



## TECHNICAL MEMORANDUM

To: Dan McGregor, Bernalillo County Hydrogeologist dmcgregor@bernco.gov  
 From: Erwin A. Melis, PhD, PG, Senior Hydrogeologist  
 Date: June 15, 2022  
 Subject: Water-level monitoring for the Estancia Basin Water Planning Committee (EBWPC)

John Shomaker & Associates, Inc. (JSAI) was contracted to perform water-level monitoring for the Estancia Basin Water Planning Committee (EBWPC) starting in the winter of 2021-2022. Thus far, two monitoring rounds have been performed, and all monitoring data have been received from the prior consultant, HydroResolutions, LLC (HydroRes). HydroRes began the water-level monitoring in the Estancia Basin in 2007. JSAI monitoring events occurred on November 16, 2021 at 12 well sites, and on March 30, 2022 at 13 well sites; a total of 14 wells are currently part of the EBWPC monitoring network (Table 1). Figure 1 shows past and present EBWPC monitored wells with the New Mexico Office of the State Engineer (NMOSE) Estancia Basin Administrative Basin boundaries in Bernalillo, Santa Fe, and Torrance Counties, New Mexico. Cross-referenced names and GPS location data are provided as Appendix A.

**Table 1. Summary of Estancia Basin Water Planning Committee (EBWPC) monitoring network in Bernalillo, Santa Fe, and Torrance Counties, New Mexico**

| monitored well name  | casing diameter, in. | casing type | stick-up, ft agl | total depth, ft bgl | screen interval, ft bgl | status       |
|----------------------|----------------------|-------------|------------------|---------------------|-------------------------|--------------|
| Anaya-1              | 5.5                  | PVC         | 2.37             | 360                 | 300-360                 | unequipped   |
| Austin-1             | 6                    | steel       | 4.95             | 117                 | 60-70; 85-95            | unequipped   |
| Bill Larson          | -3                   |             | 0.33             | 175                 | -                       | unequipped   |
| Bozlan-1             | 5.5                  | steel       | -0.75            | 143                 | -                       | unequipped   |
| Brannon OS           | 4.5                  | PVC         | 2.06             | 500                 | 460-500                 | monitoring   |
| E-0050-S10           | 15                   | steel       | 1.81             | 315                 | -                       | unequipped   |
| E-2034-S             | 16.5                 | steel       | 1.90             | 351                 | -                       | unequipped   |
| Greene-1             | 7                    | steel       | 1.37             | -                   | -                       | unequipped   |
| Magnum Steel         | 5                    | PVC         | 2.35             | -                   | -                       | domestic     |
| Romero WM            | 5                    | steel       | 1.08             | 75?                 | 35-75                   | unequipped   |
| Shaw WM              | 6                    | steel       | 0.05             | 367                 | -                       | unequipped   |
| Simmons <sup>1</sup> | 6.5                  | steel       | 1.02/2.13        | 346/800             | -                       | old/domestic |
| Smith-1              | 8.75                 | steel       | 2.20             | 249                 | -                       | unequipped   |
| Swenka Expl.         | -                    |             | 1.67             | 380                 | -                       | unequipped   |

<sup>1</sup> two wells located on-site during Nov. 16, 2021 visit: unequipped steel well/equipped PVC domestic well  
 ft agl - feet above ground level OS - Open Space  
 ft bgl - feet below ground level WM - windmill

### November 16, 2021 Site Visits

The objectives of the well site visits were to determine access, current condition of the EBWPC monitoring network, and to collect water-level data. A summary of the site visits information, including water-level data collected, is included in Appendix B. The well visits occurred on a dry, cool day.

On November 16, 2021, 13 wells were visited (Appendix B), explanation of additional detail for selected wells is as follows:

- At the Simmons property (apparent NMOSE well file number E-2298), two wells exist at the HydroRes forwarded Google Earth pin location: a steel 6.5-in. diameter well with a total tagged depth of about 346 ft bgl, and an equipped 5.5-in. diameter PVC well 10 ft to the southeast with a total estimated depth of 800 ft. HydroRes notes list a total depth of 360 ft bgl; it is not clear which well was regularly monitored by HydroRes. Both wells have depths to water that are within 1.84 ft of another, which does not account for their elevation difference, and is likely negligible.
- Well E-0050-S10 seems to only have a total depth of 73 ft, shallower than the reported depth on the NMOSE Well Record of 350 ft bgl.
- During the November 16, 2021 site visit, the Shaw WM Well lacked a well cover, as did the Bozlan-1 Well.
- During this site visit, the Swenka Expl. Well could not be accessed; as the access gate off NM-Highway 337 was locked, and the phone number listed for access was not answered.

### March 30, 2022 Site Visits

The objective of the March 30 well site visits was to collect water-level data and visit the Bill Larsen well. Summary of the site visits information, including water-level data collected, is included in Appendix B. JSAI's second round of well visits occurred on an overcast day with light precipitation in the area.

- The gate off NM-Highway 285 to the Bozlan-1 site was locked, so that well was not accessed.
- The Swenka property was accessed during this site visit with a gate code provided by Mr. Bill Larson.
- Mr. Larson also made available one of his domestic wells (Bill Larson Well), off Adams Lane between McIntosh and Moriarty. It likely has NMOSE file number E-0427-POD2 and a total depth of 175 ft bgl.
- The Romero WM Well was found dry at a depth of 72.97 ft bgl.
- During this round of monitoring, protective well cap plugs were installed in the Shaw WM Well and the Swenka Expl. Well, which will prevent entry of unwanted items into the well, securing these two wellheads.
- JSAI downloaded a transducer dataset from Well E-2034-S; computer battery issues prevented a download at Austin-1.

