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La Cienega Groundwater Level Monitoring, Santa Fe County, New Mexico: 2017 Summary of Findings

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AQUIFER MAPPING PROGRAM

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Project Funding

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I. INTRODUCTION

As a follow up to hydrogeologic research performed by the New Mexico Bureau of Geology and Mineral Resources in recent years (summarized in Johnson, et al., 2016), a groundwater monitoring network was implemented around La Cienega, Santa Fe County, New Mexico. The primary aquifer in La Cienega is within the Ancha Formation, overlying the Tesuque Formation. The Ancha Formation aquifer exists as buried valleys of coarse sediments that are highly transmissive (Figure 1). Figure 2 shows the locations of the wells in the monitoring network and the formation in which the wells are completed.

Previous hydrogeologic research by Johnson, et al. (2016) indicates that the groundwater in this region is highly susceptible to regional influences such as pumping, drought, and land use changes. The groundwater levels in many wells in the primary aquifer around La Cienega have steadily dropped since the 1970s (Figure 3). Smaller oscillations of higher winter groundwater levels and lower summer groundwater levels are superimposed on the overall downward trend.

Groundwater level monitoring provides an essential tool in groundwater management. The data are used in development of more accurate groundwater models, and can help with protection of groundwater resources. Measurements of changing groundwater levels also directly reflect changes in groundwater storage.

This report is a brief summary of 2017 groundwater level monitoring activities in La Cienega. The twice annual set of measurements was also incorporated into broader long-term monitoring that began in 2015 as an effort to monitor the potential changes and impacts to this region.

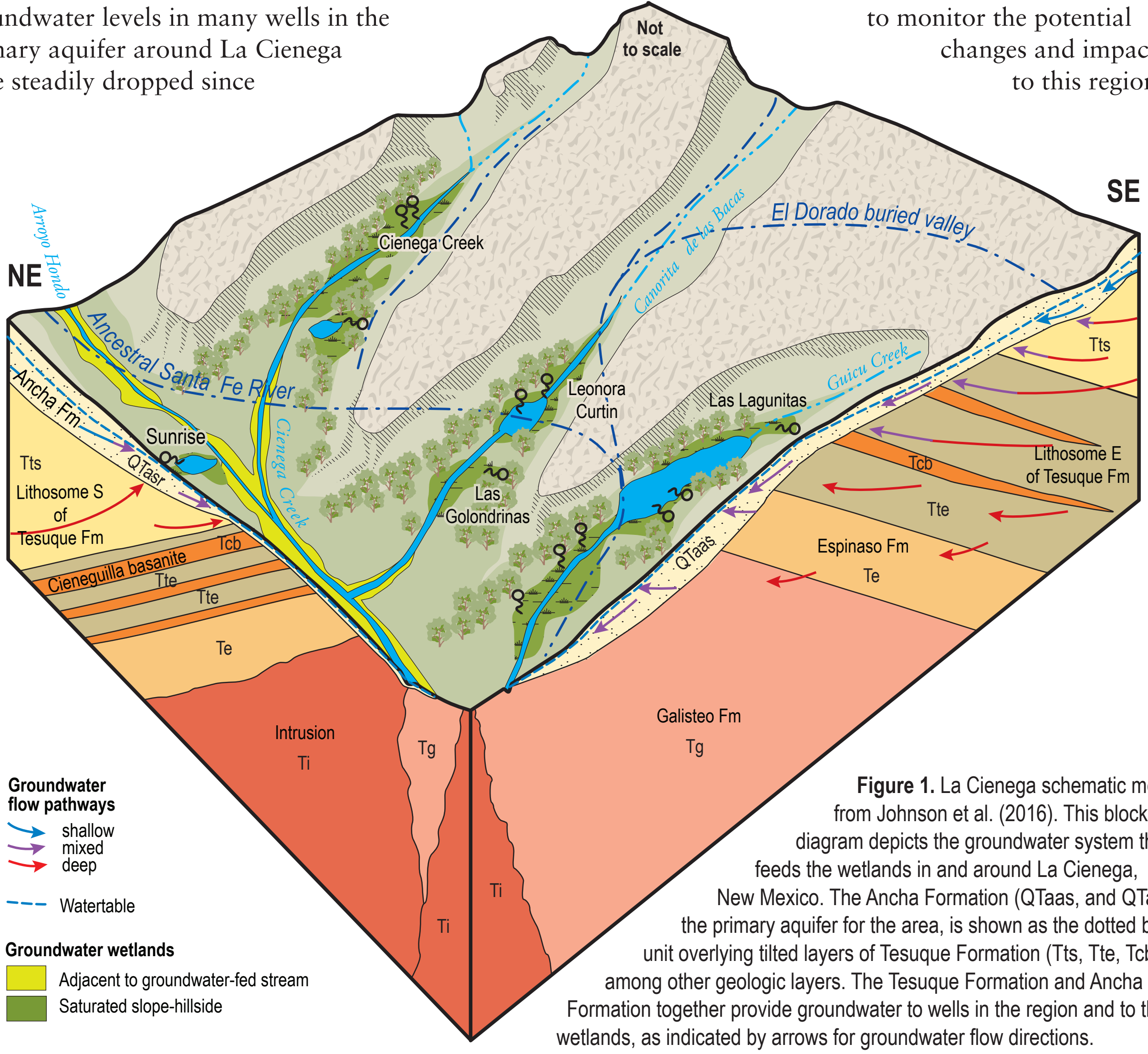

Figure 1. La Cienega schematic model from Johnson et al. (2016). This block diagram depicts the groundwater system that feeds the wetlands in and around La Cienega, New Mexico. The Ancha Formation (QTaas, and QTasr), the primary aquifer for the area, is shown as the dotted beige unit overlying tilted layers of Tesuque Formation (Tts, Tte, Tcb), among other geologic layers. The Tesuque Formation and Ancha Formation together provide groundwater to wells in the region and to the wetlands, as indicated by arrows for groundwater flow directions.

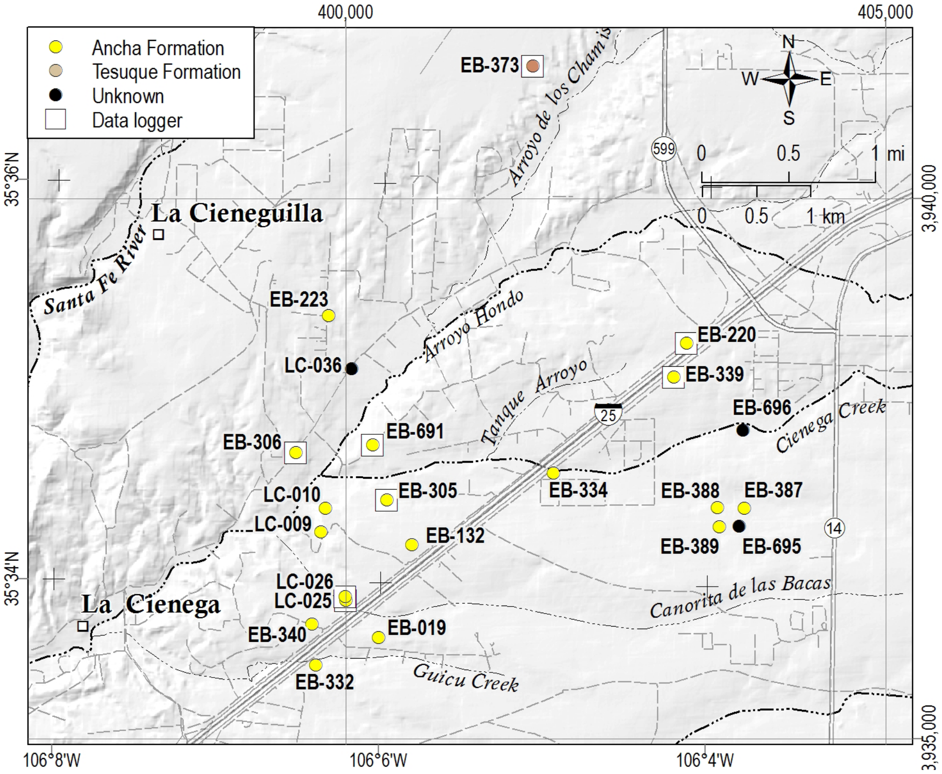

Figure 2. Location of wells in the monitoring network. Well points are color coded with the primary aquifer the well is producing from. Most wells in this study are providing groundwater from the Ancha Formation, with a few on the margins of the study that produce water from the Tesuque Formation. In this region, groundwater is generally flowing toward the southwest.

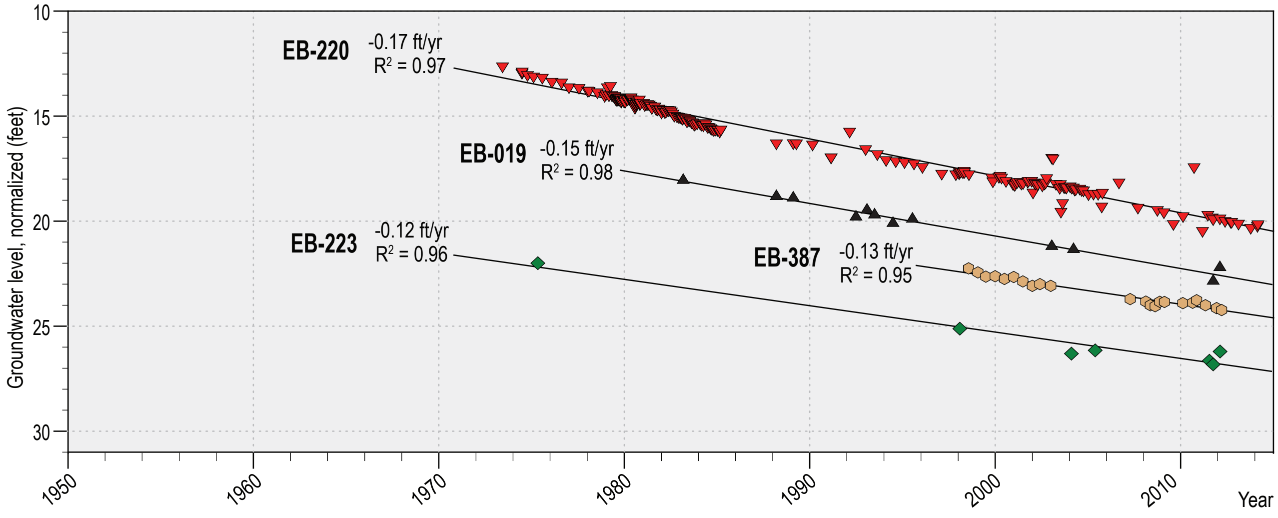

Figure 3. Modified figure from Johnson et al. (2016) that shows decline in groundwater hydrographs from shallow wells in the La Cienega over the past several decades. Water level changes from shallow wells in La Cienega over the past several decades. The rate of groundwater decline (ft/yr) is the slope of the regression line.

II. METHODS

Measurements in the monitoring network have been taken twice a year, in April and October, since 2015. The measurement frequency is intended to reflect the local seasonal high in the spring (April) and seasonal low in the fall (October), which relate to the beginning and end of the growing season. In 2017, the NMBGMR measured 22 wells in the twice annual monitoring network (Table 1, Figure 2).

For the purpose of this monitoring project, groundwater level measurements are made using existing domestic wells, and open/unused wells (without pumps). For domestic wells, water level measurements were made after the well had been off for at least 1 hour. Water levels were measured following U.S. Geological Survey protocols for a steel tape measurement device with repeat measurements to within 0.02 feet. Open wells were measured using an electronic sounder probe, also with repeated measurements within 0.02 feet. All measurements reported are in units of feet, and are reported from below ground surface (bgs). Data from manual measurements taken in 2015–2017 are provided with this report in Table 2. Hydrographs showing the water level measurements over time are found in the Appendix 1.

Table 1. Inventory of wells monitored for the bi-annual network, including location information and well construction. MP = Measuring point ("-" = below ground). NA = no data available.

Site ID	Elevation (ft)	UTM easting NAD83	UTM northing NAD83	Well depth (ft)	MP height (ft)	Screen top (ft)	Screen bottom (ft)	Measurement status
EB-019	6143	400304	3935932	80	1.00	50	80	Spring/ Fall
EB-132	6179	400609	3936794	135	-6.20	60	90	Spring/ Fall
EB-220	6259	403153	3938661	161	0.60	125	161	Continuous
EB-223	6165	399840	3938918	100	0.00	40	95	Spring/ Fall
EB-305	6127	400377	3937211	75	2.00	20	75	Continuous
EB-306	6091	399537	3937647	43	1.80	NA	NA	Continuous
EB-332	6096	399720	3935678	160	0.45	80	140	Spring/ Fall
EB-334	6144	401921	3937456	140	1.50	60	120	Spring/ Fall
EB-339	6259	403035	3938347	200	2.00	160	200	Lost continuous instrument
EB-340	6126	399686	3936057	155	0.80	NA	NA	Spring/ Fall
EB-373	6273	401729	3941231	300	0.60	NA	NA	Continuous
EB-387	6242	403690	3937134	115	1.24	NA	NA	Spring/ Fall
EB-388	6224	403442	3937136	91	1.43	NA	NA	Spring/ Fall
EB-389	6241	403458	3936959	121	1.98	NA	NA	Spring/ Fall
EB-691	6117	400249	3937717	180	1.75	NA	NA	Continuous
EB-695	6250	403641	3936964	125	1.89	NA	NA	Spring/ Fall
EB-696	6226	403679	3937857	117	2.51	NA	NA	Spring/ Fall
LC-009	6082	399771	3936914	180	0.50	NA	NA	Spring/ Fall
LC-010	6102	399811	3937131	180	0.90	160	180	Spring/ Fall
LC-025	6084	400000	3936280	18	-0.35	NA	NA	Continuous
LC-026	6085	399995	3936316	8	-0.50	NA	NA	Continous instrument malfunctioned
LC-036	6112	400055	3938426	NA	-6.10	NA	NA	Spring/ Fall

Table 2. Manual water level measurements collected for this project. Records of water level measurements prior to 2015 are available upon request, and or are also available in Johnson et al. (2016). Depth to water is feet (ft) below land surface.

Site ID	DTW Spring **2015** (ft)	DTW Fall **2015** (ft)	DTW Spring **2016** (ft)	DTW Fall **2016** (ft)	DTW Spring **2017** (ft)	DTW Fall **2017** (ft)
EB-019	44.46	45.16	44.36	45.28	44.42	45.13
EB-132	68.3	68.88	68.47	69.03	68.44	68.98
EB-220	132.96	133.02	132.84	133.07	133.06	133.12
EB-223	45.42	45.95	45.28	45.95	45.37	45.88
EB-305	22.78	23.51	22.69	23.6	22.83	23.35
EB-306	18.97	19.53	18.78	19.51	18.86	19.33
EB-332	8.83	9.5	8.63	9.65	8.69	9.35
EB-334	39.65	40.02	39.57	40.11	39.65	39.99
EB-339	137.66	137.81	137.66	137.87	137.54	137.84
EB-340	52.41	53.22	52.24	53.3	52.4	53.05
EB-373	116.38	116.45	116.26	116.26	116.37	116.3
EB-387	98.95	98.87	98.69	98.94	98.85	98.97
EB-388	88.99	89.02	88.82	89.05	88.94	89.07
EB-389	108.39	108.35	108.17	108.39	108.33	108.41
EB-691	23.21	24.14	23.27	24.33	23.17	23.79
EB-695	110.54	110.46	110.28	110.49	110.43	110.52
EB-696	91.55	91.64	91.48	91.68	91.6	91.74
LC-009	15.79	17.77	15.74	18.26	15.88	17.6
LC-010	16.1	16.56	15.85	16.87	16.1	16.37
LC-025	7.87	12.18	7.9	12.56	8.05	12.26
LC-026	7.09	7.42	6.85	7.47	6.66	7.21
LC-036	11.24	11.66	10.94	11.45	11.15	11.84

Table 3. Point locations with continuous data recorders, and date of installation. See Figure 2 for locations.

Site ID	Date installed	Notes
EB-220	10/4/11	Running
EB-305	6/4/15	Running
EB-306	10/6/11	Running
EB-339	6/1/15	Lost from well
EB-373	10/2/12	Running
EB-691	5/27/14	Running
LC-025	10/4/11	Running
LC-026	10/4/11	Instrument failed

Pressure transducers monitoring continuous changes in groundwater levels have been deployed in several wells since 2011 (EB-220, -306, LC-025, -026) (Table 3). Additional sites were instrumented in 2014 and 2015 (EB-305, -373, -339, -691). These instruments are VanEssen (Diver) brand, and provide pressure readings, which are converted to water level measurements collected every 12 hours. These are lengthy data records, and are available upon request. Images produced from these records are discussed below.

