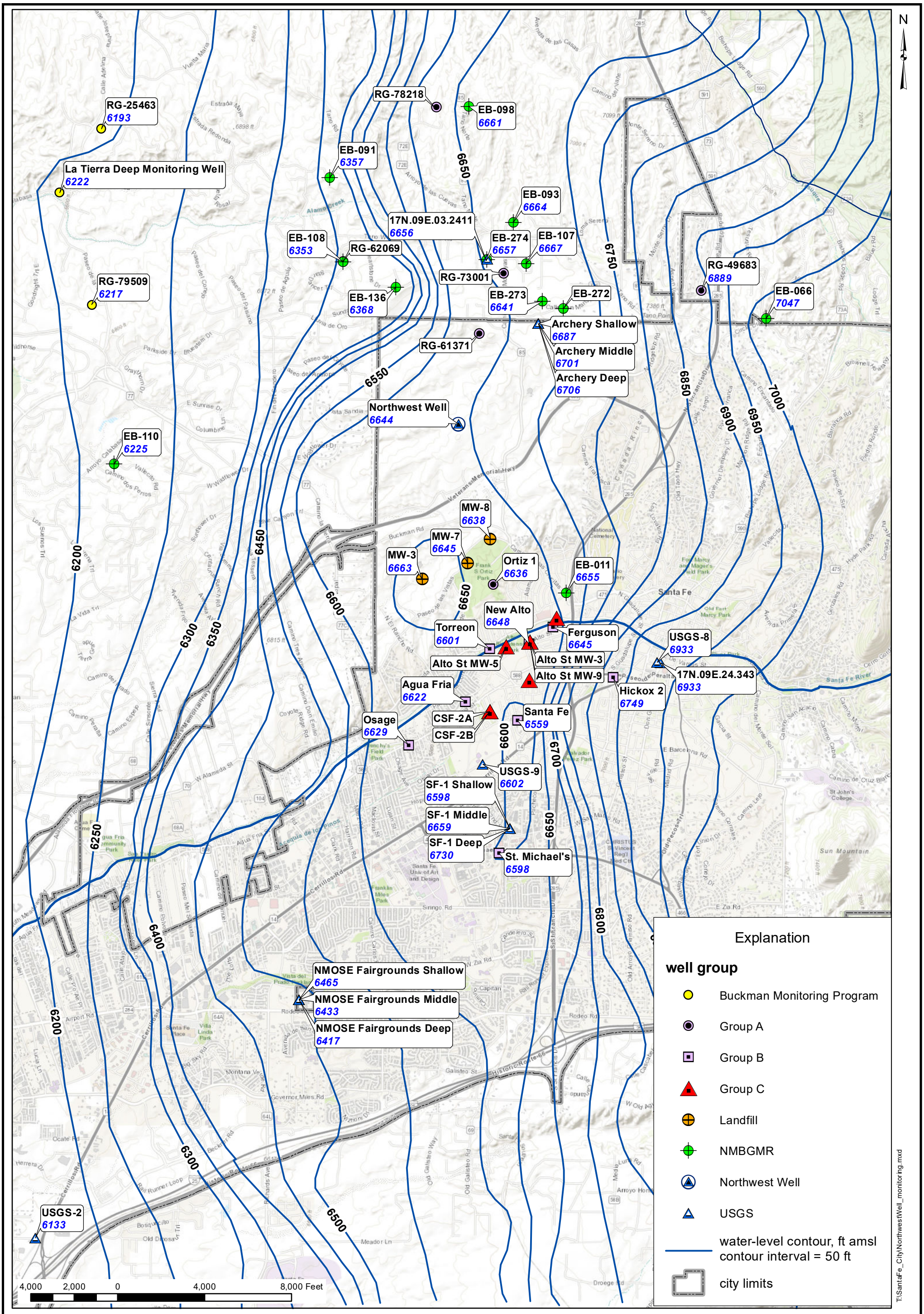

Figure 2. Map showing 2014 water-level elevation contours for Northwest Well and City Well Field area, Santa Fe, New Mexico.

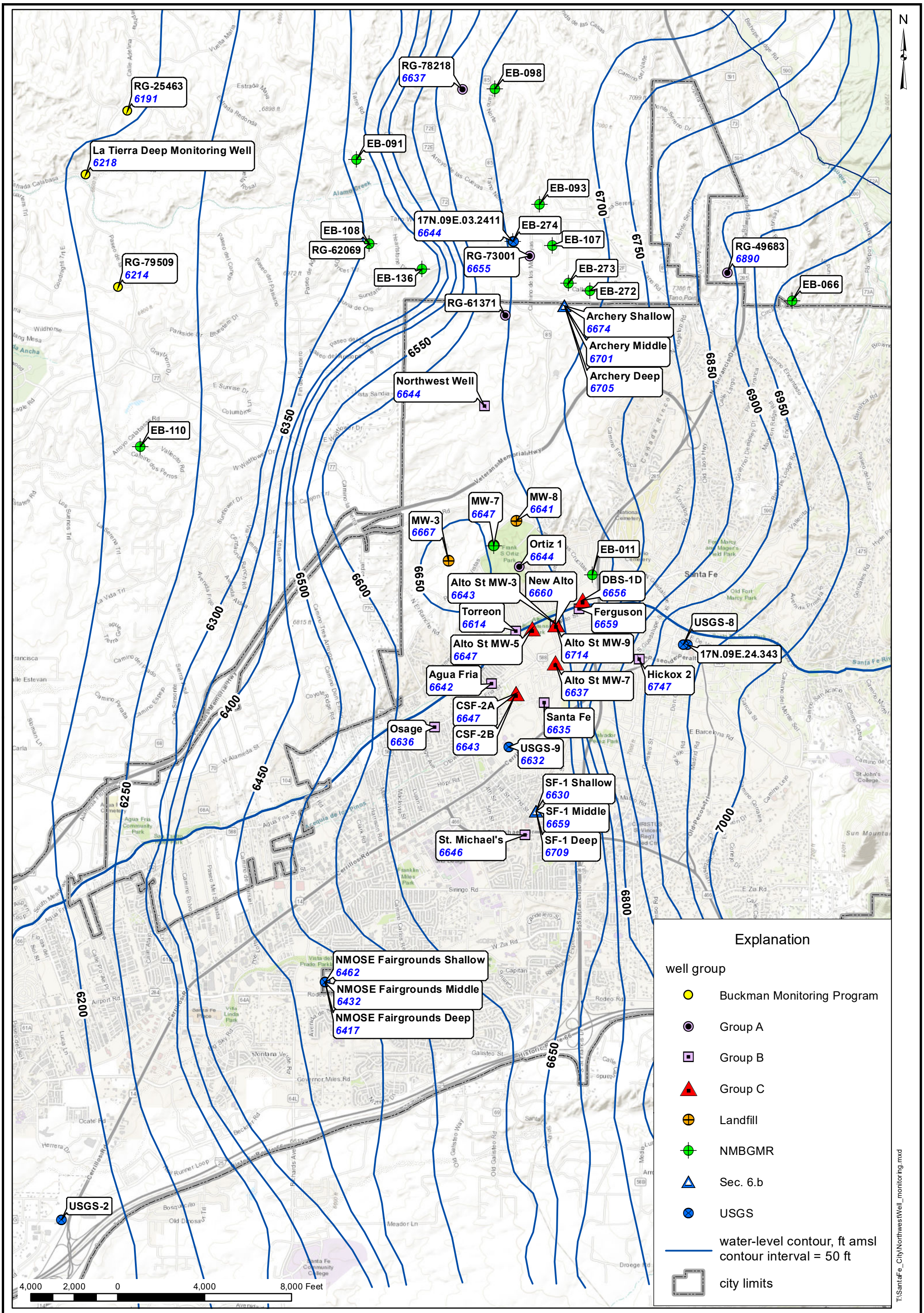

Figure 3. Map showing water-level elevation contours for Northwest Well and City Well Field area representing current conditions, Santa Fe, New Mexico.

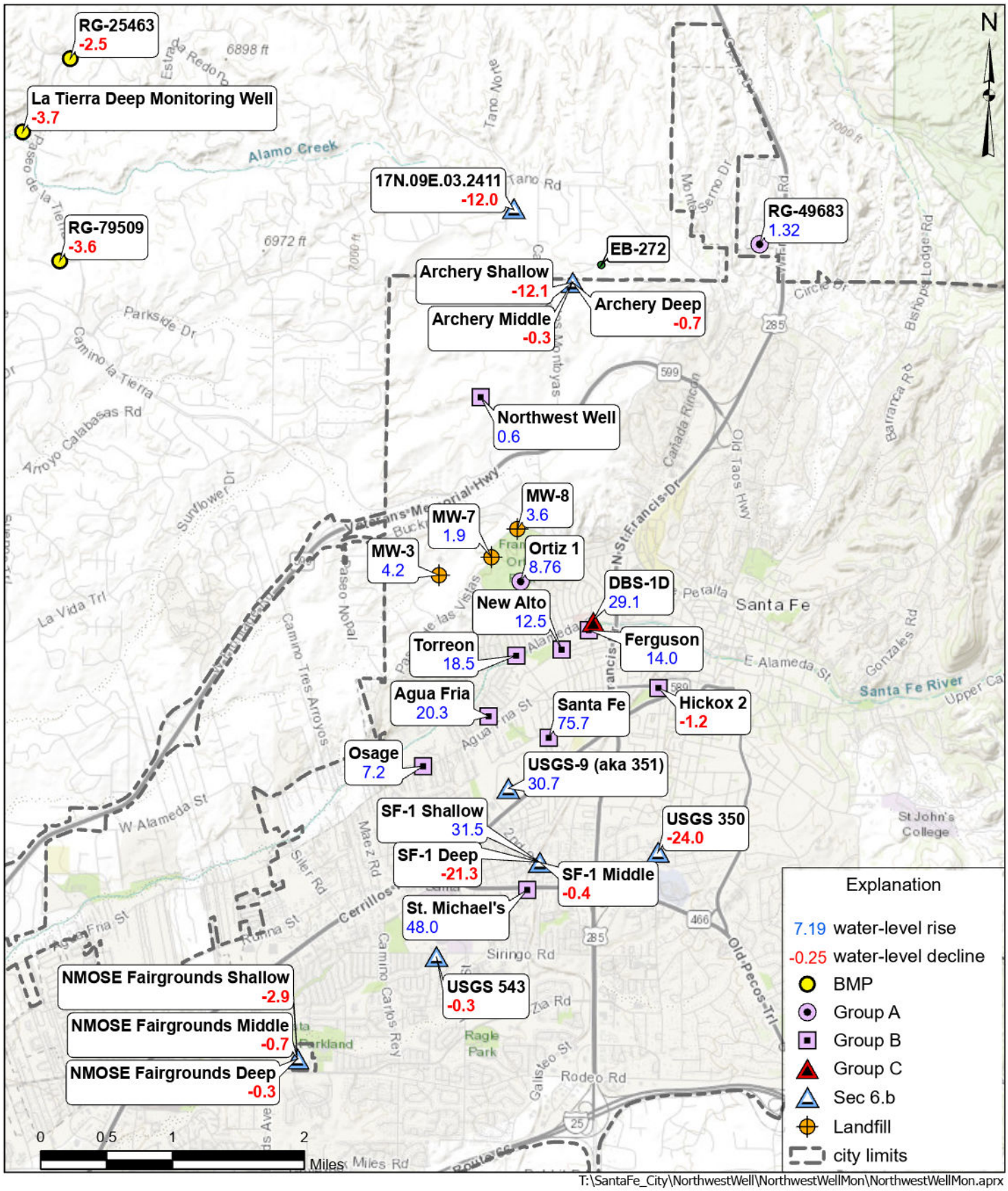

Figure 4. Map showing water-level changes between 2014 and present, Northwest Well and City Well Field area, Santa Fe, New Mexico.

APPENDICES

Appendix A.