## Data and Property Transfer

Water-level data were transferred by HydroRes starting on February 23, 2022 and completed on March 7, 2022. The scanned field books were received via emailed on April 22, 2022. Nine locks were replaced on November 16, and March 30, 2022, and returned to HydroRes by U.S. Mail on April 22, 2022 with delivery confirmation on April 26, 2022. All the data were in separate data files for each location; a few of the files for each location were in individual data packets, yet to be combined. No hydrographs were transferred. JSAI organized all data in master tables so all hydrographs could be plotted. Hand-measured data were organized to be viewed in one worksheet ready for addition future data. Two issues with the data were noted, which are listed in Table 2, and noted below:

1. The plotted data use GPS elevations and not surveyed elevations, and thus the HydroRes data likely have errors of at least 13 vertical feet, and likely more.
2. The water-level measurements reflect their depth below the top of the casing, which does not take into account the stick-up of the casing above ground level. A measurement below ground level (bgl) gives a measurement that is more relevant, and is the method employed by the USGS (Cunningham and Schalk, 2011).

**Table 2. Summary of the data irregularities, HydroRes water-level elevation data, Estancia Basin Water Planning Committee (EBWPC), New Mexico**

| monitored well name  | period of record    | HydroRes measuring point, ft amsl | U.S. topoBuilder elevations, ft amsl <sup>1</sup> | elevation difference, ft |
|----------------------|---------------------|-----------------------------------|---|--------------------------|
| Anaya-1              | 4/2015 to 3/2022    | <b>6,598</b>                      | 6,506.52 ±5.10                                    | 91.48                    |
| Austin-1             | 1/2018 to 3/2022    | 6,260                             | 6,252.70±3.67                                     | 7.30                     |
| Bill Larson          | 3/2022 <sup>2</sup> | -                                 | 6,319.91  | -                        |
| Bozlan-1             | 8/2007 to 12/2021   | 6,744                             | 6,752.69 ±3.78                                    | 8.69                     |
| Brannon OS           | 10/2010 to 3/2022   | 7,189                             | 7,195.08±9.70                                     | 6.08                     |
| E-0050-S10           | 7/2020 to 3/2022    | 6,161                             | 6,162.82±1.25                                     | 1.82                     |
| E-2034               | 11/2008 to 3/2022   | 6,266                             | 6,268.41±5.22                                     | 2.41                     |
| Greene-1             | 10/2008 to 3/2022   | 6,480                             | 6,480.73±4.10                                     | 0.73                     |
| Magnum Steel         | 7/2009 to 3/2022    | 6,273                             | 6,270.47 ±4.04                                    | 2.53                     |
| Romero WM            | 11/2009 to 3/2022   | 6,630                             | 6,638.72±6.94                                     | 8.72                     |
| Shaw WM              | 8/2007 to 3/2022    | 6,329                             | 6,329.75±7.30                                     | 0.75                     |
| Simmons <sup>3</sup> | 7/2010 to 3/2022    | 7,042                             | 7,037.77 ±2.33                                    | 4.23                     |
| Smith-1              | 8/2009 to 3/2022    | 6,489                             | 6,490.70±5.39                                     | 1.70                     |
| Swenka Expl.         | 4/2009 to 3/2022    | <b>6,669.62</b>                   | 6,697.35±7.33                                     | 27.73                    |

<sup>1</sup> error is standard deviation of Google EARTH, U.S. topographic map, and GPS elevation (JSAI and prior data)

<sup>2</sup> possible USGS well 345540106060601

<sup>3</sup> PVC domestic well, also unequipped steel cased well on-site

**bold** indicates greater than 13-ft difference in HydroResolutions measuring point  
ft amsl - feet above mean sea level

## Transducer Drift Issue

During the transducer data review, a problem was noted with the data, when compared to hand-measured data. Drift was noted in certain reviewed transducer records that is not reproducible in the hand-measured data. Well E-2034-S transducer data from 5/8/2021 to 3/30/2022 recorded a water-level decline of 2.78 ft, whereas the hand-measurements indicated a water-level decline of 5.00 ft. This suggests that transducer reliability has deteriorated to the point that the data are unreliable, and should not be reported. Instrument drift is generally large in instruments that are past their manufacturers' warranty, or just old. Imprecise measurements were also noted in older transducer data for Well E-2034-S, where transducer data underreported water-level declines by a factor of 2 between 2008 and 2021.

Currently, only three transducers remain in EBWPC monitored wells, Austin-1, Bozlan-1, and E-2034-S. Water-level data for discontinued monitored wells indicating some transducer drift are given in Table 3.

**Table 3. Summary of the discontinued monitored well data indicating difference in water-level changes based on data gathering differences, EBWPC, New Mexico**

| monitor well name<br>(discontinued) | period<br>of record | measuring<br>point,<br>ft amsl | manual data<br>water-level changes,<br>ft/yr | transducer<br>water-level changes,<br>ft/yr |
|-------------------------------------|---------------------|--------------------------------|--|---|
| E-50-1                              | 2009 to 2014        | 6,615                          | -  | -4.46                                       |
| E-6385                              | 2/2009 to 8/2017    | 6,243                          | -2.64  | -   |
| E-9407                              | 9/2012 to 12/2014   | -                              | -0.44  | 0.95 <sup>2</sup>                           |
| Greene-4                            | 3/2009 to 9/2016    | 6,442                          | 8.50   | 2.79 <sup>1</sup>                           |
| Hagerman HQ                         | 8/2007 to 7/2018    | 6,746                          | -0.03  | -   |
| Lujan-1                             | 8/2007 to 9/2012    | -                              | -  | 0.24  |
| Ruby Shaw WM                        | 4/2011 to 5/2014    | 6,645                          | 0.23   | -   |

<sup>1</sup> partial period of record for transducer

<sup>2</sup> likely collapsed; transducer buried by mud  
ft amsl - feet above mean sea level

## Water-Levels Trends (Discontinued Wells)

Discontinued data series include all the data series where monitoring is currently not occurring, due to various issues (well collapse, ownership change, or other reasons).