III. RESULTS

Seasonal Trends

Previous work in this region has highlighted seasonal groundwater level fluctuations, which are influenced by the effects of evapotranspiration. In the summer months, evapotranspiration is the effect of plants transpiring water, in addition to the evaporation of shallow groundwater or surface water into the atmosphere. This decreases groundwater levels in La Cienega during summer months. Groundwater level changes measured between April and October, during 2015, 2016 and 2017, indicate a decrease in water level from April to October, which reflects evapotranspiration during summer months (Figure 4). In this region, April typically has a higher groundwater surface due to less groundwater use during winter months, whereas October represents the lower groundwater surface at the end of summer.

Table 4. Manual water levels from period between April-October 2017. (ft bgs = feet below ground surface).

Site ID	Spring date measured	DTW Spring 2017 (ft bgs)	Fall date measured	DTW Fall 2017 (ft bgs)	Change in depth (ft)
EB-019	4/5/17	44.42	10/18/17	45.13	-0.71
EB-132	4/6/17	68.44	10/19/17	68.98	-0.54
EB-220	4/5/17	133.06	10/18/17	133.12	-0.06
EB-223	4/6/17	45.37	10/19/17	45.88	-0.51
EB-305	4/5/17	22.83	10/18/17	23.35	-0.52
EB-306	4/6/17	18.86	10/19/17	19.33	-0.47
EB-332	4/5/17	8.69	10/18/17	9.35	-0.66
EB-334	4/5/17	39.65	10/18/17	39.99	-0.34
EB-339	4/5/17	137.54	10/18/17	137.84	-0.30
EB-340	4/5/17	52.4	10/18/17	53.05	-0.65
EB-373	4/6/17	116.37	10/19/17	116.3	0.07
EB-387	4/5/17	98.85	10/18/17	98.97	-0.12
EB-388	4/5/17	88.94	10/18/17	89.07	-0.13
EB-389	4/5/17	108.33	10/18/17	108.41	-0.08
EB-691	4/5/17	23.17	10/18/17	23.79	-0.62
EB-695	4/5/17	110.43	10/18/17	110.52	-0.09
EB-696	4/5/17	91.6	10/18/17	91.74	-0.14
LC-009	4/5/17	15.88	10/19/17	17.6	-1.72
LC-010	4/5/17	16.1	10/19/17	16.37	-0.27
LC-025	4/5/17	8.05	10/18/17	12.26	-4.21
LC-026	4/5/17	6.66	10/18/17	7.21	-0.55
LC-036	4/6/17	11.15	10/19/17	11.84	-0.69

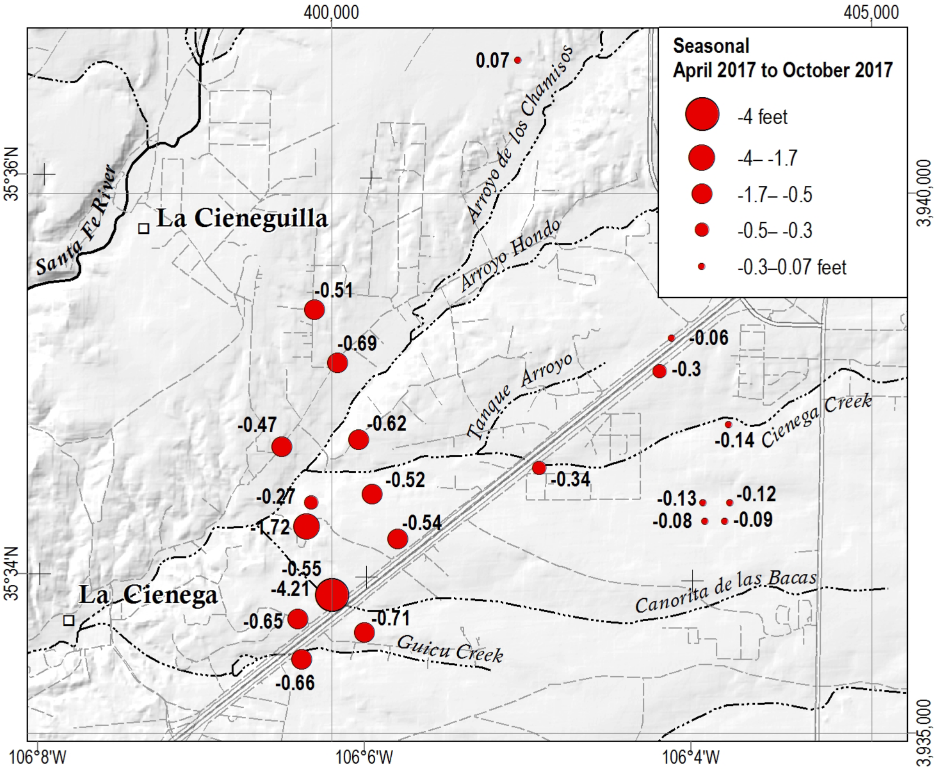

Figure 4. Groundwater level changes between seasonal high (April) and low (October) during 2017. This pattern of seasonal water level changes was also observed in 2015 and 2016 and in previous work by Johnson et al. (2016) and is related to the shallow groundwater use by vegetation and evaporation (evapotranspiration).

Continuous Data Records

As noted in Table 3, there were originally eight locations with pressure transducers monitoring groundwater level changes every 12 hours. At present there are only 6 remaining as one pressure transducer is missing and the other reached the end of its life expectancy. As we do not have funding to replace instruments, as more of the data loggers malfunction we will not be able to replace them and more wells will be removed from the data logger network. The wells that have dropped out of the data logger network due to instrumentation problems are still part of the manual monitoring network. These records are displayed in Figures 5–11. Locations of these wells are shown on Figure 2.

LC-025 is a shallow monitoring well that is 18 feet deep, and completed in the shallow Ancha Formation (Figure 1–2). The hydrograph shows a distinct seasonal fluctuation related to the growing season that is seen in numerous wells in the area, varying by ~4 feet (Figure 5). Water levels begin to recover after plants go dormant later in the fall, typically by mid-November. This well sees rapid recharge as noted in September 2013, where water levels rose 6 ft following a large storm event.

LC-026 is a shallow monitoring well, approximately 8 feet deep, completed in the Ancha Formation (Figure 2). This well responds quickly to seasonal fluctuations in the shallow water table, responding to changes earlier in the season than other wells in the data logger network, but shows relatively small fluctuation between the summer low and winter high water levels (~0.5 feet) (Figure 6). The shift from summer to winter water levels occurs fairly early (late September) compared with the other loggers that show seasonal water level fluctuations. The shift to summer conditions occurs generally by mid-May. The pressure transducer data have fairly stable water levels, while the manual measurements appear to indicate that the water level is slowly rising by nearly 0.3 feet per year (Figure 6).

This well has been removed from the data logger network. The data logger that was collecting data was quite old and has begun to near the end of its lifetime expectancy. As these instruments get older, the measurements they record begin to drift farther from the true values. The measurements recorded by the data logger have drifted farther and farther from the manual measurement over the past 3 years. This well will still be monitored as part of the manual water level monitoring network. Fortunately, there is another well (LC-025) that is located very close by that is also instrumented with a data logger, so the removal of this well from the monitoring network will not leave a significant gap in our monitoring network.

EB-373 is 300 feet deep, located near the Santa Fe airport, and was completed in the Tesuque Formation (Figure 2). This is the only well with a consistent upward trend in the groundwater level (Figure 7) since the well was instrumented in late 2012. Wells in the area of the Santa Fe Airport were shut down in the mid-1990s, as the airport was connected to City of Santa Fe water supply, which may be influencing the water level rise in the well. From 2012 when a pressure transducer was first deployed in the well through mid-2016 water levels were coming up at approximately 0.4 feet per year. Since 2016, water level changes have remained steady. Where previously there was no noticeable seasonality to the water level trend there is now a very slight seasonality to the water level fluctuation similar to that seen in other wells in the area.

EB-306 is a 43 foot deep well that was completed in the Ancha Formation (Figure 2). The water level time series recorded in this well shows a distinct seasonal fluctuation in the shallow water table suspected to be related to evapotranspiration (Figure 8). The winter recovery, following the growing season generally occurs at the end of September and since 2014 water levels have returned to approximately 18.8 feet below land surface. Once the growing period begins in late spring/early summer, the groundwater levels drop approximately 0.8 feet.

EB-220 is a well completed in the Ancha Formation, with a total depth of 161 feet (Figure 2). This well has a long record of decline since the 1970s, on the order of roughly 0.2 feet per year (Johnson et al., 2016). Beginning in 2013, the water level appears to have begun to recover. The peak winter water level between 2013 and 2016 were consistently 0.1 feet higher each year (Figure 9). This most recent calendar year, however, saw a slight change. The winter high in 2017 was 0.1 feet lower than the previous year.

This well also shows a muted water level response to seasonal changes; typically rising and falling approximately 0.25 feet. The seasonal fluctuation in this well is different from other wells in the area that respond quickly to the growing season. The signal in this well appears to be more muted or offset. Typically the water level in this well does not fully recover until June, and doesn't full decline until early January.

EB-691 is a 180 foot deep pumping well completed in the Ancha Formation (Figure 2). Records of water levels measured when the well was pumping

The black line indicates the depth to water measured by the pressure transducer instrument, and the yellow points are manually measured depth to water levels.

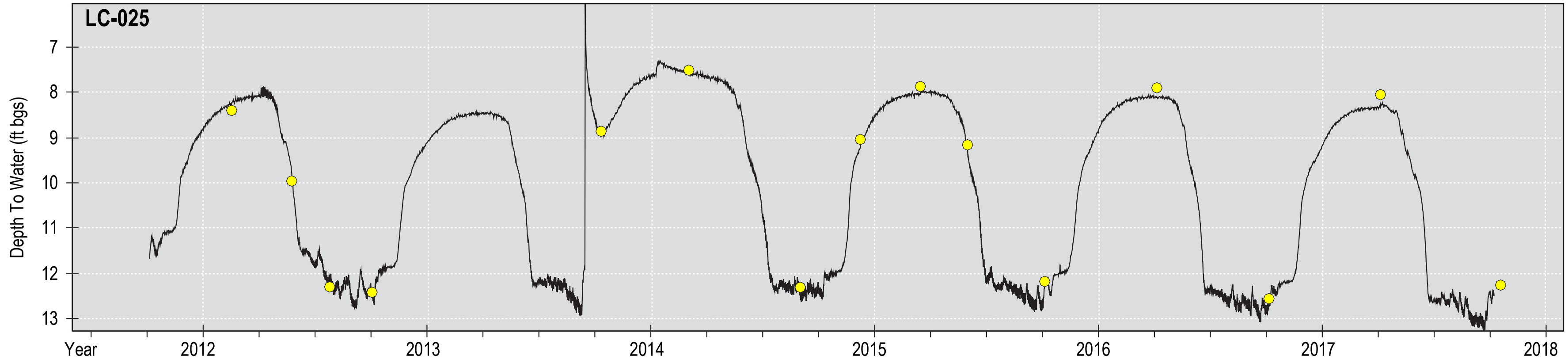

Figure 5. LC-025 is a shallow, 18 foot deep monitoring well, completed in the Ancha Formation. The spike in water level that occurs in September 2013 coincides with a significant precipitation event.

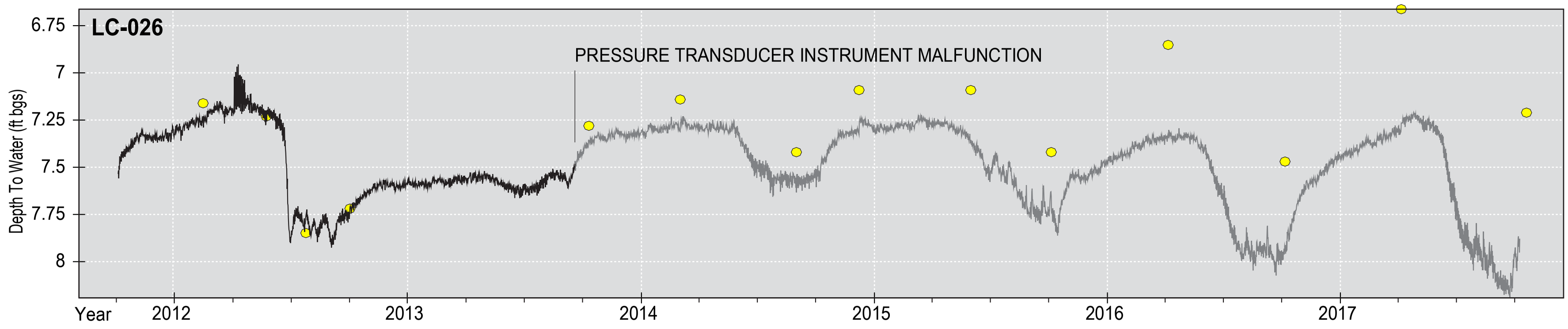

Figure 6. LC-026 is a shallow, 8 foot deep monitoring well, completed in the Ancha Formation.

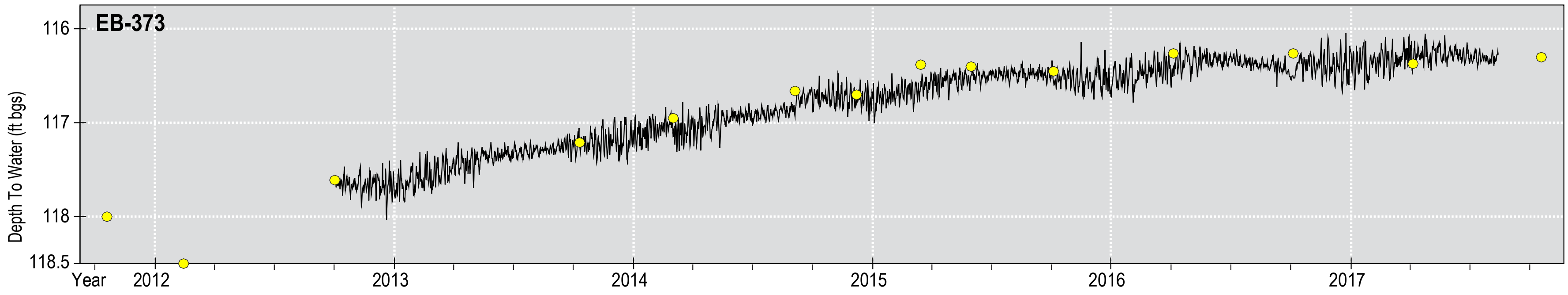

Figure 7. EB-373 is 300 foot deep well, located near the Santa Fe airport, and completed in the Tesuque Formation.

The black line indicates the depth to water measured by the pressure transducer instrument, and the yellow points are manually measured depth to water levels.

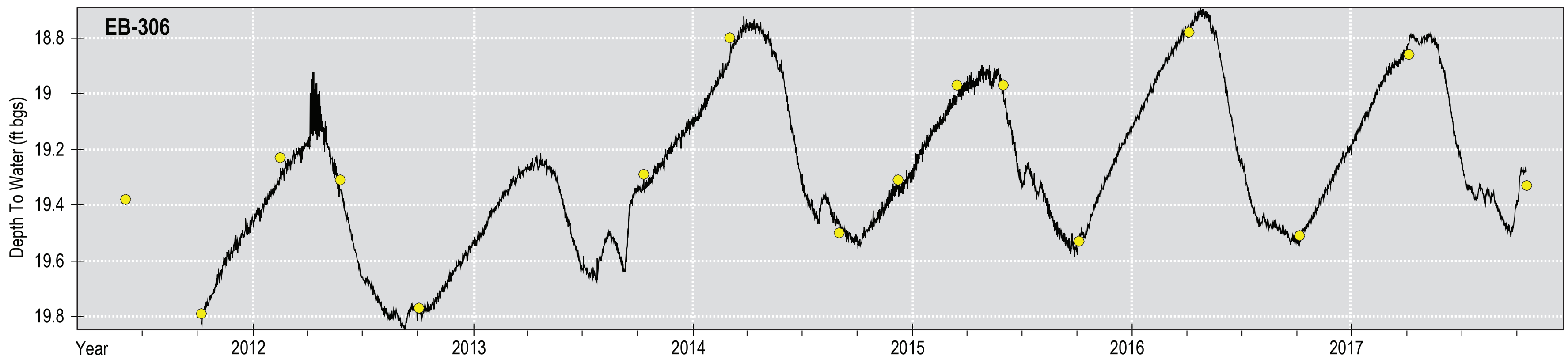

Figure 8. EB-306 is a 43 foot deep well completed in the Ancha Formation.