Graphs showing water levels in Group A wells of the Northwest Well and City Well Field Monitoring Program

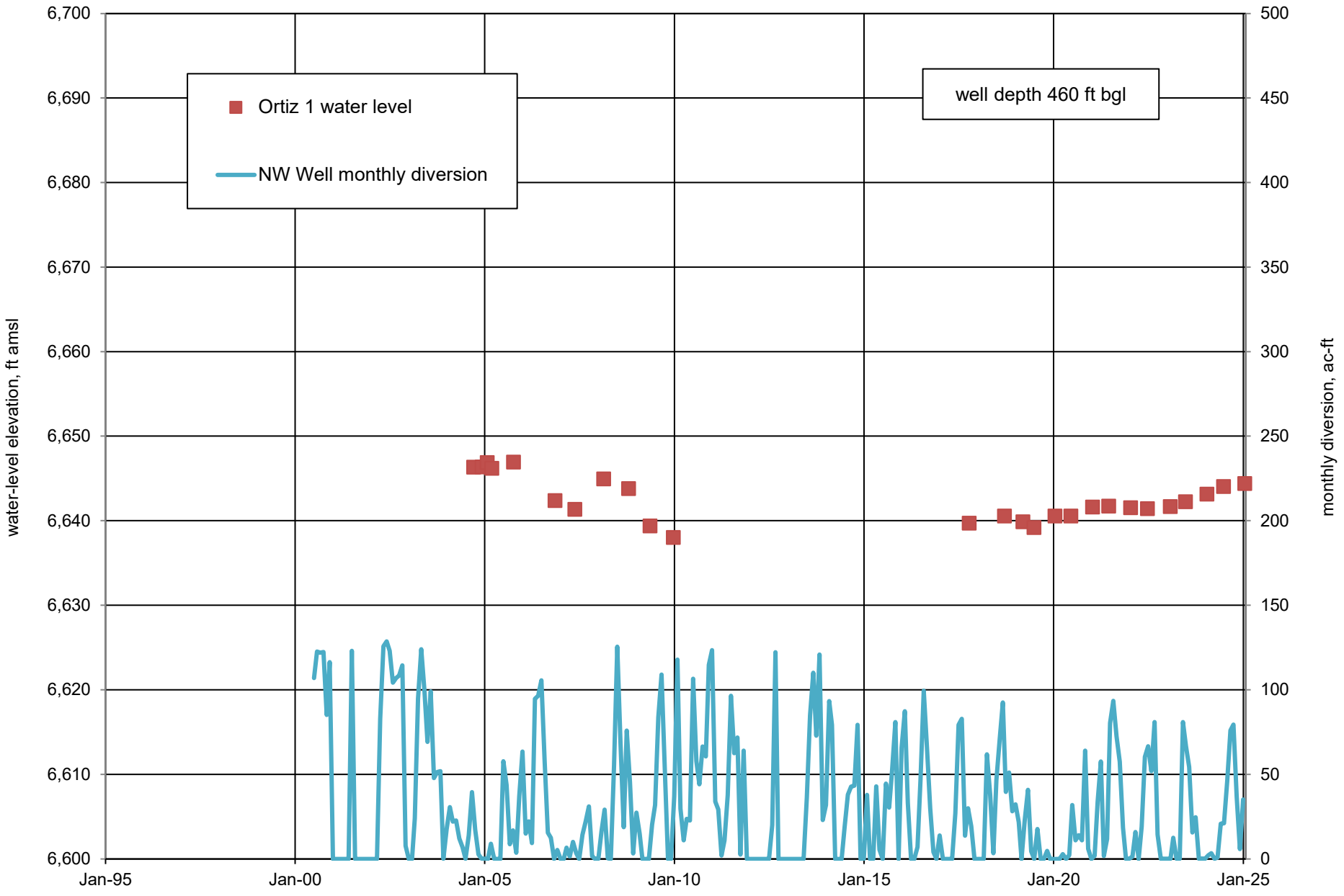

Figure A1. Water-level elevations for Group A Ortiz 1 Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

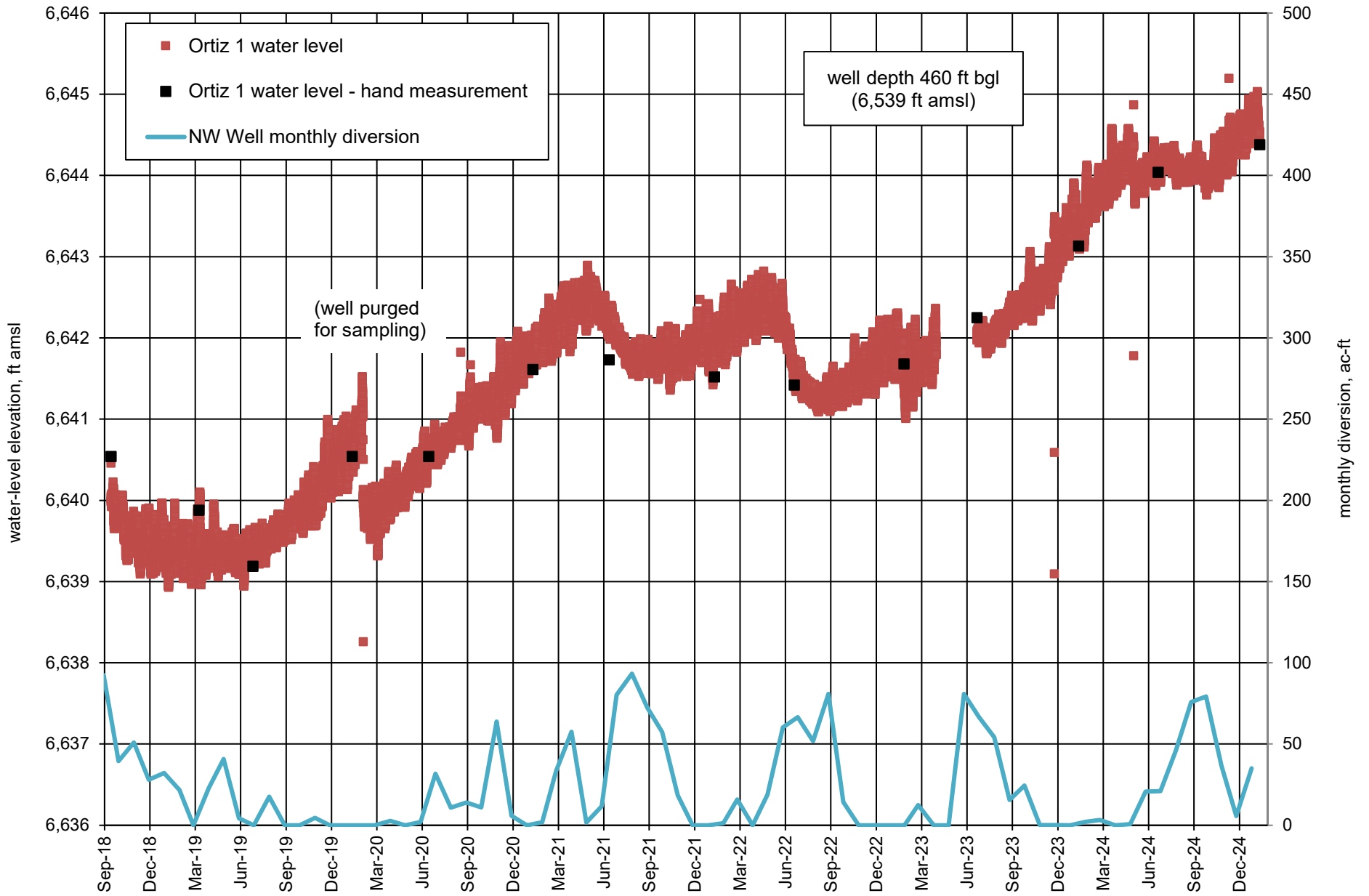

Figure A2. Water-level elevations measured hourly by transducer, Group A Ortiz 1 Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

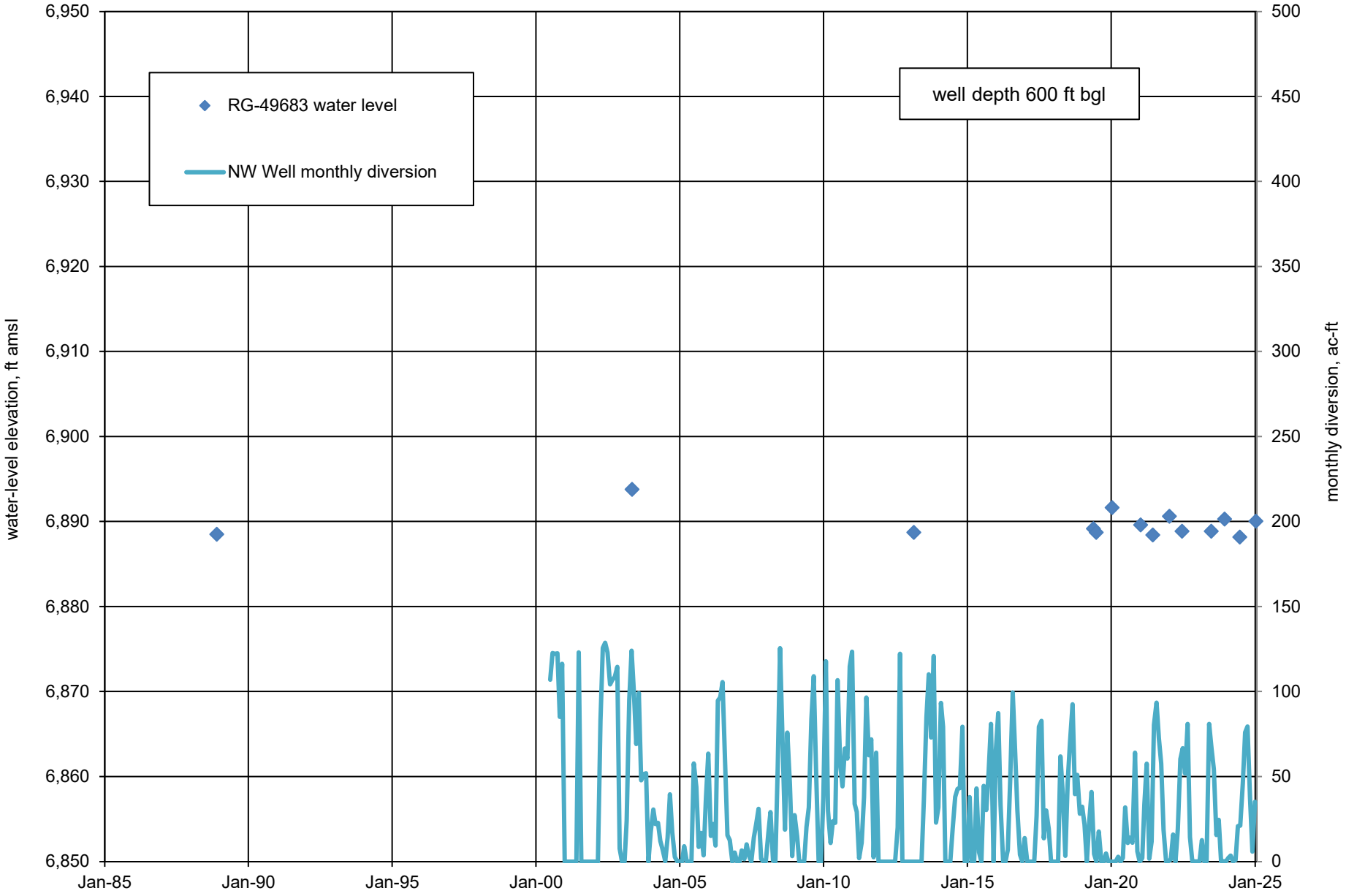

Figure A3. Water-level elevations for Group A well RG-49683, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

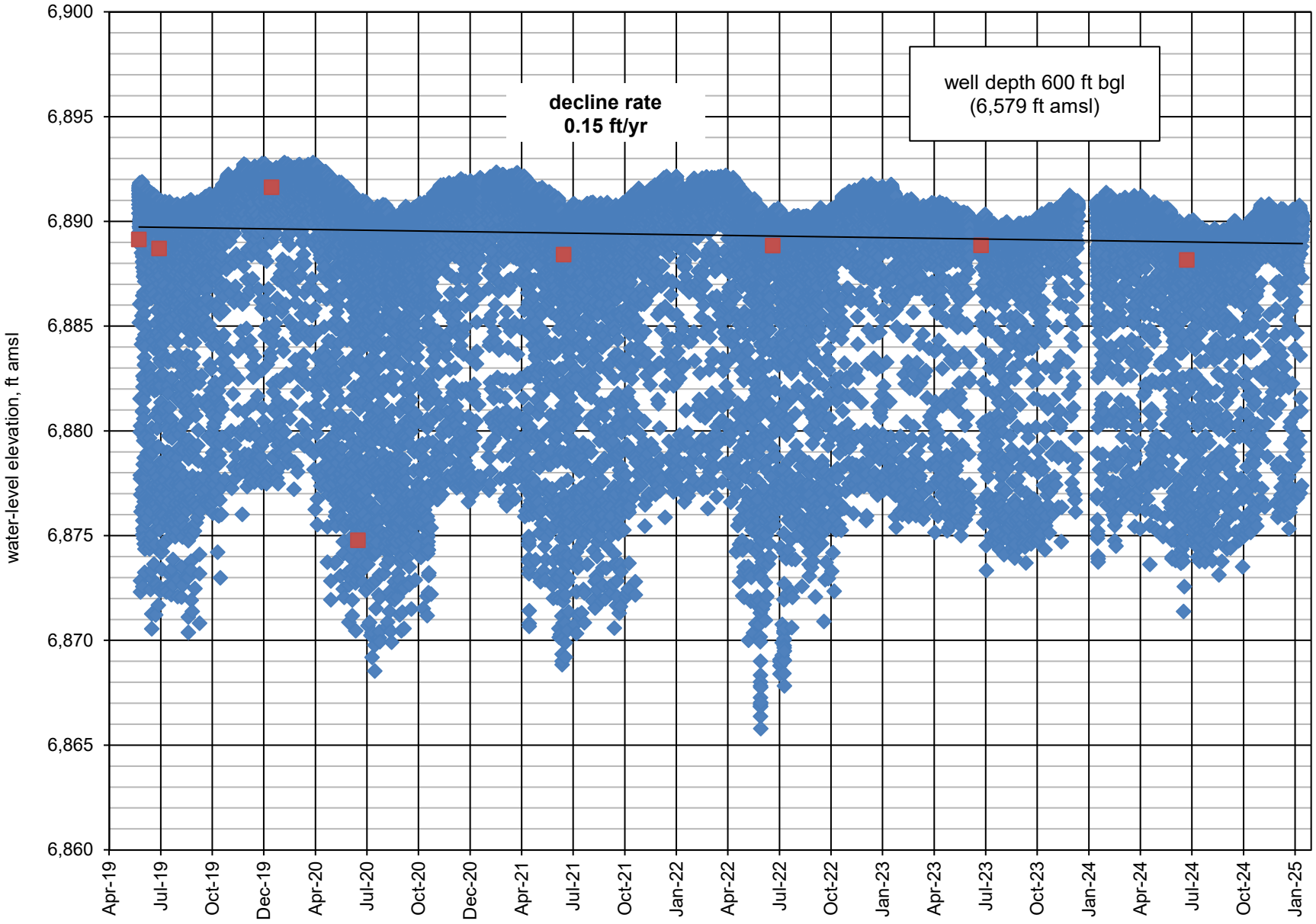

Figure A4. Transducer-measured water-level elevations for Group A well RG-49683, Northwest Well and City Well Field Monitoring Program, Santa Fe, New Mexico.