Hydrographs for the archived Estancia Basin wells (seven wells) are organized in two arbitrary categories, shallow (about 40 to 200 ft bgl water depth), and deep (deeper than 200 ft bgl water depth) for data management. Archived data of wells discontinued from the EBWPC monitoring network show variable water-level trends (Table 3 and Figs. 2 and 3). Three wells (Lujan-1, E-9407, and Ruby Shaw WM) show relatively flat water-level trends with very little change (less than 2 ft over the period of record) in water levels.

Two wells (E-50-1 and E-6385) show a general water-level decline of between 24 and 26 ft between 2008 and 2014 and 2008 and 2017, respectively. These two wells also show a seasonal variation of between 8 to 26 ft, higher water levels in winter, and correspondingly lower in summer. For E-50-1, the summer water levels are stable, and define a non-declining water level of 199 ft bgl, whereas the winter water levels show a 26-ft decline over six winters (2009 to 2013-2014) to a final water level of about 193 ft bgl. For E-6385, both summer and winter water levels trend irregularly downward. Both E-50-1 and E-6385 are completed in alluvium of the Estancia Basin, very close to the geographic center of the basin; summer-winter water levels likely reflect nearby agricultural pumping during the growing season.

The final two wells (Hagerman HQ and Greene-4) show a variable water level with both increases and declines of between 5 and 15 ft on a yearly and monthly basis from 2007 to 2018 and 2008 to 2011 respectively, with both trends ending at nearly the same water level as the initial water level. For the Greene-4 Well, a final datapoint in 2016 shows a water level increase of 60 ft from 2011 water levels. Both wells with highly variable water levels (5 to 15 ft monthly variation) are completed in the Triassic and Permian-sedimentary units at the basin edges, where highly variable water levels could be associated with variable recharge and a local presence/lack of winter precipitation. USGS studies suggest that residence times for groundwater samples from the Tijeras area (measured with stable isotopes) are between 1 month to 4 months, and dependent mostly on mountain snowpack (McCoy and Blanchard, 2008). Water-level trends are summarized in Table 4.

### **Water-Level Trends**

Hydrographs for the actively monitored Estancia Basin wells show variable trends similar to those described for the wells where monitoring was discontinued (Table 4 and Figs. 4 and 5). Four wells (Austin-1, Smith-1, Shaw WM, and Greene-1, all in the southern Estancia Basin) show relatively flat trends with little change in water levels. Four wells (E-2034-S, E-0050-S10, Magnum Steel, and Anaya-1) show a decline of between 10 to 22 ft from 2008-2009 and 2015 to present, and averaging 18 ft over the period of record (and 1.95 ft/yr). All four show either a strong or weak seasonal variation; all are completed in alluvium near the basin center (McIntosh to Moriarty to Edgewood area).

Five wells (Swenka Expl., Romero WM, Bozlan-1, Simmons, and E-9673) show a variable water level with both increases and declines of between 5 and 15 ft on a monthly and yearly basis, with water levels today very similar to initial water levels at the start of the EBWPC monitoring network. All these wells are at the basin edges (see above) and the dominant aquifer for these wells is the Madera Limestone.

**Table 4. Summary of water-level trends in EBWPC monitored wells in the Estancia Basin in Bernalillo Santa Fe, and Torrance Counties, New Mexico**

| monitored well name   | period of record       | current monitoring activity | current measurement record | annual water-level decline or rise, ft/yr | likely aquifer  | general trend |
|---|------------------------|-----------------------------|----------------------------|---|-----------------|---------------|
| <b>monitored wells currently in EBWPC monitoring network</b>              |                        |                             |                            |   |                 |               |
| Anaya-1   | to present             | active                      | logs to 2020               | -2.89                                     | alluvium        | decline       |
| Austin-1  | to present             | active                      | logs                       | -0.24                                     | alluvium        | flat          |
| Bill Larson   | 2022 to present        | active                      | manual                     | -   | alluvium        | -             |
| Bozlan-1  | to present             | active                      | logs                       | -0.28                                     | Chinle Fm.      | variable      |
| Brannon OS  | to present             | active                      | logs to 2020               | 2.75                                      | Madera Fm.      | variable      |
| E-0050-S10  | to present             | active                      | logs to 2018               | -2.61                                     | alluvium        | decline       |
| E-2034-S  | to present             | active                      | logs                       | -1.50                                     | alluvium        | decline       |
| Greene-1  | to present             | active                      | logs to 2018               | -0.02                                     | San Andres Fm.  | flat          |
| Magnum Steel  | to present             | active                      | manual                     | -0.79                                     | alluvium        | decline       |
| Romero WM   | to present             | active                      | logs to 2018               | 1.23                                      | alluvium/Madera | variable      |
| Shaw WM   | to present             | active                      | manual                     | 0.02                                      | alluvium/Yeso   | flat          |
| Simmons   | to present             | active                      | logs to 2021               | 0.62                                      | alluvium/Madera | variable      |
| Smith-1   | to present             | active                      | logs to 2020               | 0.00                                      | Yeso Fm.        | flat          |
| Swenka Expl.  | to present             | active                      | logs to 2020               | 0.83                                      | Madera Fm.      | variable      |
| <b>wells discontinued (no longer in current EBWPC monitoring network)</b> |                        |                             |                            |   |                 |               |
| E-50-1  | 2009 to 2014           | none                        | logs to 2014               | -4.46                                     | alluvium        | decline       |
| E-6385  | 2009 to 2017           | none                        | manual                     | -2.64                                     | alluvium        | decline       |
| E-9407  | 2012 to 2014           | none                        | logs to 2014               | 0.95                                      | granite         | flat          |
| Greene-4  | 2008 to 2011<br>(2016) | none                        | logs to 2020               | -1.09                                     | San Andres Fm.  | variable      |
| Hagerman HQ   | 2007 to 2018           | none                        | manual                     | -0.03                                     | Chinle Fm.      | variable      |
| Lujan-1   | 2011 to 2012           | none                        | logs to 2012               | 0.23                                      | -               | flat          |
| Ruby Shaw WM  | 2011 to 2014           | none                        | manual                     | 0.23                                      | Yeso Fm.        | flat          |
|   |                        |                             |                            | <b>-0.49</b>                              |                 |               |

Fm. – Formation

logs – transducer recorder data available

## Conclusions

This Technical Memo is a preliminary reporting of time-series water-level data, and current data collected by JSAI. Some data in the tables still need to be verified, with tables improving for future EBWPC monitoring network reports. The EBWPC water-level monitoring data are a premier data set, that will serve not only the communities of the Estancia Basin, but potentially also water resources managers statewide. These data show that water levels in the alluvium and the center of the basin are declining, but at the edges of the basin water levels are either flat, or very susceptible to changes in recharge from nearby mountains, or upland areas. These data could be used to delineate recharge protection areas in those areas where recharge and water quality are exemplary. Some problems with data integration and reporting will need to be solved before these data can be shared with the public.