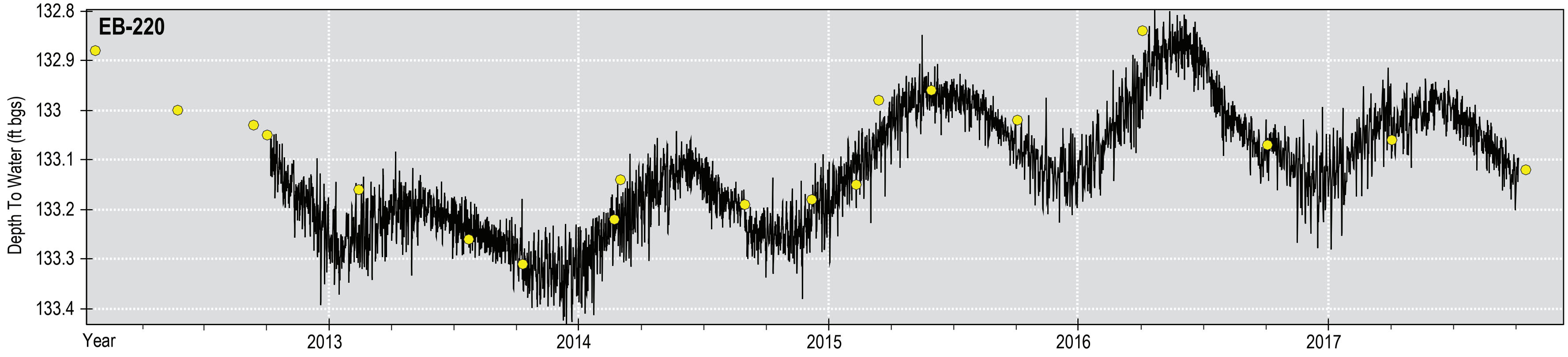

Figure 9. EB-220 is a 161 foot deep well completed in the Ancha Formation.

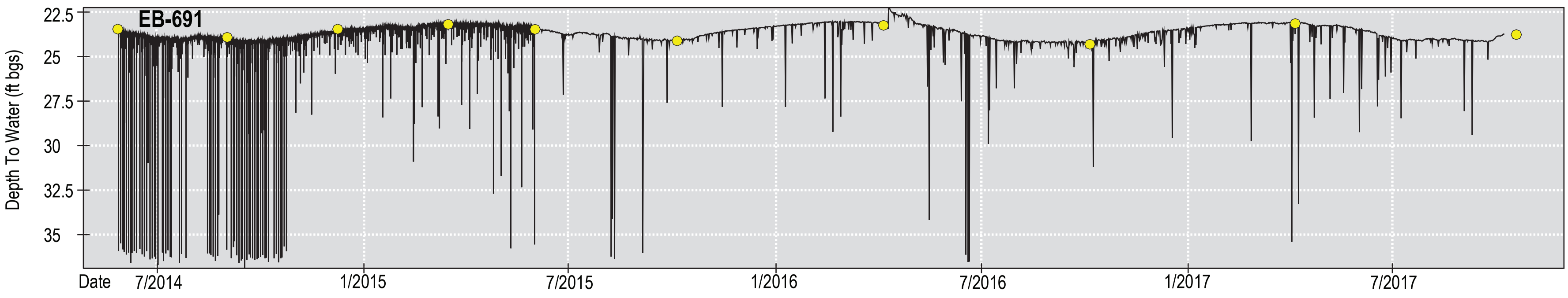

Figure 10. EB-691 is a 180-foot pumping well completed in the Ancha Formation. Water levels measured when the well was pumping are dramatically lower than the static water level, with water levels reaching 36 ft below land surface. The overall trend in the static water level of this well, indicated by the blue line of points, shows that this well reflects a seasonal fluctuation of approximately 1 ft.

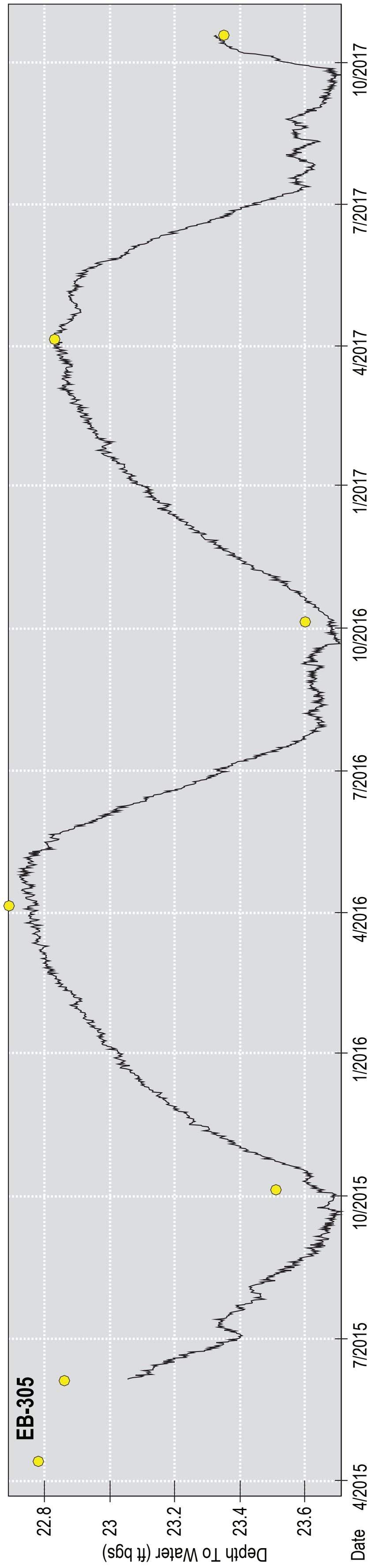

Figure 11. EB-305 is a 75 foot deep well completed in the Ancha Formation. Installed in June 2015.

are shown by the dips in water levels, with water levels reaching 36 feet below land surface (Figure 10). The overall trend in the static water level of this well, as indicated by the level that the water level recovers to after pumping, shows that this well has a seasonal fluctuation of approximately 1 foot. Static water levels are close to 23 feet below land surface in the winter months, and approximately 24 feet below land surface during summer months.

EB-305 is a 75 foot deep well completed in the Ancha Formation.The overall trend of water level change in this well reflects the seasonal decline common in other shallow Ancha Formation wells in the region; rising and falling 1 foot between summer and winter seasons (Figure 11). A previous water level measurement from this well in January 2004 was 22.1 feet below land surface. This well has seasonal fluctuations, but there has been a long term decline in the overall water level at this well since it was measured in 2004. At present the well appears to be stable; recovering to approximately the same levels in the spring and decreasing to same levels in the fall.

Discussion of other Regional Datasets

Within the hydrologically up-gradient proximity to La Cienega, the U.S. Geological Survey maintains continuous data recorders in several nested piezometer well sets; Jail Well, NMOSE County and NMOSE Fairgrounds (Figure 12). Nested piezometers consist of groups of three wells that are drilled within close proximity to each other. Each well that is part of the nested piezometer grouping is completed at different depths; a shallow, a middle, and a deep well. This allows for analysis of the vertical gradient in an aquifer; the measure of groundwater flow in the 'Z' direction, up or down. The shallowest of these wells can be compared to the sites monitored in La Cienega. The results in the figures below show that regional groundwater levels in the Tesuque Formation aquifer are largely declining, with small seasonal rises superimposed on the overall downward trend (Figures 13–15). While the majority of the wells in La Cienega are screened in the Ancha formation, the underlying Tesuque formation is believed to discharge into the Ancha in this area, where the units intersect (Johnson et al., 2016).

The "Jail Well shallow piezometer" is 340 feet deep, completed in the bottom of the Ancha Formation and Tesuque Formation aquifers. This well has seen a groundwater decline from 2006 to 2014, with declines of approximately 1.5 feet over that time (Figure 13). For the past four years water levels have

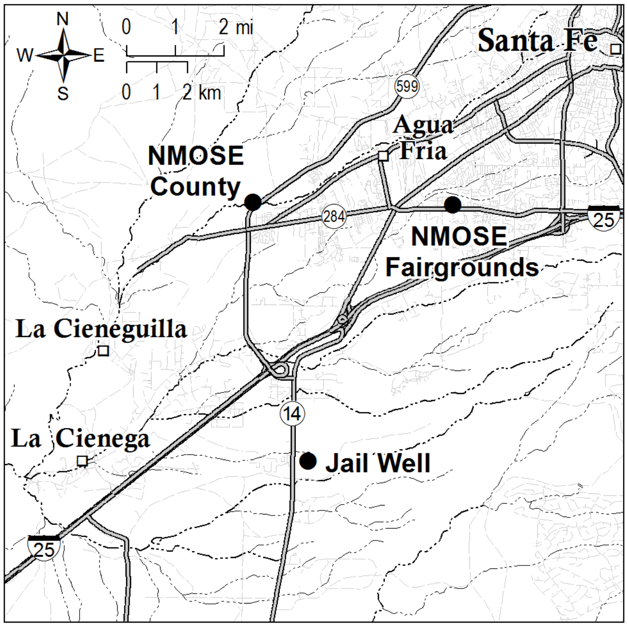

Figure 12. Map showing location of U.S. Geological Survey piezometer well sets. Wells discussed here include Jail Well, NMOSE County, and NMOSE Fairgrounds.

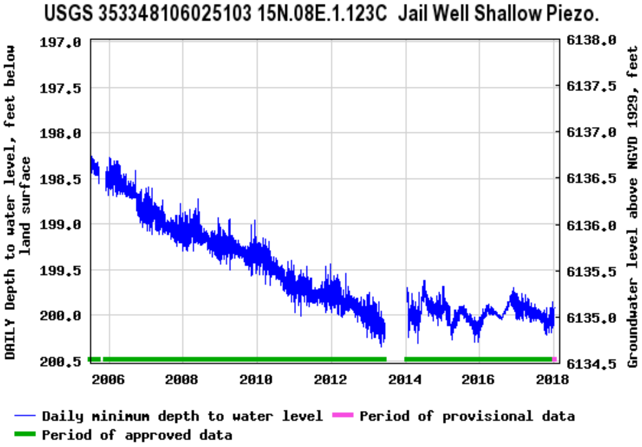

Figure 13. Jail Well Shallow piezometer. This well is 340 ft deep, completed in the bottom of the Ancha Formation and Tesuque Formation aquifers.

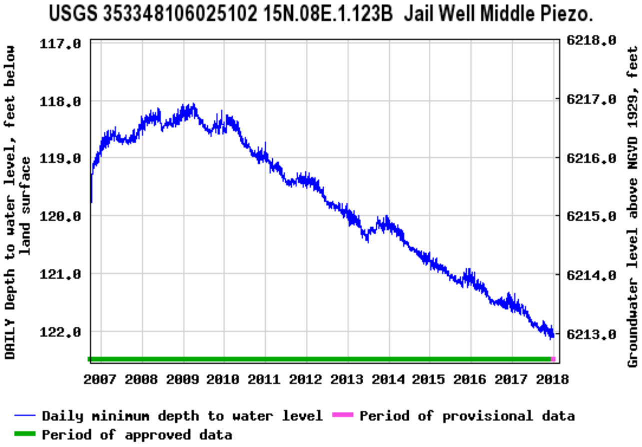

Figure 14. Jail Well middle piezometer. This well is 640 ft deep, completed in the Tesuque Formation aquifer.

remained steady. The "Jail Well middle piezometer" is 640 feet deep, and was completed in the Tesuque Formation aquifer. The Jail middle piezometer had consistent groundwater declines since 2006, approximately 3 feet over that time (Figure 14). This set of nested piezometers shows an upward vertical gradient of 0.13.

The "NMOSE County shallow piezometer" is 460 feet deep and was completed in the Tesuque Formation aquifer (Figure 12). It has a continuous decline from 2006 to 2016, with declines of approximately 2.5 feet over that time (Figure 15). Recently, water level decline in this well does appear to be slowing down. This set of nested piezometers shows a slightly downward vertical gradient of 0.01.

The "NMOSE Fairgrounds shallow piezometer" is 540 feet deep, completed in the Tesuque Formation aquifer (Figure 12). This well shows consistent groundwater declines of approximately 3 feet over that time (Figure 16). This set of nested piezometers shows a slightly downward vertical gradient of 0.04.

Long-term Trends

In the La Cienega area water levels have been monitored over the past several decades. Most wells in the monitoring network have records dating back 10 or more years. As was noted by Johnson et al. (2016), since the 1950s when the wells were first measured, water levels have been declining, between 0.12 and 0.23 feet per year. On the hydrographs that were presented in Johnson et al. (2016) it was noted, however, that at the very end of the data collection period, early 2014, that there did appear to be a slight rise in water levels (Figure 3). With the continued collection of data over the past three years we now have a more clear understanding of the recent water level trends. Starting between 2010 and 2013, water level declines in most wells in the La Cienega area slowed down, and in some cases are now stable or rising (Figure 17).

Changes in the City of Santa Fe water use and sources may play a role in the recent variation in hydrograph trends. In 2010, Santa Fe completed the Buckman Direct Diversion (BDD), which takes San

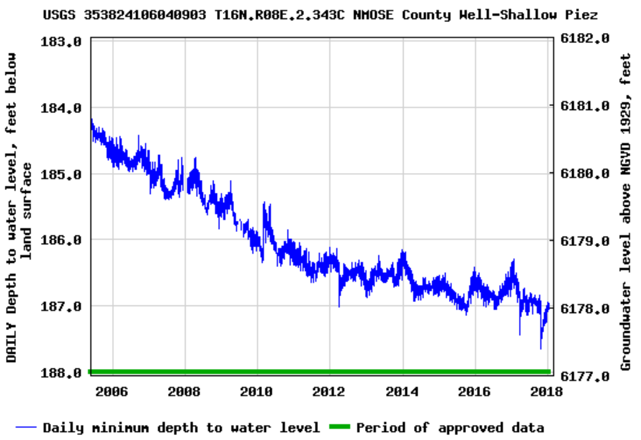

Figure 15. NMOSE County shallow piezometer. This well is 460 ft deep, completed in the Tesuque Formation aquifer.

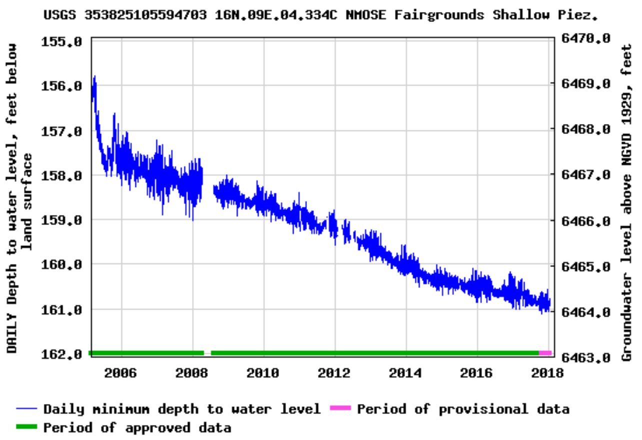

Figure 16. NMOSE Fairgrounds shallow piezometer. This well is 540 ft deep, completed in the Tesuque Formation aquifer.