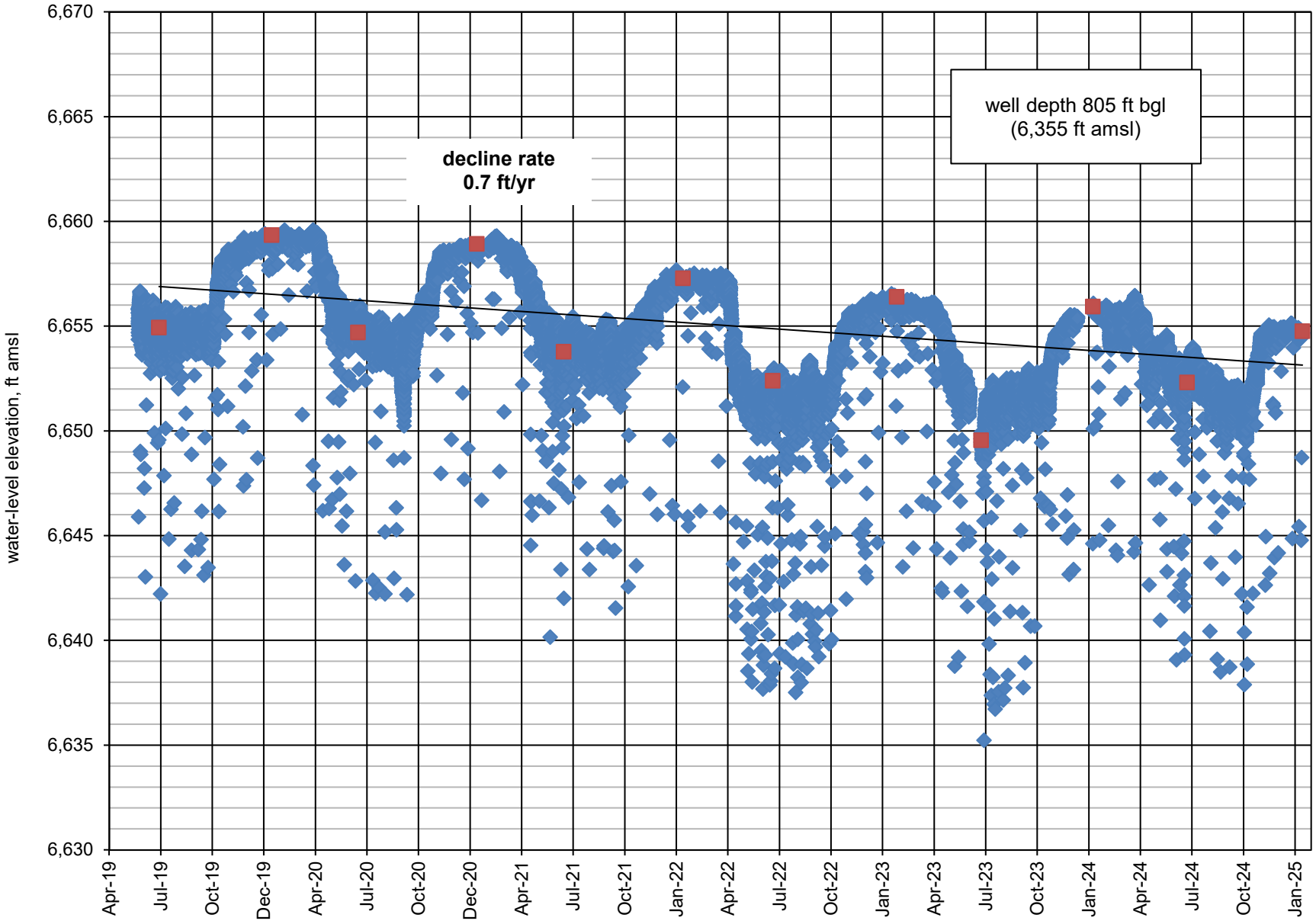

Figure A5. Transducer-measured water-level elevations for Group A well RG-73001, Northwest Well and City Well Field Monitoring Program, Santa Fe, New Mexico.

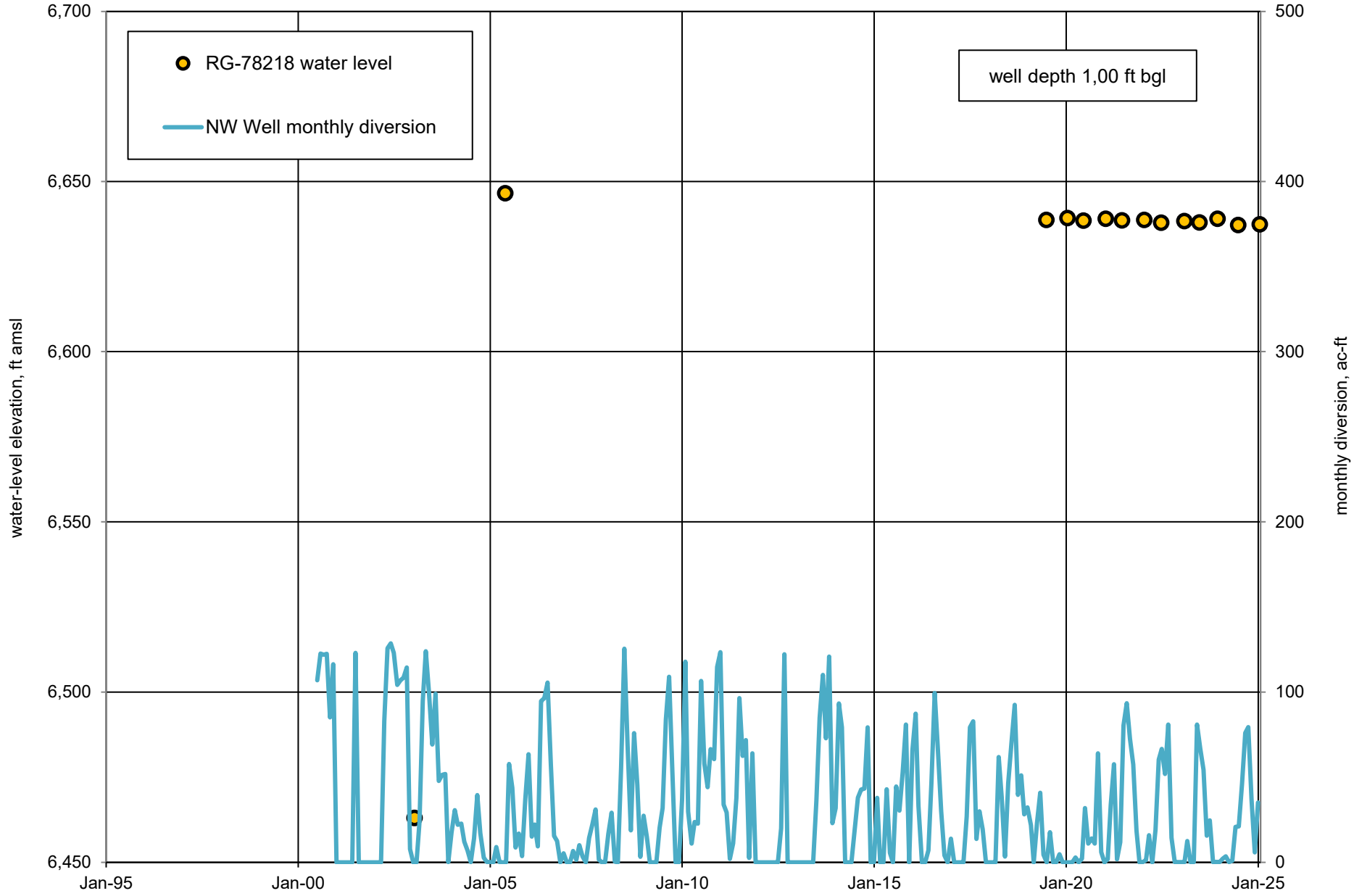

Figure A6. Water-level elevations for Group A well RG-78218, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

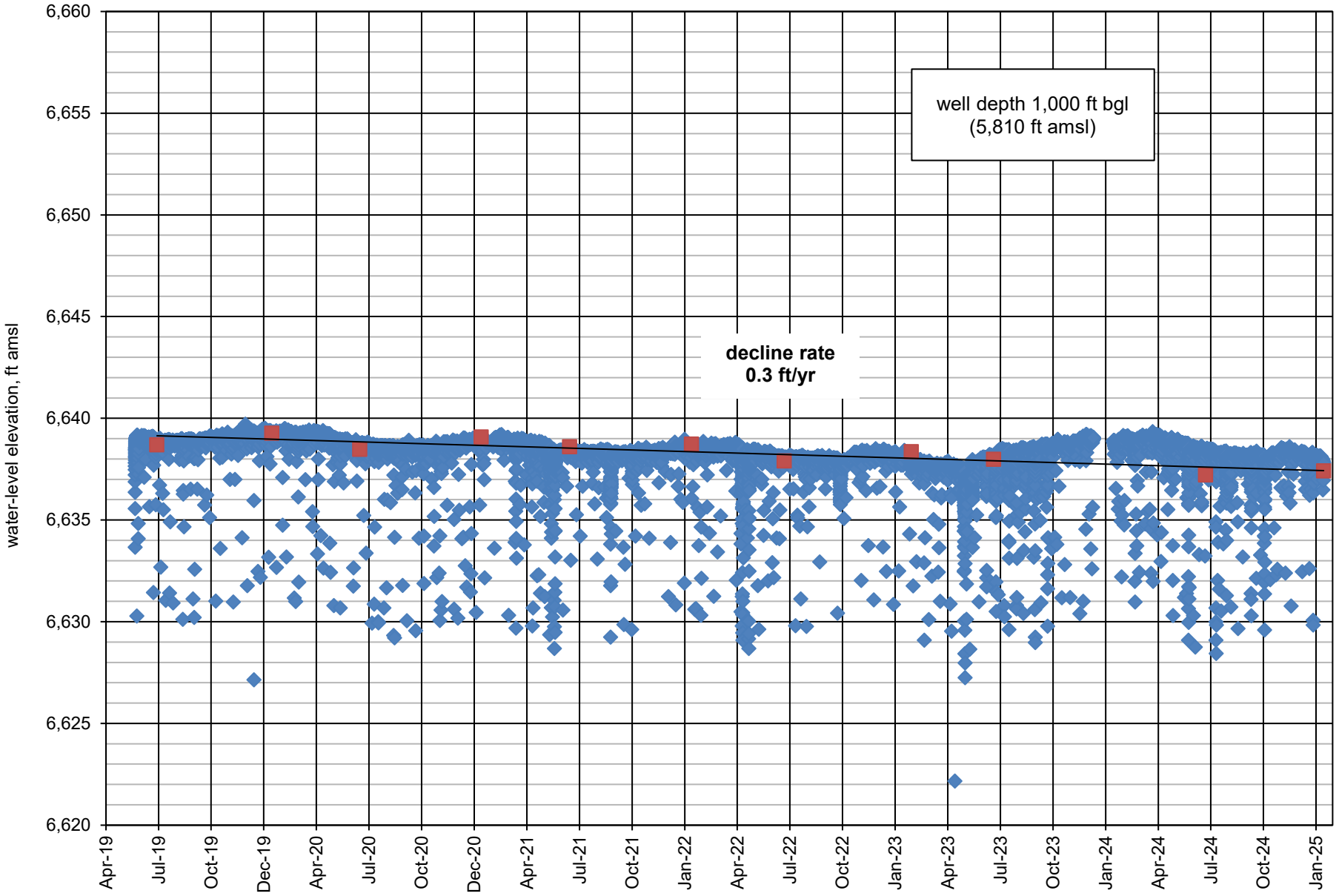

Figure A7. Transducer-measured water-level elevations for Group A well RG-78218, Northwest Well and City Well Field Monitoring Program, Santa Fe, New Mexico.

Appendix B.