## Recommendations

1. Obtain location and stick-up data for the archived (discontinued) monitored wells in Table 3.
2. Measure total well depths for all monitored wells with a steel tape.
3. Obtain well records for all monitored wells (Table 1), including screened intervals if available, and determine likely formations completed in.
4. Discard the remaining transducers installed in the Bozlan-1, E-2034-S, and Austin-1 Wells.
5. Decide on long-term viable new transducers for the EBWPC monitoring network due to drift issues.
6. Identify areas of the Estancia Basin where water-level monitoring is beneficial, but data gaps exist.
7. Transfer all data to the New Mexico Bureau of Geology and Mineral Resources Healy Groundwater monitoring program for sharing after solving data integration problems and deciding on reporting guidelines (Standard Operating Procedures).

Enc: Figures 1 thru 5  
Appendices A and B

## References

- Cunningham, W.L., and Schalk, C.W., compilers, 2011, Groundwater Technical Procedures of the U.S. Geological Survey: USGS Techniques and Methods 1-A1, 151 p.
- EBWPC, 2021, Evaluation of Groundwater Level Data from Estancia Basin Monitoring Wells; consultant's report (HydroResolutions, LLC.) to the East Torrance Soil & Water Conservation District, 17 p.
- McCoy, K.J., and Blanchard, P.J., 2008, Precipitation, Ground-water Hydrology, and Recharge along the Eastern Slopes of the Sandia Mountains, Bernalillo County, New Mexico: U.S. Geological Survey Scientific Investigations Report 2008-5179, 33 p.
- [NMBGMR] New Mexico Bureau of Geology and Mineral Resources, 2022, Healy Collaborative Groundwater Monitoring Network: public groundwater level data of the Aquifer Mapping Program and water users, <https://geoinfo.nmt.edu/resources/water/cgmn/home.cfm>
- [USGS] U.S. Geological Survey, 2022, National Water Information System (NWIS) the internet interface of the USGS Water Resources Division, [water levels in wells] <https://waterdata.usgs.gov/nwis>
- [USGS] U.S. Geological Survey, 2022, The National Map (topoBuilder) the internet interface of the USGS Topographic map, [apps.nationalmap.gov/viewer](https://apps.nationalmap.gov/viewer)