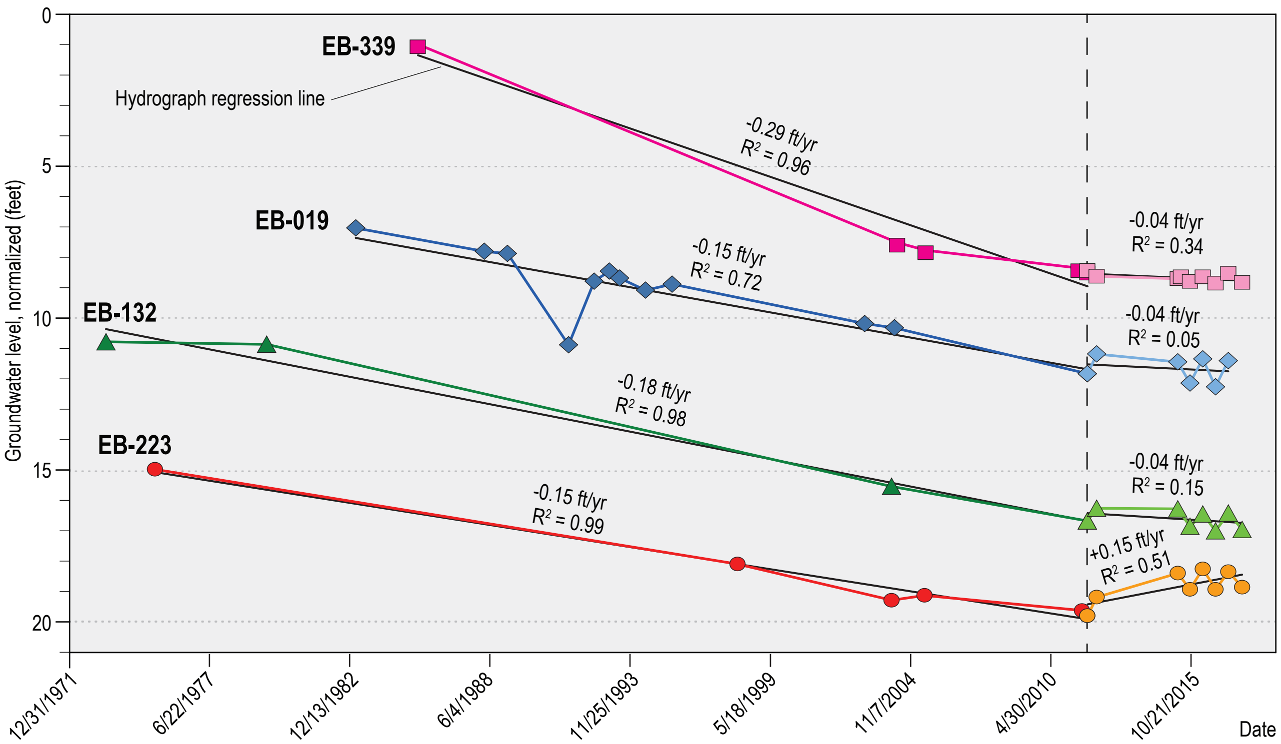

Figure 17. Groundwater hydrographs from four well in the study area that show significant decline for several decades; between 0.29 and 0.15 ft per year. Starting in 2012 the rate of decline was significantly reduced in these wells; between 0.04 ft decline and 0.15 ft per year of recovery.

Juan-Chama surface water from the Rio Grande, and pumps it up to the Santa Fe Water Division. With the help of the BDD supplementing water to the system, Santa Fe has reduced pumping from both the City Well Field, and the Buckman Well Field. Before the BDD, Santa Fe would pump nearly 2500 acre-feet per year (AFY) from the City Well Field, and 5000 AFY from the Buckman Well Field. In 2016, the City Well Field pumped 869 acre-feet, and the Buckman Well Field pumped 925 acre-feet (City of Santa Fe Water Division, 2017).

Another policy change that may have had an impact on the hydrology in the area was the enactment of the Living River Ordinance. In 2012, the Santa Fe City Council voted to by-pass 1,000 acre feet of water into the Santa Fe River during wet or normal years. This controlled release of water allows the river to flow throughout much of the year. In

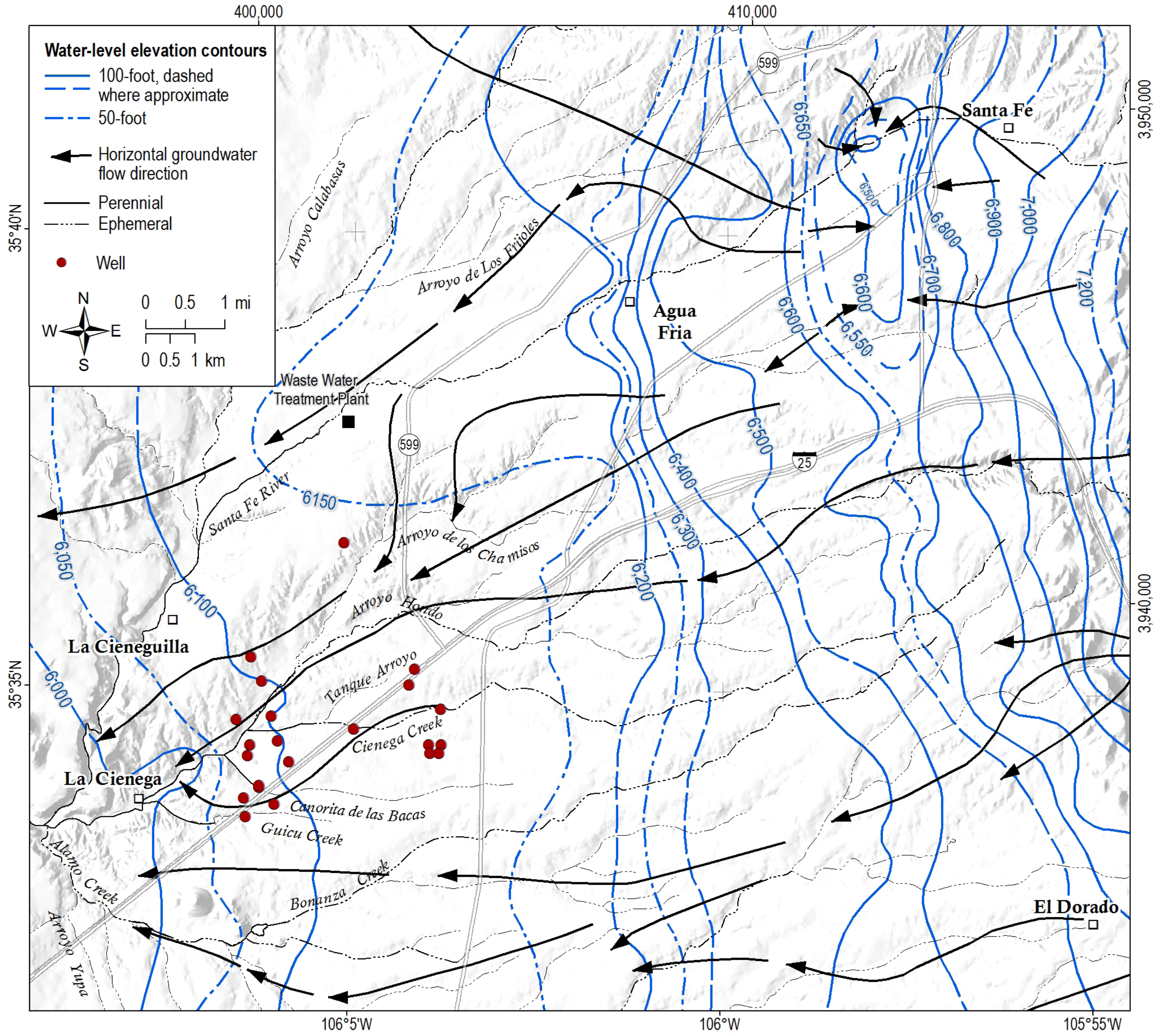

Figure 18. Groundwater map of 2012 water-table conditions in La Cienega and up-gradient areas. Groundwater flow is shown by the dark arrows that are drawn perpendicular to groundwater contours.

addition to the social and community benefits derived from the flowing river, there is likely a significant amount of recharge that occurs along the reach that has been restored (Mcoy et al., 2017). Changes in pumping, as well as the Living River Ordinance likely have a hydraulic impact on La Cienega.

Based on 2012 water level data, groundwater flow paths in area were drawn based on groundwater flow contours (Johnson et al., 2016) (Figure 18). The water level contours indicate that La Cienega is located at the termination of several flow paths (Johnson et al., 2016). These flow paths originate from both the City of Santa Fe to the northeast and Eldorado to the east. Other regional land and water use changes in the region upgradient also likely impact changes we observe in La Cienega.

IV. CONCLUSIONS

Results of this monitoring project in La Cienega highlight the importance of continued monitoring of groundwater levels in the region. The complexity of the groundwater system in and around La Cienega is indicated by the variety of results. As previous work (Johnson et al., 2016) and deeper groundwater monitoring sites in the Tesuque and Ancha Formation aquifers (i.e. USGS piezometers) have shown, there has been an overall trend of declining groundwater levels around La Cienega. Many of these declining trends have been ongoing since the 1970s. Superimposed on this trend, we also observe shallow groundwater fluctuations on a daily and seasonal time scale. Interestingly, in several of the shallow wells measured in this project that have extended water level records, we see a trend toward slowing declines (i.e. EB-132) and even some recovery that started in the early 2010s (i.e. EB-223) (Appendix 1). We also see small rises in the Tesuque Formation aquifer at the Santa Fe Airport well (EB-373) (Appendix 1). This contradicts the NMOSE County shallow piezometer, which is also completed in the Tesuque formation (though it is screened 260 feet deeper than EB-373 at the airport). At the NMOSE County shallow piezometer, the water level has dropped 2.5 feet since 2007, though the decline may be slowing down. Measures to reduce the amount of groundwater pumping from the Ancha and Tesuque Formation aquifers, the living river project, and other water conservation practices may be responsible for the slowing rate of decline.

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McCoy, A., Hook, A., Finch, S., 2017, Middle Santa Fe River Monitoring Program: Implications to the Living River, Acequia Deliveries and Aquifer Storage and Recovery: Espanola Basin Technical Advisory Group 2017 fall meeting.

Johnson, P., Koning, D., Timmons, S., Felix, B., 2016, Geology and Hydrology of Groundwater-Fed Springs and Wetlands at La Cienega, Santa Fe County, New Mexico: New Mexico Bureau of Geology, Bulletin 161.

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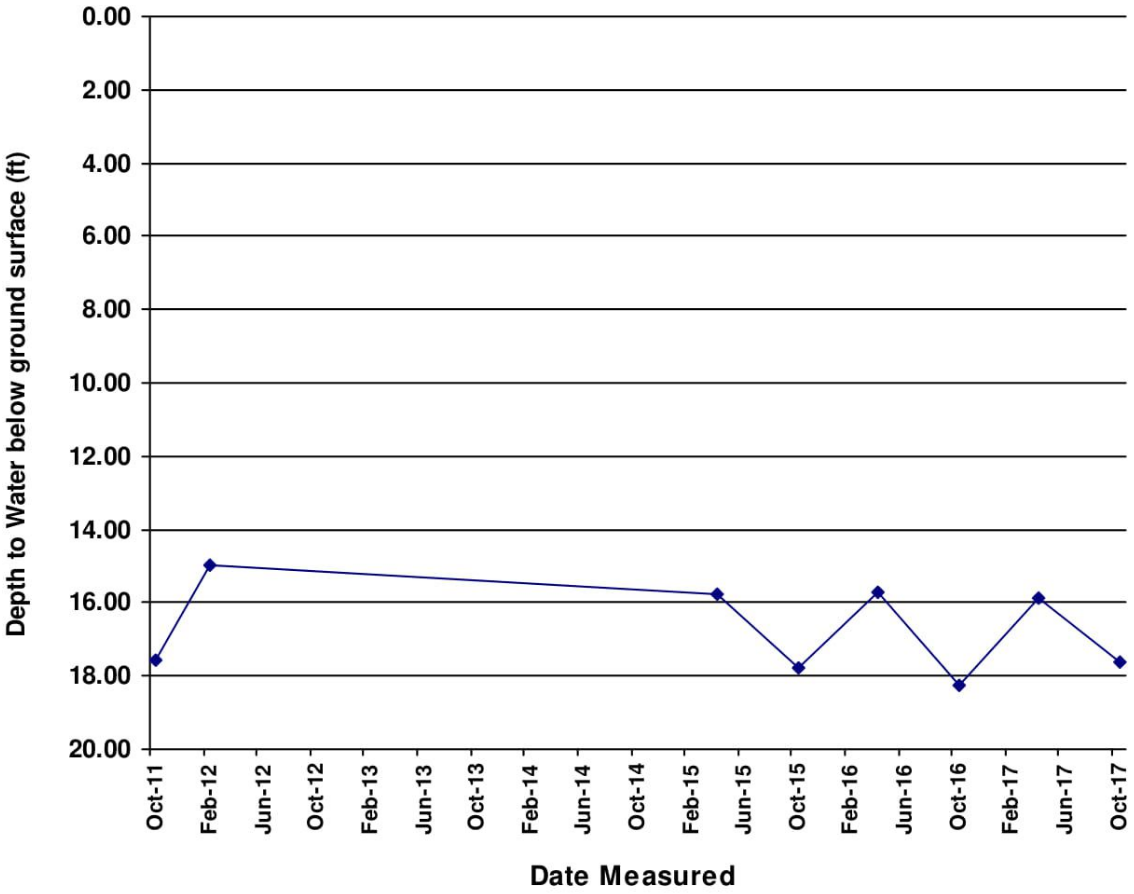
Water level Hydrograph

Point ID: **LC-009**



Water level Hydrograph

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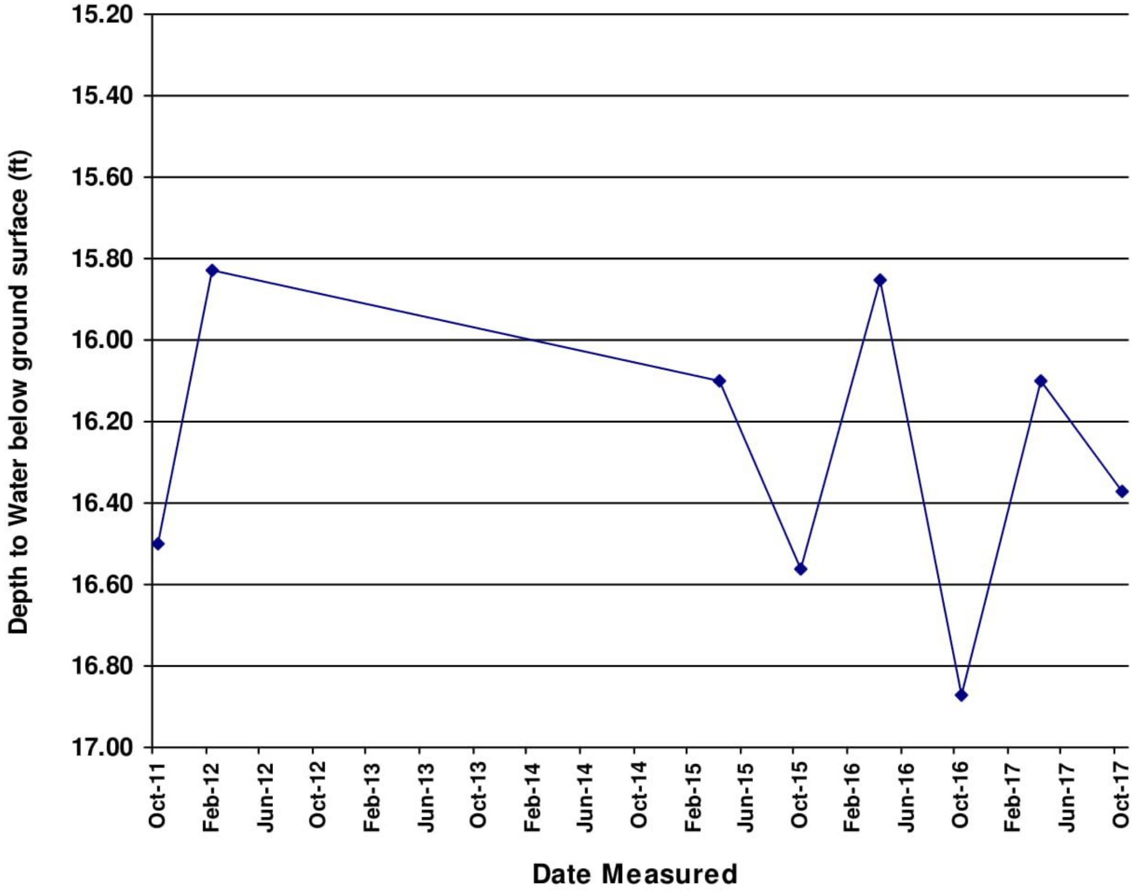

