# ANNUAL GROUNDWATER REPORT

## 2020 - 2021

### US GYPSUM, IMPERIAL COUNTY

**September 2021**

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## 1. INTRODUCTION

US Gypsum (USG) began an expansion of the Plaster City Plant outside of Ocotillo, California, in 1999, replacing the production line from 1956 with a modern and efficient gypsum wallboard manufacturing facility. An environmental impact report and study (EIR/EIS) of the expansion was approved in 2008, and it showed declining groundwater levels in the Coyote Wells Valley Basin (**Figure 1**). This EIR/EIS found that the levels were declining prior to the Plaster City Plant expansion and suggested the Plaster City Plant expansion and operations could exacerbate groundwater level declines. In response to the EIR/EIS, a Groundwater Monitoring Program was developed for USG in 2015 (Todd 2015), and a 2018 settlement agreement with the Sierra Club updated the Monitoring Program (Imperial County Superior Court, 2018). As part of the Monitoring Program, annual reports are submitted to Imperial County by the first business day of October.

This annual report details groundwater conditions in the Coyote Wells Valley Basin and documents any changes that occurred between Spring 2020 through Spring 2021. It documents groundwater levels and groundwater quality monitored throughout the Basin by the United States Geologic Survey (USGS) each spring. It also includes additional groundwater level and quality data monitored by USG.

In general, groundwater conditions have remained stable over the past year. The USGS monitored groundwater levels in 27 wells throughout the Basin and sampled groundwater quality from 19 wells during Spring 2021. In Spring 2020, groundwater levels were monitored in 25 wells and water quality was monitored in 16 wells. Between Spring 2020 and Spring 2021, USG measured daily water levels and additional contaminants in 5 of these wells. Groundwater level declines over 4 years or more were identified in one well. Because this well constitutes less than ten percent of all monitored wells, this does not exceed the threshold for regional water decline. No significant adverse trends that indicate regional groundwater level decline or groundwater quality degradation were observed.

# 2. PHYSICAL SETTING

## 2.1. Description of Groundwater Basin

The Coyote Wells Groundwater Basin is located in the Yuha Desert, west of Imperial Valley, California (**Figure 1**). This Basin, DWR Groundwater Basin No. 7-29 (DWR, 2003), has an area of 64,400 acres (100 square miles). It is bounded by impermeable rocks to the north, west, and southwest, while its southern and eastern borders are political, as opposed to geologic, boundaries. **Appendix A** contains a more detailed description of the Basin's hydrogeology. Groundwater from this Basin is pumped for the Plaster City Plant, the community of Ocotillo, domestic wells, and, recently, dewatering of a construction project by US Customs and Border Protection that has since been abandoned.

## 2.2. Hydrology

The Coyote Wells Valley Basin has an arid climate. Over the period of record from 1933-2021 at the El Centro precipitation station (Western Regional Climate Center, 2021), the average spring to spring rainfall is 2.58 inches (**Figure 2**). Annual rainfall ranges from 0.05 inches in 2001-2002 water year to 7.3 inches during the 1982-1983 water year. From April 2020 through March 2021, annual precipitation was 1.56 inches. The Basin receives limited natural recharge.

## 2.3. Groundwater Pumping

Groundwater pumped from the Coyote Wells Valley Basin is used by the Plaster City Plant for primarily industrial use and is pumped from three wells (USG- 4, 5, and 6) located near the center of the Basin (**Figure 3**). Monitoring wells, shown in **Figure 3**, observe groundwater conditions throughout the Basin. **Figure 4** provides a closer view of well locations near Ocotillo.

**Figure 5** shows annual USG production between 1970 and 2020 and **Table 1** tabulates annual production by well for the 2005 through 2020 calendar years. The total groundwater production reported by USG in the 2020 calendar year was 347 acre feet (AF) and was 388 AF in calendar year 2019.

The total water pumped by USG during the time covered by this Annual Report, from the end of Spring 2020 (Q3 and Q4 2020) through Spring 2021 (Q1 and Q2 2021), was 382 AF. **Table 2** shows pumping during this period, as well as during the first two quarters of 2021. Quarterly production between 2020 Q3 and 2021 Q2 ranged from 91 AF (2021 Q1) to 100 AF (2021 Q2).

**Pumping from Other Sources**

Groundwater pumping from the Basin has traditionally been for residential and industrial uses. Calculating the annual pumping from the two mutual water companies and domestic wells in the Basin is beyond the scope of this study. However, a previous study estimated production from these sources to be 127 AFY as of 2004 (Todd, 2007).

In 2020, a large volume of pumping by the United States Customs and Border Protection (USCBP) for a construction project was reported along the southern portion of the Coyote Wells Basin (**Figure 3**). The 2020 annual report reported that 305.9 AF was pumped by this source from December 2019 to July 2020, but no declining water level trends were observed in southern monitoring wells. No further updates have been provided by the USCBP, and this report assumes that pumping has ceased in 2021 due to project abandonment.

## 3. MONITORING PROGRAM

**Table 3** identifies all recently monitored wells within and just east of the Basin. In Spring 2021, USGS monitored quarterly water levels in 27 wells and USG monitored daily water levels in a subset of these wells (3 production wells and 2 nearby monitoring wells). In 2020, USGS measured water levels in 25 wells. The USGS also monitored water quality in 19 wells, primarily collecting major and minor inorganic constituents. USG monitored additional contaminants in the three USG production wells. In Spring 2020, USGS measured water quality in 16 wells. Two wells that were recently monitored but were not monitored in Spring 2021 are listed at the bottom of **Table 3**. **Figure 3** shows recently monitored wells in and surrounding the Coyote Wells Valley Basin, and **Figure 4** shows monitoring wells, zoomed in on Ocotillo. In these figures blue indicates wells that have both water level (WL) and water quality (WQ) data from 2021, yellow indicates wells with water level data only and green indicates water quality data only.

The USGS measures water levels and water quality semi-annually and reports results publicly on the National Water Information System (NWIS) at https://waterdata.usgs.gov/. USG monitors water levels in the three production wells (USG-4, USG-5, and USG-6) and for two nearby monitoring wells (36A1/MW-2B and 36A2/ MW-2A). Water level measurements in the three production wells may not be representative of regional water levels because the water level fluctuates significantly due to pumping. When the well is pumped, the groundwater levels in and near the well decline. The resultant drawdown is dependent on several variables, including the pumping rate, well efficiency, and the type of pump. Hydrographs for all wells are found in **Appendix B**, and fluctuations in the production wells due to pumping are evident in these hydrographs.

### 3.1. WATER LEVELS

**Appendix B** contains hydrographs for all monitoring wells. The hydrographs are presented in two sets. The first set shows hydrographs for all active wells with the same scale for easy comparison. The second set shows the same water levels and wells, but with a vertical range of 25 feet (ft) to highlight subtle changes in the water levels.

Several key wells, shown with their hydrographs in **Figure 6**, were selected to show trends across the groundwater basin. These wells were chosen as key wells because they have relatively complete water level histories and locations representative of the groundwater basin. For easy comparison, the hydrographs in **Figure 6** all use the same vertical scale.

Drawdown from pumping in the USG wells is observed in the nearby monitoring Wells 31B1 and 36D2. These wells show decreasing trends from the 1990s through 2008 and then a slight increase in response to lower pumping rates in 2008-2015. From 2015-2021 water levels show a slightly decreasing trend, likely due to recent increases in USG production.

Wells further way from the USG wells do not show a clear response to USG pumping rates. For example, Well 24D1, north of the USG wells, shows steadily decreasing water levels over the past 30 years while water levels in Well 16J1 have steadily increased during this time period. Towards the eastern edge of the Basin, Well 42L1 reflects seasonal variations and shows sharp increases after peak precipitation events in 1993 and 1997.

Of the 21 wells monitored by the USGS in both Spring 2020 and Spring 2021, eight show increasing water levels, ten show stable water levels of less than 0.18 ft in either direction, and four show decreasing water levels (**Table 4**). These four wells are all located in the eastern portion of the Basin or slightly east of the Basin. Because of their fluctuations in water levels due to pumping, the three USG production wells are excluded from this trend analysis. For the monitoring wells 36A1(MW-2B) and 36A2 (MW-2A), which are monitored by both the USGS and USG, the Spring USGS measurements were used for trend analysis to maintain consistent methodology.

The maximum water level decrease observed during Spring 2020 through Spring 2021 was 0.64 ft in Well 32R1, the most northeastern well in the Basin. The maximum increase was 0.99 ft, measured in Well 11G1. In general, groundwater trends from 2020 to 2021 have remained similar to those from 2019 to 2020.

The groundwater contours and flow direction near Ocotillo are shown in **Figure 7**. Like previous years, the groundwater flows, in general, from west to east. A pumping depression on the west is likely due to recent pumping in one or more private, non-USG wells.

## 3.2. Assessment of Groundwater Level Declines

Groundwater level declines in the Coyote Wells Valley Basin have been previously characterized as either short-term or long-term declines. Short-term drawdowns correspond to nearby pumping and quickly recover after nearby pumping has ceased. Production wells have alternating periods where the well is on and off. When the well pump is operating, groundwater levels in and around the pumping well will decline. As shown in hydrographs for the production wells USG-4, USG-5, and USG-6 (**Appendix B**), water levels vary significantly while the wells are pumping, but levels recover within days.

Short-term declines in water levels can adversely affect surrounding wells. This drawdown is called well interference. The monitoring program developed for USG addresses well interference with the following performance standard:

> *Well interference is defined as the combined pumping from all USG pumping wells so as **not to exceed 5 feet of drawdown at the nearest water-supply well.***

No private wells have reported well interference issues due to USG pumping thus far.

Long-term declines do not quickly recover, and long-term declines are exacerbated by additional pumping. Several wells in the Coyote Wells Valley Basin exhibit long-term declines. The performance standard to evaluate long-term regional decline in the Coyote Wells Valley Basin is as following:

> *Water level decline is defined as four consecutive* ***annual*** *groundwater measurements (****spring only****) declining at a rate that is greater* ***than 0.1875 feet per year****, occurring at more than* ***10 percent of wells*** *in the regional monitoring program.*

Spring measurements are used to calculate the rate of decline to avoid seasonal effects on groundwater levels, and USGS measurements are used to maintain consistent methodology. The calculated rate of decline for the period of record (2010-2021), is listed by well in **Table 4**. Declines greater than 0.1875 feet in a year are highlighted. Well 42L1 is the only well to show four consecutive years of water level decline, reporting a water level decrease of 0.48 ft from 2020 to 2021 and a decline of greater than 0.1875 feet per year for the past five years. During this five-year period, the average decline was 0.43 ft. Well 42L1 is the only well in the monitoring program to show water level declines over at least four consecutive years since annual reporting began.

The groundwater level data shown in **Table 4** and **Figure 6** indicate that the pattern and rates of groundwater level changes in Well 42L1 differ from that of other monitoring wells in the Basin, including wells closer to USG wells. This suggests that local factors may be affecting water level declines in addition to regional decline. The hydrographs in **Figure 6** shows that historical water level trends in the Basin vary by location. Comparison between the Well 42L1 hydrograph on **Figure 6** and the annual rainfall amounts on **Figure 2** show that high rainfall years correspond with short-term increases in groundwater levels at Well 42L1. This well is located along Yuha Wash, which concentrates and percolates rainfall-induced runoff from surrounding uplands and may make this well's water levels susceptible to precipitation trends, despite the arid environment. This well may be particularly vulnerable to shifting precipitation trends due to climate change.

Despite declines at a rate greater than 0.1875 feet per year for five years, Well 42L1 represents less than 10 percent of the total wells monitored (excluding USG production wells). The performance standard for assessing long-term regional decline has not been exceeded.

In subsequent annual reports, attention should be given to Well 31B1. For the past four years, water levels in this well have decreased. For three consecutive years, the groundwater levels decreased by more than 0.1875 ft, followed by a decrease of 0.17 ft from 2020-2021. Because the most recent annual groundwater level decrease was less than 0.1875 ft, this well does not meet the criteria for groundwater level decline. Well 31B1 is located near the USG production wells, and local water level decreases may be linked to USG production. Even if water levels in Well 31B1 had decreased by 0.1875 feet for five consecutive years, Wells 31B1 and 42L1 would still constitute less than 10 percent of all monitored wells.

# 4. WATER QUALITY

## 4.1. GROUNDWATER QUALITY

The EIR/EIS indicated that increased groundwater production can lead to groundwater quality degradation. Outcrops of Tertiary marine sediments occur in the Ocotillo area and the No Mirage area in the east of the groundwater basin, and these sediments are present beneath the alluvial aquifer. Groundwater stored in these sediments naturally has a higher salinity level. Increases in groundwater production could increase groundwater salinity in the Coyote Wells Valley Basin through two processes:

- lateral migration of saline water from near-surface Tertiary marine sediments
- vertical migration of saline water from the Tertiary marine sediments present at depth below the alluvial aquifer.

The monitoring program is designed to detect changes in total dissolved solids (TDS) concentrations due to increased pumping by USG wells. TDS is used as an indicator for general mineral groundwater quality. Tracking TDS changes is a simplified, but widely accepted, method to detect changes in general water quality.

## 4.2. POTENTIAL WATER QUALITY DEGRADATION

TDS concentrations for the active USGS monitoring wells are shown in **Table 5** and tables of other constituents are presented in **Appendix C.** The water quality data shows clear spatial trends in the Basin, with little change over recent years. While higher TDS concentrations exist in the eastern portion of the Basin, the stable temporal trends show that high TDS concentrations in the east are most likely not migrating west.

The following performance standard has been developed as an early warning of changing conditions from USG pumping and its potential effect on water quality:

> *A significant increasing trend in* ***total dissolved solids*** *(TDS) concentrations is defined as TDS concentrations in groundwater from any well in the groundwater basin whereby* ***four consecutive annual samples (collected each spring)*** *show a cumulative increase greater than* ***20 percent of the long-term average*** *for that well.*

No wells show increasing TDS concentrations, as defined by the updated 2018 USG performance standard listed above. Four wells (11H3, 24D1, 30R1, and 34B4) showed an increase in TDS over the past year that was at or greater than 5 percent of the long-term average.  Eleven of the seventeen active monitoring wells with both 2020 and 2021 measurements showed stable TDS concentrations, defined as a change of less than five percent of the mean concentrations. Well 24D1 showed a TDS concentration decrease of greater than 5 percent. The wells with decreasing TDS concentrations are located throughout the Basin.

**Figures 8A** and **8B** show springtime TDS concentrations. **Figure 8A** shows all of the wells with a scale of 0 to 1,600 mg/L and **Figure 8B** shows Well 31B1, a key well that has shown salinity fluctuations over the past several years. All active wells in the monitoring network have satisfied the performance standard for TDS, meaning that cumulative 4-year increases in TDS concentrations (if any) have been less than 20 percent of the well's average TDS concentration.

**Figure 9** shows TDS concentrations within the groundwater basin for Spring 2021 data are provided in **Appendix C**. Although the maximum TDS concentration is used as the metric for reporting TDS concentrations, every well in the monitoring network only had TDS concentrations measured once in Spring 2021. As documented in **Table 5**, one well with previously high TDS concentrations (42A8) showed a decline from a high of 1,220 mg/L in April 2011 to 556 mg/L in March 2021. Well 24B1, located north of Ocotillo, had the highest March 2021 TDS concentration at 1,280 mg/L. This concentration is the same as the Spring 2020 TDS concentration.

## 5. SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA)

Pursuant to the Sustainable Groundwater Management Act (SGMA), Imperial County assumed the role of Groundwater Sustainability Agency (GSA) for all groundwater basins and sub-basins within the county. Consequently, the County has been deemed the exclusive GSA for the Coyote Wells Valley Basin.

The County has continued to work cooperatively with local agencies, water providers, and other interested stakeholders within the Basin in this role. DWR has determined Coyote Wells Valley Basin to be very low priority basin and is therefore not required to prepare a Groundwater Sustainability Plan (GSP). Should the County choose to prepare a GSP for the Basin, the County will consider the interests of all beneficial uses and users of groundwater, as directed by California Water Code section 10723.2. USG is a beneficial user of groundwater and should remain aware of and participate in any GSP process; groundwater management may change how groundwater is monitored, reported, or allocated in the Basin.

As of August 2021, there is no initial notification for a GSP of Coyote Wells Valley Basin and there are no other indications that the County is moving ahead in the process.