Graphs showing water levels and monthly pumping for Group B wells of the Northwest Well and City Well Field Monitoring Program

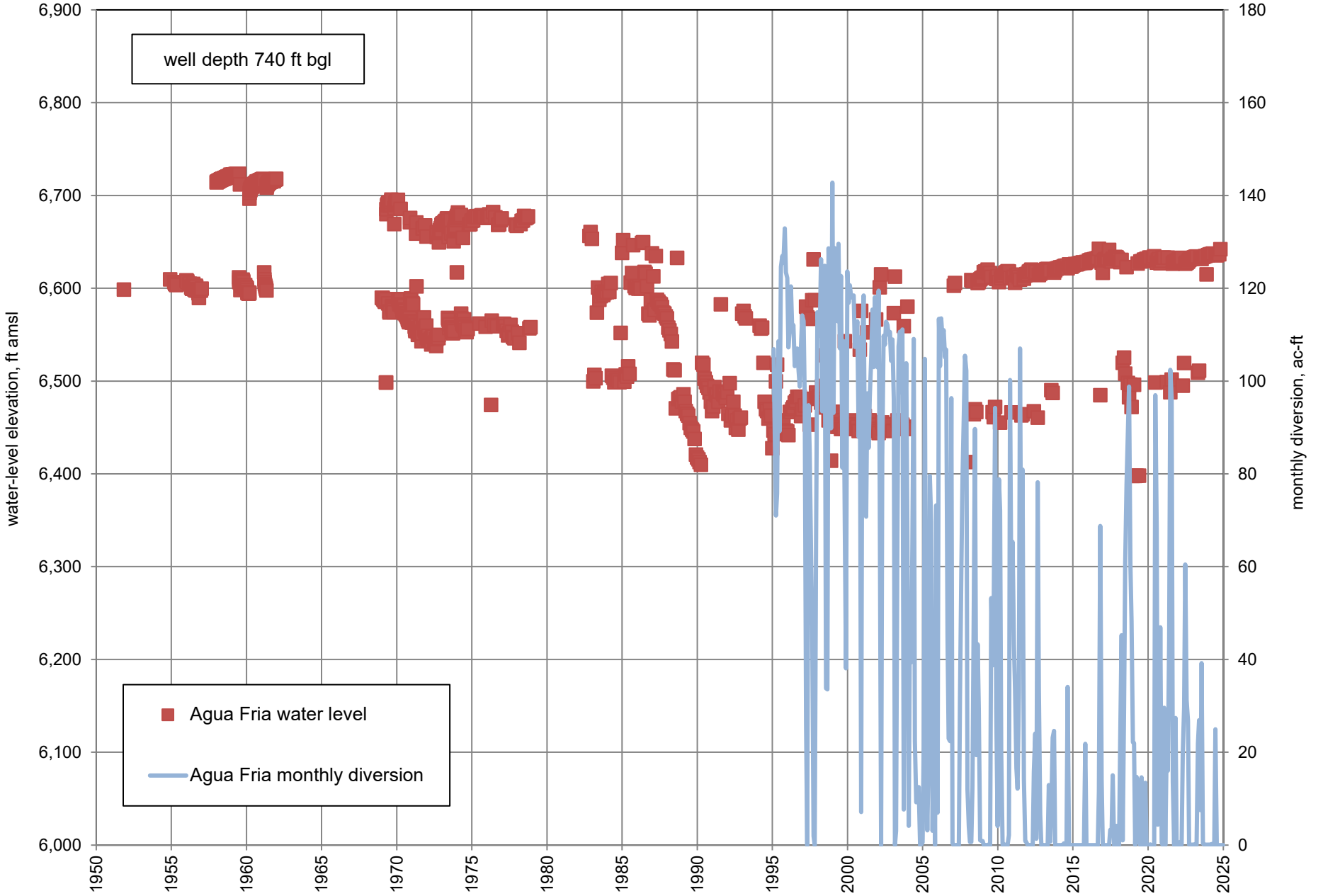

Figure B1. Water-level elevations for Group B Agua Fria Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

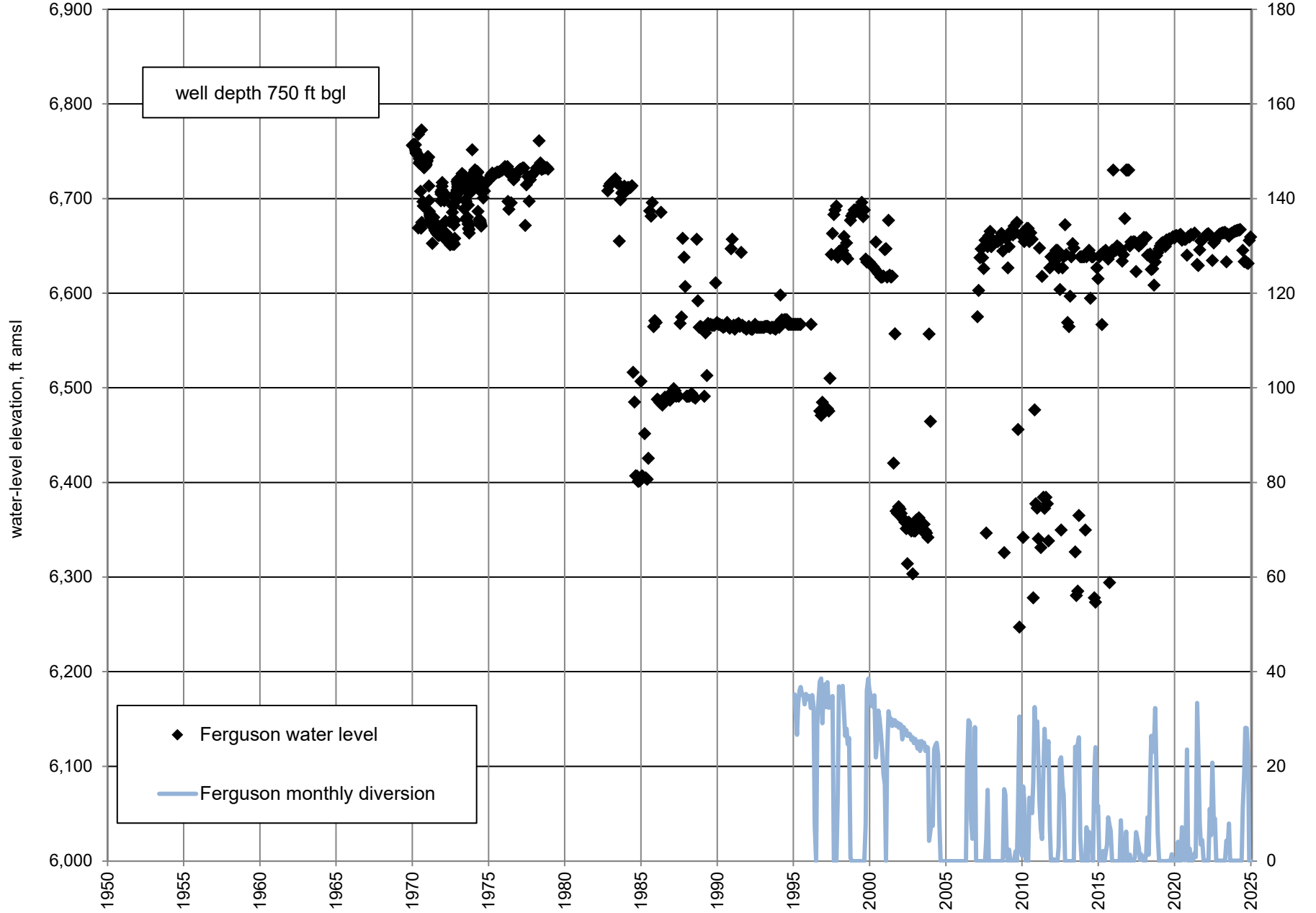

Figure B2. Water-level elevations for Group B Ferguson Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

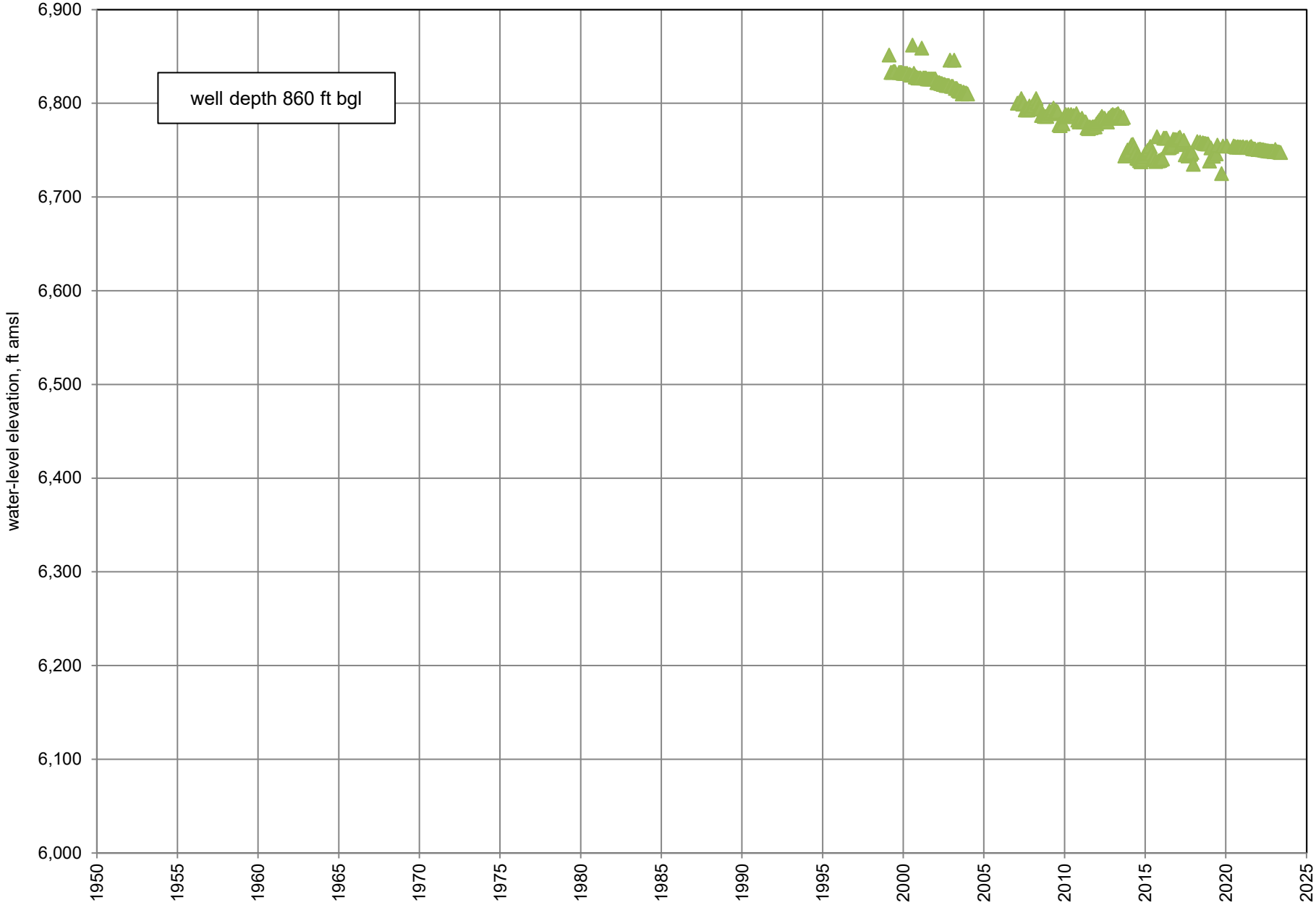

Figure B3. Water-level elevations for Group B Hickox No. 2 Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