Water level Hydrograph

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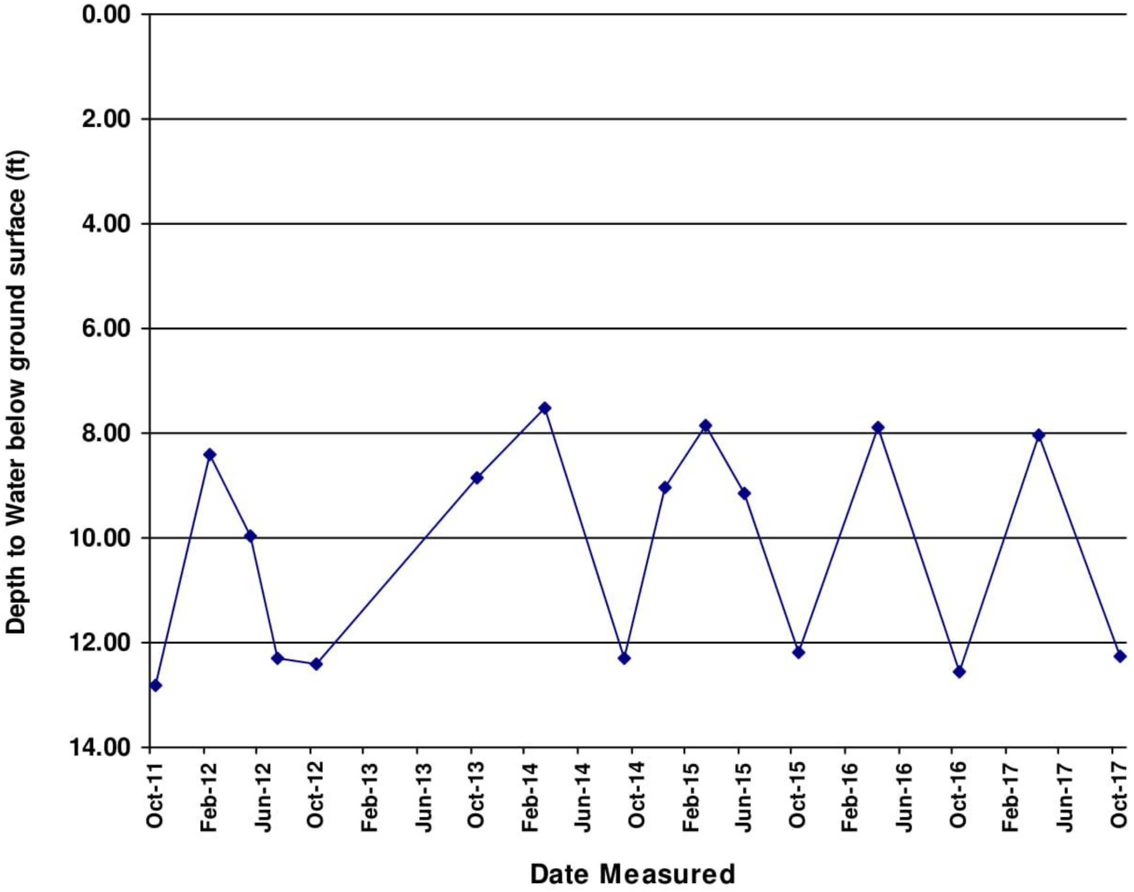

Water level Hydrograph

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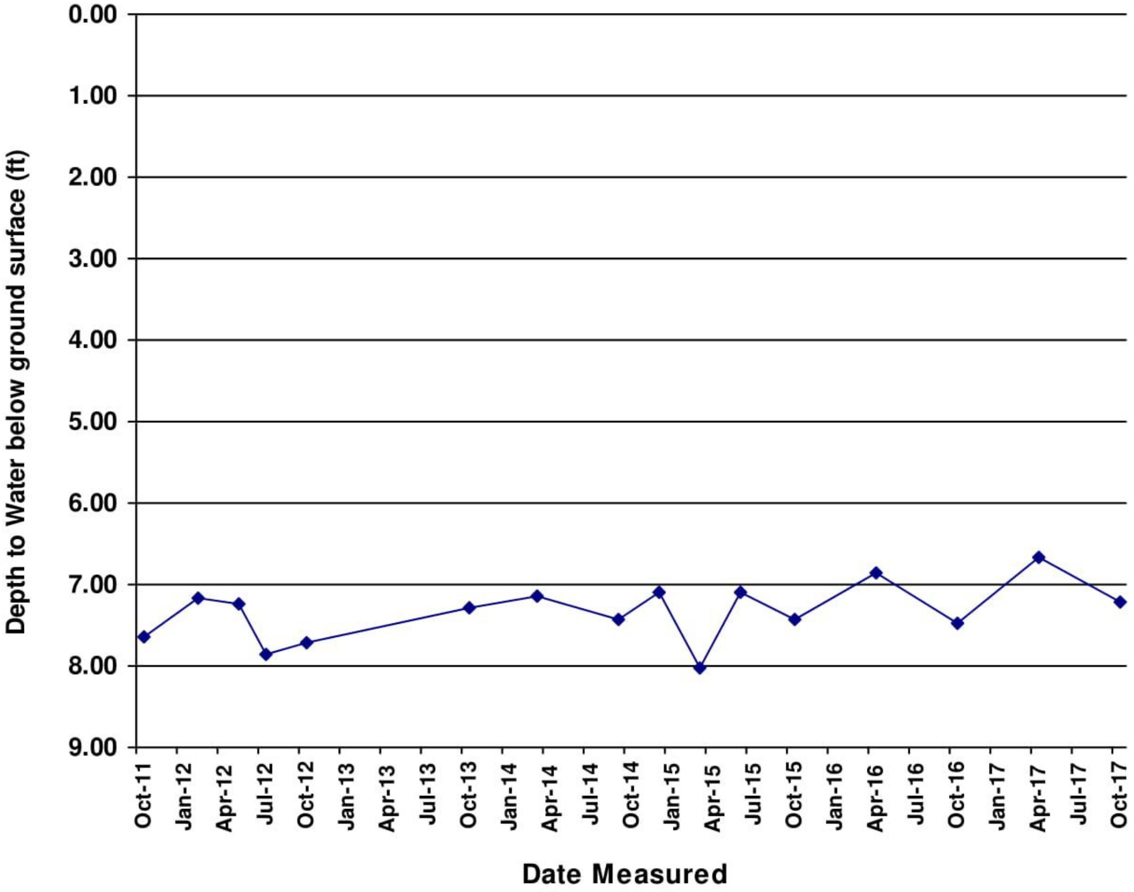

Water level Hydrograph

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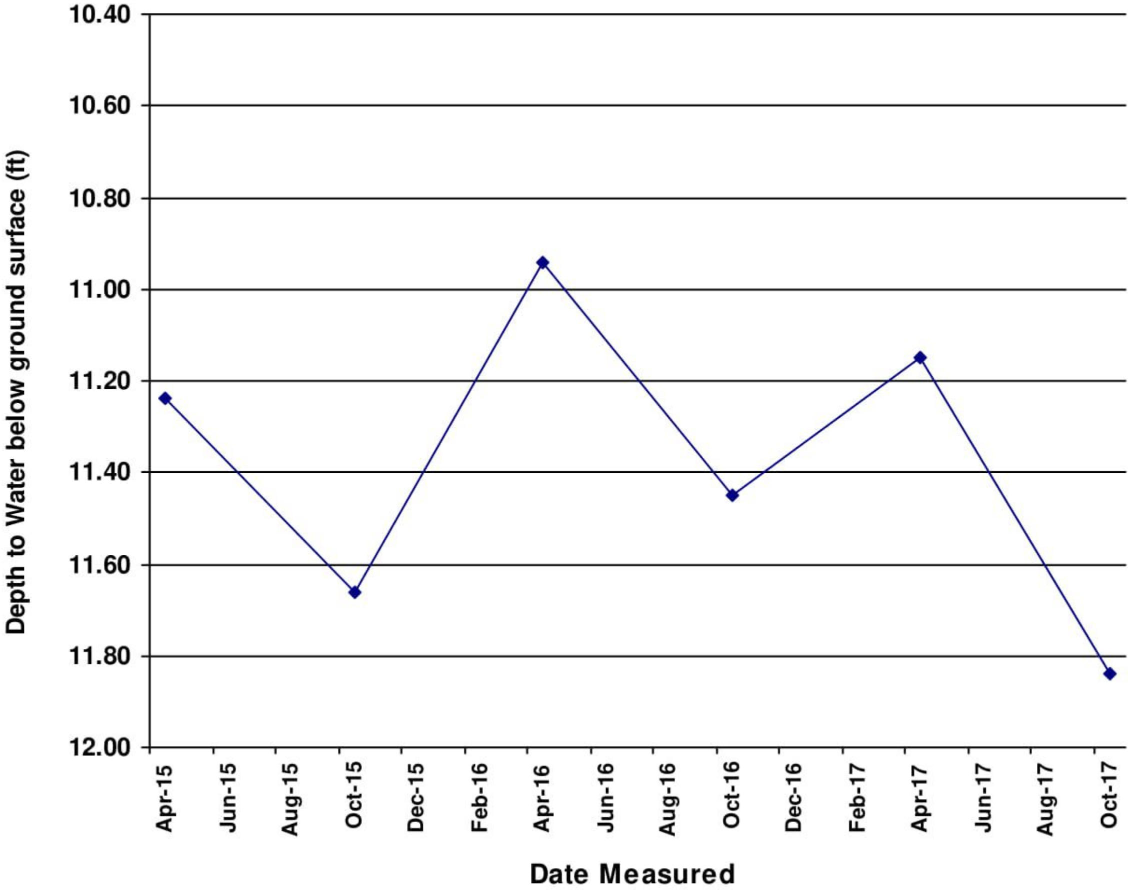

Water level Hydrograph

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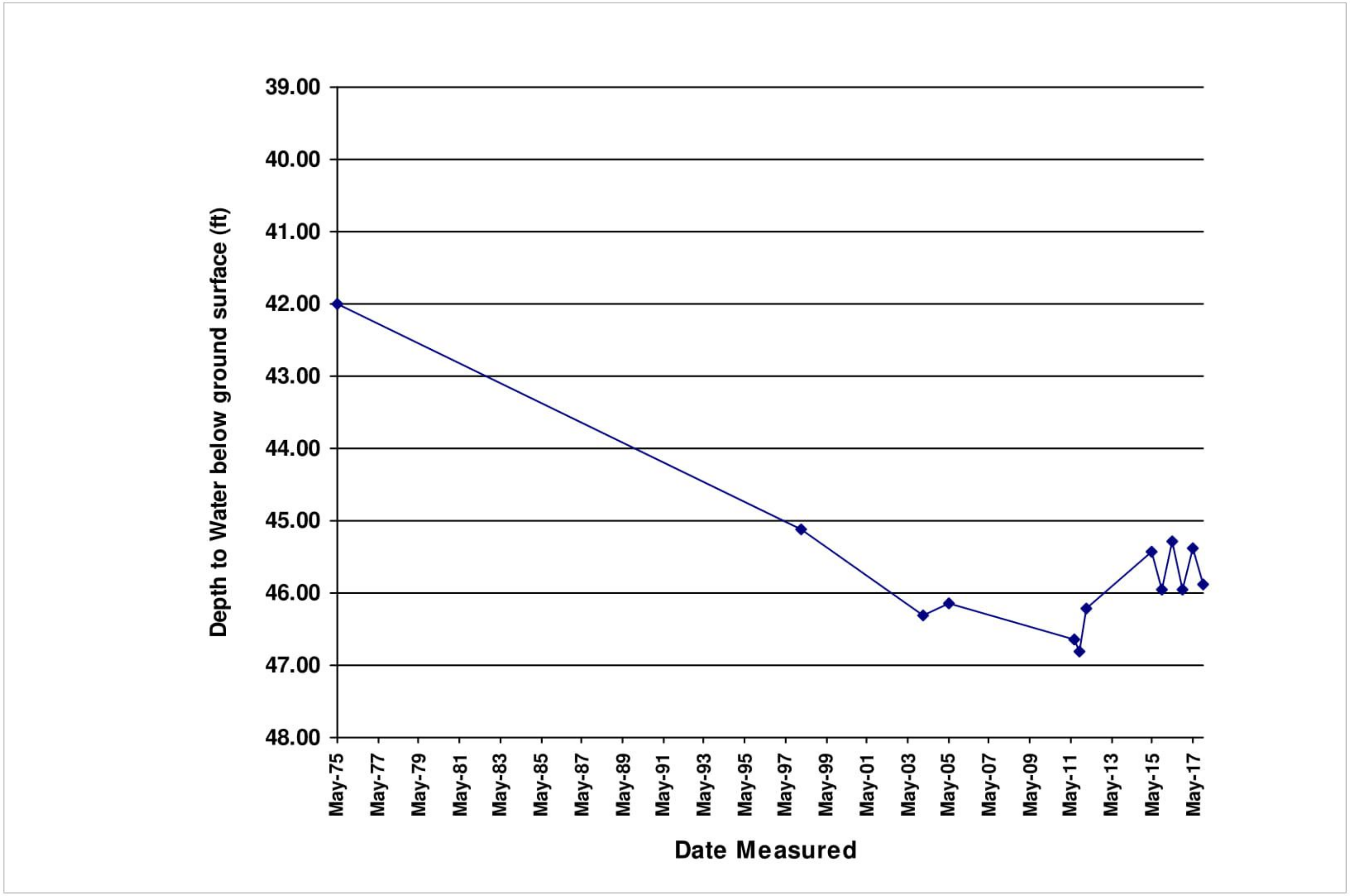

Water level Hydrograph

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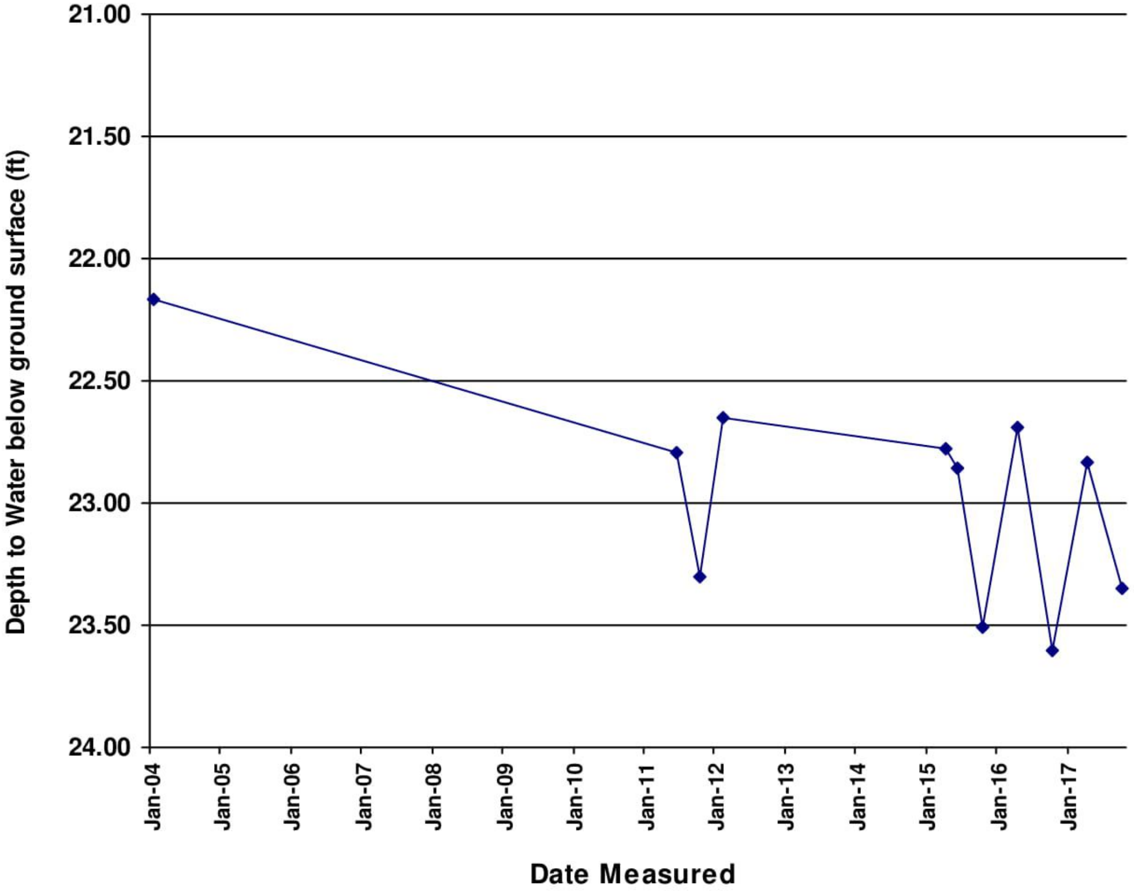