## 6. CONCLUSIONS

The USG monitoring program meets every objective established in the EIR/EIS. Continued data collection by the USGS is crucial for maintaining monitoring. The current monitoring network and program is sufficient to identity the occurrence of regional water level declines and identify regional water level declines related to the Plaster City Plant production. This annual report identified one well that has shown declining water levels over the past five years. However, this well represents less than 10 percent of the actively monitored wells in the monitoring network.

The current monitoring program meets the objectives set forth in EIR/EIS, noting the importance of continued USGS data collection. The water level data collected are sufficient to identify increases in the rate of water-level decline and for potential water quality degradation. In summary, none of the performance standards have been exceeded, and no significant adverse trends have been identified.

US Gypsum will prepare the next Annual Report due to the County of Imperial by the first business day in October 2022.

## 7. REFERENCES

County of Imperial/ U.S. Bureau of Land Management, 2008, U.S. Gypsum Company Expansion/Modernization Project, Imperial County, California, Volumes I and II Final Environmental Impact Report/Environmental Impact Statement.

DWR, California's Ground Water 2003. Bulletin No. 118, Basin Number 7-29. accessed August 2021. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/2003-B118-Basin-Descriptions/B118_2003_BasinDescription_7_029.pdf

Imperial County Superior Court, 2018, Settlement Agreement for *Sierra Club v. County of Imperial, et al.*, No. 97911.

Loeltz, O.J, Burgde Irelan, J.H. Robison, and F.H. Olmstead, Geohydrologic Reconnaissance of the Imperial Valley, California, USGS Professional Paper 486-K, 1975.

Skrivan, J. A, 1977, Digital-Model evaluation of the Ground-Water Resources in the Ocotillo-Coyote Wells Basin, Imperial County, California. U.S. Geological Survey. Water–Resources Investigations 77-30. 50 p.

Todd Groundwater, 2007, Review of Groundwater Issues, Draft EIR/EIS for US Gypsum Expansion/Modernization Project.

Todd Groundwater, 2015, Groundwater Management Plan, for US Gypsum, Imperial County.

US Geological Survey, National Water Information System, https://waterdata.usgs.gov/ca/nwis/nwis, Last Accessed: August, 2021.

Todd Groundwater, US Gypsum Annual Reports, 2013-2020, El Centro, California.

Western Regional Climate Center, Desert Research Institute, El Centro Station, https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca2713, accessed August 2021.

# TABLES

## Table 1. Annual USG Pumping by Well (AFY)

| Calendar Year Pumping | Well #4 | Well #5 | Well #6 | Total |
|---|---|---|---|---|
| **2005** | 226 | 199 | 149 | 575 |
| **2006** | 199 | 188 | 162 | 549 |
| **2007** | 192 | 174 | 135 | 501 |
| **2008** | 140 | 136 | 125 | 400 |
| **2009** | 75 | 84 | 78 | 237 |
| **2010** | 78 | 82 | 79 | 239 |
| **2011** | 81 | 83 | 82 | 247 |
| **2012** | 69 | 109 | 70 | 248 |
| **2013** | 106 | 66 | 78 | 250 |
| **2014** | 98 | 59 | 82 | 239 |
| **2015** | 87 | 93 | 91 | 271 |
| **2016** | 115 | 118 | 106 | 339 |
| **2017** | 93 | 148 | 121 | 362 |
| **2018** | 154 | 127 | 92 | 374 |
| **2019** | 145 | 101 | 141 | 388 |
| **2020** | 109 | 108 | 130 | 347 |

## Table 2. Quarterly USG Pumping by Well (AF per quarter)

| Year | Quarter | #4 | #5 | #6 | TOTAL | Annual Distribution |
|---|---|---|---|---|---|---|
| 2020 | Q1 | 23 | 17 | 31 | 71 | -- |
| 2020 | Q2 | 29 | 26 | 30 | 85 | -- |
| 2020 | Q3 | 30 | 32 | 34 | 95 | 24.9% |
| 2020 | Q4 | 28 | 33 | 35 | 96 | 25.1% |
| 2021 | Q1 | 28 | 30 | 33 | 91 | 23.8% |
| 2021 | Q2 | 26 | 36 | 38 | 100 | 26.2% |

## Table 3. List of Actively Monitored Wells and Available Data for 2021

| Well Name | Short Name | Active WL Network | Active WQ Network | First WL Measurement | First WQ Measurement | Agency |
|---|---|---|---|---|---|---|
| 17S11E22E2 | 22E2 | Y | | 1975 | 1975 | USGS |
| 17S10E11B1 | 11B1 | Y | | 1975 | * | USGS |
| 17S10E11G1 | 11G1 | Y | | 1967 | 1967 | USGS |
| 17S10E11G4 | 11G4 | Y | | 1978 | * | USGS |
| 17S10E11H3 | 11H3 | Y | Y | 1987 | 1987 | USGS |
| 17S11E16J1 | 16J1 | Y | | 1970 | 1972 | USGS |
| 16S11E23B1 | 23B1 | Y | | 1974 | 1964 | USGS |
| 16S9E24B1 | 24B1 | Y | Y | 1976 | 1977 | USGS |
| 16S9E24D1 | 24D1 | Y | Y | 1976 | 1977 | USGS |
| 16S9E25K2 | 25K2 | Y | Y | 1972 | 1972 | USGS |
| 16S9E25M2 | 25M2 | Y | Y | 1991 | 1971 | USGS |
| 16S9E26F1 | 26F1 | Y | Y | 1998 | 2013 | USGS |
| 16S11E27F1 | 27F1 | Y | | 1975 | * | USGS |
| 16S10E27R1 | 27R1 | Y | | 1975 | 1975 | USGS |
| 16S10E29H1 | 29H1 | Y | | 1975 | 1975 | USGS |
| 16S10E20R1 | 30R1 | | Y | 1959 | 1959 | USGS |
| 16S10E31B1 | 31B1 | Y | Y | 1993 | 2013 | USGS |
| 16S01E32N1 | 32N1 | | Y | 2018 | 2018 | USGS |
| 16S10E32P2 | 32P2 | Y | | 2017 | * | USGS |
| 16S01E32P3 | 32P3 | | Y | 2016 | 2016 | USGS |
| 15S11E32R1 | 32R1 | Y | | 1974 | 1964 | USGS |
| 16S9E34B1 | 34B1 | | Y | 1998 | 1997 | USGS |
| 16S9E35M1 | 35M1 | Y | | 1962 | 1962 | USGS |
| 16S9E36A1 | 36A1(MW-2B) | Y | Y | 2012 | 2013 | USGS, USG |
| 16S9E36A2 | 36A2 (MW-2A) | Y | Y | 2012 | 2013 | USGS, USG |
| 16S9E36B1 | 36B1 / USG-6 | Y | Y | 1969 | 1963 | USGS, USG |
| 16S9E36C2 | 36C2 | | Y | 1975 | 1961 | USGS |
| 16S9E36D2 | 36D2 | Y | | 1975 | 1975 | USGS |
| 16S9E36G3 | 36G3 / USG-4 | Y | Y | 1969 | 1963 | USGS, USG |
| 16S9E36H2 | 36H2 | Y | Y | 2015 | 2015 | USGS |
| 16S9E36H2 | 36H2 / USG-5 | Y | Y | 1954 | 1963 | USGS, USG |
| 16S10E42A8 | 42A8 | | Y | 1994 | 1994 | USGS |
| 16S11E42L1 | 42L1 | Y | | 1975 | 1975 | USGS |

* No WQ data collected

Wells Not Monitored in 2021 that were recently active

| Well Name | Short Name | Agency | Reason |
|---|---|---|---|
| 16S10E28D1 | 28D1 | USGS | No reason given by USGS, Last monitored 2020 |
| 16S10E32P1 | 32P1 | USGS | No reason given by USGS, Last monitored 2017 |

**Table 4. Water Level Trends**

| Well | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | Maximum consecutive years of declines greater than 0.1875 ft/year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11B1 | 0.60 | 0.52 | 0.56 | 0.44 | 0.37 | 0.60 | 0.62 | 0.43 | 0.42 | 0.37 | 0.47 | 0.49 | |
| 11G1 | | 0.83 | -0.18 | 0.84 | 0.64 | -0.39 | 1.46 | -0.89 | | | 1.13 | 0.99 | |
| 11G4 | 0.62 | 0.29 | 0.30 | 0.60 | 0.55 | 0.42 | 0.62 | -0.48 | 1.70 | 0.28 | 0.24 | 0.57 | |
| 11H3 | | | -1.09 | 2.05 | 0.29 | 0.84 | 0.66 | -0.05 | 0.79 | 0.24 | 0.39 | 0.37 | |
| 16J1 | 0.38 | 0.46 | 0.12 | 0.27 | 0.13 | 0.03 | 0.20 | 0.08 | 0.27 | 0.06 | 0.06 | 0.21 | |
| 22E2 | 0.38 | 0.41 | 0.16 | 0.24 | 0.46 | -0.27 | 0.20 | 0.71 | -0.34 | 0.03 | 0.09 | 0.17 | |
| 23B1 | -0.30 | 0.26 | -0.45 | -0.06 | -0.63 | 0.55 | -0.10 | 3.74 | -3.80 | 0.05 | -0.06 | -0.32 | 1 |
| 24B1 | -0.07 | -0.23 | -0.16 | | | -0.14 | -0.09 | -0.10 | -0.13 | -0.13 | -0.11 | -0.01 | |
| 24D1 | -0.08 | -0.18 | -0.11 | | | -0.51 | 0.30 | -0.04 | -0.13 | -0.11 | -0.14 | -0.1 | |
| 26F1 | -0.07 | -0.05 | -0.11 | -0.07 | -0.10 | -0.06 | -0.08 | -1.21 | | | -0.15 | -0.15 | |
| 27F1 | -0.10 | -0.25 | -0.28 | 0.13 | -0.10 | -0.15 | 0.05 | -0.08 | 0.13 | -0.02 | -0.21 | 0.29 | |
| 27R1 | -0.12 | 0.01 | -0.09 | 0.01 | 0.41 | 0.05 | 0.13 | -0.13 | 0.22 | 0.30 | -0.16 | 0.14 | |
| 29H1 | 0.35 | -0.31 | -0.09 | -0.01 | 0.01 | 0.00 | -0.02 | -0.08 | 0.08 | 0.03 | 0.04 | 0.82 | |
| 31B1 | 0.35 | 0.27 | 0.18 | 0.03 | -0.02 | -0.78 | -2.37 | 2.73 | -0.35 | -0.20 | -0.20 | -0.17 | |
| 32P2 | | | | | | | | | | -0.16 | 0.00 | -0.52 | 1 |
| 32R1 | 0.01 | 0.02 | -0.09 | 0.22 | 0.12 | -0.07 | -0.01 | | | -0.26 | -0.02 | -0.64 | 1 |
| 35M1 | | 4.30 | 0.00 | 2.83 | 1.10 | -0.07 | -0.26 | -0.10 | -0.05 | 0.05 | -0.39 | 0.02 | |
| 36A1(MW-2B) | | | | | 0.25 | -0.88 | -0.31 | -1.22 | -0.01 | -1.26 | -0.42 | 0.14 | 2 |
| 36A2 (MW-2A) | | | | | -0.32 | 3.58 | -0.50 | -1.03 | -0.13 | -1.41 | 0.05 | -0.16 | |
| 36D2 | 0.48 | 0.36 | 0.17 | 0.11 | -0.03 | 0.03 | -0.17 | -0.25 | -0.15 | -0.23 | -0.24 | -0.14 | 2 |
| 42L1 | -0.97 | -1.01 | -0.29 | 3.03 | 0.19 | -0.05 | 0.01 | -0.43 | -0.40 | -0.40 | -0.44 | -0.48 | 5 |
| USG-4 | | | | 0.38 | 1.02 | 2.56 | -1.64 | | | | | | Pumping |
| USG-5 | 2.99 | 0.93 | | | | | | -3.17656 | 0.8122 | | | | Pumping |
| USG-6 | | | | 39.93 | -0.20 | -2.46 | 2.51 | -0.11 | | | | | Pumping |

**Table 5: Total Dissolved Solids Concentrations (mg/L)**

| Date | Chem | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32P03S | 34B1 | 36A1 (MW-2B) | 36A2 (MW-2A) | 36C2 | 36D3 | 36H1/36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mar-09 | Total Dissolved Soilds | 287 | 1210 | | 335 | | | 517 | | | | 302 | | | 359 | 365 | 305 | 910 | | | |
| Mar-10 | Total Dissolved Soilds | 307 | 1200 | | 306 | | | 498 | | | | 300 | | | 349 | 346 | 304 | 1100 | | | |
| Apr-11 | Total Dissolved Soilds | 280 | 1220 | | 325 | | | 525 | | | | 298 | | | 485 | 359 | 306 | 1220 | | | |
| Mar-12 | Total Dissolved Soilds | 315 | 1210 | 486 | | | | 511 | | | | 303 | | | 359 | | 320 | 886 | | | |
| Feb-13 | Total Dissolved Soilds | 284 | 1220 | 497 | 302 | | | 530 | 299 | | | 306 | | | | | | 739 | | | |
| Apr-14 | Total Dissolved Soilds | 292 | 1290 | 499 | 309 | | | 543 | 284 | | | 314 | | | 360 | | 327 | 728 | | | |
| Mar-15 | Total Dissolved Soilds | 297 | 1350 | 492 | | | | | 298 | | | 315 | | | | | | | | | |
| Mar-16 | Total Dissolved Soilds | 280 | 1350 | 484 | 291 | | 356 | 559 | 271 | | | 303 | 298 | 399 | 362 | | | 654 | 362 | 334 | 309 |
| May-17 | Total Dissolved Soilds | 298 | 1350 | 495 | 323 | | 353 | 567 | 283 | | | 300 | 303 | 412 | 357 | | | 594 | | 328 | 314 |
| Mar-18 | Total Dissolved Soilds | 288 | 1310 | 439 | 304 | 352 | 342 | 565 | 274 | 469 | 612 | 305 | 291 | 396 | 350 | | 323 | 564 | 343 | | |
| Mar-19 | Total Dissolved Soilds | 322 | 1310 | 503 | 309 | 373 | 365 | 583 | 273 | 477 | 621 | 322 | 307 | 423 | 368 | | 331 | 575 | 361 | | 317 |
| Mar-20 | Total Dissolved Solids | 289 | 1280 | 431 | 296 | 367 | 366 | 572 | 288 | 474 | | 305 | 303 | 420 | 369 | | 324 | 555 | 372 | | 309 |
| Mar-21 | Total Dissolved Solids | 310 | 1280 | 464 | 304 | 359 | 358 | 598 | 293 | 472 | 618 | 319 | 308 | 409 | 369 | | 335 | 556 | 350 | | 314 |
| | Average | 296 | 1,275 | 479 | 309 | 363 | 357 | 547 | 285 | 473 | 617 | 307 | 302 | 410 | 372 | 357 | 319 | 757 | 358 | 331 | 313 |
| | Change from 2020-2021 | 21 | - | 33 | 8 | (8) | (8) | 26 | 5 | (2) | 618 | 14 | 5 | (11) | - | - | 11 | 1 | (22) | - | 5 |
| | 20 percent of average | 59 | 255 | 96 | 62 | | 71 | 109 | 57 | | | 61 | 60 | 82 | 74 | 71 | 64 | 151 | 72 | 66 | 63 |