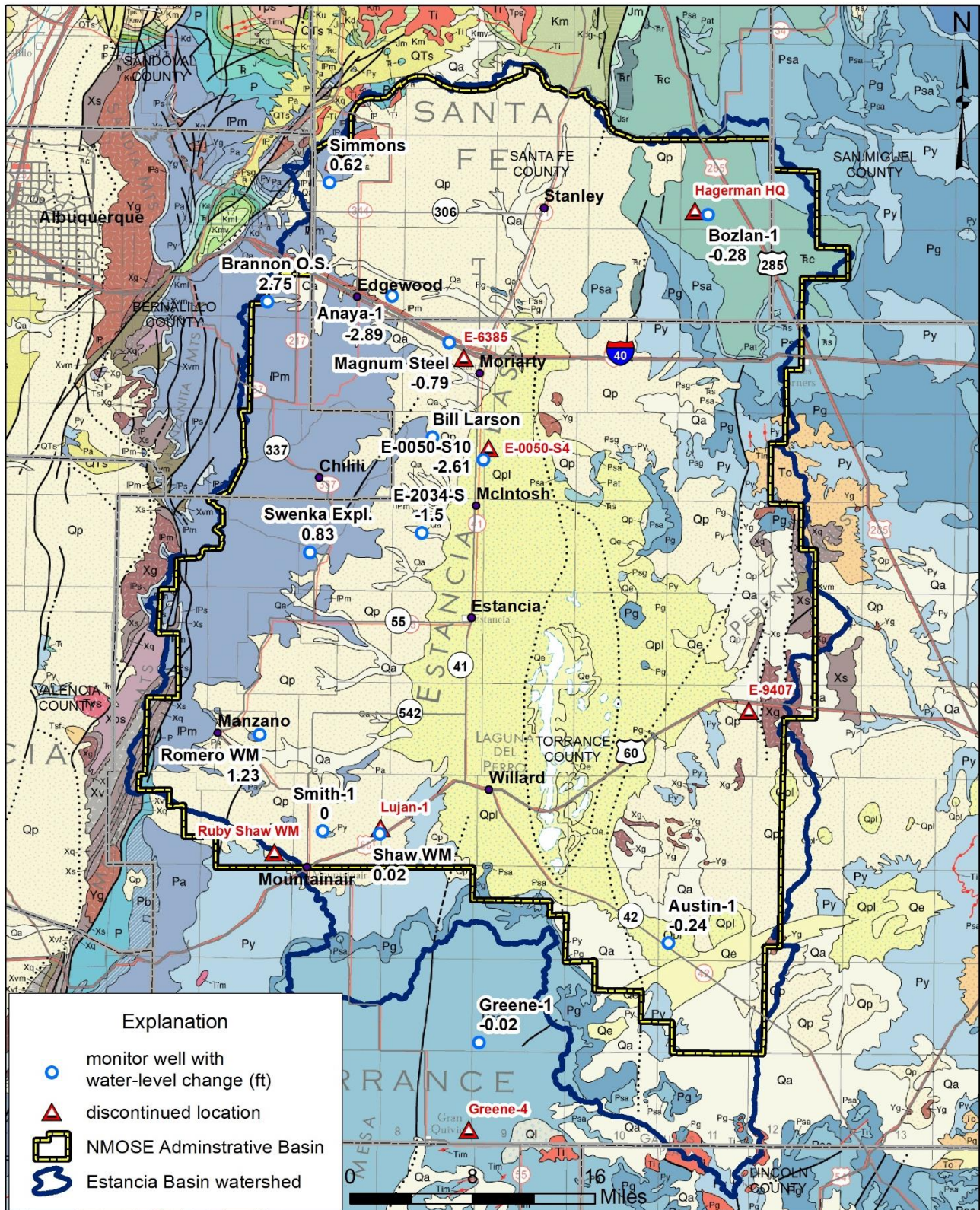


Figure 1. Estancia Basin Water Planning Committee (EBWPC) monitored wells, NMOSE Estancia Basin Administrative model boundary and watershed, Bernalillo, Santa Fe, and Torrance Counties, New Mexico.



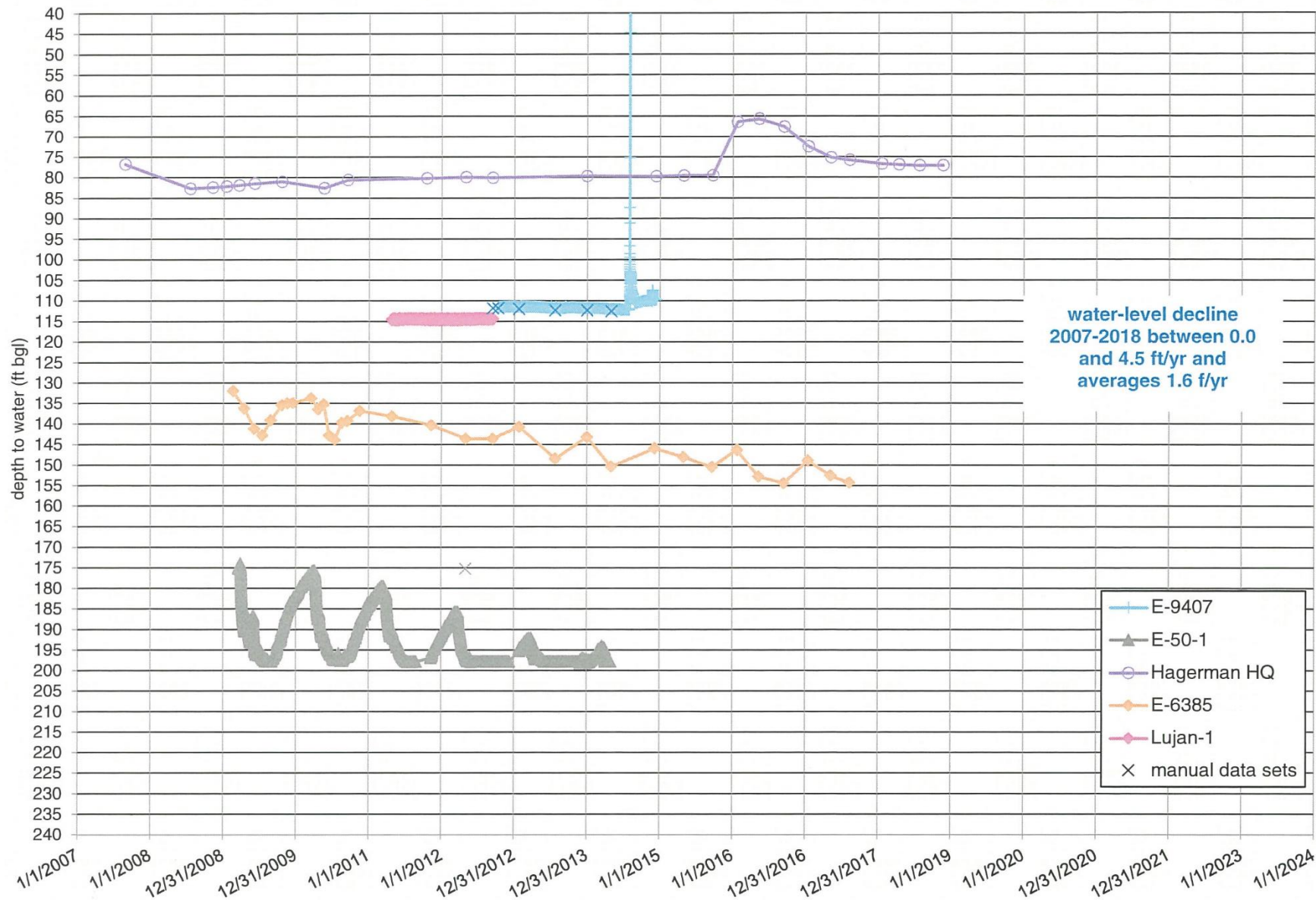


Figure 2. Hydrographs for EBWPC-monitored shallow wells since discontinued (various periods of record), New Mexico.