Water level Hydrograph

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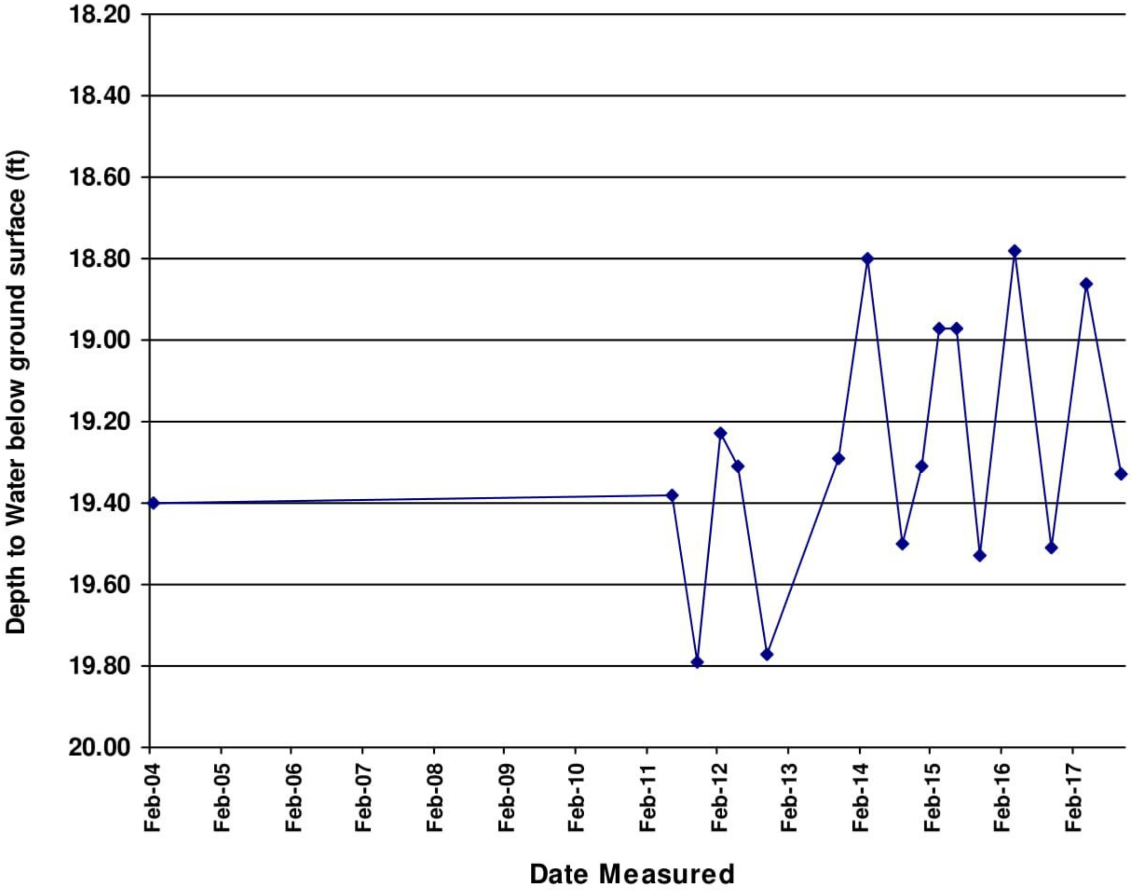

Water level Hydrograph

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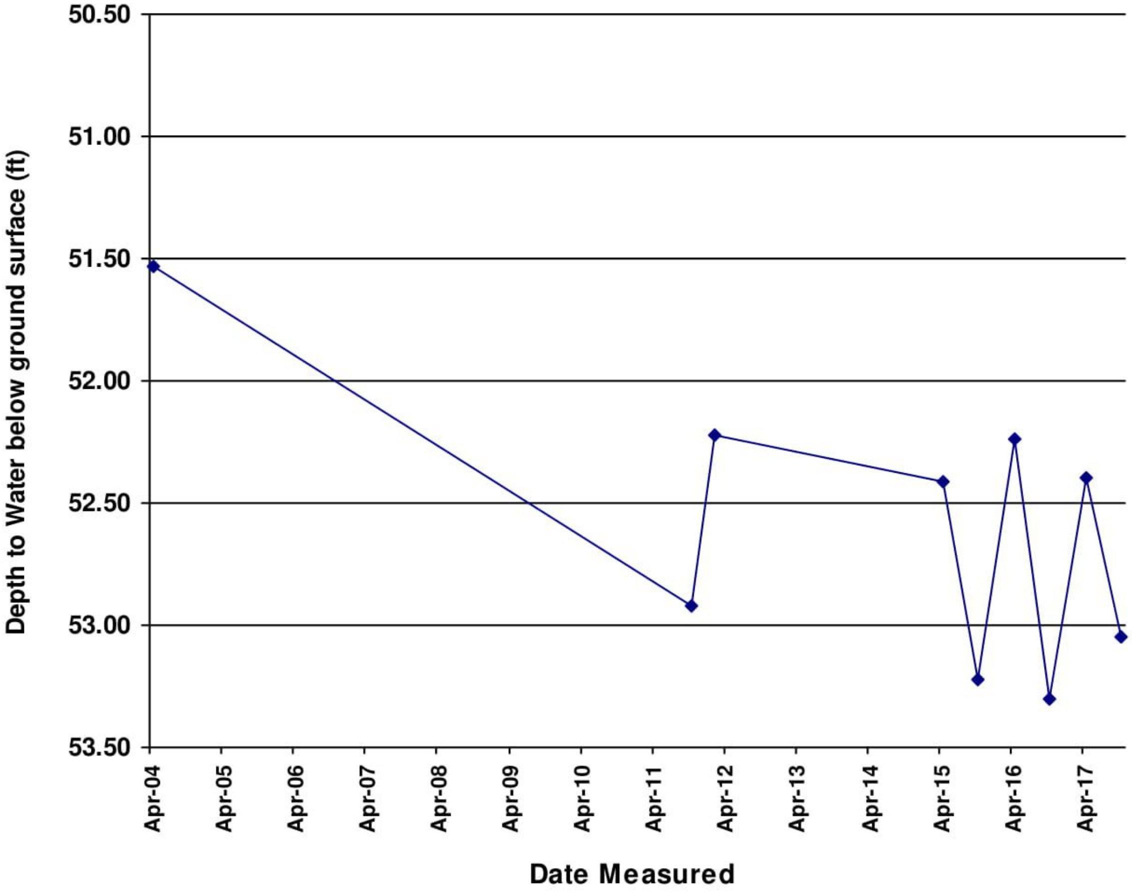

Water level Hydrograph

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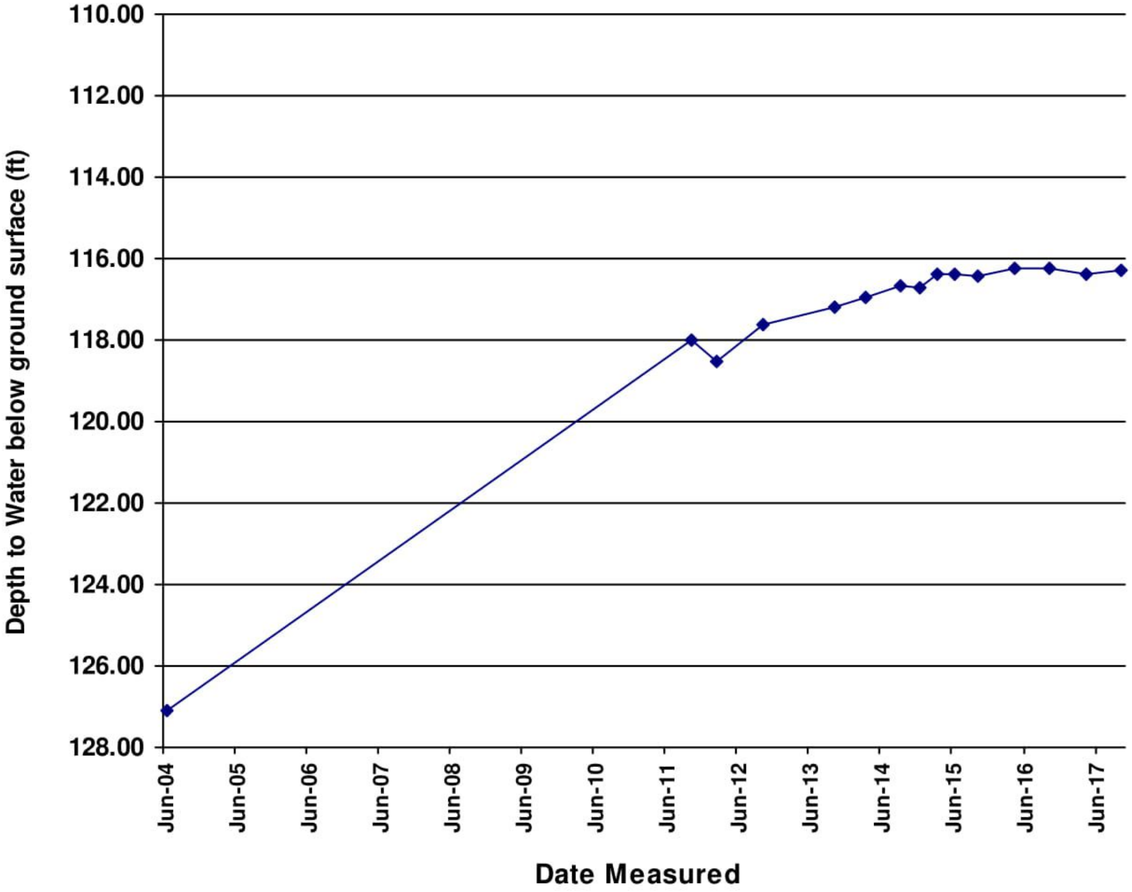

Water level Hydrograph

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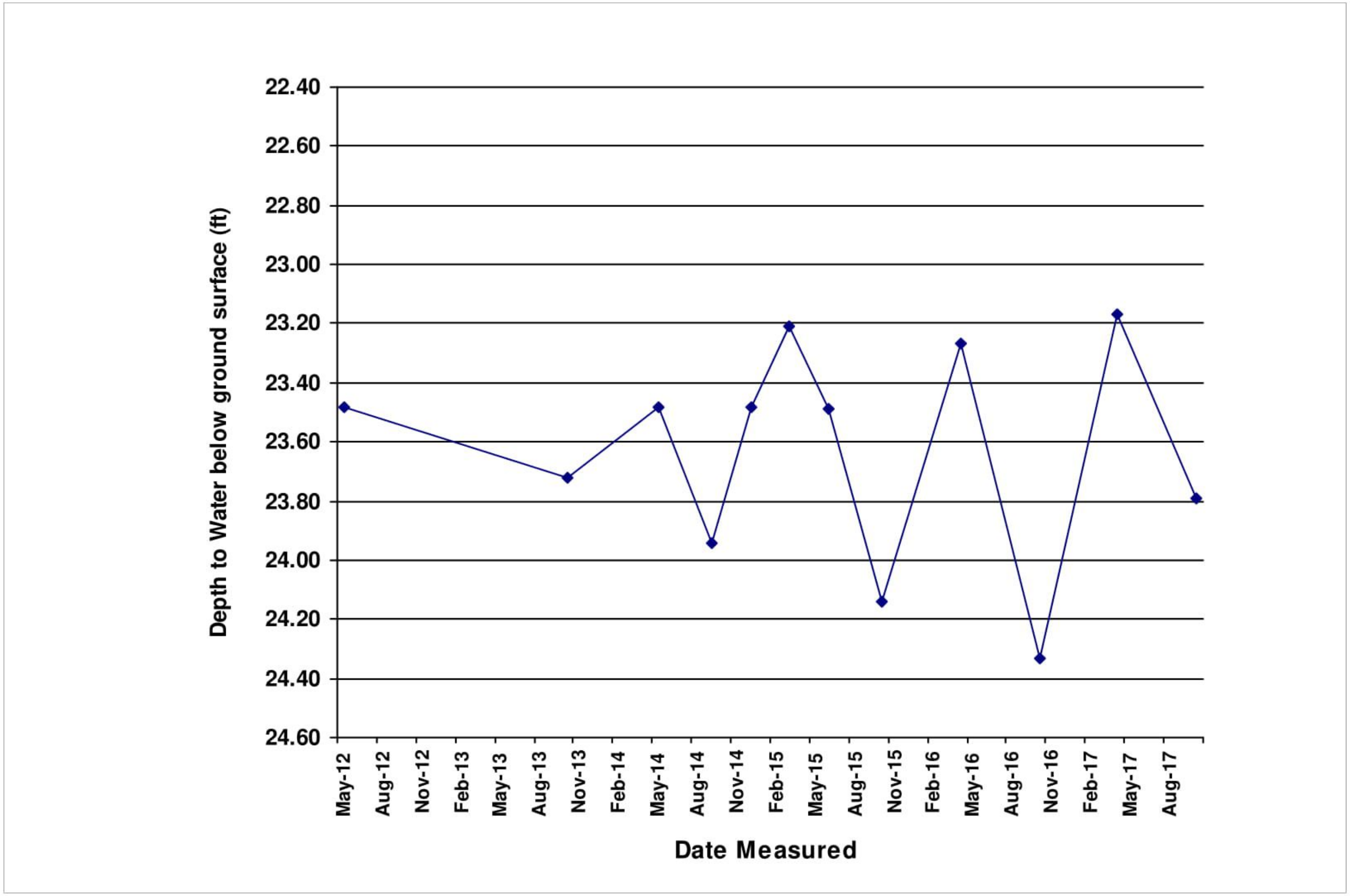
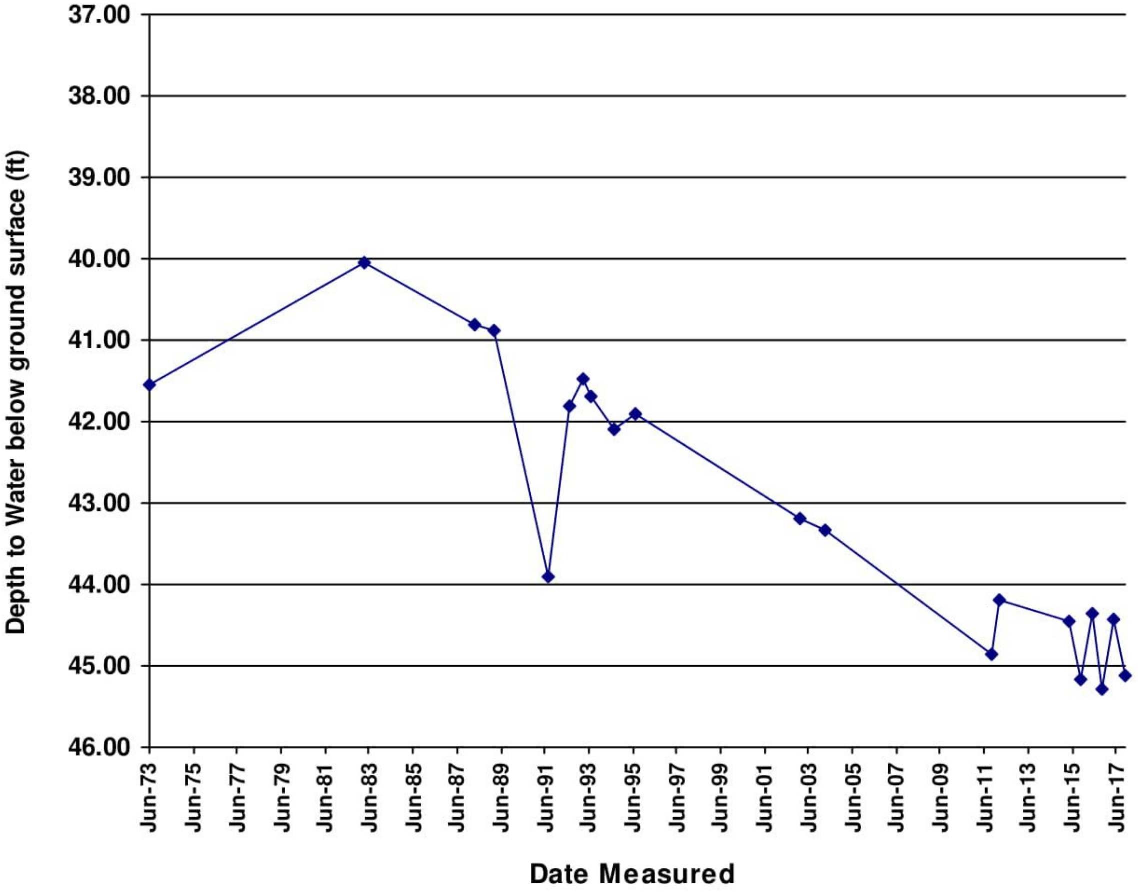