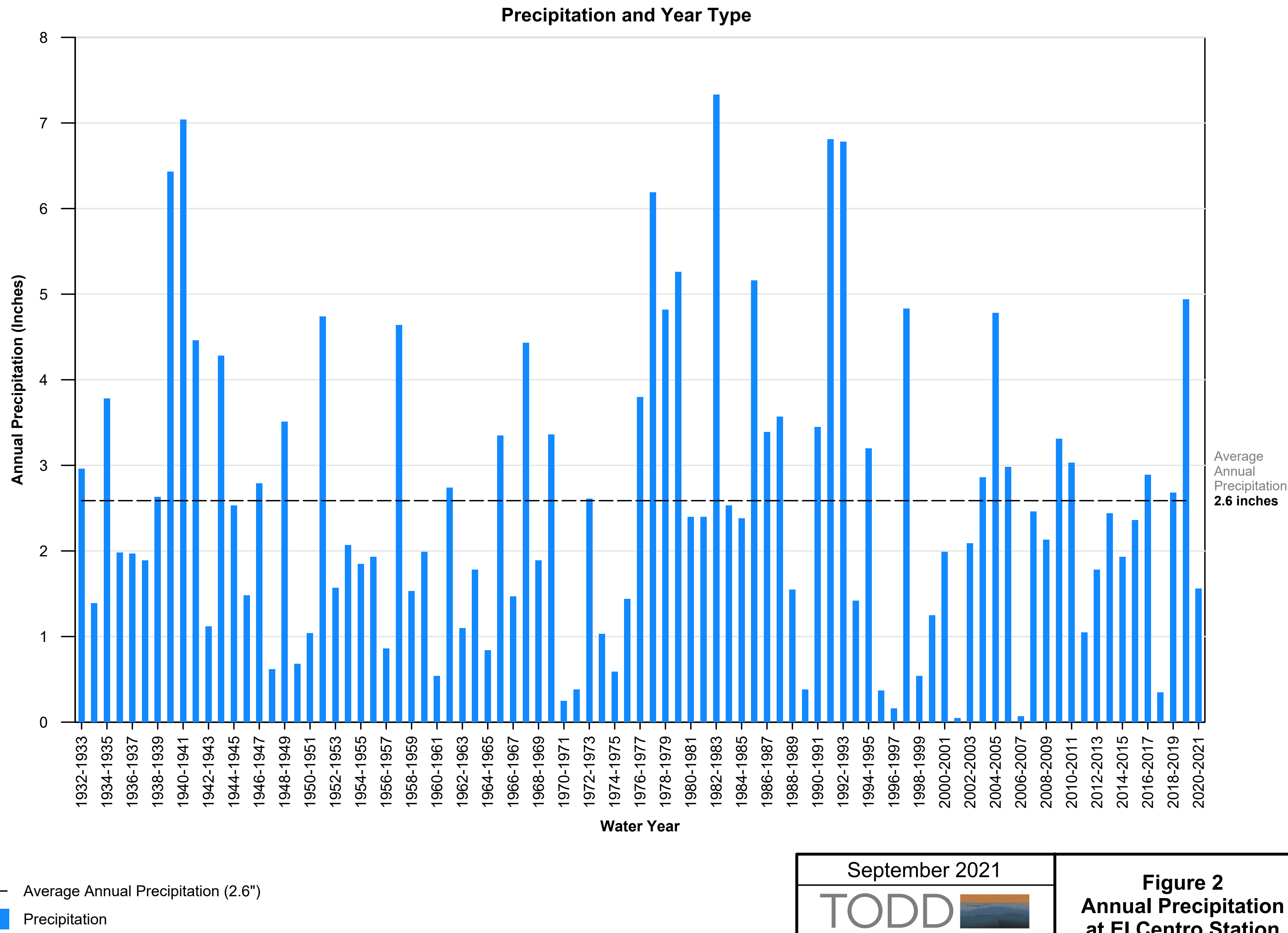
# FIGURES


Coyote Wells Groundwater Basin

September 2021

TODD GROUNDWATER

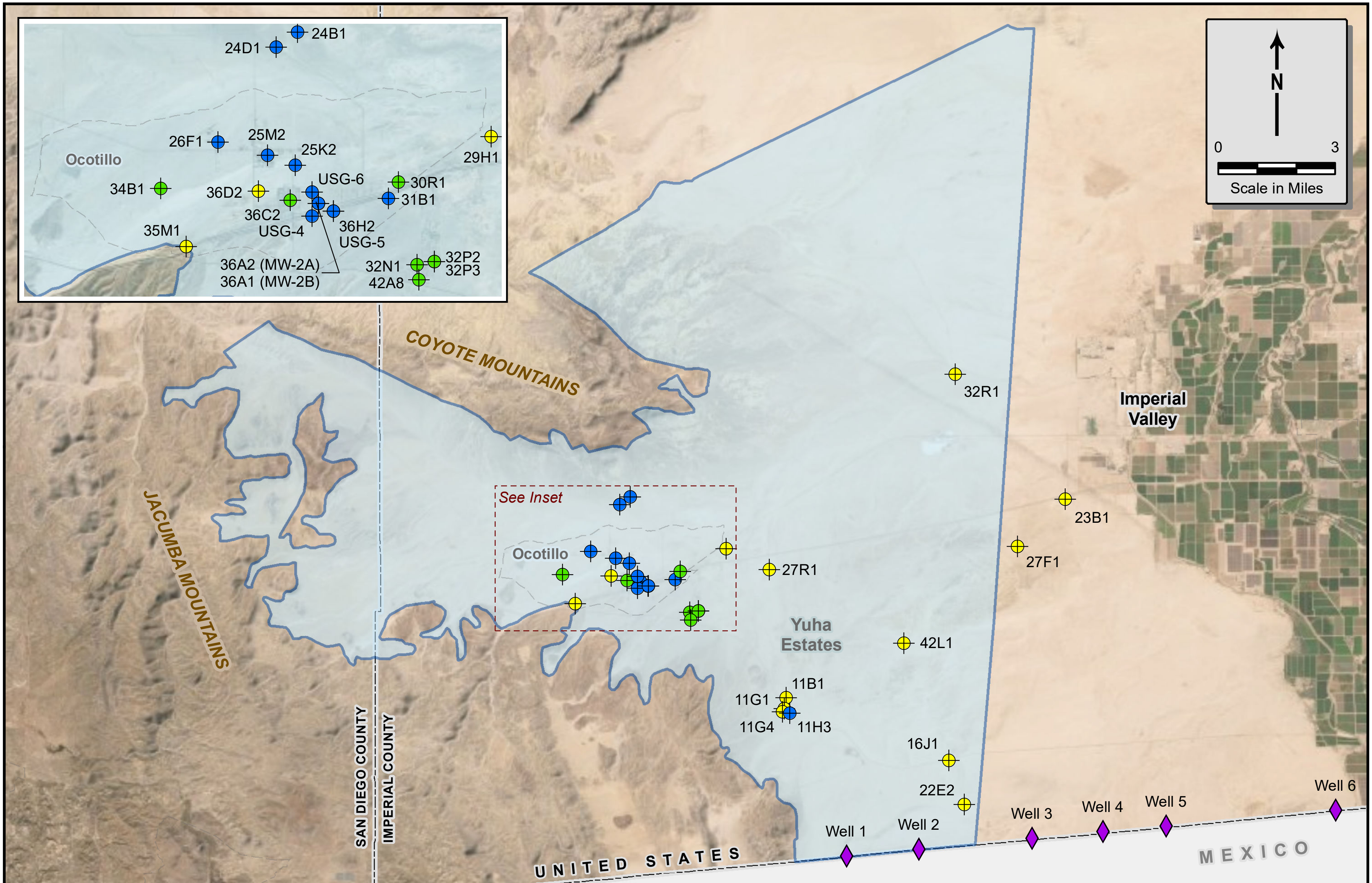
**Figure 1**
**Groundwater Basin Boundary**




September 2021

TODD GROUNDWATER

**Figure 2**
**Annual Precipitation at El Centro Station**



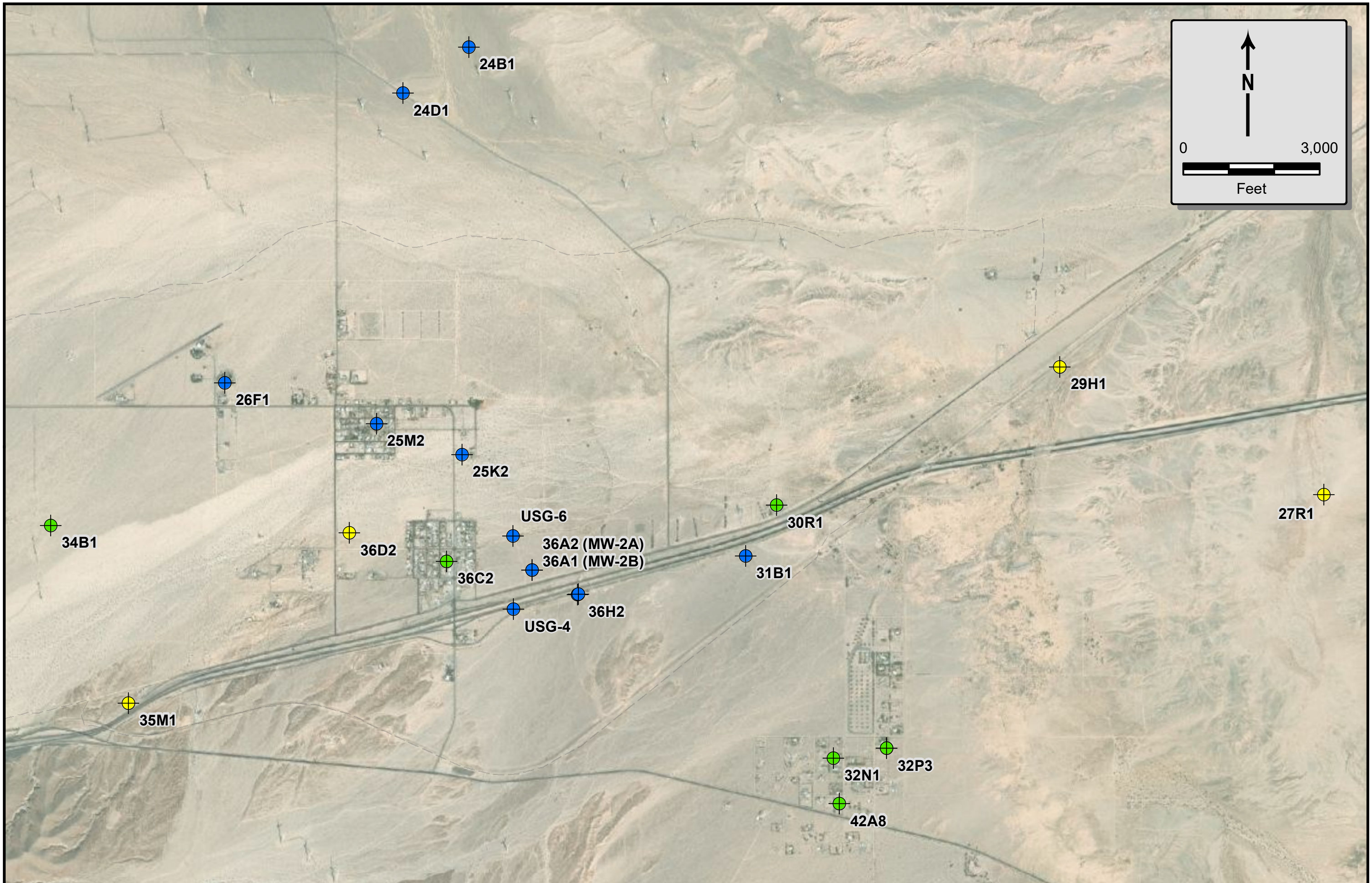

**Active Wells**

- Monitoring Well - Water Level Only
- Monitoring Well - Water Level and Water Quality
- Monitoring Well - Water Quality Only
- USCBP Wells
- Coyote Wells Groundwater Basin

September 2021

TODD GROUNDWATER

**Figure 3**
**Active Monitoring Wells**



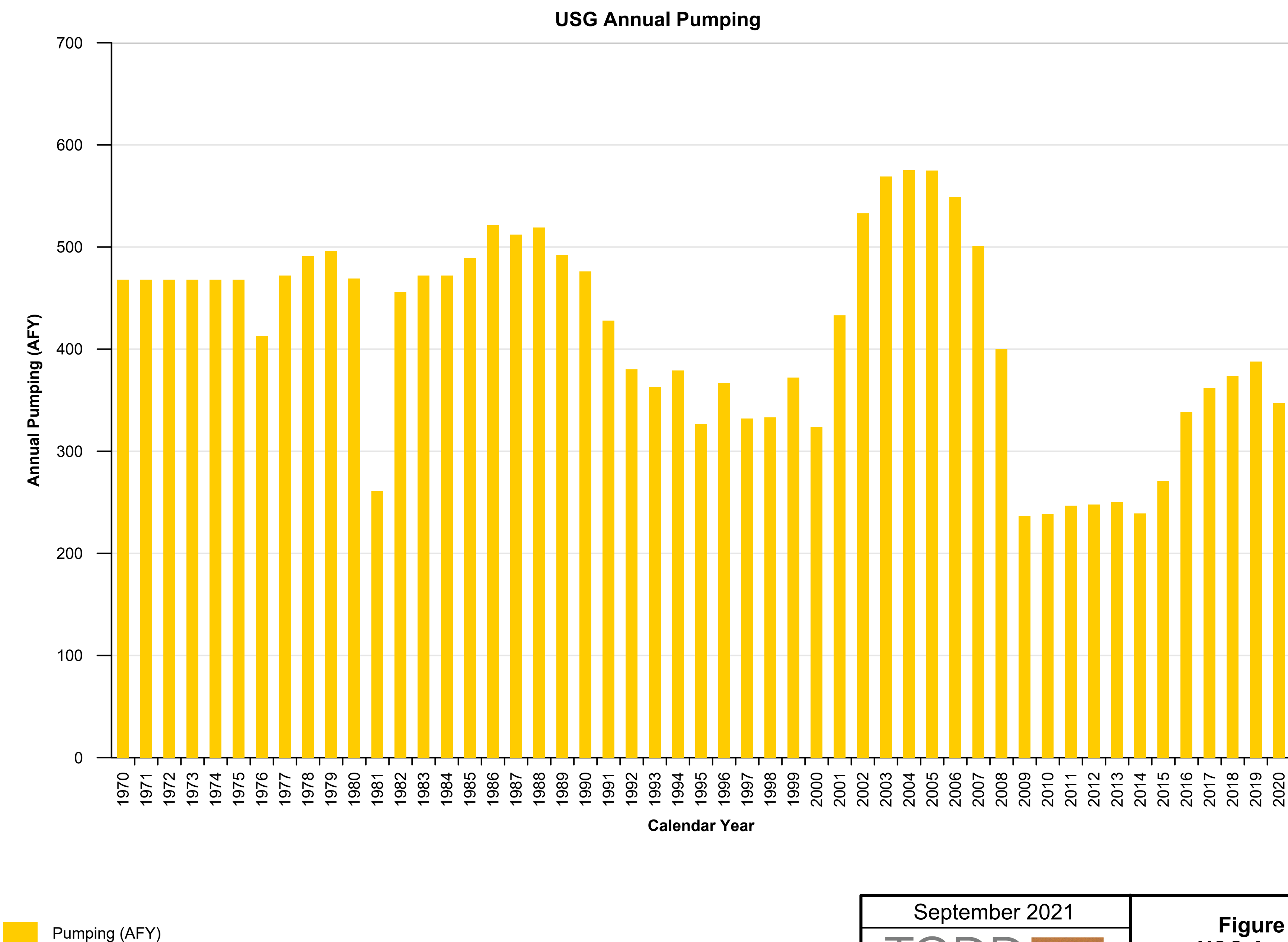

**Active Wells**

- Monitoring Well - Water Level Only
- Monitoring Well - Water Level and Water Quality
- Monitoring Well - Water Quality Only

September 2021

TODD GROUNDWATER

**Figure 4**
**Monitoring Wells Near Ocotillo**




September 2021

TODD GROUNDWATER

**Figure 5**
**USG Annual Pumping**

Path: \\todd-file\data\Projects\US_Gypsum_Annual_7420x\USG Annual - 74204\GRAPHICS\Figure 5 USG Annual Pumping.grf