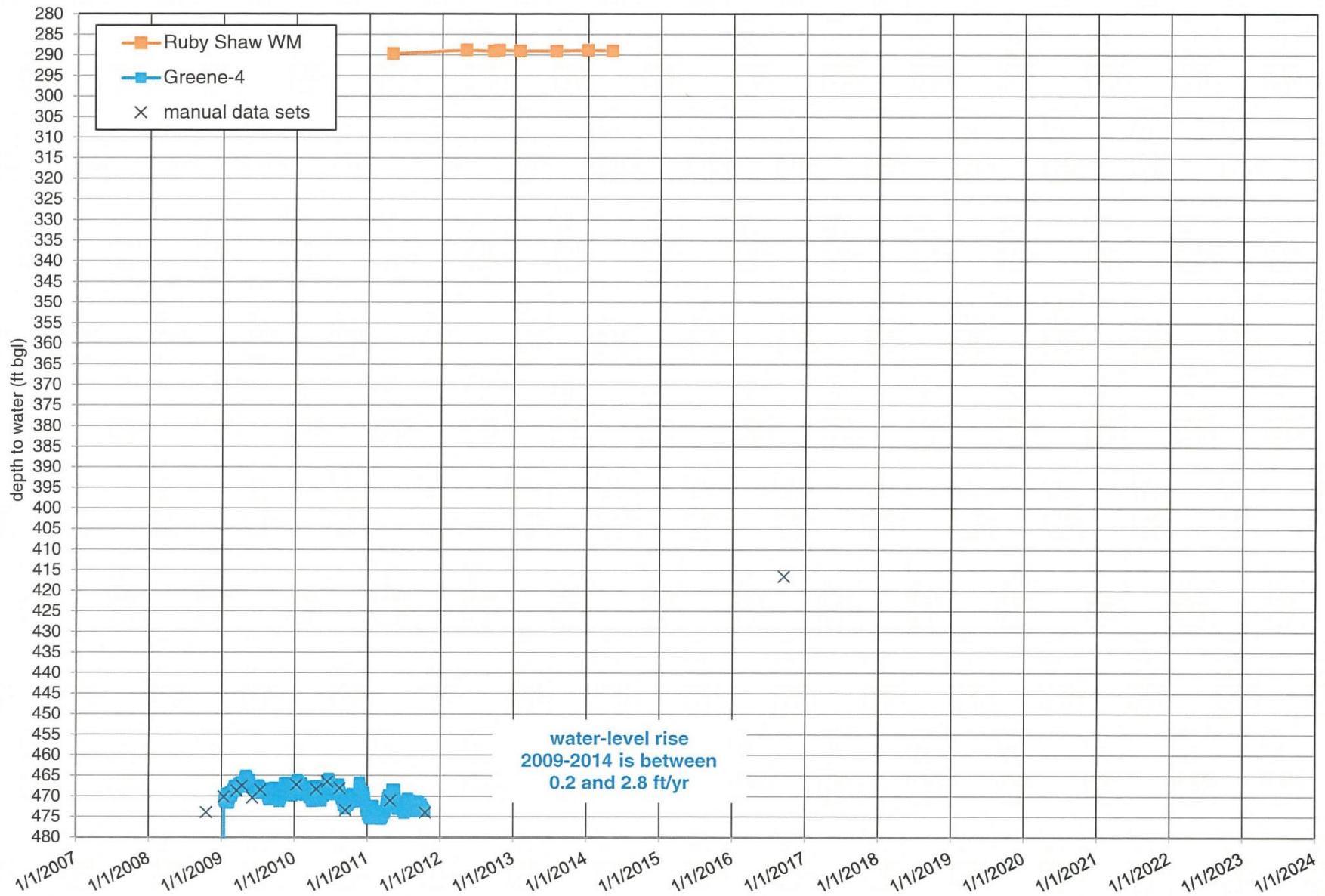


Figure 3. Hydrographs for EBWPC-monitored deep wells since discontinued (various period of record), New Mexico.