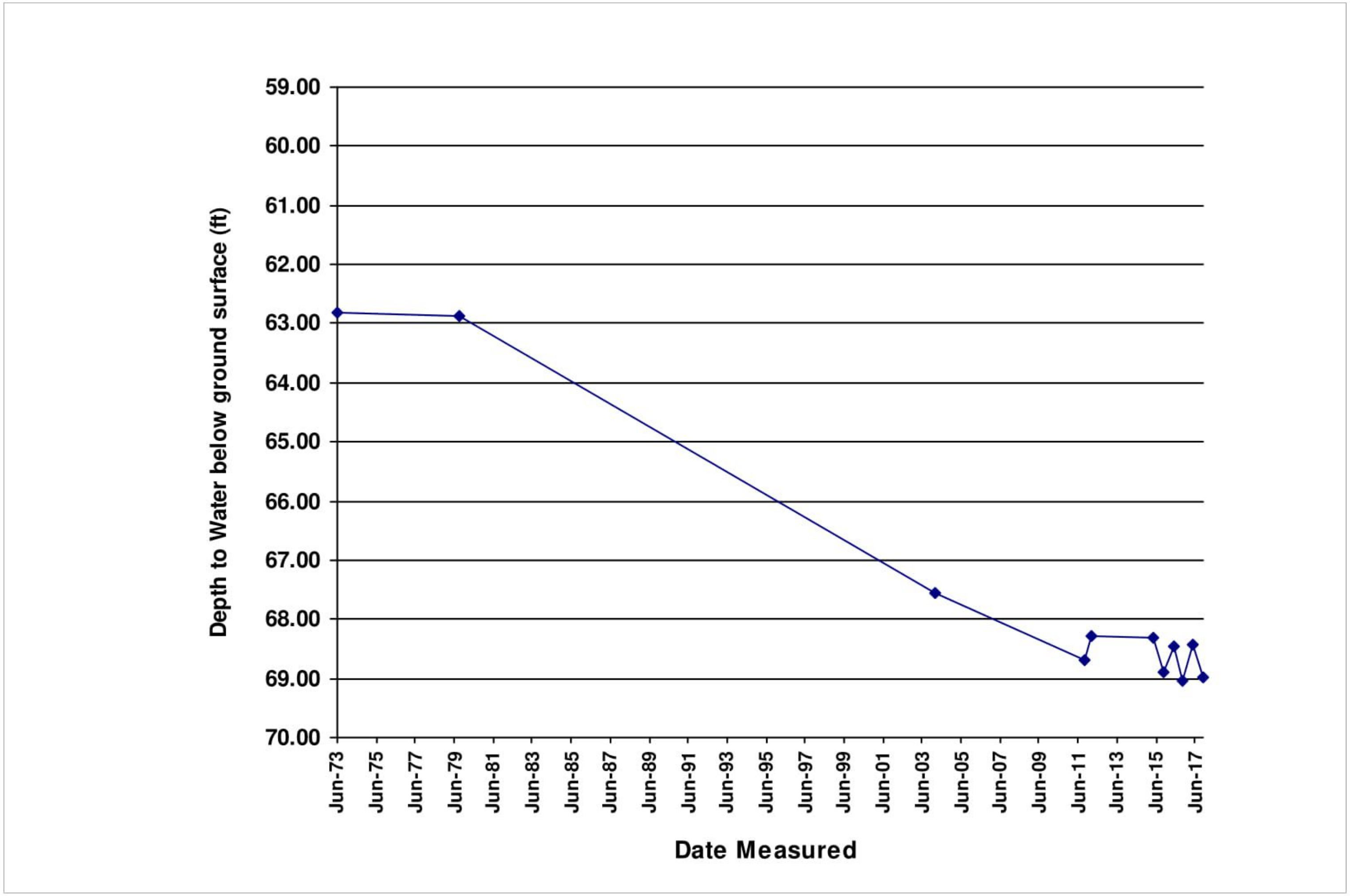
Water level Hydrograph

Point ID: **EB-019**



Water level Hydrograph

Point ID: **EB-132**



Water level Hydrograph

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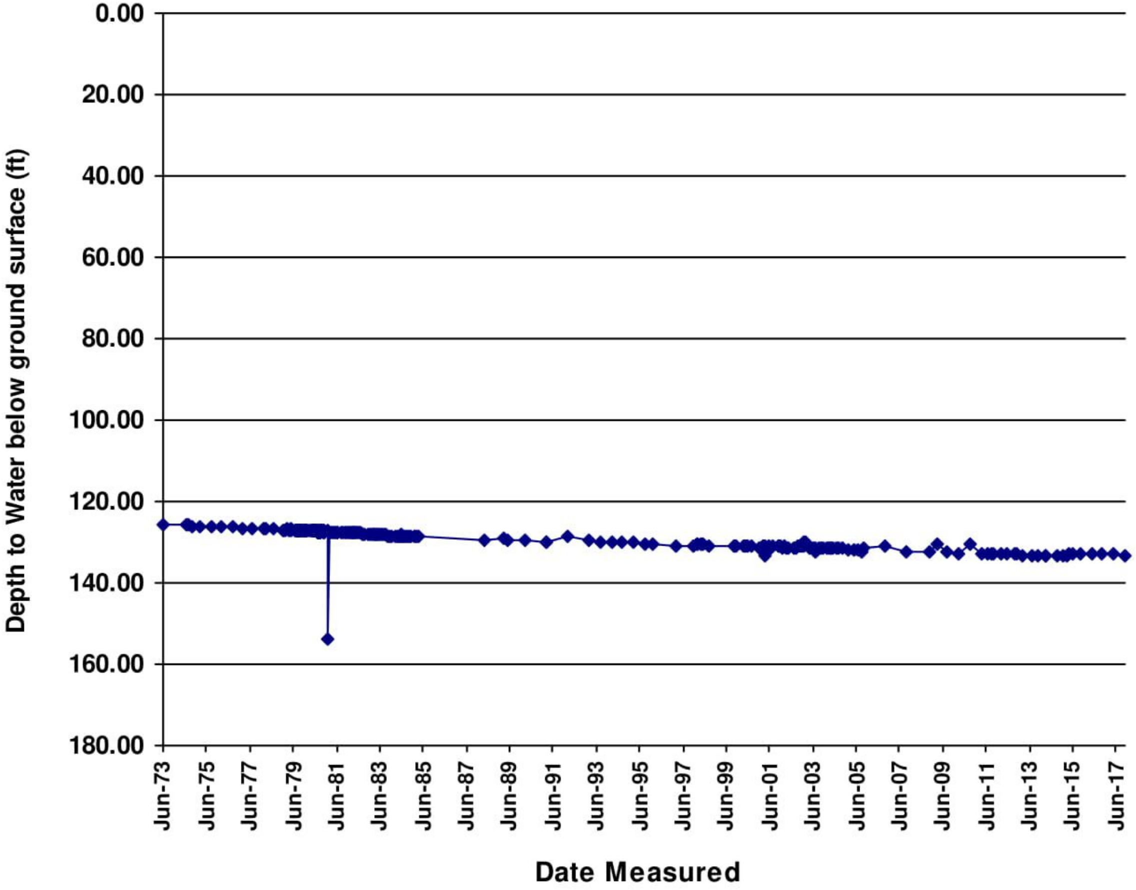

Water level Hydrograph

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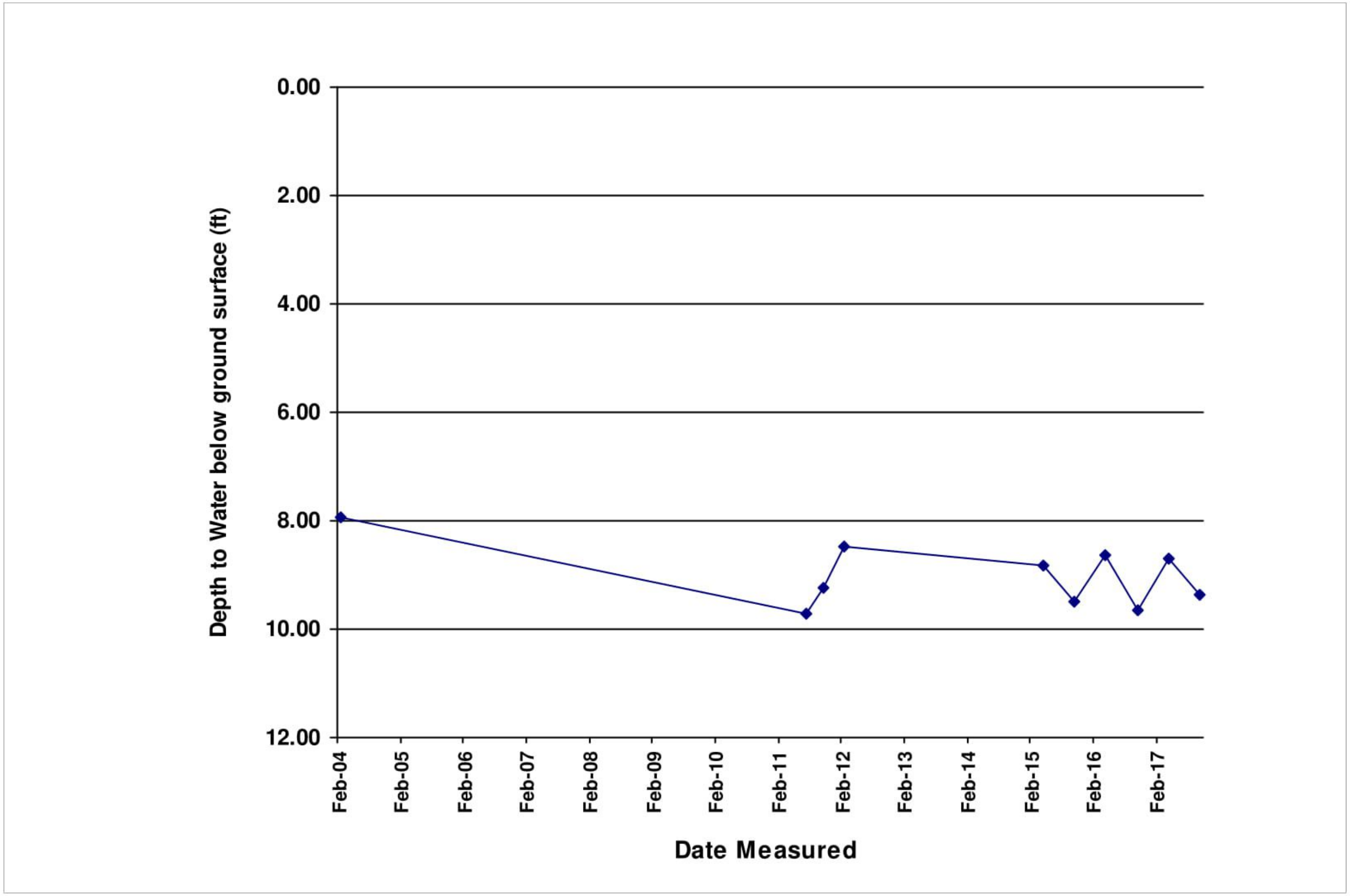

Water level Hydrograph

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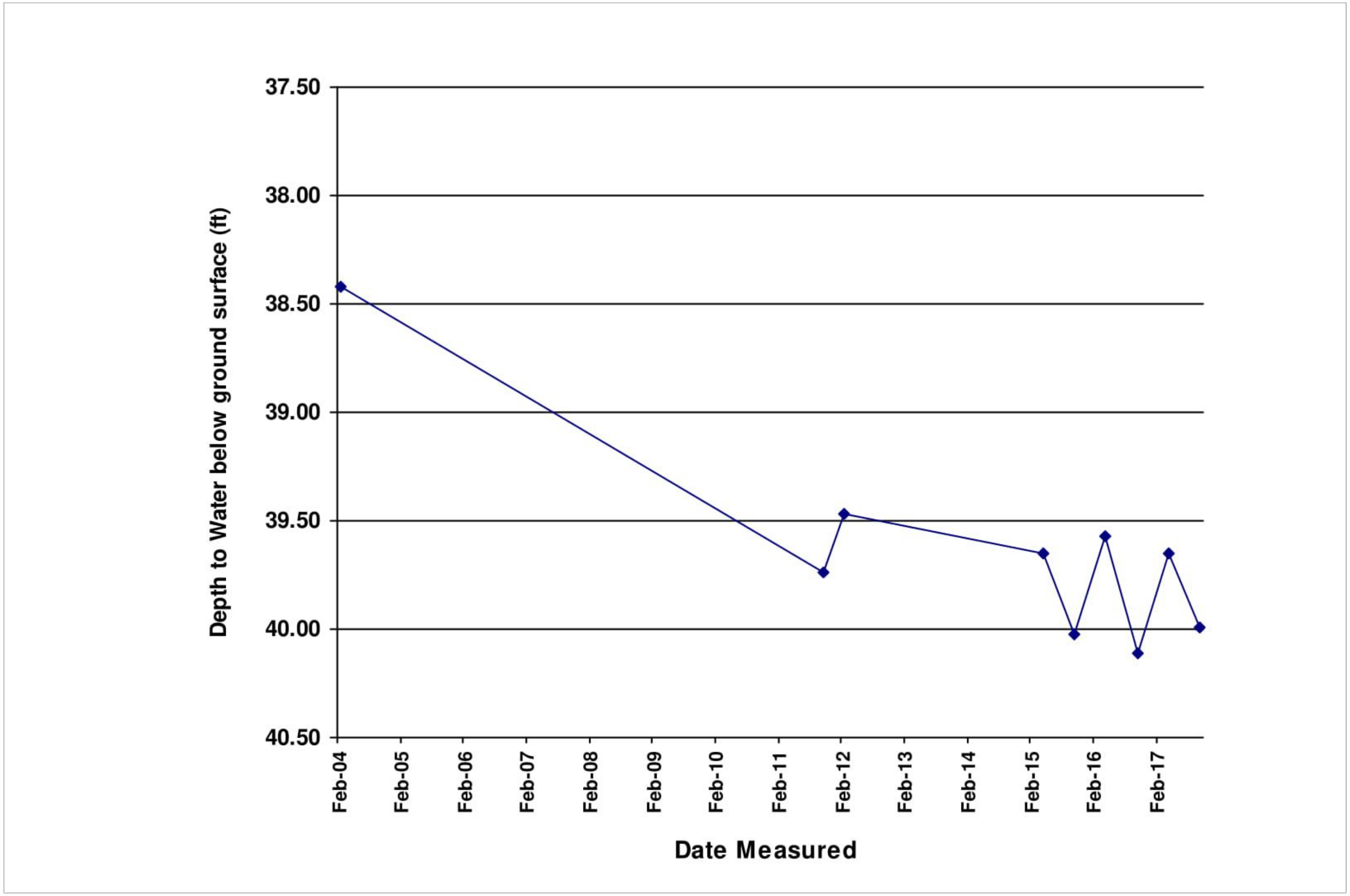

Water level Hydrograph

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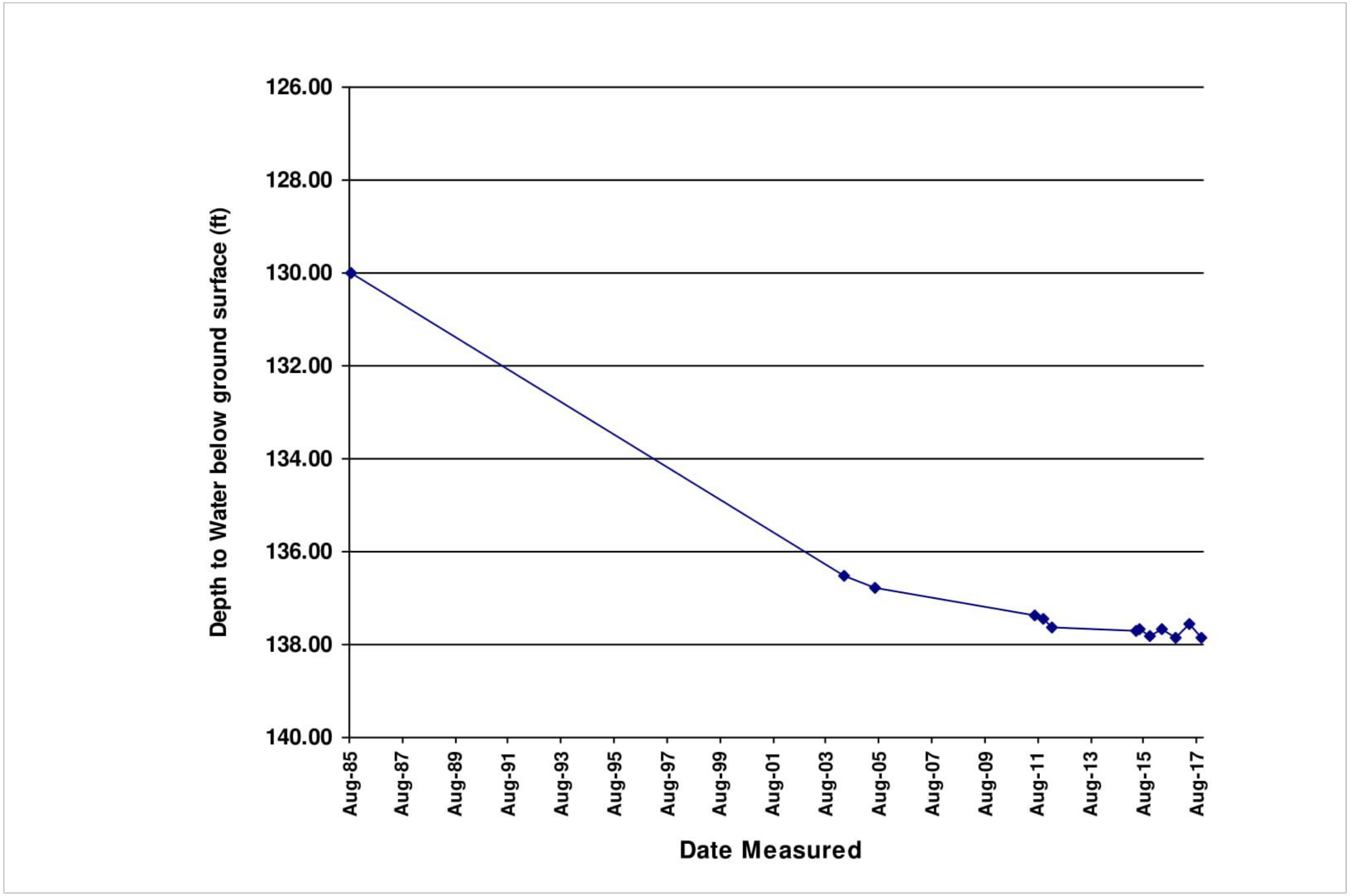