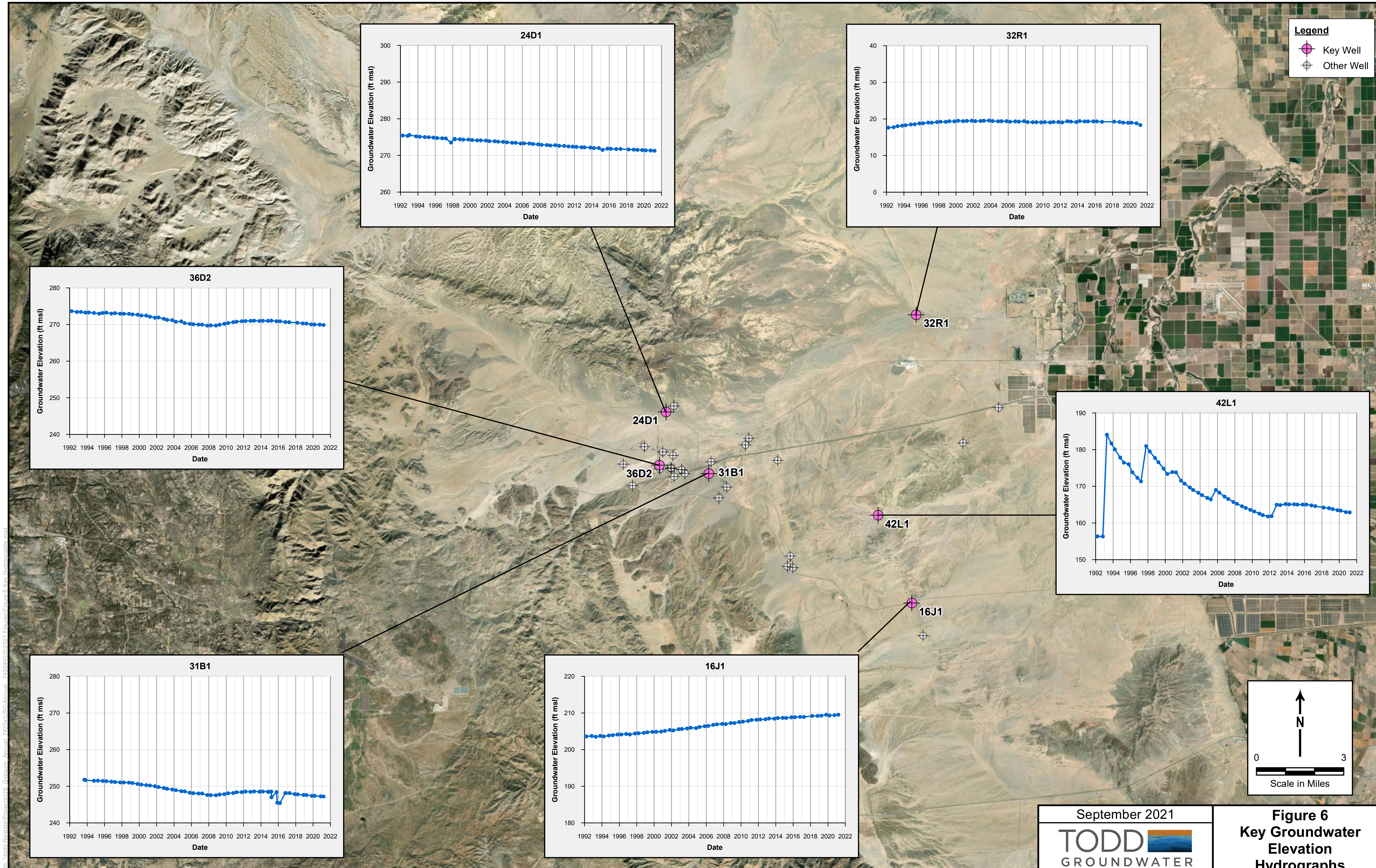



**Figure 6**
**Key Groundwater Elevation Hydrographs**

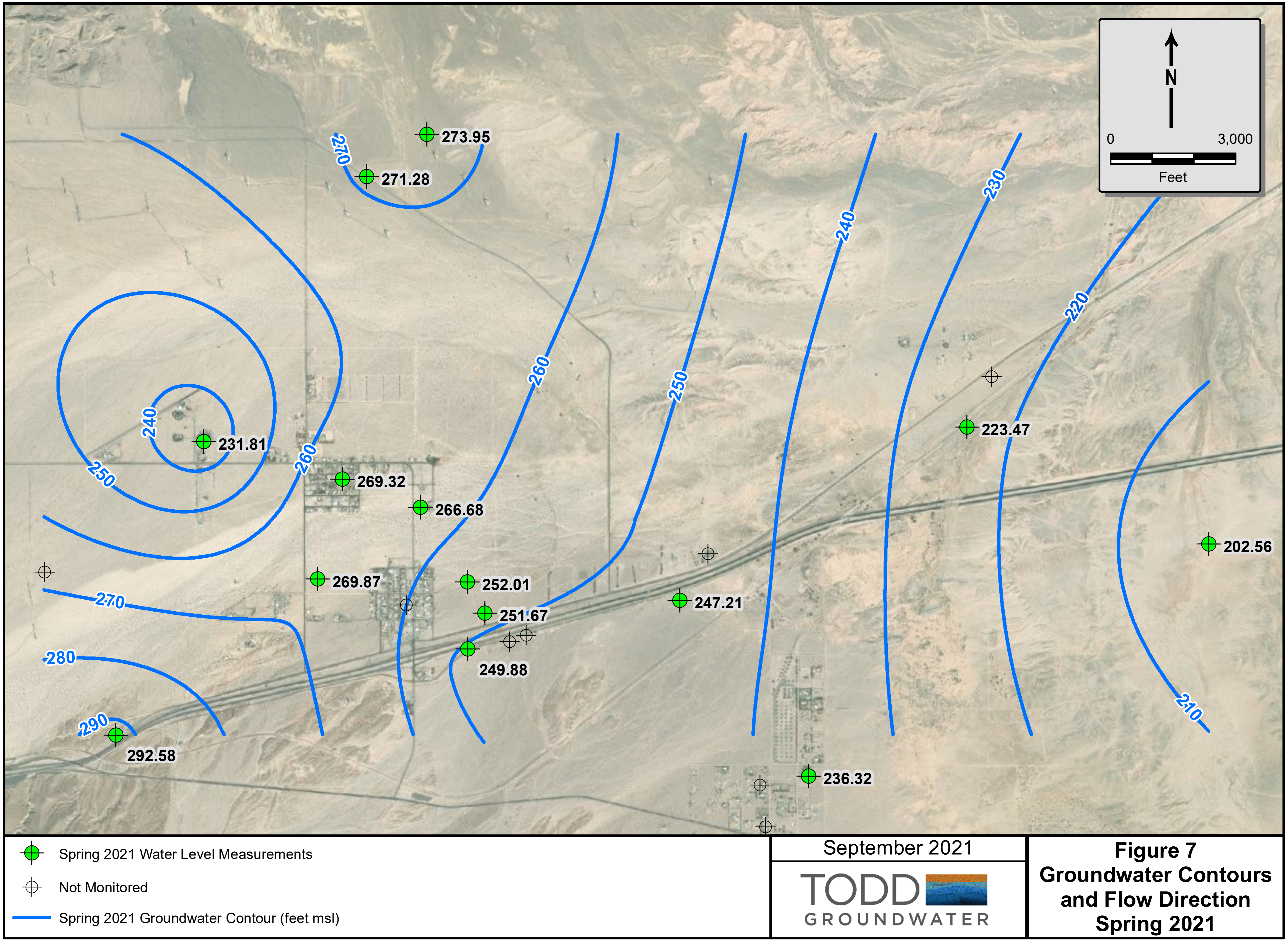
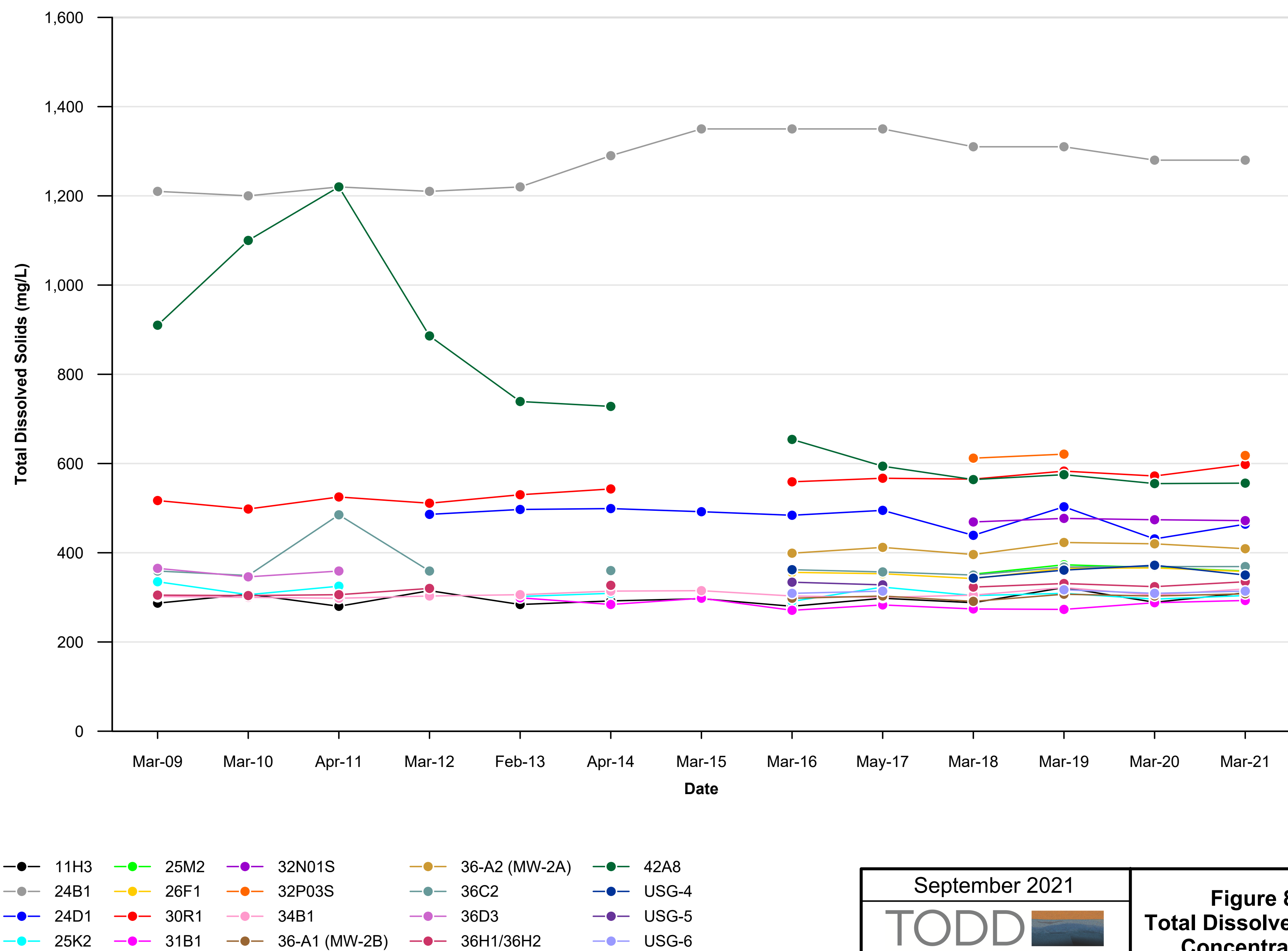



**Figure 7**
**Groundwater Contours and Flow Direction Spring 2021**




September 2021

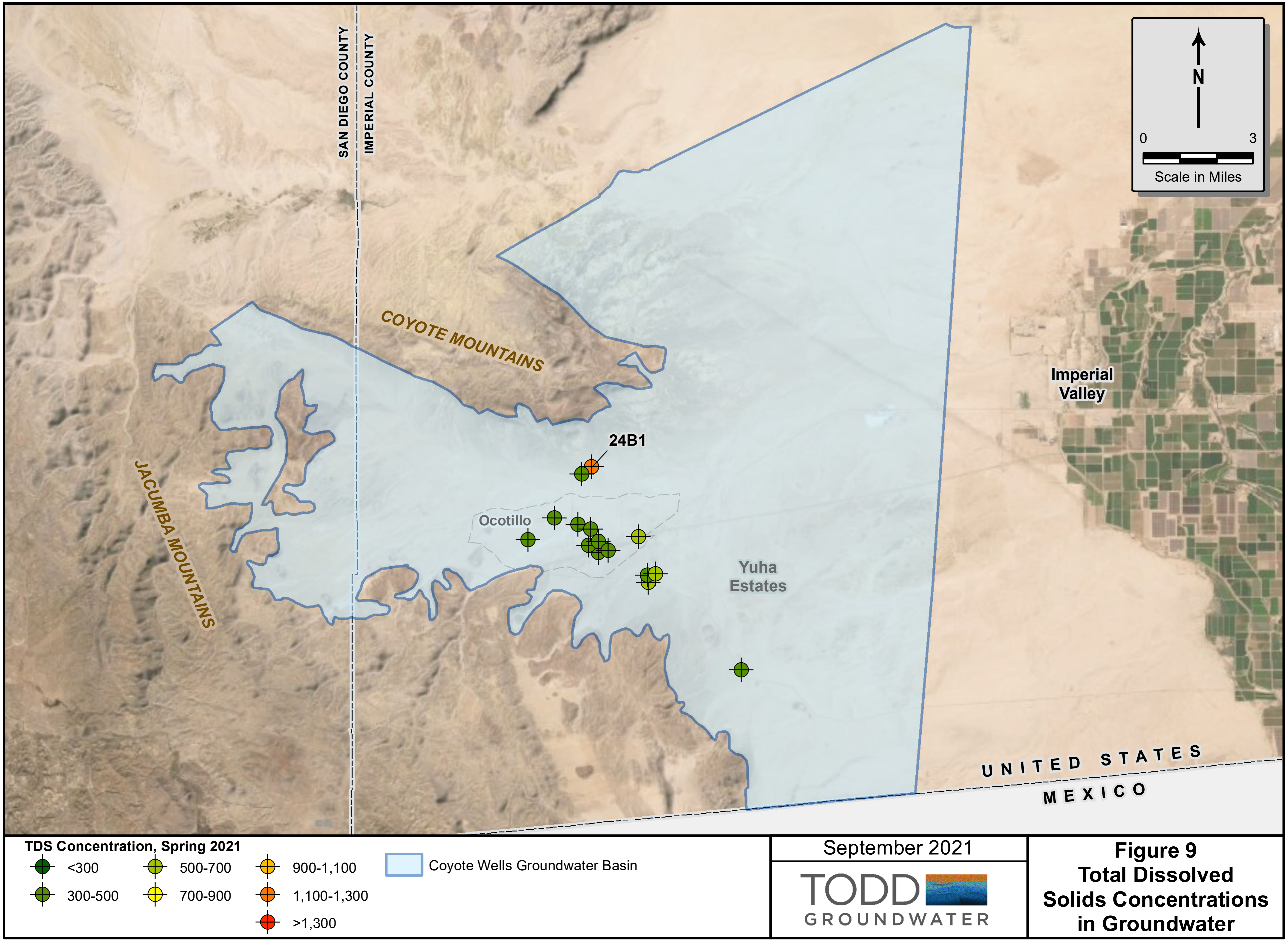
**Figure 8A**
**Total Dissolved Solids Concentrations**


Path: \\todd-file\data\Projects\US_Gypsum_Annual_7420x\USG Annual - 74204\GRAPHICS\Figure 8B TDS Concentration in Well 31B1.grf

September 2021

TODD GROUNDWATER

**Figure 8B**
**Total Dissolved Solids Concentrations in Well 31B1**




September 2021

TODD GROUNDWATER

**Figure 9**
**Total Dissolved Solids Concentrations in Groundwater**

# APPENDIX A

## BASIN DESCRIPTION AND HYDROGEOLOGY

Groundwater for the Plaster City Plant, community of Ocotillo, and local domestic wells is pumped from the Coyote Wells Valley Groundwater Basin (No. 7-29), as defined by the California Department of Water Resources (DWR, 2003)[1]. DWR generally defines groundwater basins based on the extent of alluvial deposits. As depicted in **Figure A-1,** the Basin encompasses 64,000 acres (100 square miles) in the Yuha desert west of Imperial Valley, California. It is located mostly in Imperial County, with the western edge extending into San Diego County. The Basin is bounded by the Coyote Mountains to the north and the Jacumba Mountains to the west and southwest. These boundaries correspond to the geologic contacts between alluvium and less permeable geologic formations as mapped by DWR. The southern basin boundary is the United States-Mexico border and the eastern boundary is a roughly north-south line from Superstition Mountain on the north to the international border. Part of the northeastern boundary is a surface drainage divide connecting the Coyote Mountains with Superstition Mountain.

## 7.1. HYDROGEOLOGY

**Figure A-2** shows the surficial geology within the Coyote Wells Valley Groundwater Basin, as mapped by the USGS (Loeltz, 1975). The groundwater basin boundaries on the north, west, and southwest generally coincide with the low-permeability formations of the mountain ranges; some discrepancies reflect the scale and interpretation of geologic mapping. The main water-bearing units of the Basin are the Quaternary alluvial deposits forming the Basin floor. In many areas, alluvium and lake deposits overlie older Quaternary/Tertiary formations including the Palm Springs and Imperial formations. As shown in **Figure A-2**, these crop out to the west and east.