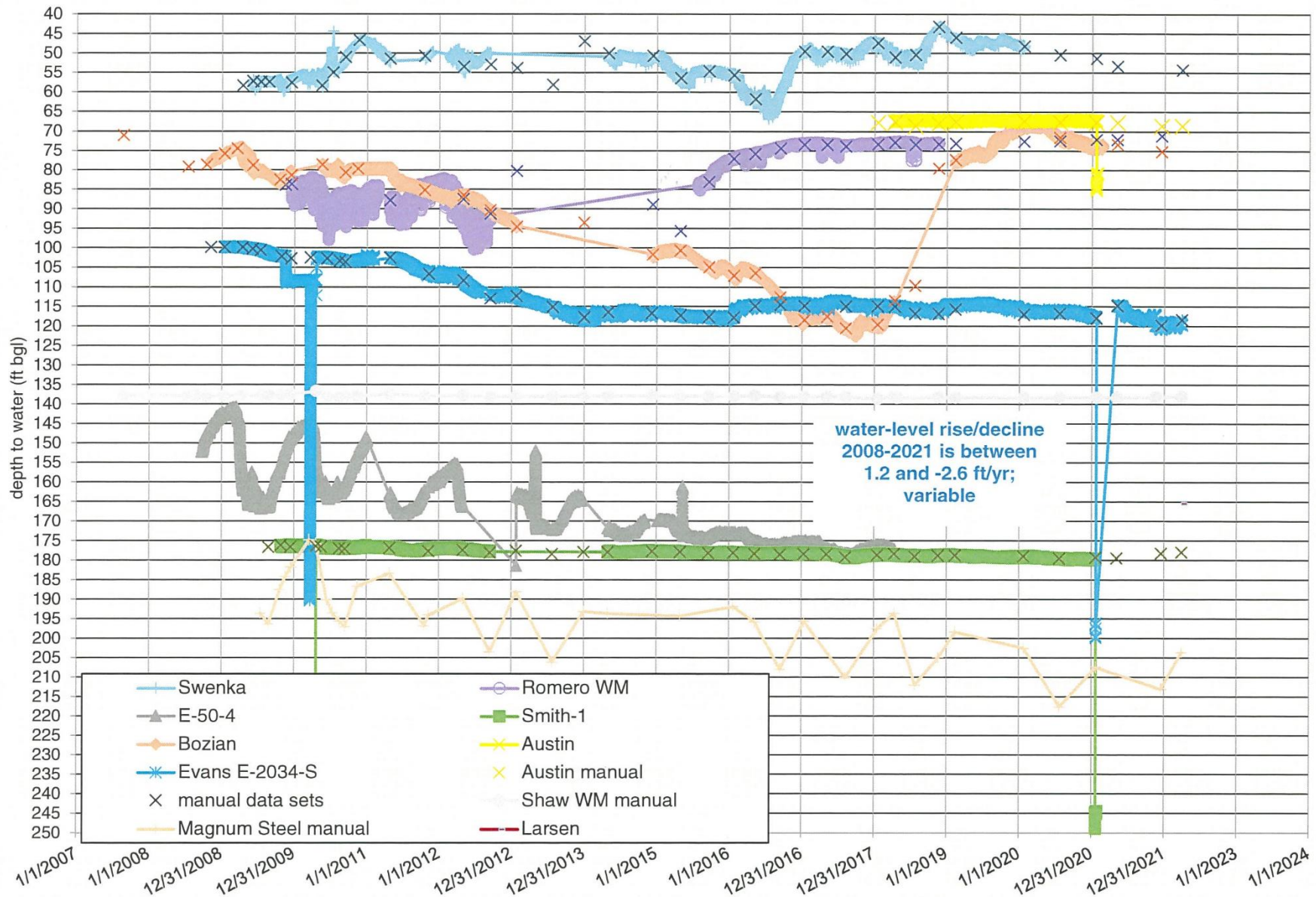


Figure 4. Hydrographs for EBWPC-currently monitored shallow wells (HydroResolutions transducer data), New Mexico.

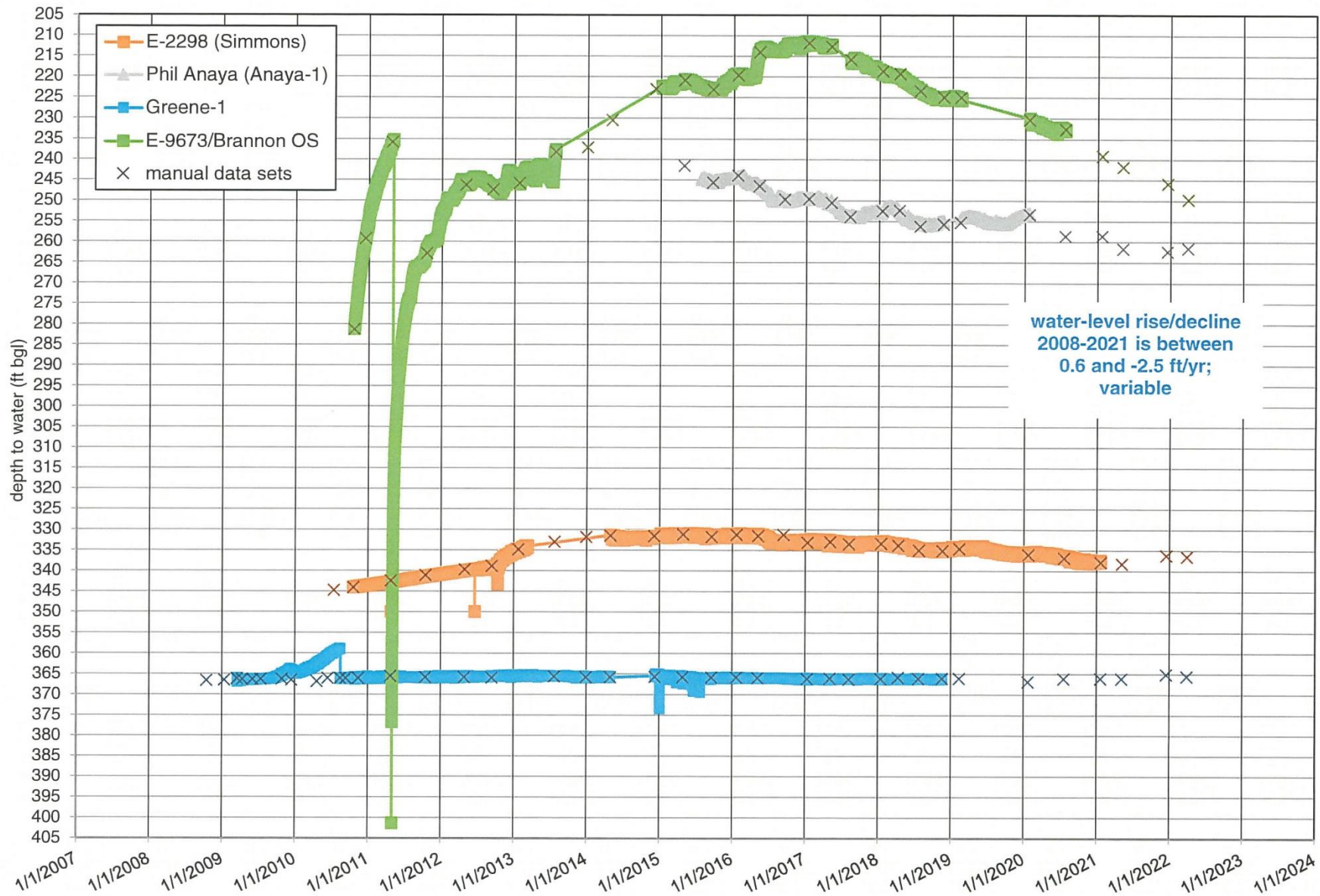


Figure 5. Hydrographs for EBWPC-currently monitored deep wells (HydroResolutions transducer data), New Mexico.

## APPENDIX A.

**Table A1. Estancia Basin Water Planning Committee (EBWPC)  
well names cross-reference, and well locations, New Mexico**