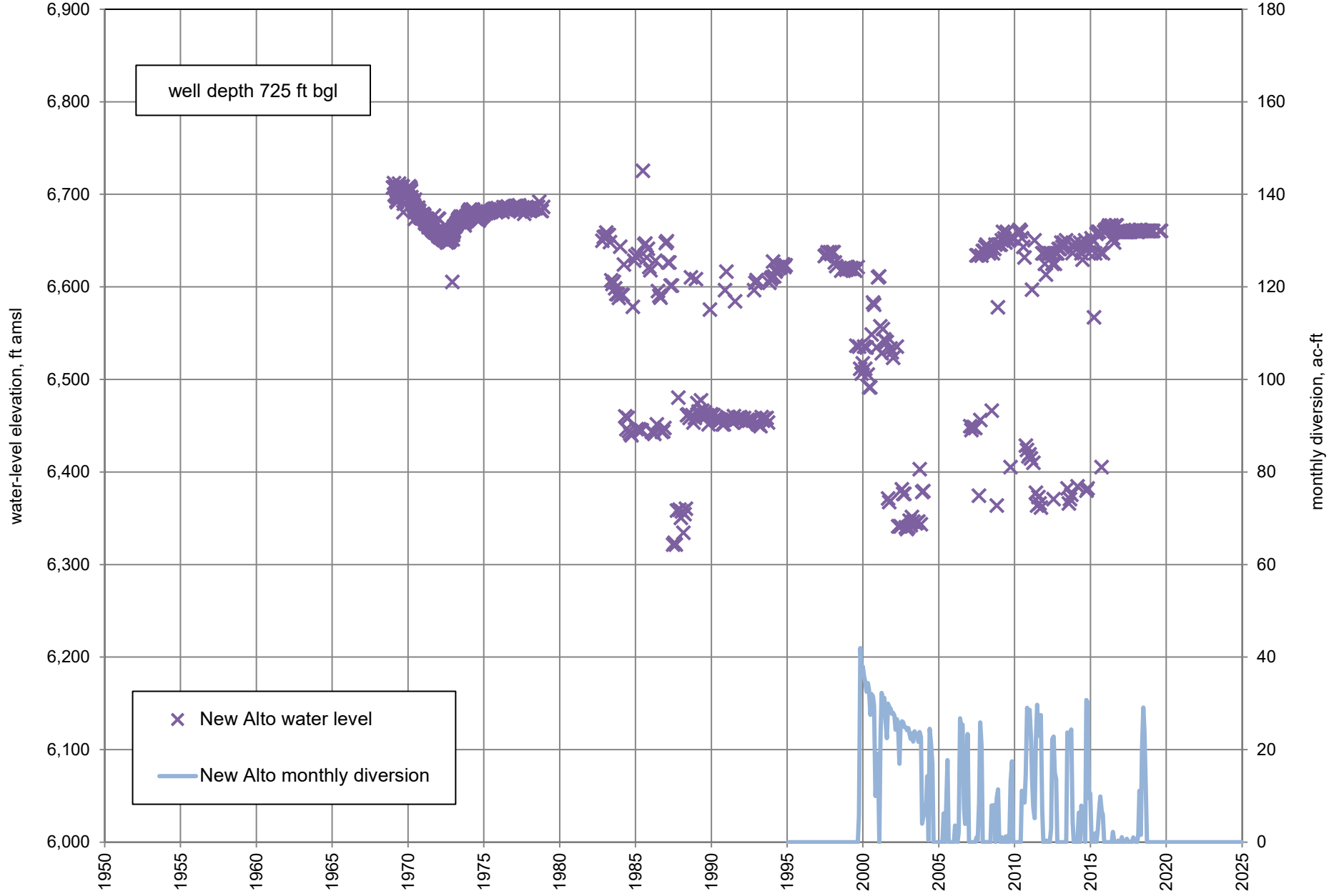

Figure B4. Water-level elevations for Group B New Alto Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

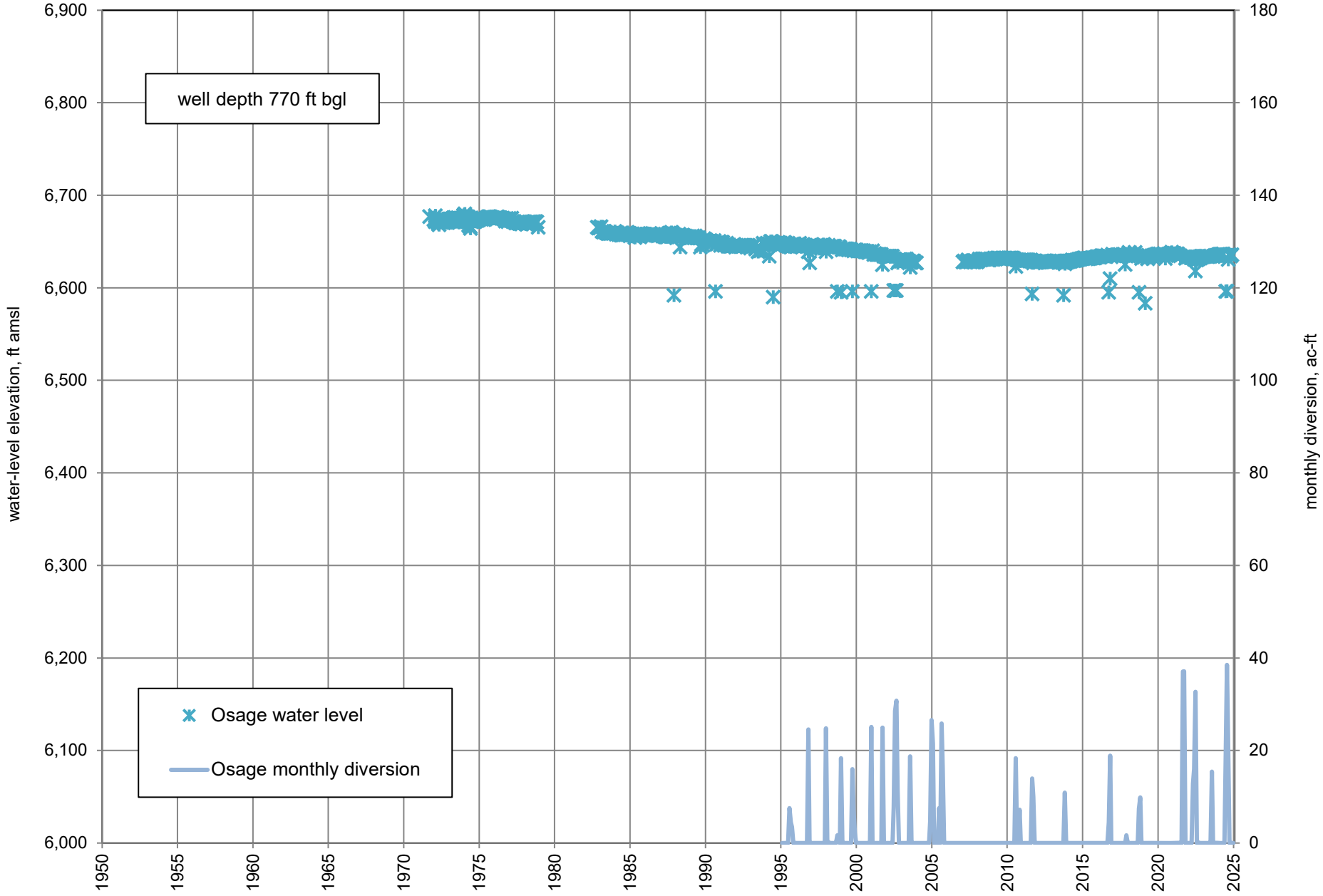

Figure B5. Water-level elevations for Group B Osage Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

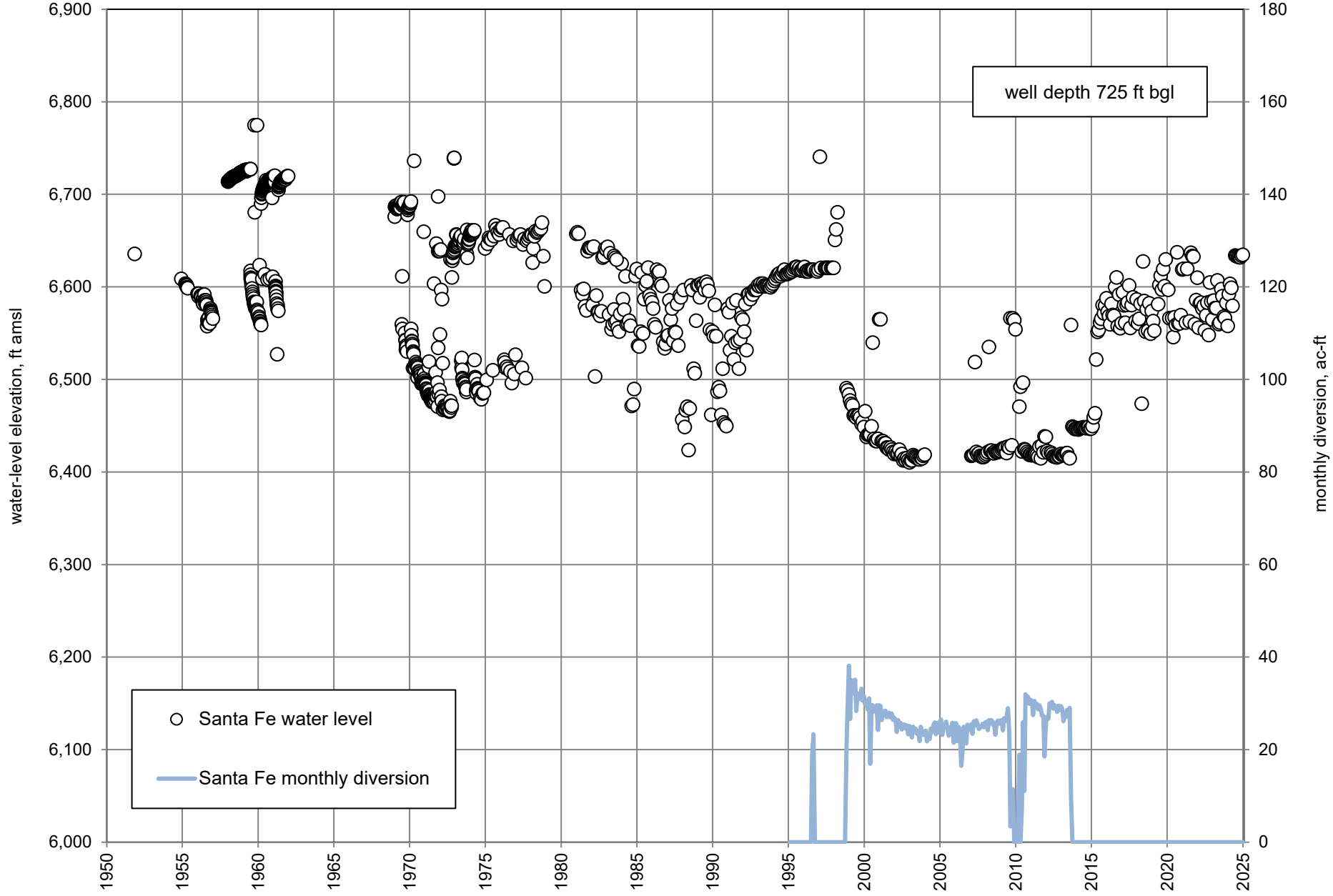

Figure B6. Water-level elevations for Group B Santa Fe Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

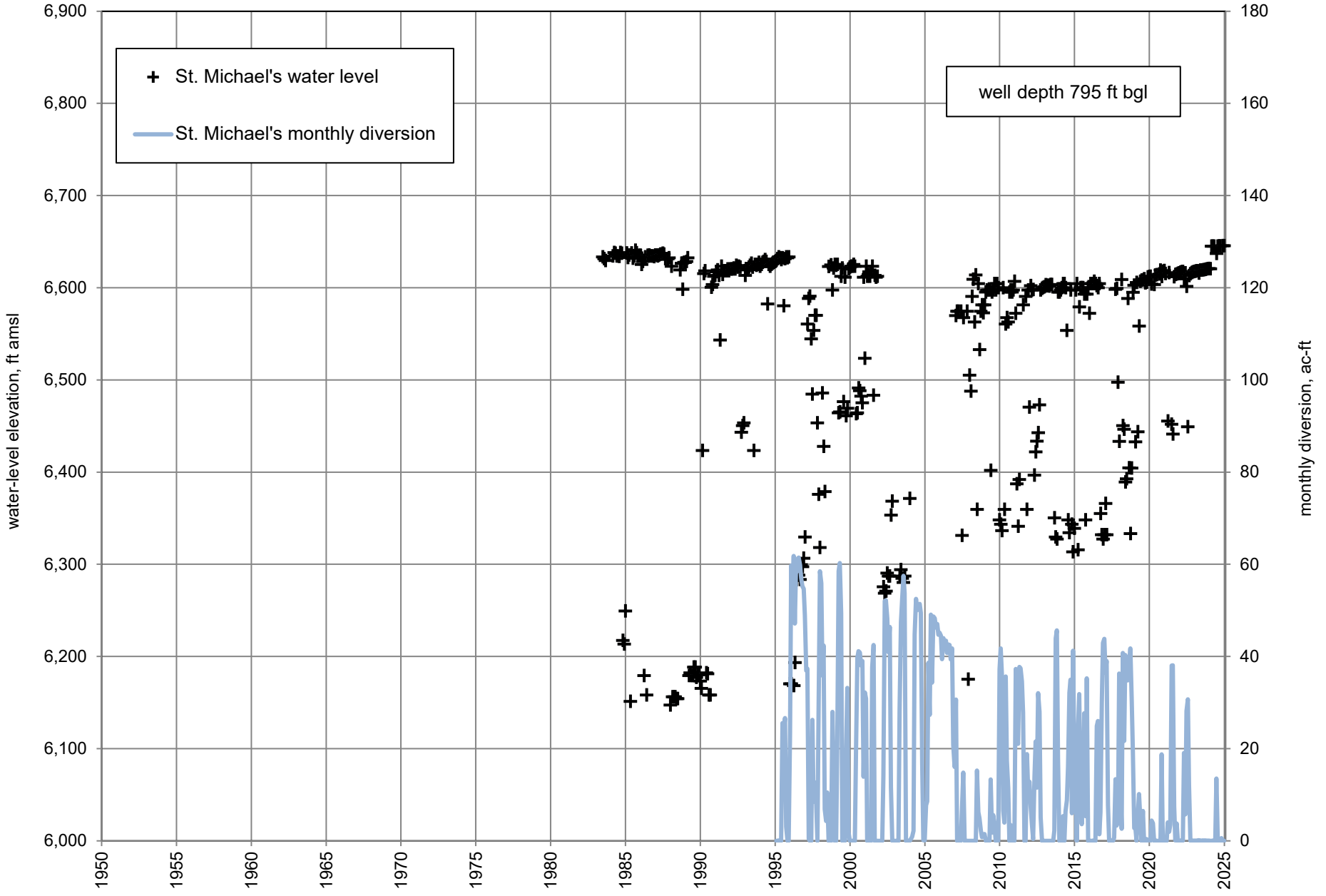

Figure B7. Water-level elevations for Group B St. Michael's Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