**Figure A-3** is a general cross-section illustrating the major formations in the basin. This cross-section is reproduced from the Final EIR/EIS and shows two layers defined for groundwater flow modeling. The upper layer (Layer 1) consists of alluvial deposits (Qa/Qof) and the lower layer (Layer 2) is composed of the Palm Springs and Imperial formations (QTp/QTi), which have been uplifted in the area east of Ocotillo and are relatively near the ground surface. The water-bearing alluvial deposits (Layer 1) are primarily restricted to the center of the Basin, with thickness of 550 feet or greater in the Ocotillo area. As shown, the alluvium was previously indicated to be 650 feet thick; however, monitoring wells recently drilled near USG pumping encountered alluvium to a depth of 800 feet. The alluvial deposits thin toward the margins of the Basin where they become unsaturated. Along the Basin margins, the saturated zones occur in the Palm Springs and Imperial formations.

In brief, the alluvial Layer 1 aquifer near Ocotillo is generally characterized by relatively high permeability, good water quality, and rapid recovery from pumping. The less permeable Layer 2 (Palm Springs/Imperial formations) east of Ocotillo and in the Yuha Estates area is characterized by relatively poor water quality and greater, more persistent impacts from pumping. In the Ocotillo area, groundwater levels in Layer 1 have been indicated to be higher than those in Layer 2. However, continued groundwater level declines in Layer 1—at more rapid rates than those in Layer 2—present the potential for significant change in that vertical gradient. In that case, relatively poor groundwater from Layer 2 could migrate into Layer 1, resulting in water quality deterioration in Layer 1.

[1] The EIR/EIS refers to the area as the Ocotillo/Coyote Wells Groundwater Basin as defined by USGS.

Geologic units in the Ocotillo/Coyote Wells Groundwater Basin can be grouped as follows:

- Quaternary Alluvium (Layer 1), composed of poorly consolidated older alluvial fan deposits and sand, underlies much of the basin floor and extends locally into large canyons of the surrounding mountains. Lake deposits also are mapped by USGS. Most wells drilled in the Ocotillo area are completed within the alluvium. The alluvial wells are noted for high yields and relatively good water quality.
- The Palm Springs Formation (in Layer 2) is composed of fluvial and deltaic sand, silt, and clay deposits deposited by the ancestral Colorado River during the early Pleistocene. Thicknesses can range up to several thousand feet. No pumping test data were found for the Palm Springs Formation, but the aquifer properties (e.g., transmissivity and specific yield) are likely similar to those of the Imperial Formation.
- The Late Miocene to Pliocene Imperial Formation (in Layer 2) is generally described as interbedded claystone and sandstone of dominantly marine origin. The Imperial Formation has an exposed thickness of over 1,500 feet in the Yuha area. Wells drilled into the Imperial Formation typically have low yields and produce poor quality water.

Significant differences have been noted in the hydrogeologic properties, water levels, and water quality between the area around the community of Ocotillo and areas to the east. Near Ocotillo, transmissivities (aquifer properties describing the ease with which groundwater flows through the aquifer) have been noted as significantly higher than those to the east. Transmissivities have been measured in the range of 5,800 to 6,700 $ft^2$/day near Ocotillo, whereas transmissivities of 34 to 957 $ft^2$/day have been noted in the eastern areas. These variations are reflected in groundwater gradients: shallower (flatter) hydraulic gradients have been mapped in the Ocotillo area and steeper hydrologic gradients have been mapped in the area east of Ocotillo.

While there is an occurrence of unconfined groundwater in other parts of the basin, water quality these areas are generally poor, with existing wells drilled in confined groundwater showing improved water quality. Groundwater generally flows southeast through the basin, with the principal recharge derived from percolation from precipitation and ephemeral runoff from the surrounding mountains (Skrivan, 1977).

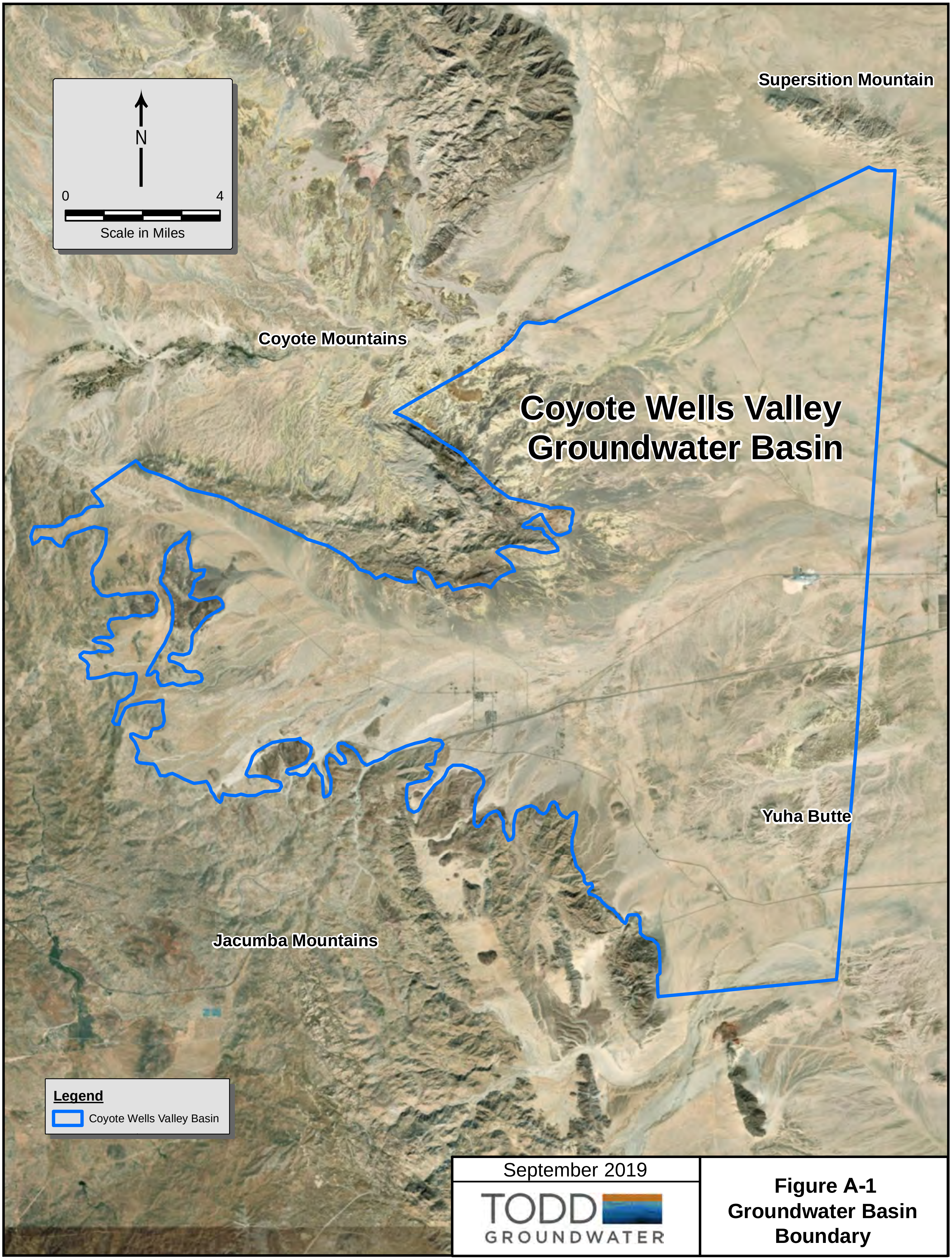
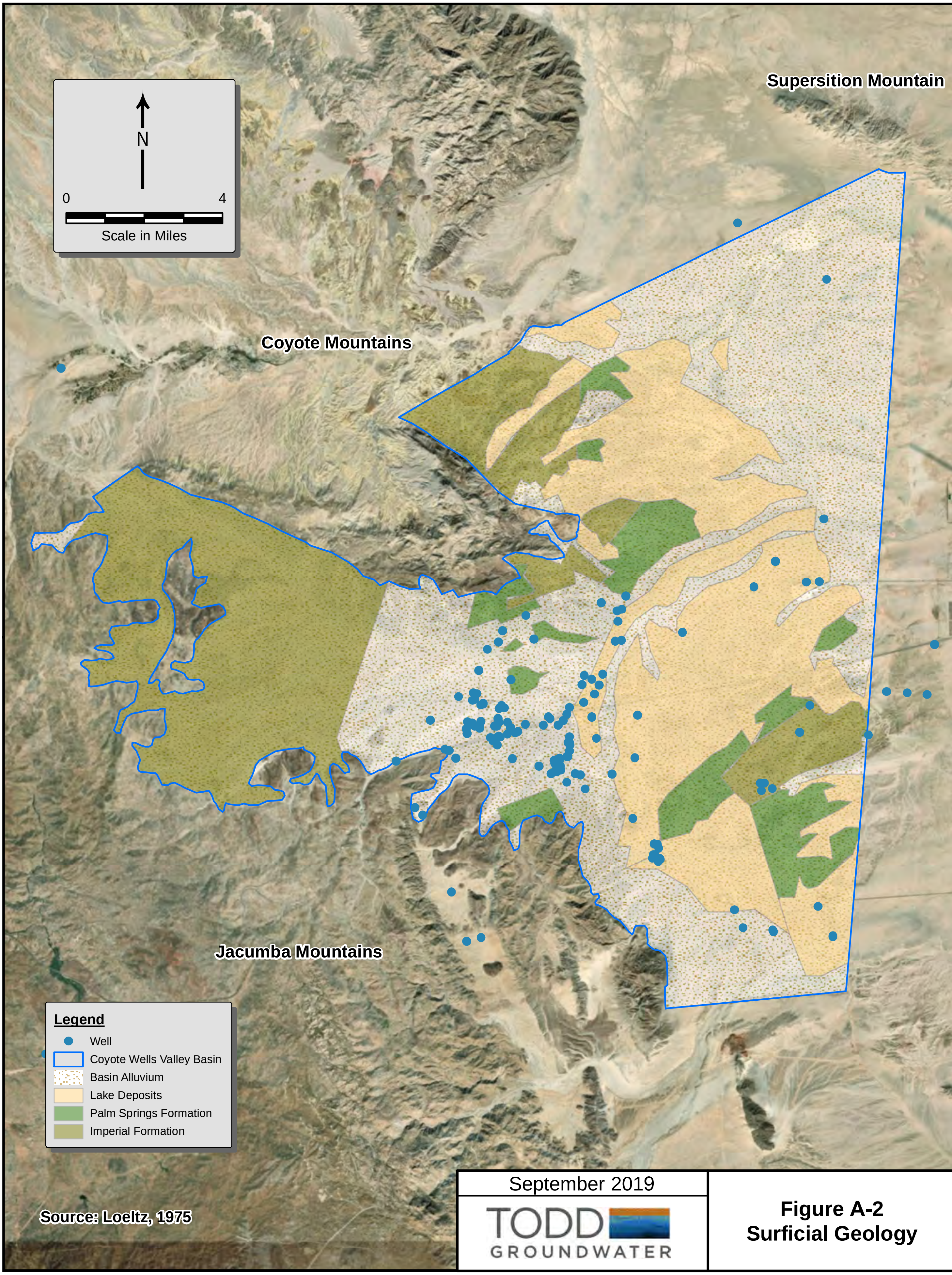


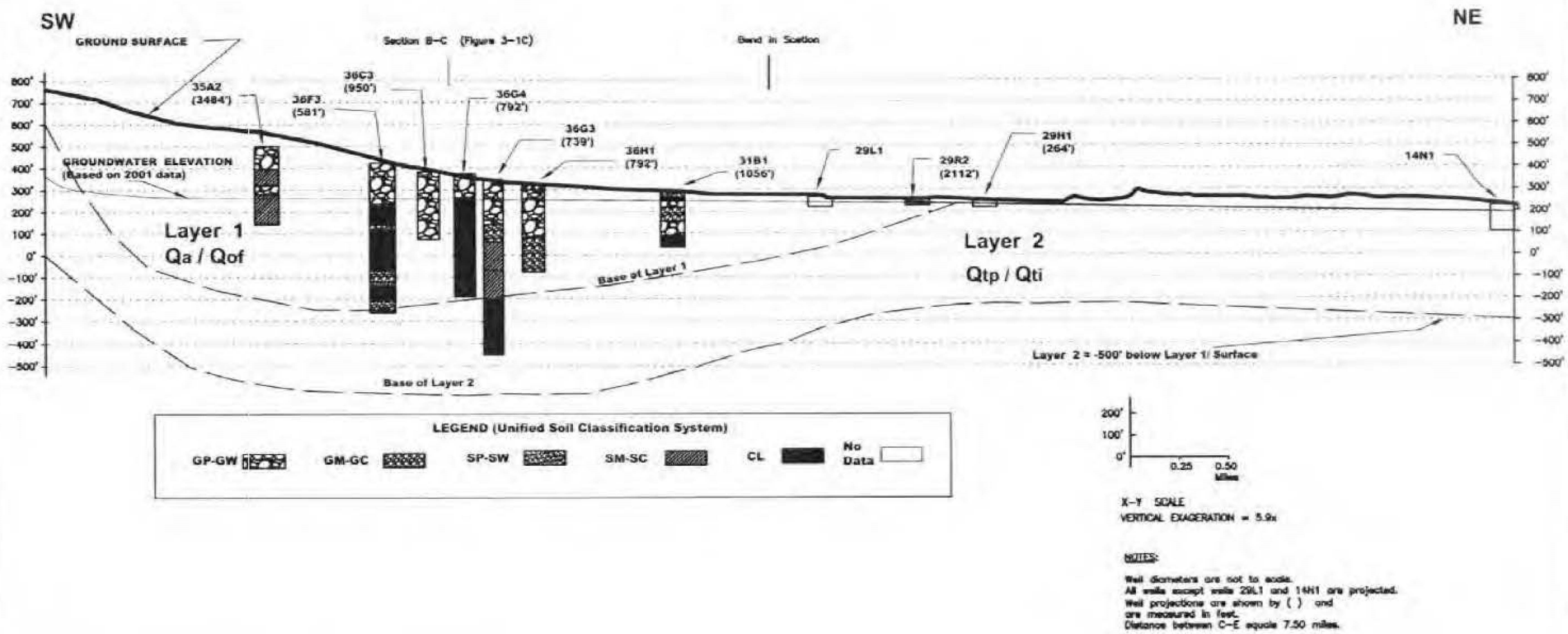

**Figure A-1**
**Groundwater Basin Boundary**




September 2019

TODD GROUNDWATER

**Figure A-2**
**Surficial Geology**




Bookman-Edmonston
A Division of GEI Consultants, Inc.