| JSAI name   | HydroRes <sup>1</sup> name     | likely NMOSE File No./ USGS Name | UTM, m E (NAD83, zone 13) <sup>1</sup> | UTM, m N (NAD83, zone 13) <sup>1</sup> |
|---|--------------------------------|----------------------------------|--|--|
| <b>wells in current EBWPC monitoring network</b>                          |                                |                                  |  |  |
| Anaya-1   | Anaya/Phil Anaya               | E-9272-POD1                      | 395,066                                | 3,880,536                              |
| Austin-1  | Austin #1                      | E-1638-POD1                      | 424,100                                | 3,812,580                              |
| Bill Larson   | -                              | E-0427-POD2/<br>3455401060606001 | 399,315                                | 3,865,705                              |
| Bozlan-1  | Bozlan-1                       | -/nl                             | 428,285                                | 3,889,072                              |
| Brannon OS  | E-9673 (Bernalillo County)     | E-9673                           | 381,975                                | 3,879,951                              |
| E-0050-S10  | E-50-4 (Schwebach 4)           | E-50-S10                         | 404,660                                | 3,863,338                              |
| E-2034-S  | E-2034-S (Evans)               | E-2034-S                         | 398,176                                | 3,855,674                              |
| Greene-1  | Greene-1                       | T-6363-POD1                      | 404,197                                | 3,802,110                              |
| Magnum Steel  | Magnum Steel (Trixiar)         | -                                | 401,055                                | 3,875,642                              |
| Romero WM   | E.B. Romero WM/Romero Windmill | E-8184-POD1                      | 381,162                                | 3,834,482                              |
| Shaw WM   | Shaw WM/Shaw Windmill          | -                                | 393,754                                | 3,824,033                              |
| Simmons   | E-2298 (Simmons)               | E-2298-S2/nl                     | 388,505                                | 3,892,477                              |
| Smith-1   | Smith-1                        | -                                | 387,742                                | 3,824,322                              |
| Swenka Expl.  | Swenka Exploratory             | E-3867-S3                        | 386,426                                | 3,853,603                              |
| <b>wells discontinued (no longer in current EBWPC monitoring network)</b> |                                |                                  |  |  |
| E-0050-S4   | E-50-1 (Schwebach 1)           |                                  |  |  |
| E-6385  | E-6385 (Carol Bowman)          |                                  |  |  |
| E-9407  | E-9407 (Wetterman)             |                                  |  |  |
| Greene-4  | Greene-4                       |                                  |  |  |
| Hagerman HQ   | Hagerman Headquarters          |                                  |  |  |
| Lujan-1   | Lujan-1/Cheri Lujan            |                                  |  |  |
| Ruby Shaw WM  | Ruby Shaw Windmill             |                                  |  |  |

<sup>1</sup> data from HydroResolutions, LLC (HydroRes); however, wells need to be surveyed  
USGS - U.S. Geological Survey  
nl - not listed

**APPENDIX B.**

**Table B1. Summary of collected water-level data, including site visits information for Estancia Basin Water Planning Committee (EBWPC) monitoring network in Bernalillo, Santa Fe, and Tarrant Counties, New Mexico**

| monitored well name   | stick-up, ft agl | date       | depth to water, ft bgl | entire record water-level change, ft/yr | comment   |
|-----------------------|------------------|------------|------------------------|---|---|
| Anaya-1               | 2.37             | 11/16/21   | 262.35                 |   | no comment  |
|                       |                  | 03/30/2022 | 261.53                 | -2.89                                   | no comment  |
| Austin-1 <sup>T</sup> | 4.95             | 11/16/21   | 68.56                  |   | no comment  |
|                       |                  | 03/30/2022 | 68.53                  | -0.21                                   | computer battery dead; transducer not read              |
| Bill Larson           | 0.33             | 11/16/21   | -                      |   | [not visited]   |
|                       |                  | 03/30/2022 | 165.31                 | -                                       | under tarp, which also covers pile of used tires        |
| Bozlan-1 <sup>T</sup> | -0.75            | 11/16/21   | 75.12                  | -0.28                                   | well in vault, no cover – rock on casing                |
|                       |                  | 03/30/2022 | -                      | -                                       | access gate on NM-285 locked                            |
| Brannon OS            | 2.06             | 11/16/21   | 245.79                 |   | locking cover not locked                                |
|                       |                  | 03/30/2022 | 249.70                 | 2.76                                    | well combo lock 1578                                    |
| E-0050-S10            | 1.81             | 11/16/21   | 67.80                  |   | northwest-most well of two; tagged at 73 ft total depth |
|                       |                  | 03/30/2022 | 68.84                  | 3.44                                    | no comment  |
| E-2034-S <sup>T</sup> | 1.90             | 11/16/21   | 119.67                 |   | casing severely dented                                  |
|                       |                  | 03/30/2022 | 118.29                 | -1.25                                   | transducer read   |
| Greene-1              | 1.37             | 11/16/21   | 364.97                 |   | sand at end of sounder; water level near total depth    |
|                       |                  | 03/30/2022 | 365.47                 | 0.08                                    | no comment  |
| Magnum Steel          | 2.35             | 11/16/21   | 212.94                 |   | equipped  |
|                       |                  | 03/30/2022 | 203.50                 | -0.79                                   | no comment  |
| Romero WM             | 1.08             | 11/16/21   | 71.09                  |   | no comment  |
|                       |                  | 03/30/2022 | dry at 72.97           | 1.56                                    | dry at a depth of 72.97 ft bgl                          |
| Shaw WM               | 0.05             | 11/16/21   | 138.17                 |   | no well cover; windmill rickety and dangerous           |
|                       |                  | 03/30/2022 | 138.02                 | -0.02                                   | added protective well-cap plug                          |
| Simmons <sup>1</sup>  | 1.02/2.13        | 11/16/21   | 338.00/336.16          |   | both wells measured                                     |
|                       |                  | 03/30/2022 | 336.39                 | 0.71                                    | PVC domestic well measured                              |
| Smith-1               | 2.20             | 11/16/21   | 178.15                 |   | no comment  |
|                       |                  | 03/30/2022 | 177.88                 | -0.10                                   | no comment  |
| Swenka Expl.          | 1.67             | 11/16/21   | -                      |   | entrance gate locked, no access and not monitored       |
|                       |                  | 03/30/2022 | 54.28                  | 0.31                                    | added protective well-cap plug                          |

<sup>1</sup> two wells were located on-site during Nov. 16, 2021 visit: PVC domestic well is equipped; steel well is 346 ft in total depth and unequipped

<sup>T</sup> transducer in monitored well  
 ft amsl - feet above mean sea level  
 ft agl - feet above ground level  
 ft bgl - feet below ground level