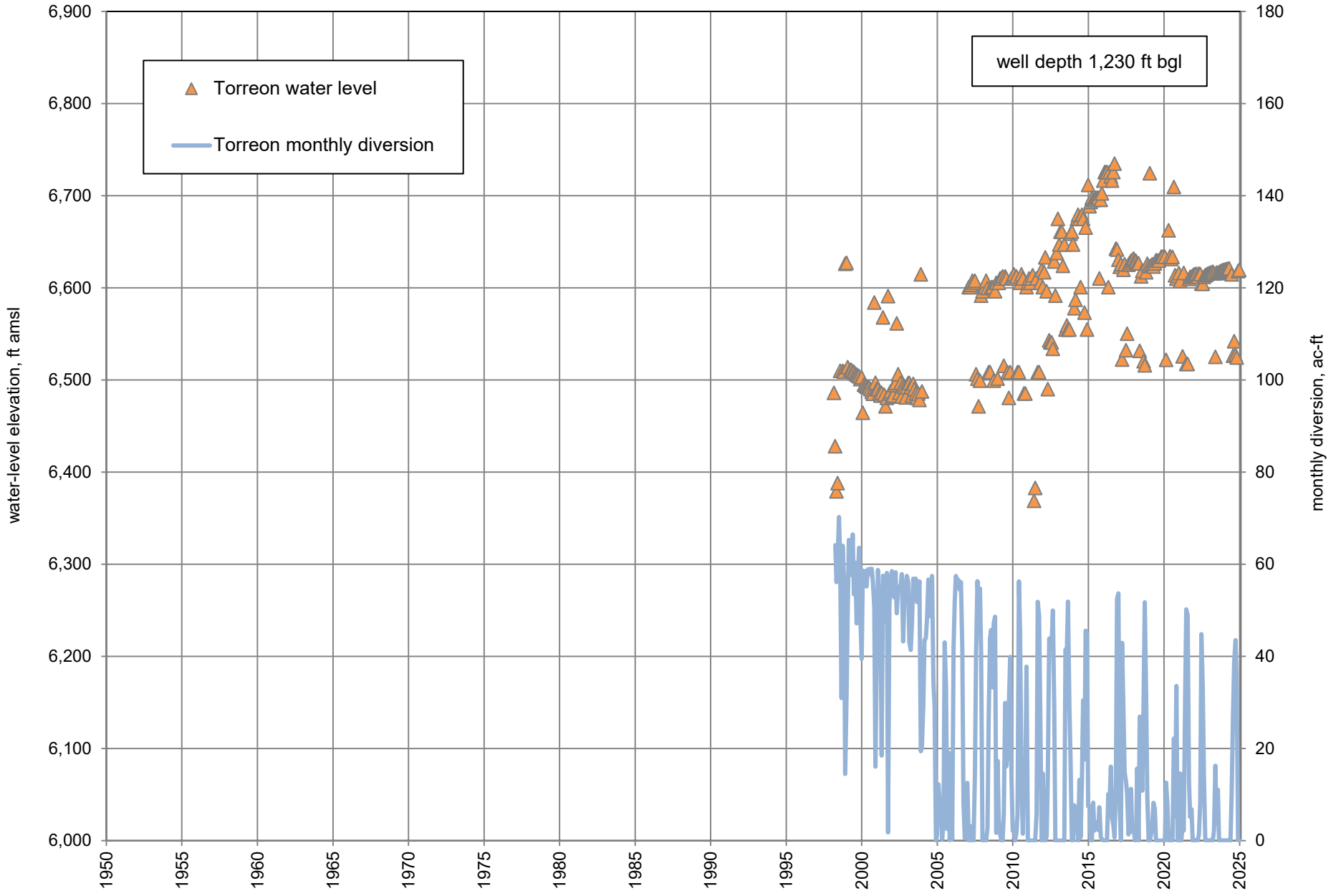

Figure B8. Water-level elevations for Group B Torreon Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

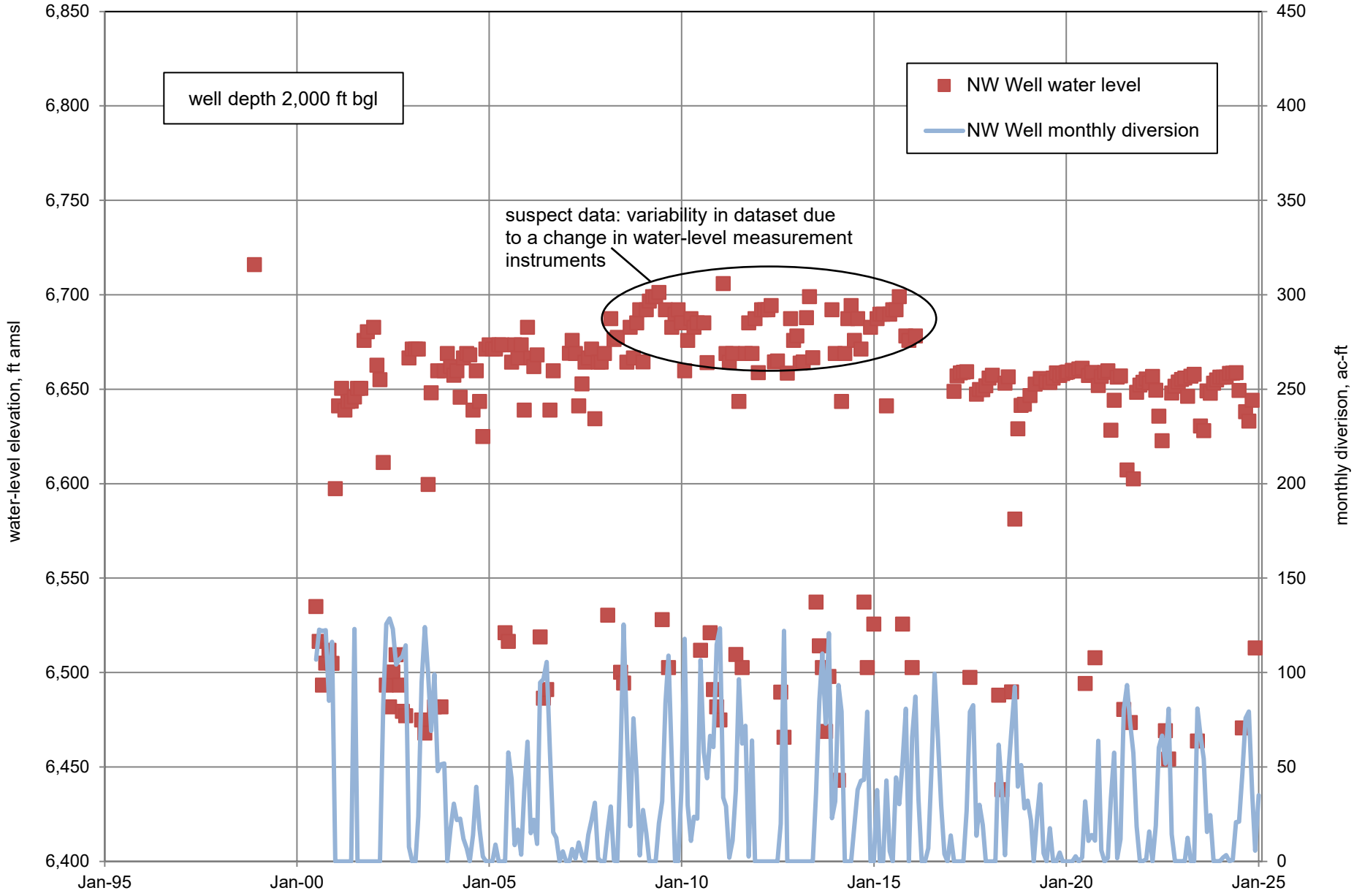

Figure B9. Water-level elevations for Northwest Well, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

Appendix C.

Graphs showing water levels in Group C wells of the Northwest Well and City Well Field Monitoring Program

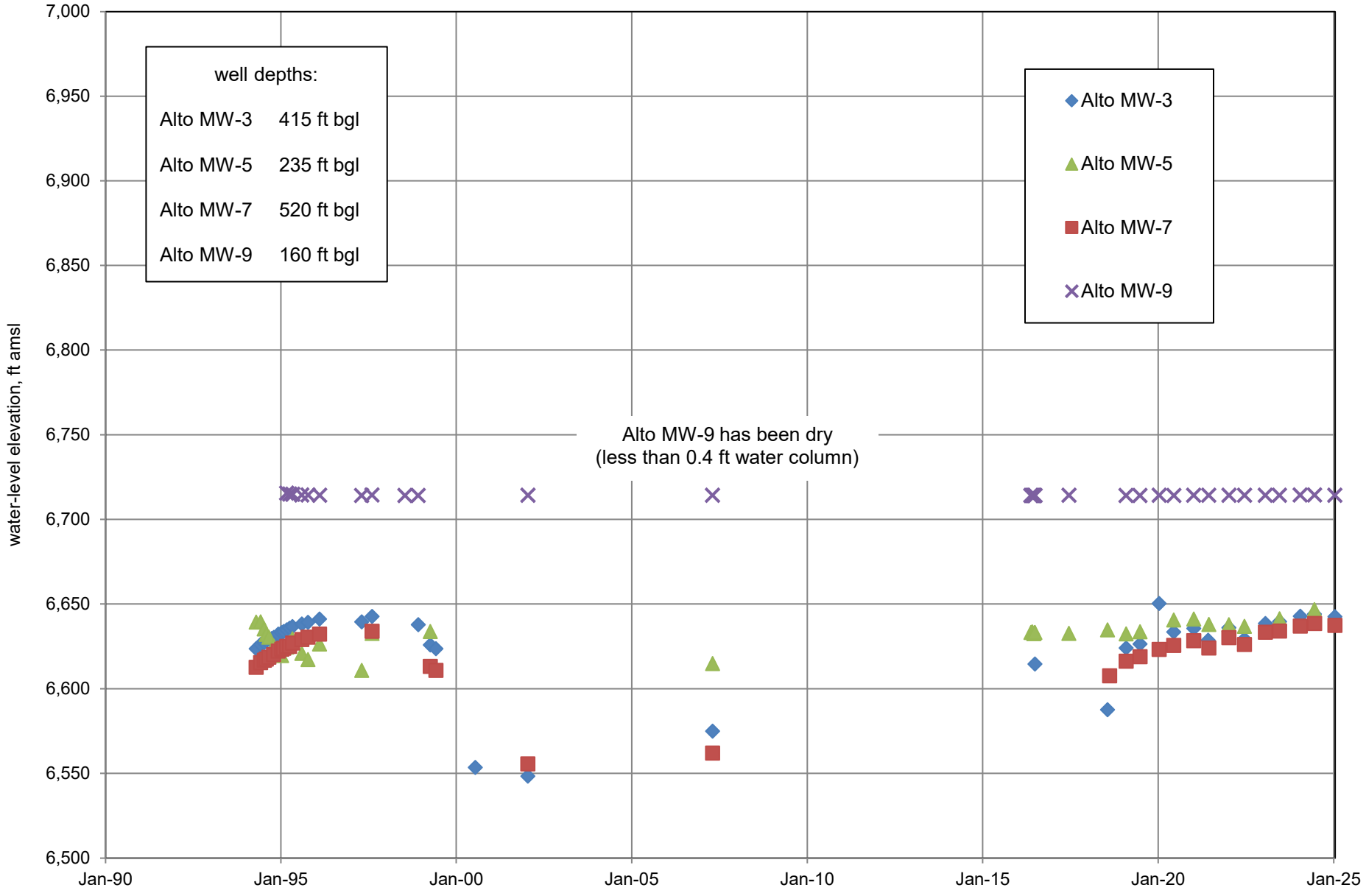

Figure C1. Water-level elevations for Group C wells Alto Street MW-3, MW-5, and MW-9, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