Water level Hydrograph

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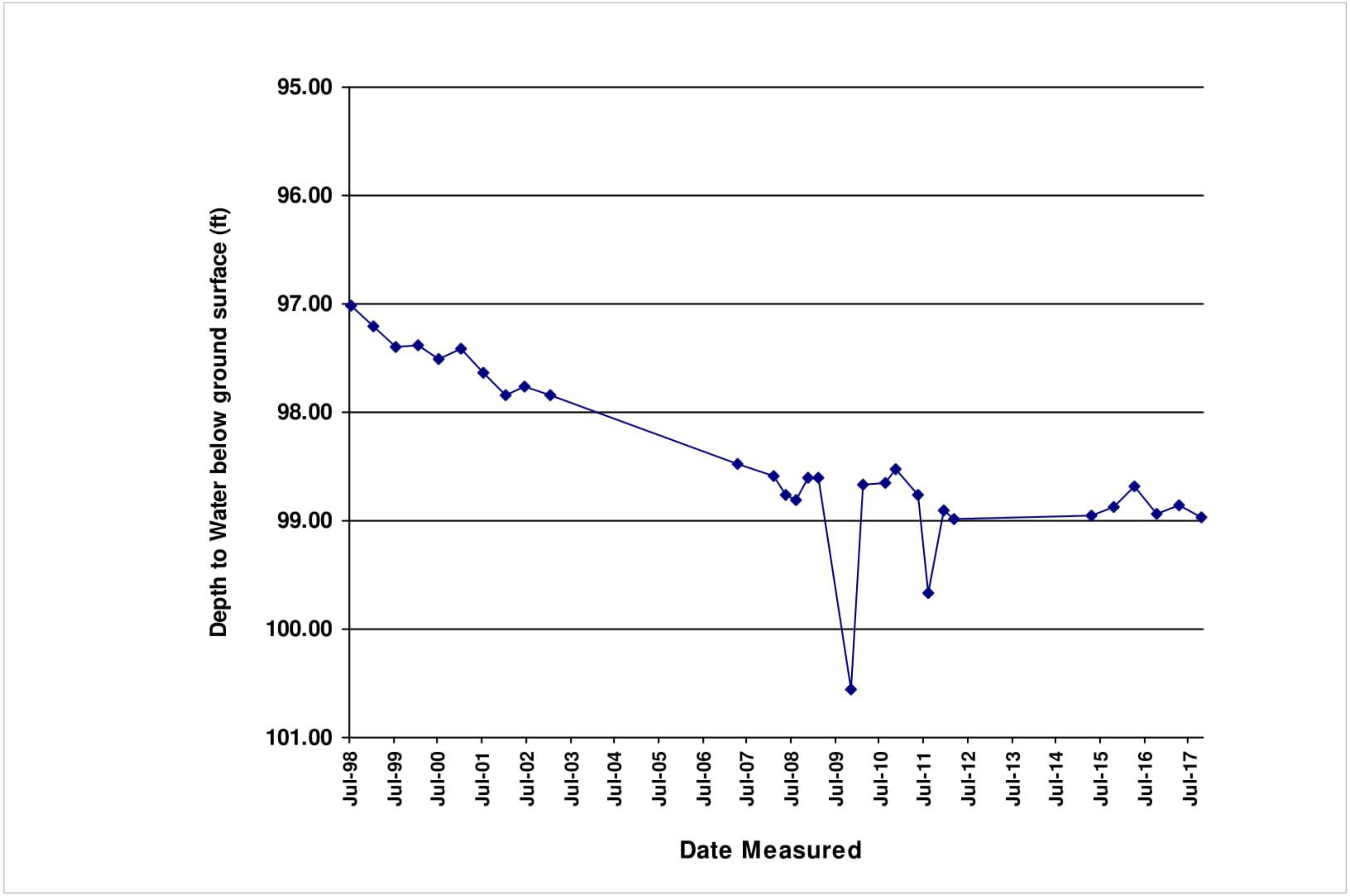

Water level Hydrograph

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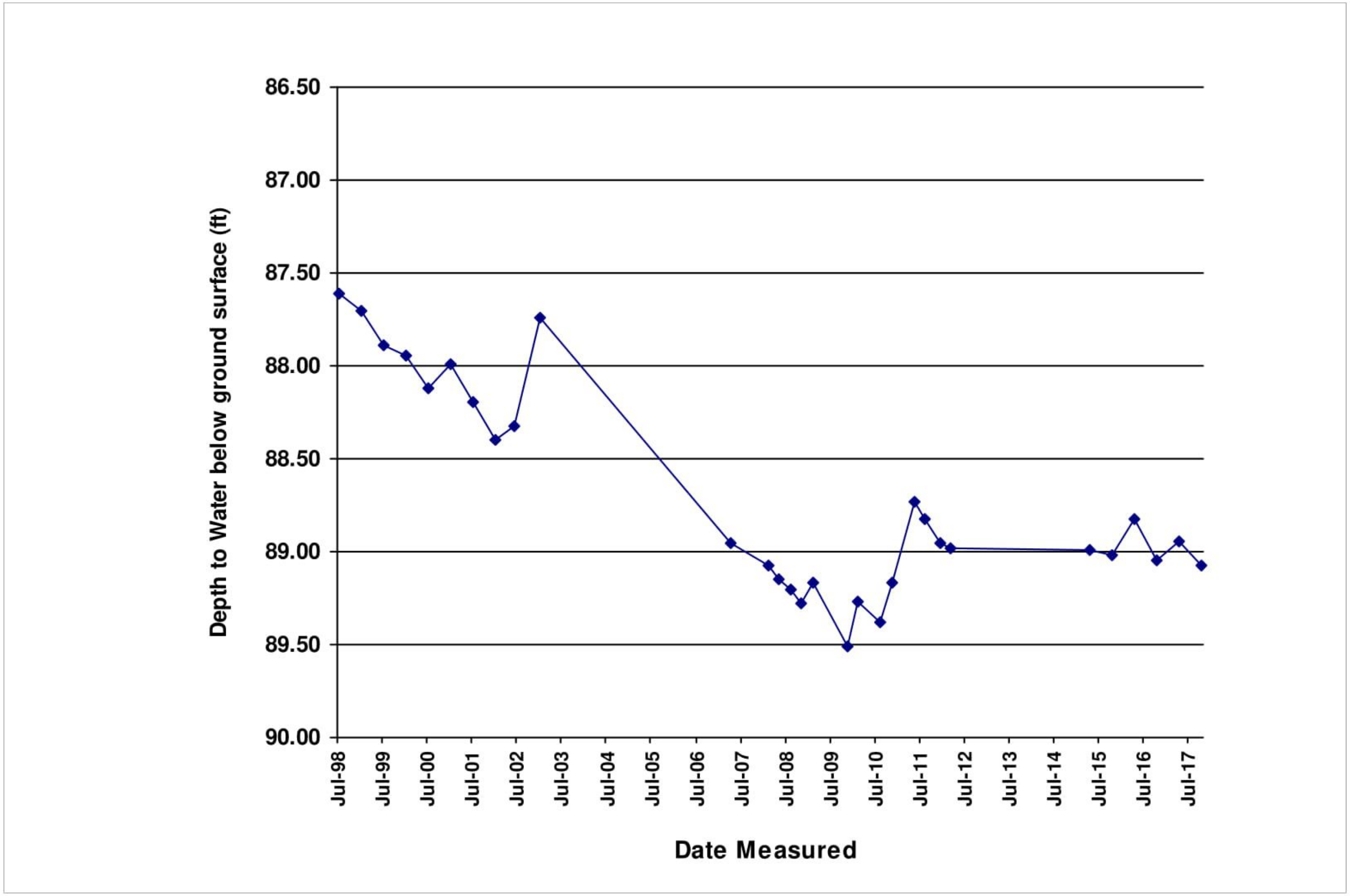

Water level Hydrograph

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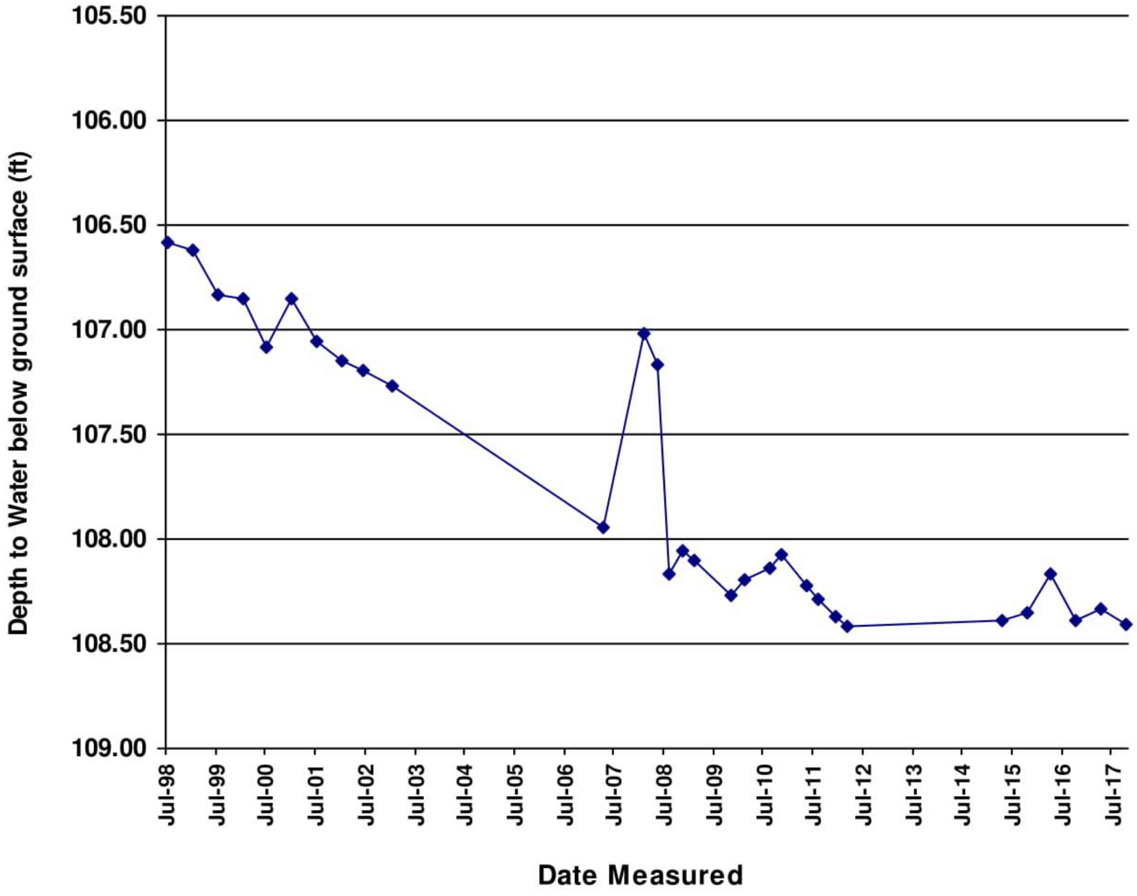

Water level Hydrograph

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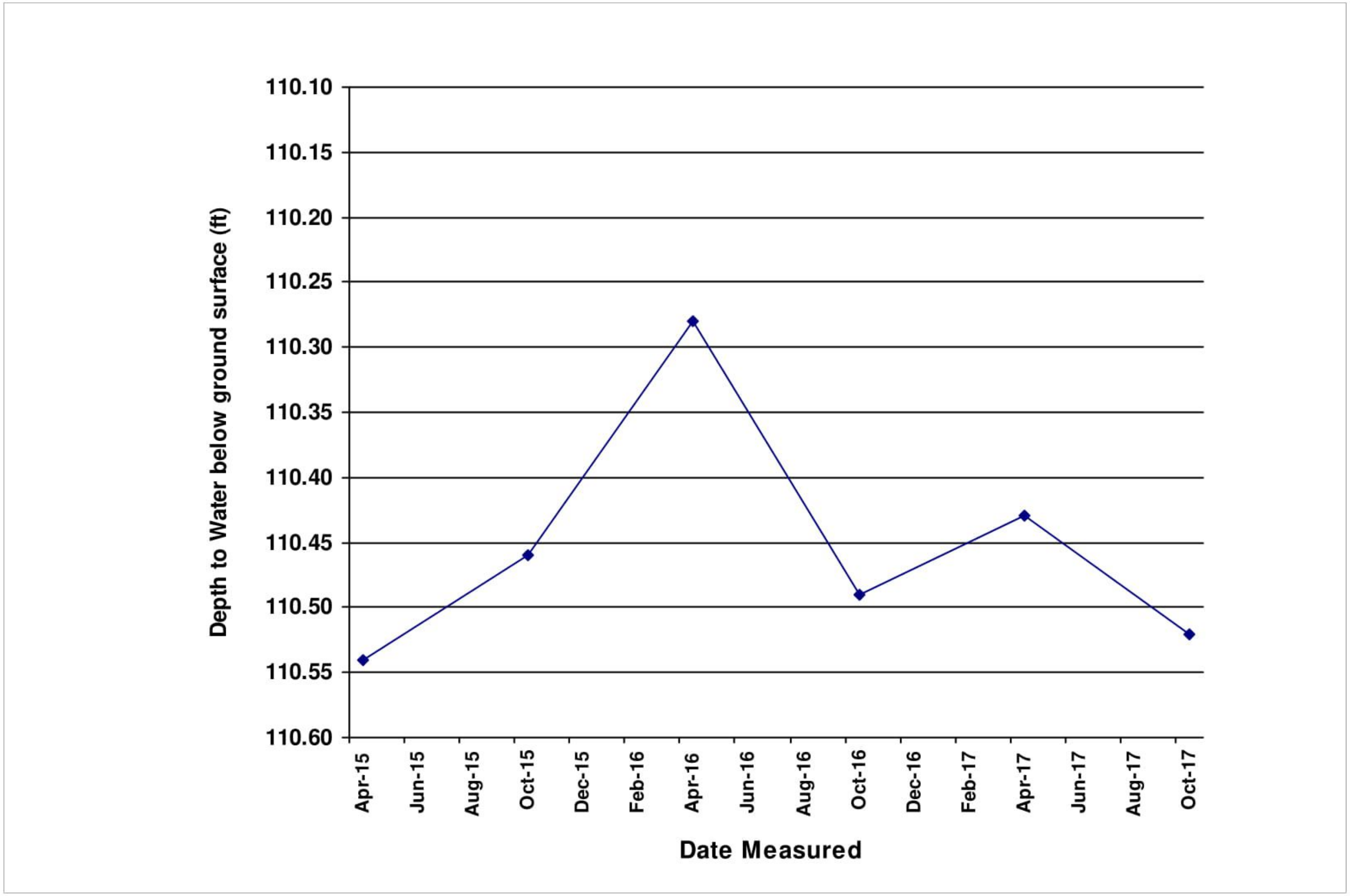

Water level Hydrograph

Point ID: **EB-696**