Ocotillo/Coyote Wells Groundwater Study
Geologic Cross-Section (Ocotillo-Transverse)
U.S. Gypsum Company

9/24/03

FIGURE 3-1E

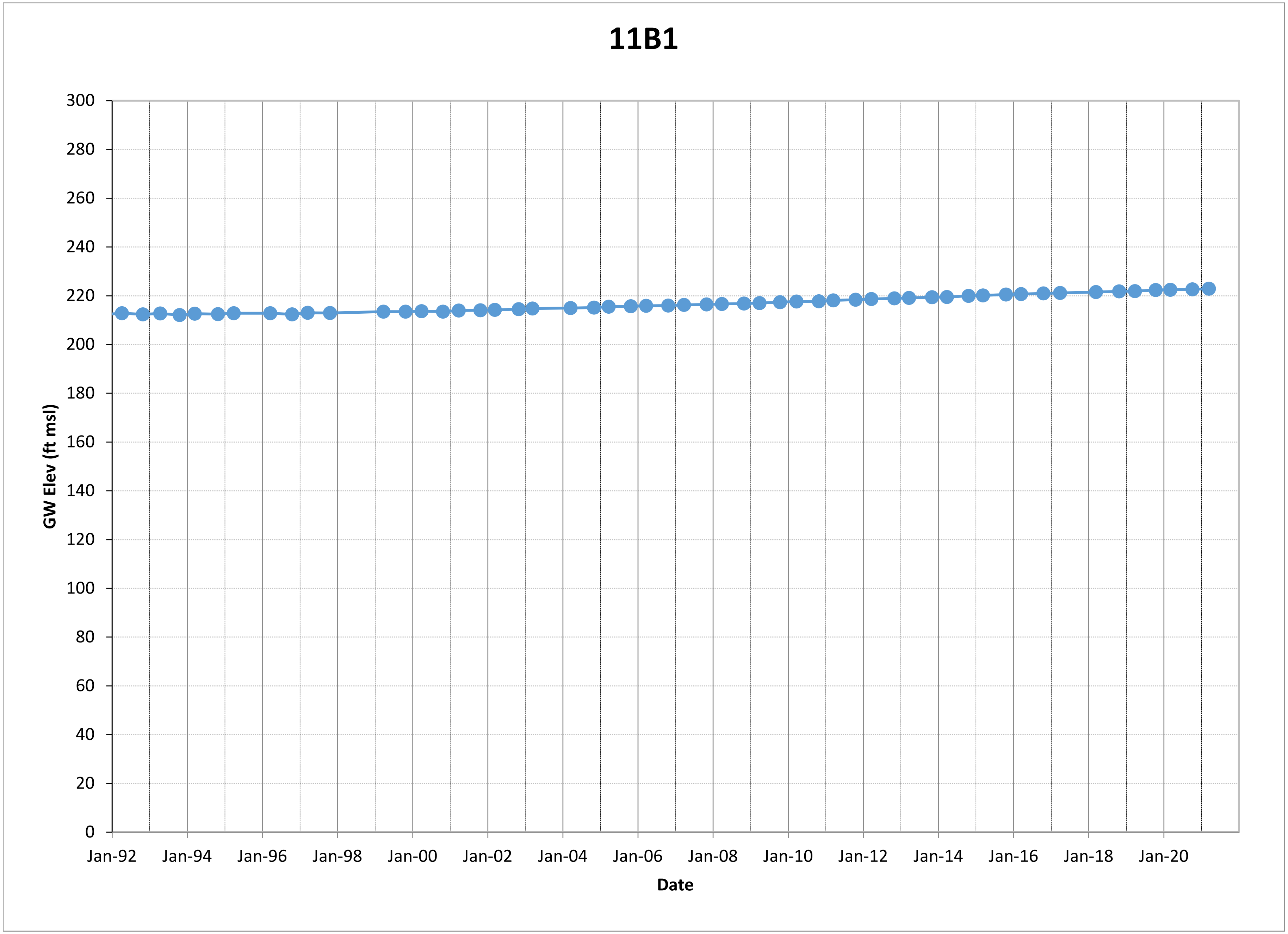
September 2019

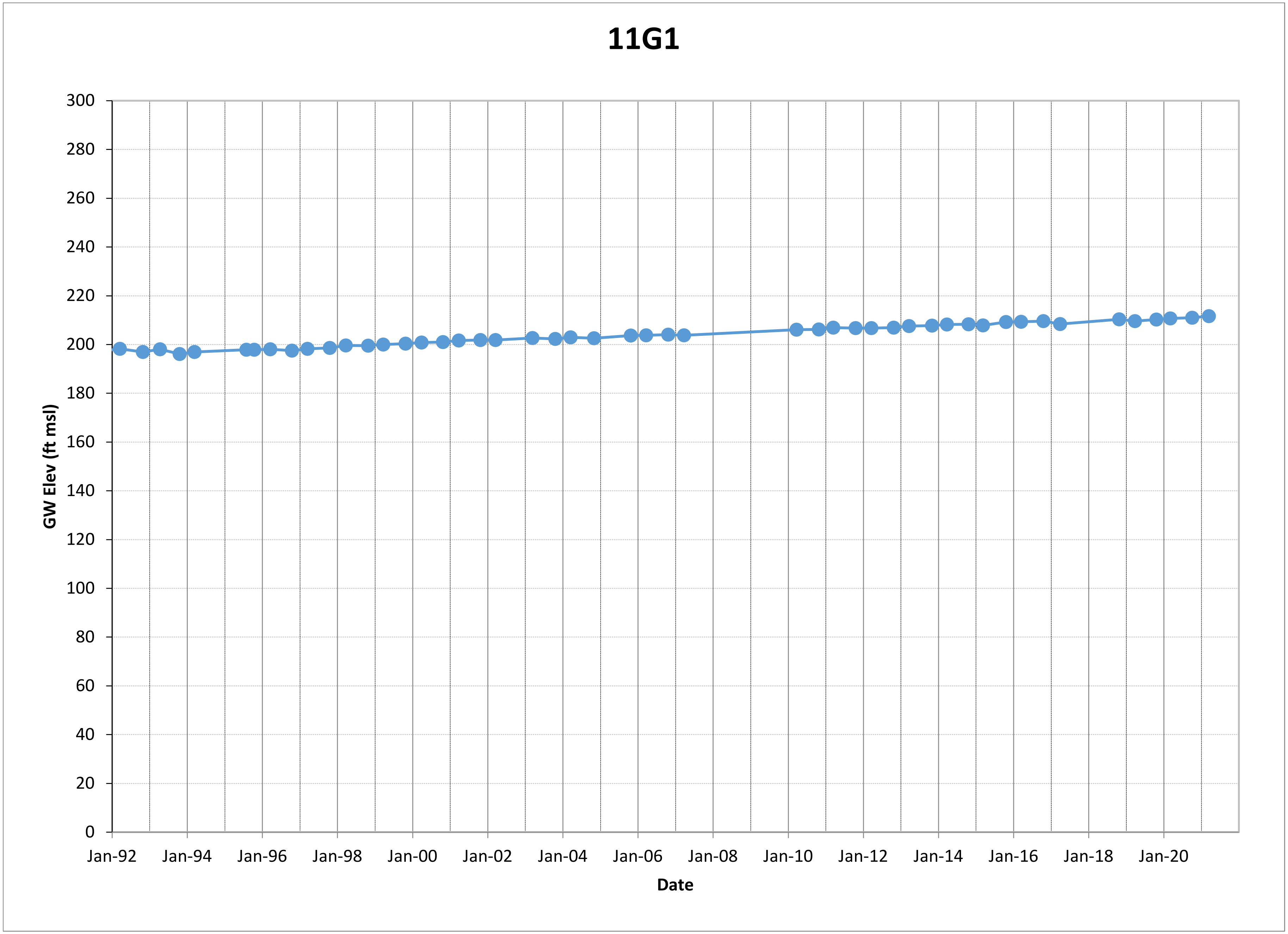
TODD GROUNDWATER

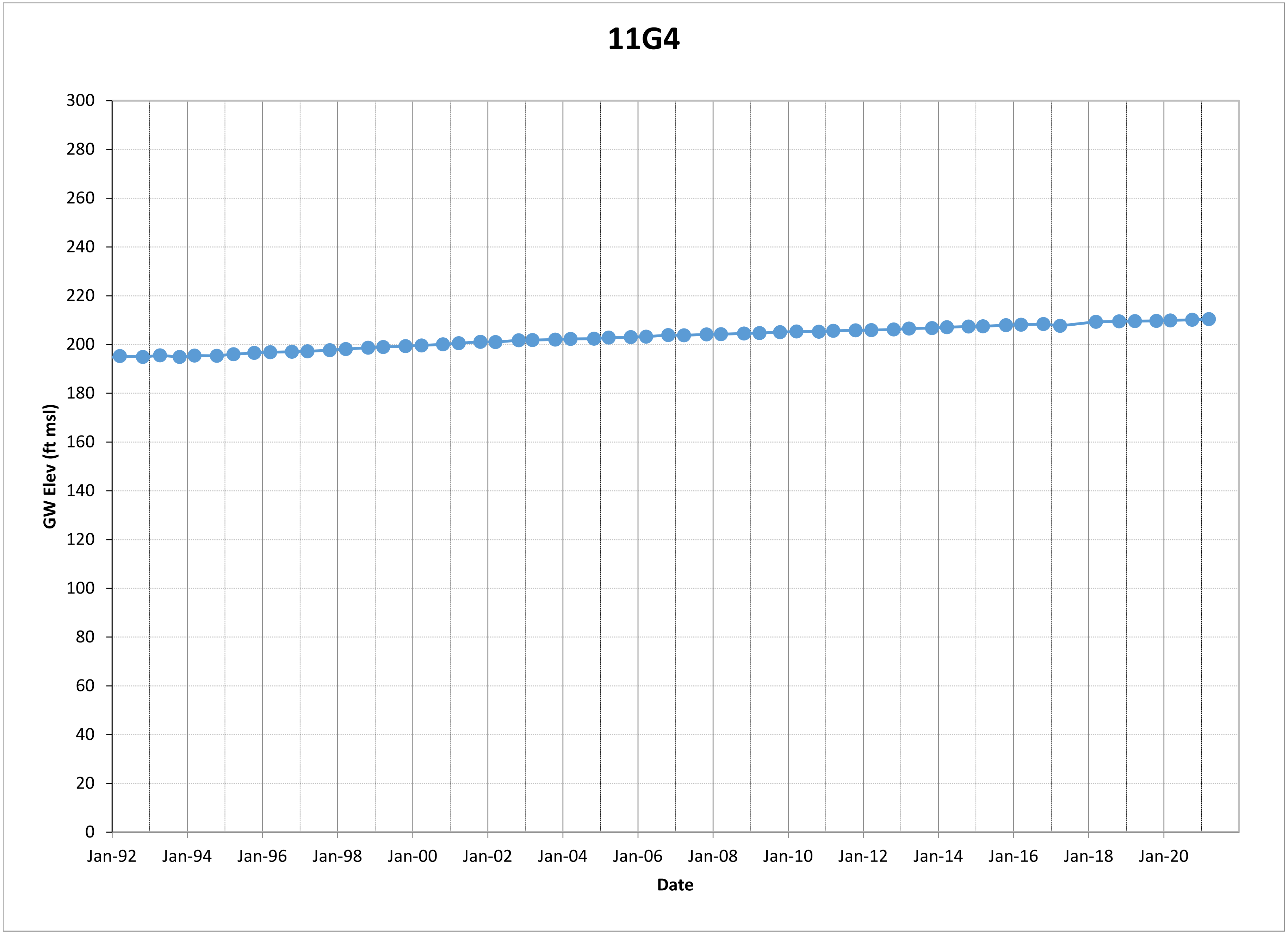
**Figure A-3**
**Geologic Cross Section**