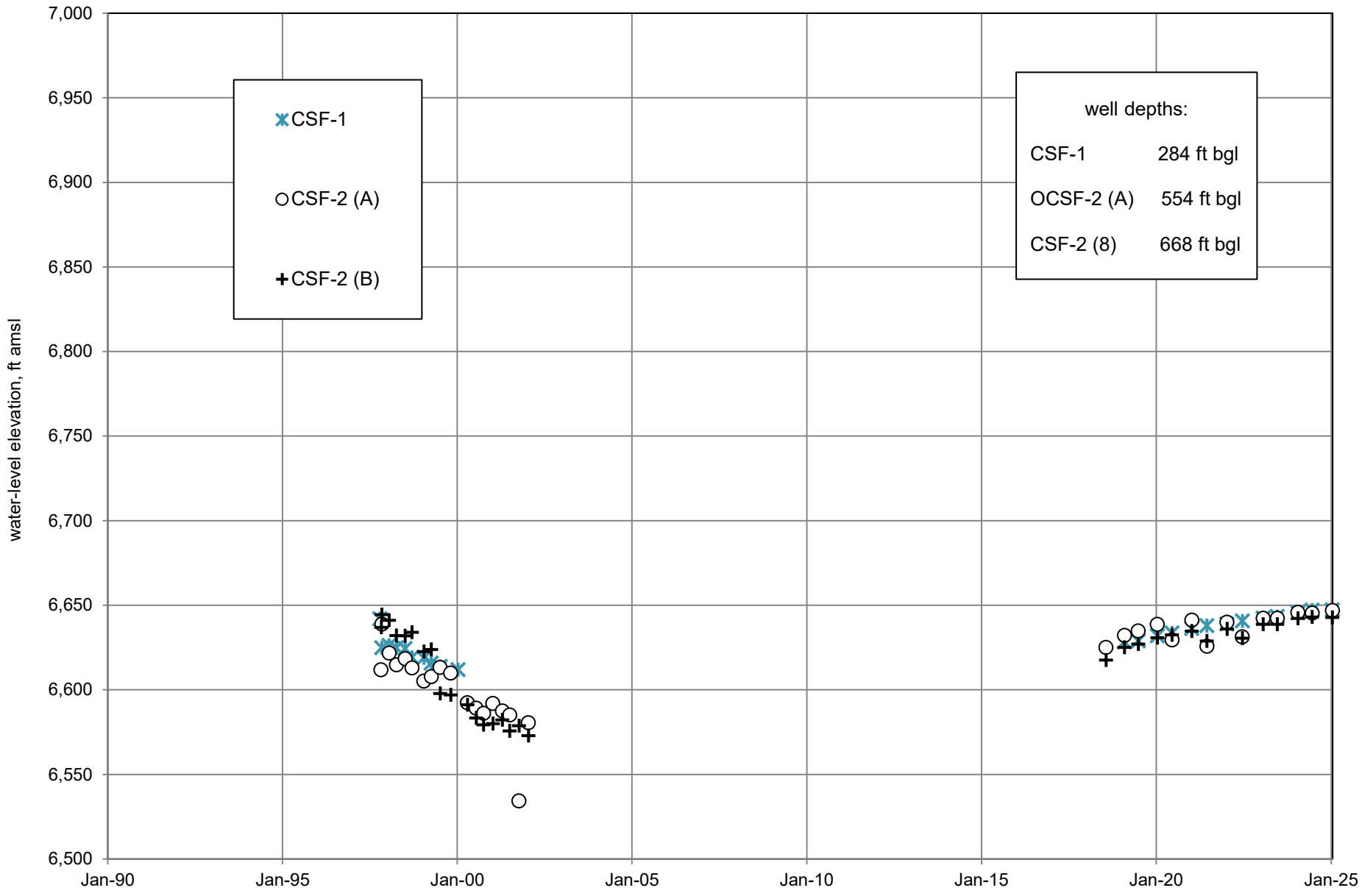

Figure C2. Water-level elevations for Group C wells CSF-1, CSF-2 (A), and CSF-2 (B), Northwest Well Monitoring Plan, Santa Fe, New Mexico.

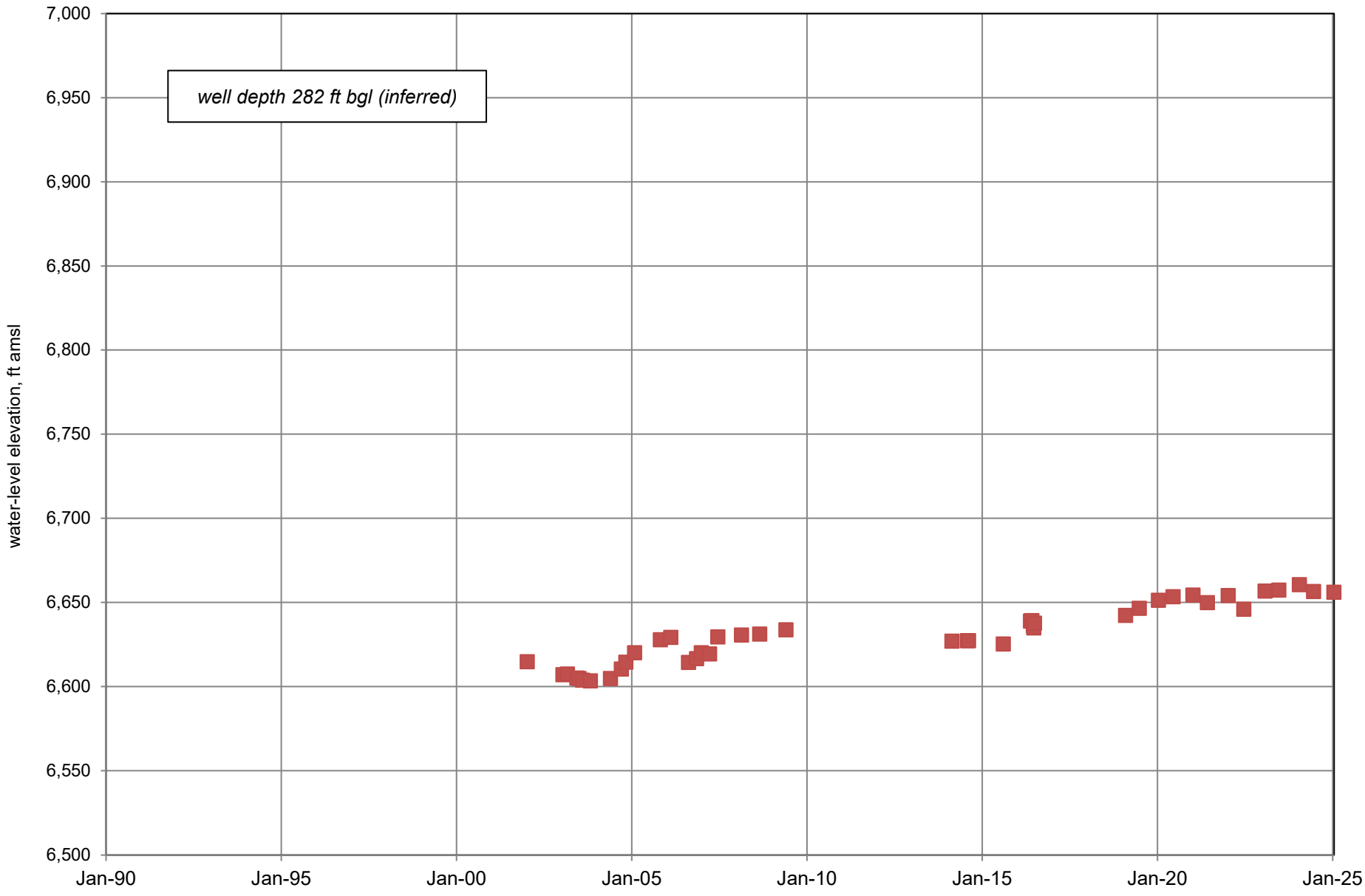

Figure C3. Water-level elevations for Group C well DBS-1D, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

Appendix D.

Graphs showing water levels in Section 6.b wells of the Northwest Well and City Well Field Monitoring Program

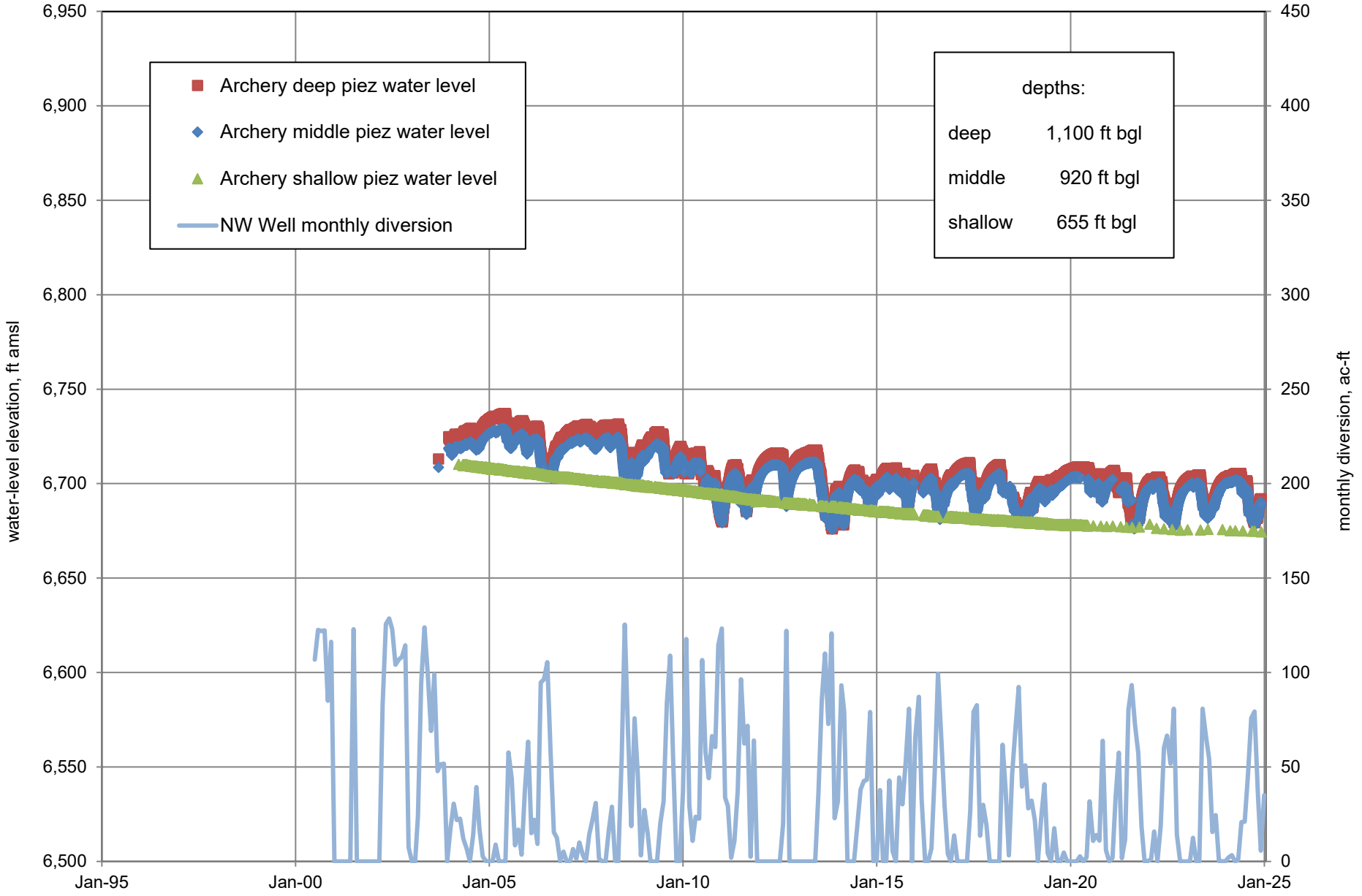

Figure D1. Water-level elevations for Section 6.b wells Archery shallow, middle, and deep piezometers, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