# APPENDIX B

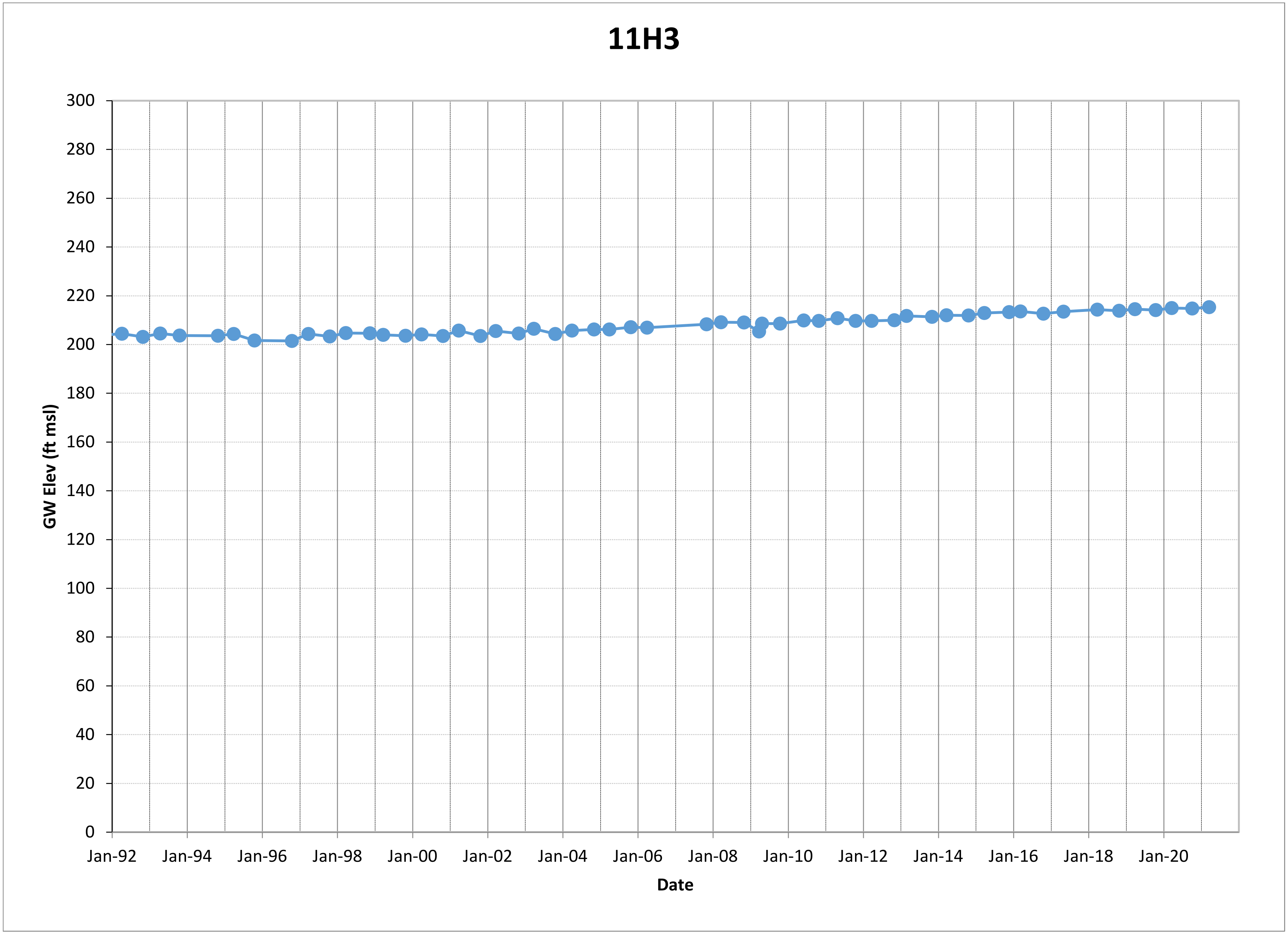
## GROUNDWATER ELEVATION HYDROGRAPHS

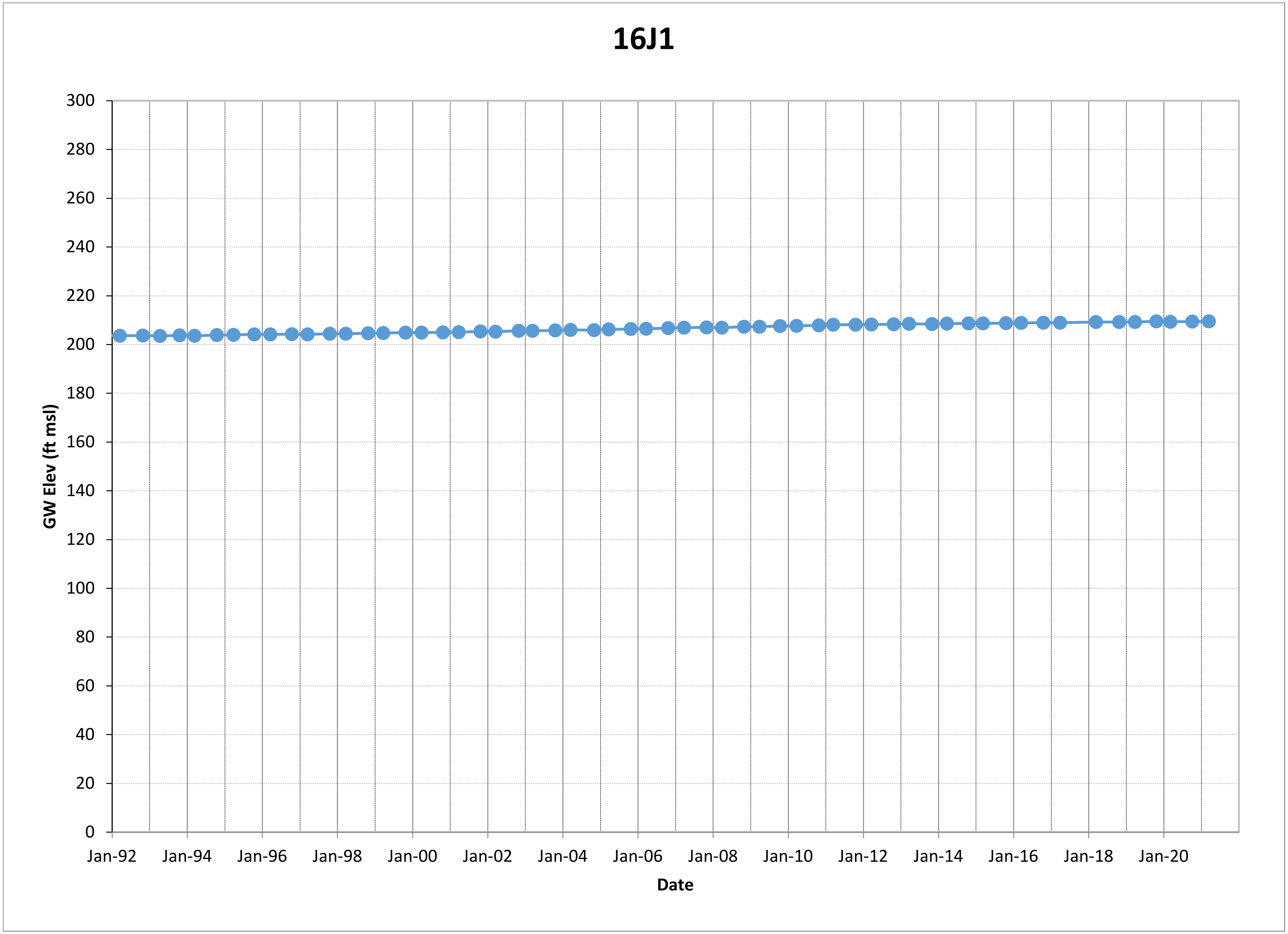

11B1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


11G1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

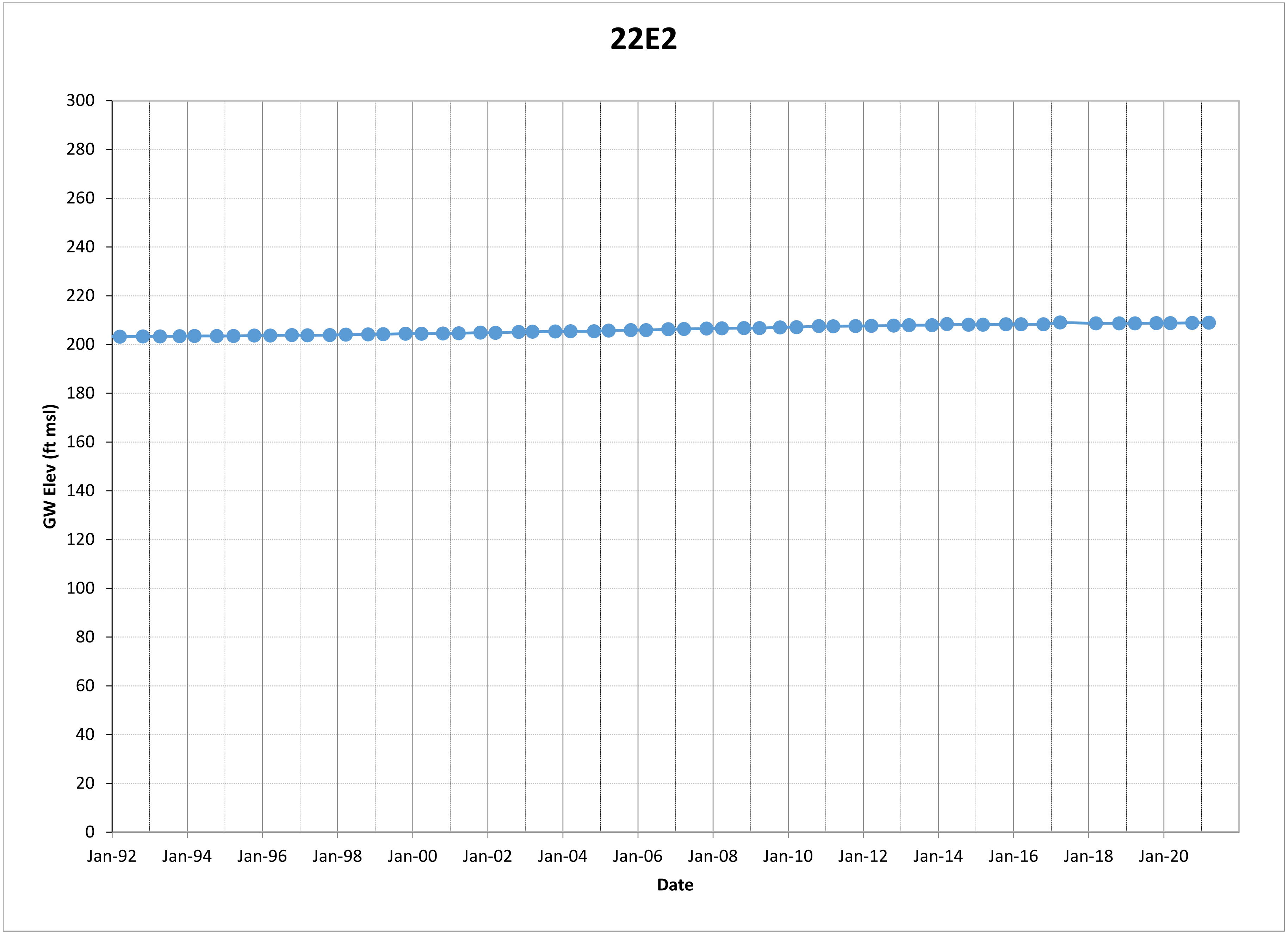


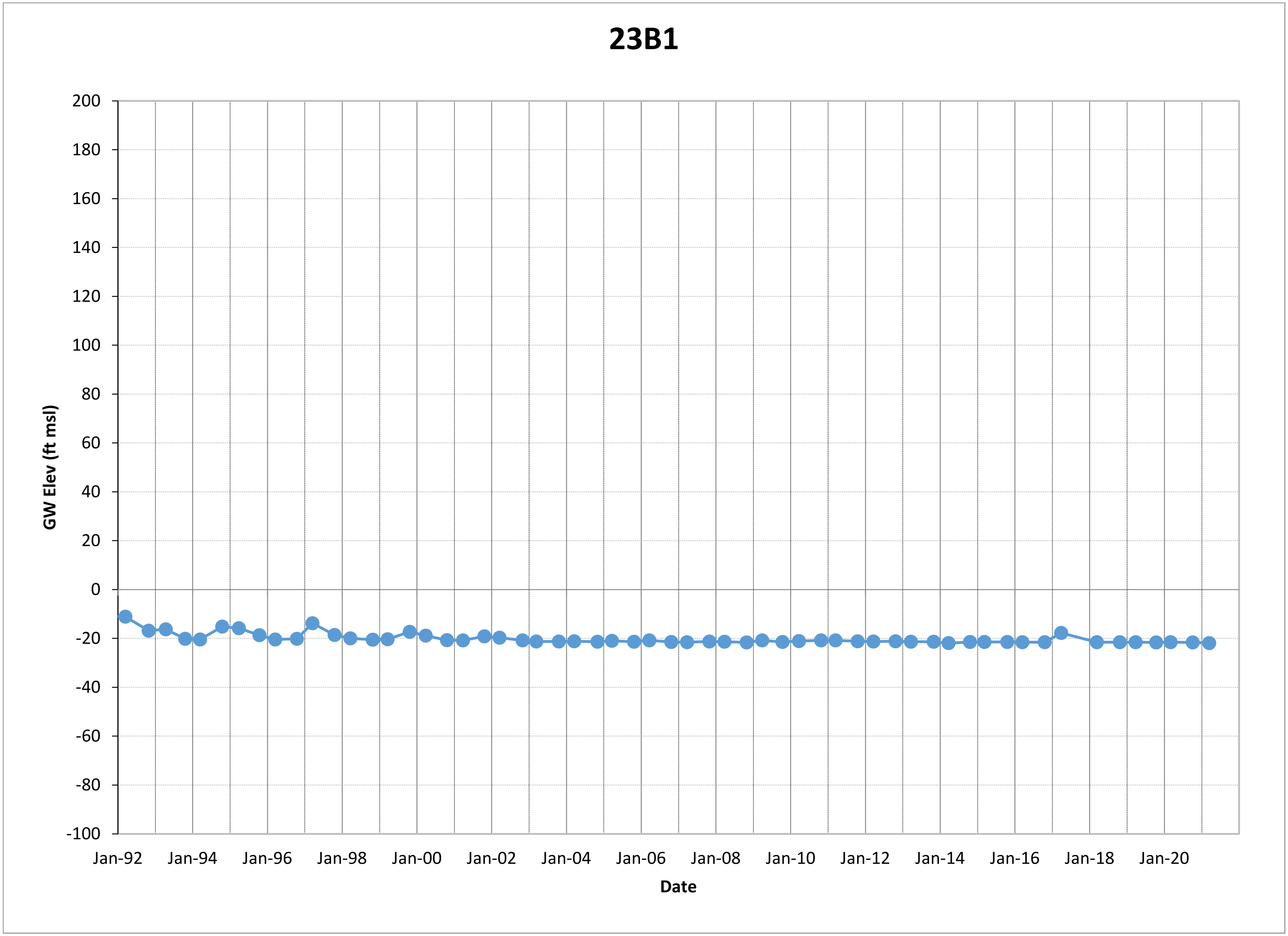
11G4
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


11H3
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

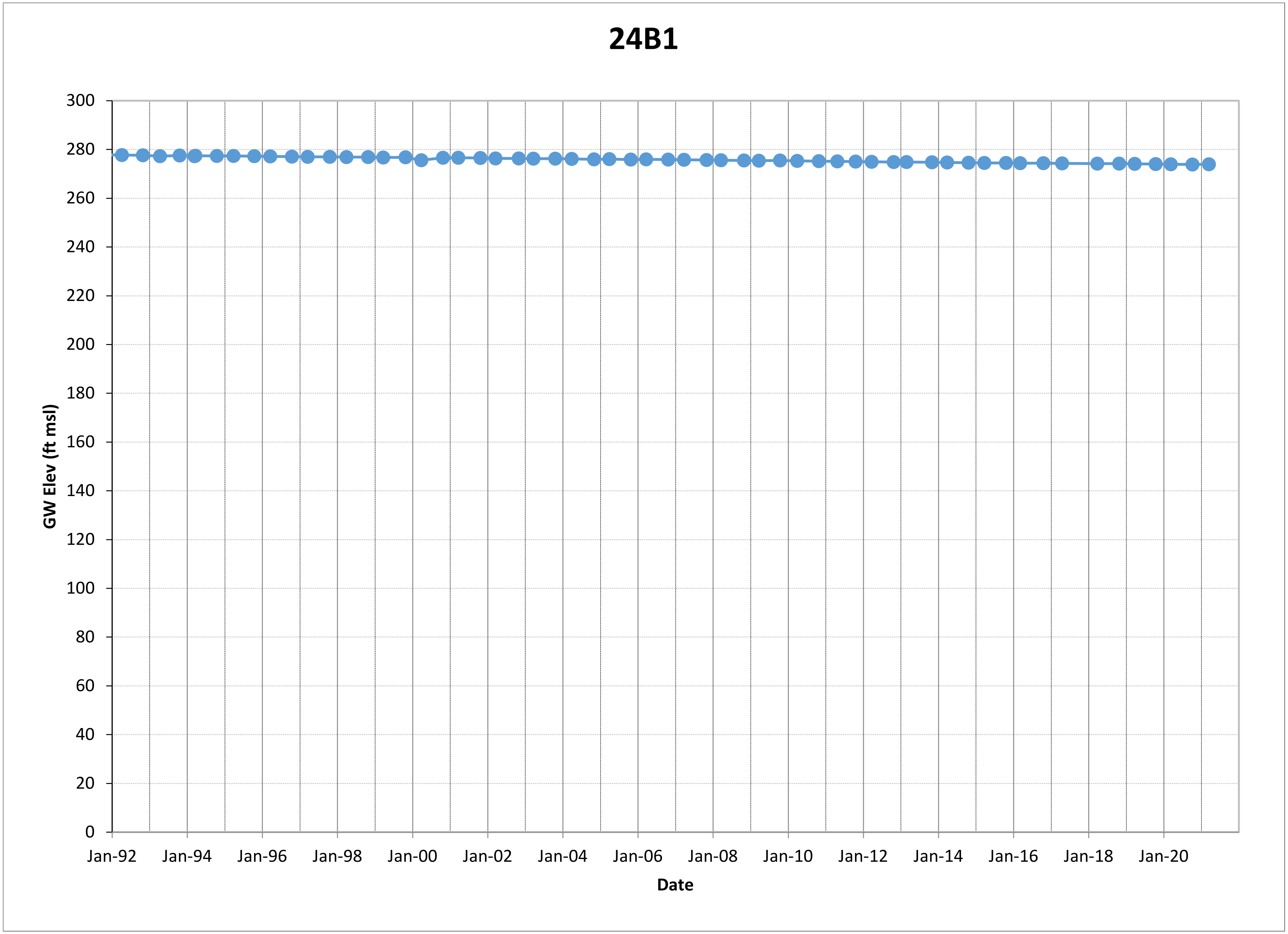


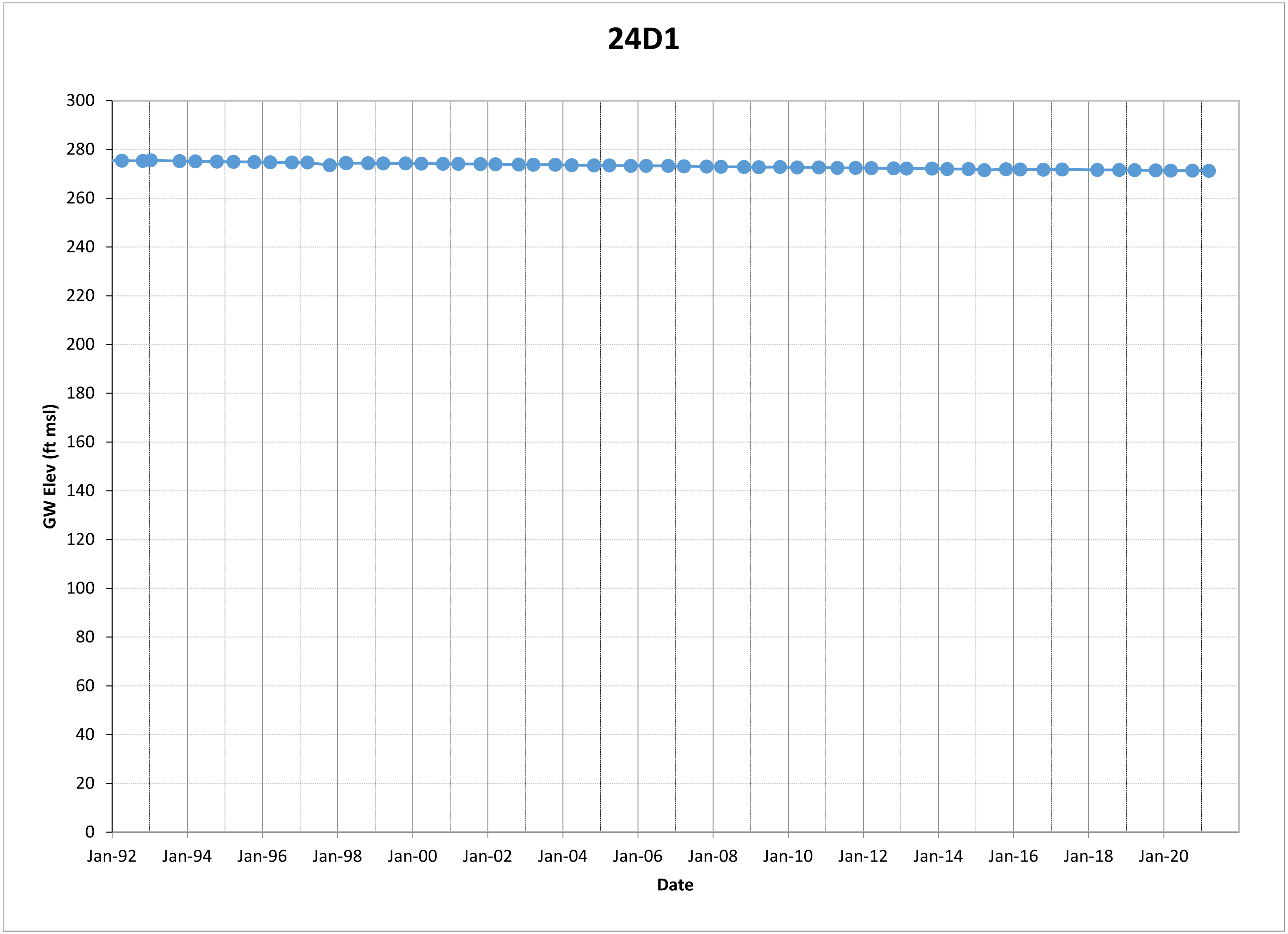
16J1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