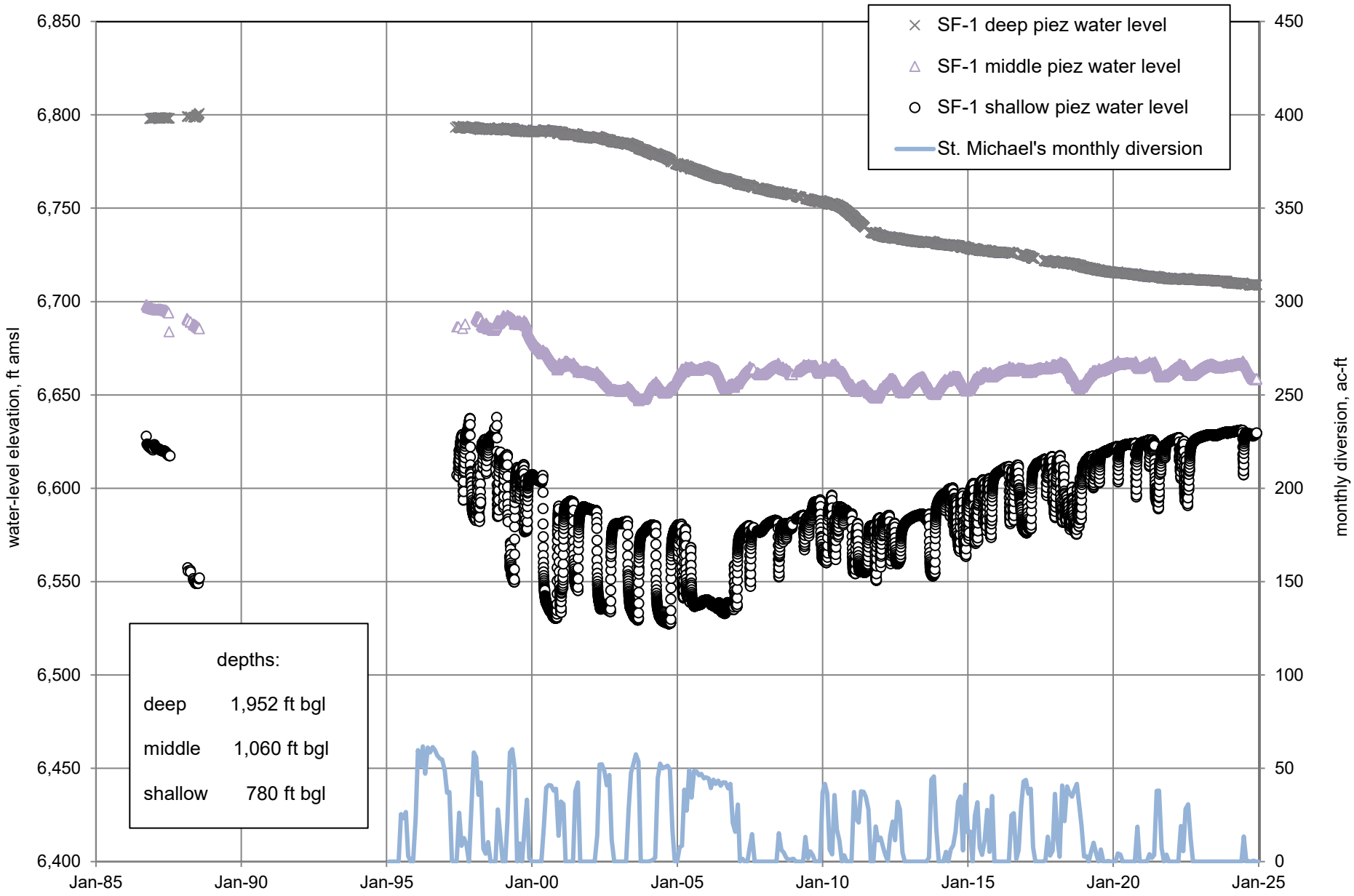

Figure D2. Water-level elevations for Section 6.b wells SF-1 shallow, middle, and deep piezometers, Northwest Well Monitoring Plan, Santa Fe, New Mexico.

Appendix E.

Water-level data used for contouring

Appendix E. Water-level data used for contouring

									Fig. 2			Fig. 3			Fig. 4		
well	ID-2	USGS ID	category	TRSq4q16q64	X_UTM83, m	Y_UTM83, m	TD, ft	elev, ft amsl	DTW, ft	WLE, ft amsl	WL date	DTW, ft	WLE, ft amsl	WL date	2014-2021 change in WL, ft	comment	NMBGMR ID
RG-25463	BMP		domestic		407017	3956720	841	6664.00	470.68	6193	1/7/2014	473.18	6191	1/9/2025	-2.5		
La Tierra Deep Monitoring Well	BMP		observation		406436	3955825	1200	6595.00	373.31	6222	1/14/2014	377.01	6218	1/9/2025	-3.7		
RG-79509	BMP		domestic		406889	3954249	800	6745.00	527.61	6217	2/7/2014	531.16	6214	1/9/2025	-3.6		
Ortiz 1	Group A		monitoring well		412514	3950334	460	6999.03	363.41	6636	10/7/2014	354.65	6644	1/16/2025	8.8	Ortiz Park Landfill MW-1	EB-475
MW-3			monitoring well		411518	3950412	351	6931.63	268.84	6663	10/7/2014	264.63	6667	5/6/2024	4.2	Paseo de Vista Landfil	
MW-7			monitoring well		412158	3950632	435	7028.67	383.65	6645	10/7/2014	381.70	6647	11/14/2024	1.9	Paseo de Vista Landfil	
MW-8			monitoring well		412475	3950976	450	7048.02	410.14	6638	10/7/2014	406.58	6641	11/14/2024	3.6	Paseo de Vista Landfil	
RG-49683	Group A		domestic	17N.09E.1.4141	415431	3954452	600	7178.50	289.78	6889	2/21/2013	288.46	6890	1/16/2025	1.3	SDC1	EB-080
RG-73001	Group A		domestic		412656	3954692	805	7160.00				505.24	6655	1/16/2025			
RG-78218	Group A		domestic		411717	3957024	1000	6810.00				172.58	6637	1/16/2025			EB-275
St. Michael's	Group B		municipal		412595	3946570	795	6853.45	255.75	6598	1/31/2014	207.80	6646	12/31/2024	48.0		
Osage	Group B		municipal		411324	3948080	770	6750.00	121.49	6629	1/31/2014	114.30	6636	11/30/2024	7.2		
Santa Fe	Group B		municipal		412858	3948427	725	6871.60	312.70	6559	8/31/2013	237.00	6635	12/31/2024	75.7	2014 WLs represented pumping WLs	
Agua Fria	Group B		municipal		412124	3948689	740	6797.65	175.80	6622	1/31/2014	155.50	6642	10/31/2024	20.3	8/2018-1/2019 DTW represent pumping WLs	
New Alto	Group B		municipal		413015	3949504	725	6861.40	213.50	6648	4/30/2014	201.00	6660	1/31/2019	12.5	Jan-2014 WL represented recovery WL	
Ferguson	Group B		municipal		413347	3949741	750	6877.00	231.62	6645	5/31/2014	217.60	6659	12/31/2024	14.0	Jan-2014 WL represented recovery WL	
Torreon	Group B		municipal		412462	3949430	1230	6828.00	227.18	6601	6/30/2014	208.70	6619	12/31/2024	18.5	Jan-2014 WL represented pumpingWL	
Hickox 2	Group B		observation		414198	3949035	860	6965.00	216.39	6749	1/31/2014	217.60	6747	12/31/2024	-1.2	WL not representative of regional flow fielc	
Alto St MW-3	Group C		monitoring well		413029	3949523	415	6873.90				231.36	6643	1/16/2025			
Alto St MW-5	Group C		monitoring well		412691	3949465	235	6842.80				196.06	6647	6/18/2024			
Alto St MW-7	Group C		monitoring well		413018	3948987	520	6892.70				255.35	6637	1/16/2025			
Alto St MW-9	Group C		monitoring well		413026	3949523	160	6873.90				159.59	6714	1/16/2025			
CSF-1	Group C		monitoring well		413187	3848709	284	6913.00				265.77	6647	1/16/2025			
CSF-2A	Group C		monitoring well		412467	3948553	554	6858.00				211.04	6647	1/16/2025			
CSF-2B	Group C		monitoring well		412467	3948553	668	6858.00				215.17	6643	1/16/2025			
DBS-1D	Group C		monitoring well		413401	3949861	282	6885.73	258.75	6627	2/22/2014	229.68	6656	1/16/2025	29.1		
RG-62069			domestic	17N.09E.4.233	410410	3954860	940	6980.00								Welsh Family Expl	EB-108
RG-61371			domestic		412320	3953853	710	7160.00									
EB-011	NMBGMR		domestic	17N.09E.23.23214	413539	3950220	260	6894.90	239.83	6655	2/21/2014					MWB Wood Well	EB-011
EB-273	NMBGMR		domestic	17N.09E.2.3231	413205	3954305	800	7214.47	573.33	6641	2/20/2014					Tano Rd - Stapleton; WL may be influenced by pumping cycles	EB-273
EB-274	NMBGMR		domestic	17N.09E.3.2411	412424	3954893	800	7101.00	443.76	6657	2/20/2014					Cowden Henry MW1	EB-274
MW-7	NMBGMR		monitoring well	17N.09E.22.221	412158	3950630	435	7028.67	381.07	6648	2/20/2014						EB-473
EB-066	NMBGMR		domestic	17N.10E.6.343	416340	3954065	725	7345.00	298.32	7047	Feb-13					Circle Drive	EB-066
EB-091	NMBGMR		domestic	18N.09E.33.324	410225	3956040	1040	6994.00	636.80	6357	Feb-13					Spiegel	EB-091
EB-093	NMBGMR		domestic	17N.09E.2.111	412794	3955412	650	7114.60	450.82	6664	Feb-13					SDC4; Sharp	EB-093
EB-098	NMBGMR		domestic	18N.09E.34.212	412169	3957033	840	6946.00	284.54	6661	Feb-13					TanoVistaGrande Expl	EB-098
EB-107	NMBGMR		domestic	17N.09E.2.31	412977	3954837	640	7155.00	488.07	6667	Feb-13					Rancho de los Cuervos	EB-107
EB-110	NMBGMR		domestic	17N.09E.18.213	407200	3952020	730	6718.00	493.28	6225	Feb-13					Brenner; Vallecitos #1	EB-110
EB-136	NMBGMR		domestic	17N.09E.3.313	411150	3954500	860	7068.20	700.20	6368	Feb-13					Heartstone Development Exp	EB-136
EB-272	NMBGMR		domestic	17N.09E.2.3244	413500	3954201	618	7255.50								Tano Rd - Dulaney	EB-272
EB-108	NMBGMR		domestic		410410	3954860	940	6978.00	625.50	6353	Feb-13						EB-108
Northwest Well	NW		municipal		412027	3952586	2000	7124.00	480.45	6644	2/28/2014	479.86	6644	10/31/2024	0.6		
Archery Shallow	Sec 6.b	354321105573703	nested peizometer	17N.09E.11.124	413149	3953989	665	7223.00	536.41	6687	5/24/2014	548.55	6674	12/5/2024	-12.1		
Archery Middle	Sec 6.b	354321105573702	nested peizometer	17N.09E.11.124	413149	3953989	920	7223.00	521.62	6701	5/23/2014	521.90	6701	5/23/2024	-0.3	Jan-2014 WL influenced by nearby pumping	
Archery Deep	Sec 6.b	354321105573701	nested peizometer	17N.09E.11.124	413149	3953989	1100	7223.00	516.93	6706	5/23/2014	517.61	6705	5/23/2024	-0.7	Jan-2014 WL influenced by nearby pumping	EB-295
17N.09E.03.2411 (aka 550)	USGS	354403105580401	USGS-monitored	17N.09E.03.2411			600	7100.00	443.76	6656	2/20/2014	455.75	6644	2/13/2024	-12.0		
17N.09E.24.343	USGS	354100105562701	USGS-monitored	17N.09E.24.343	414866	3949234	180	6990.00	57.38	6933	4/17/2014						
SF-1 Shallow	Sec 6.b	353945105574503	nested peizometer	17N.09E.35.123	412748	3946908	780	6880.00	281.88	6598	5/22/2014	250.42	6630	12/10/2024	31.5	Jan-2014 WL influenced by nearby pumping	
SF-1 Middle	Sec 6.b	353945105574502	nested peizometer	17N.09E.35.123	412748	3946908	1060	6880.00	220.88	6659	5/22/2014	221.32	6659	12/10/2024	-0.4	Jan-2014 WL influenced by nearby pumping	
SF-1 Deep	Sec 6.b	353945105574501	nested peizometer	17N.09E.35.123	412748	3946908	1952	6880.00	149.68	6730	5/22/2014	170.93	6709	12/11/2024	-21.3		
NMOSE Fairgrounds Shallow	USGS	353825105594703	nested peizometer		409790	3944508	540	6625.00	159.98	6465	1/1/2014	162.83	6462	12/5/2024	-2.9		
NMOSE Fairgrounds Middle	USGS	353825105594702	nested peizometer		409790	3944508	1380	6625.00	192.47	6433	1/10/2014	193.18	6432	12/5/2024	-0.7		
NMOSE Fairgrounds Deep	USGS	353825105594701	nested peizometer		409790	3944508	1700	6625.00	207.8	6417	1/10/2014	208.12	6417	12/5/2024	-0.3		
USGS-9 (aka 351)	USGS	354013105580601	USGS-monitored	17N.09E.27.441	412363	3947810	989	6845.00	243.3	6602	2/20/2014	212.56	6632	2/8/2024	30.7		
USGS-8	USGS	354100105562701	USGS-monitored	17N.09E.24.343	414814	3949238	180	6990.00	57.38	6933	4/17/2014						
USGS-2	USGS	353636106021001	USGS-monitored	16N.08E.13.444	406092	3941174	337	6395.00	261.98	6133	2/21/2014						
USGS 543	USGS	353906105583801	USGS-monitored	16N.09E.03.1213			130	6742.00	84.74	6310	2/21/2014	84.99	6657	2/8/2024	-0.3	may not be representative of regional aquife	
USGS 350	USGS	353943105564801	USGS-monitored	17N.09E.35.2422			-	7002.00	220.00	6175	2/21/2014	243.95	6758	2/13/2024	-24.0	total depth unknown	
USGS 352	USGS	354053105565301	USGS-monitored				-	6964.00				241.17	6723	2/8/2024		total depth unknown	

USGS - U.S. Geological Survey
NMBGMR - New Mexico Bureau of Geololgy and Mineral Resource
NMOSE - New Mexico Office of the State Enginee
BMP - Buckman Montioring Progran
DTW - depth to water
WLE - water level elevatio
TD - total depth
ft amsl - feet above mean sea leve
WL - water leve

Appendix F.

Jump drive with water-level and pumping data
(Copies of Excel Files of Appendices A through E)