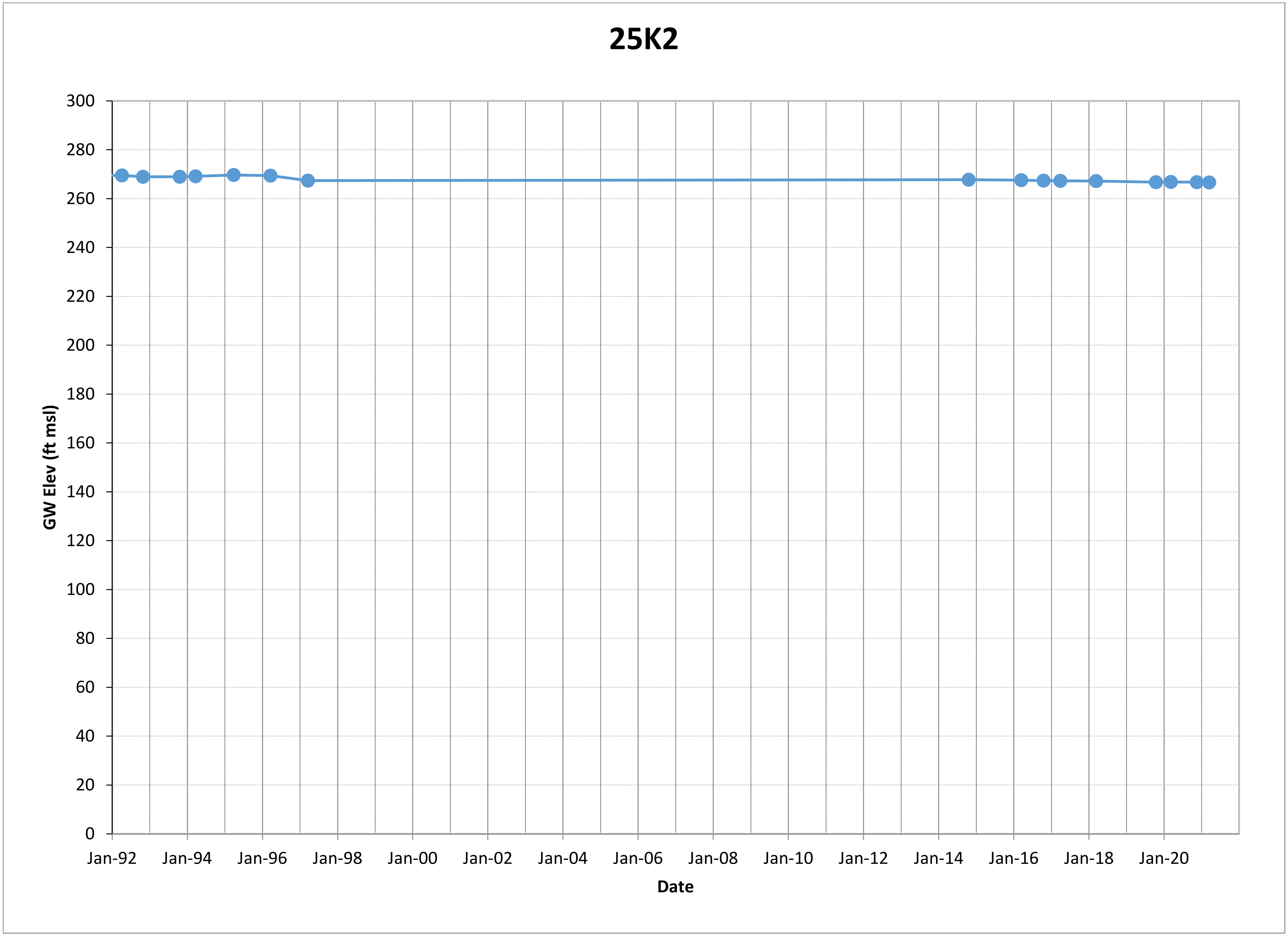

22E2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date

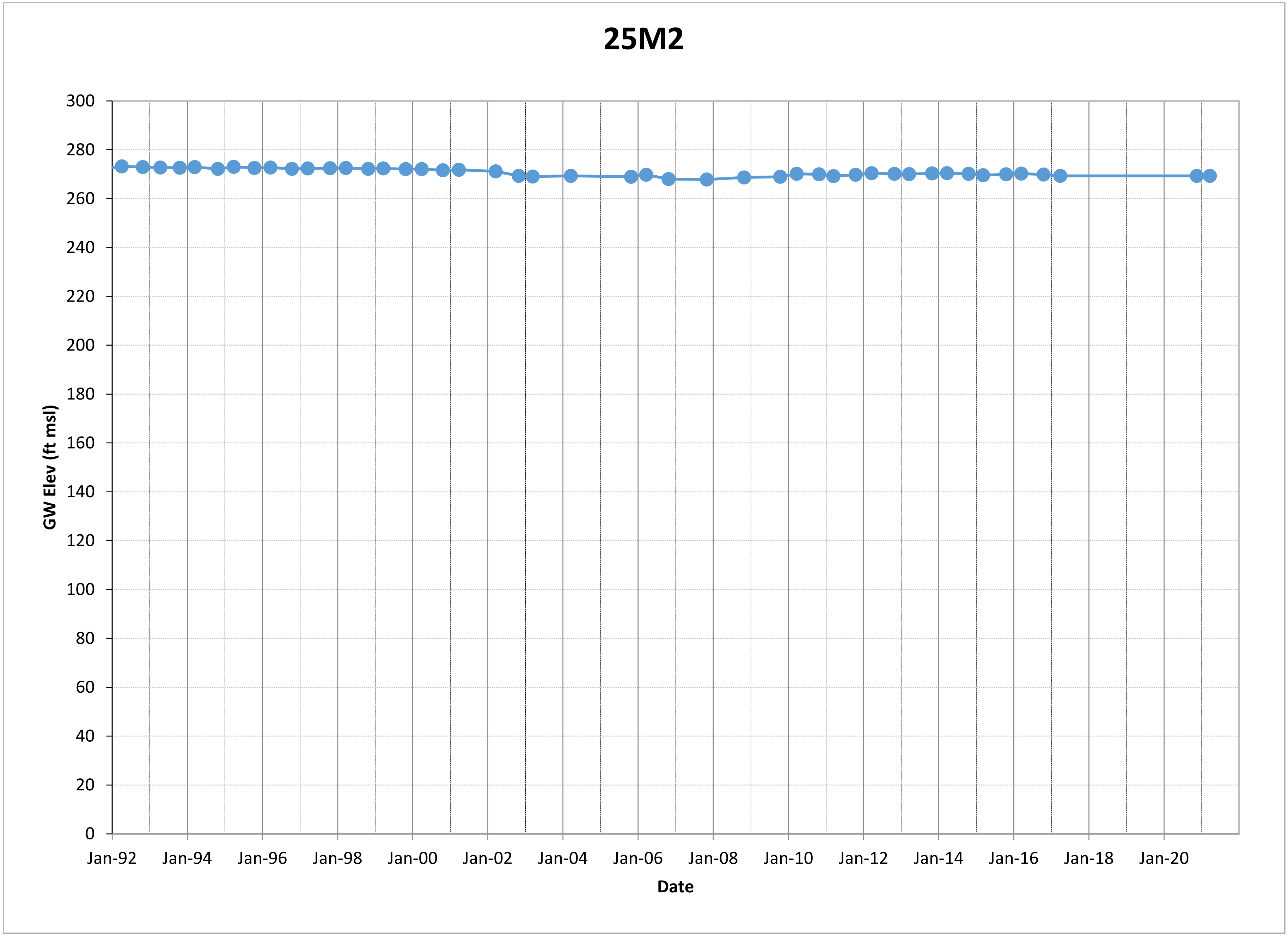


23B1
200
180
160
140
120
100
80
60
40
20
0
-20
-40
-60
-80
-100
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


24B1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


24D1
GW Elev (ft msl)
0
20
40
60
80
100
120
140
160
180
200
220
240
260
280
300
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


25K2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date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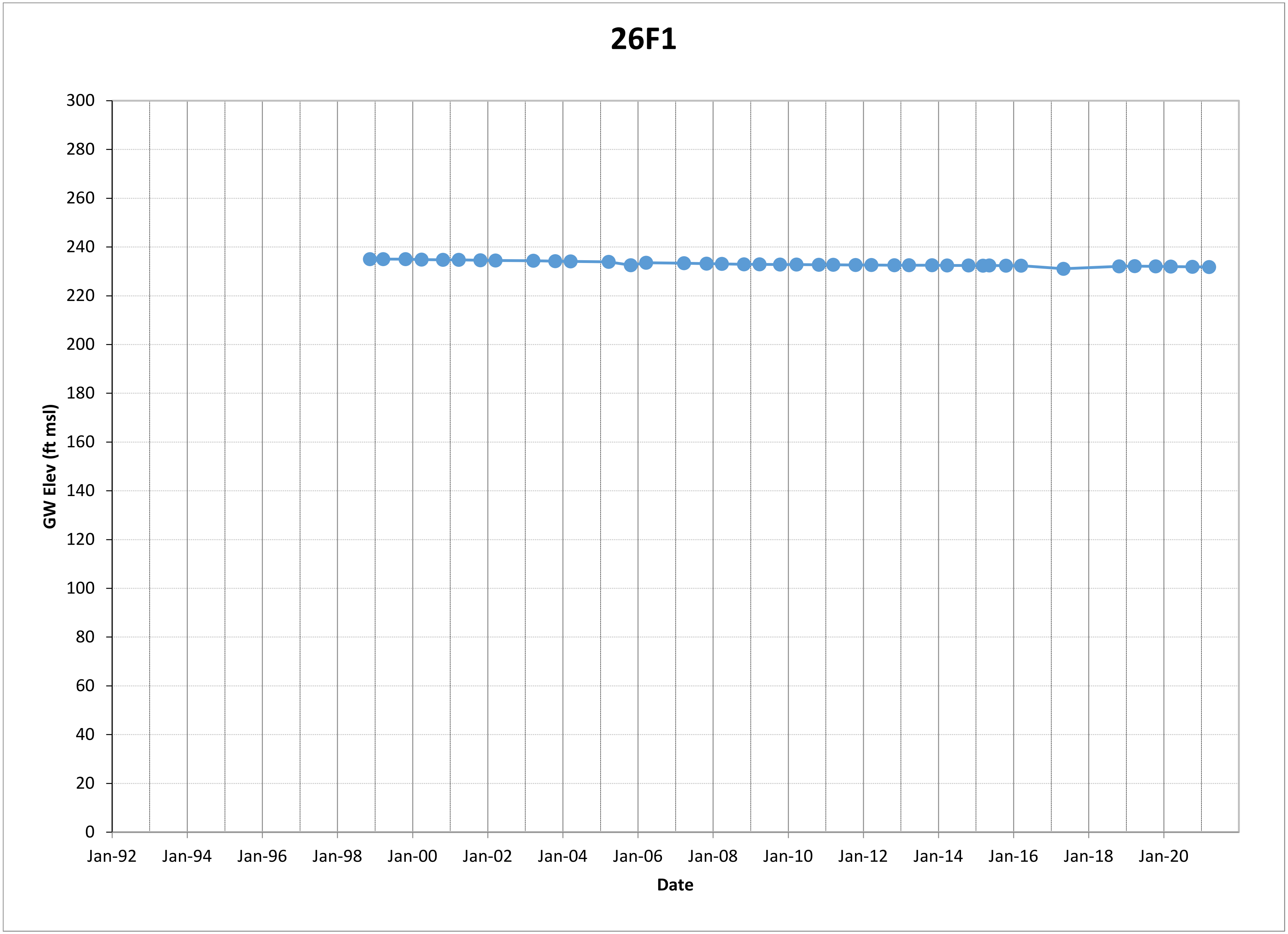
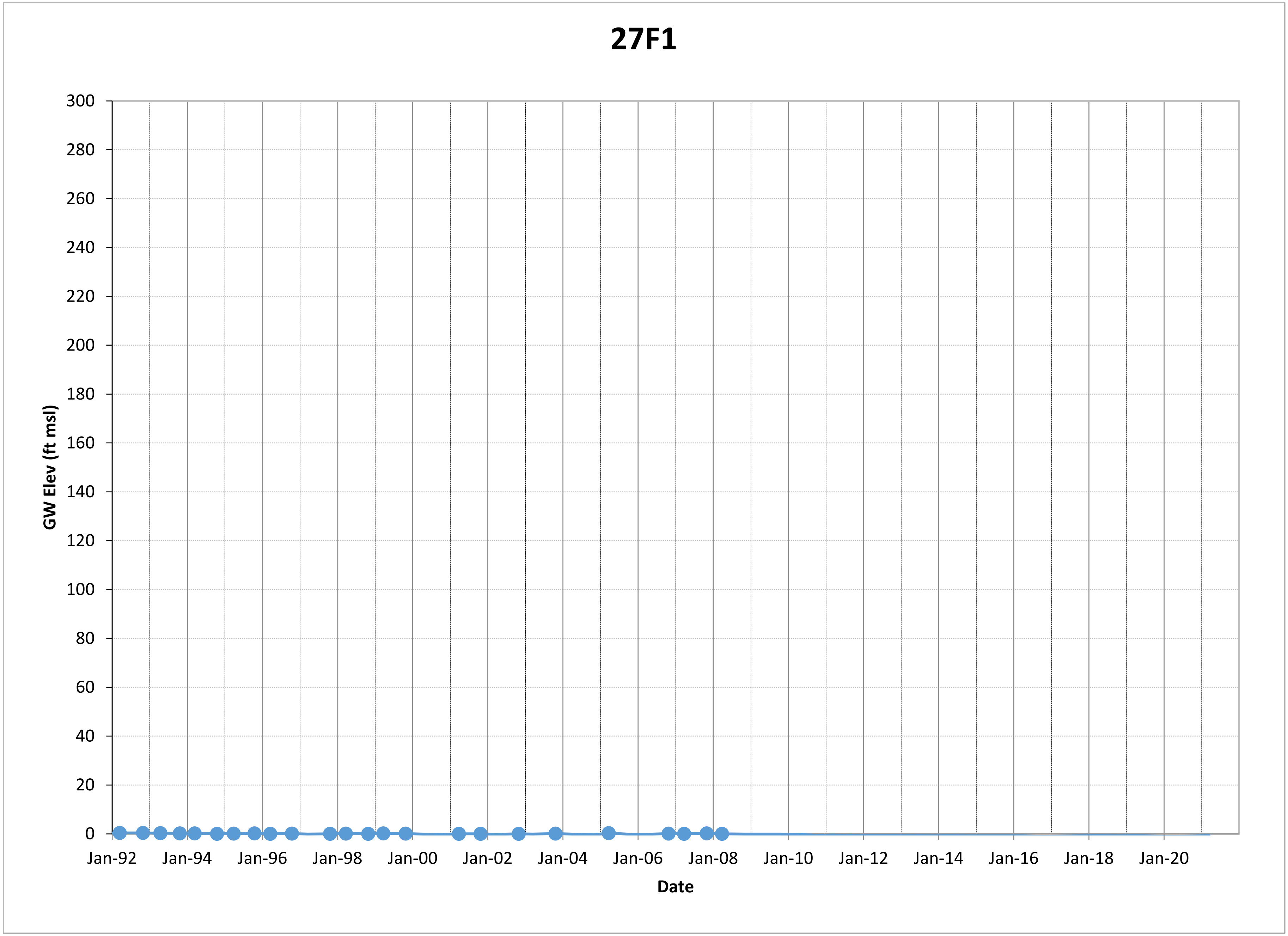
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



26F1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


27F1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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Jan-12
Jan-14
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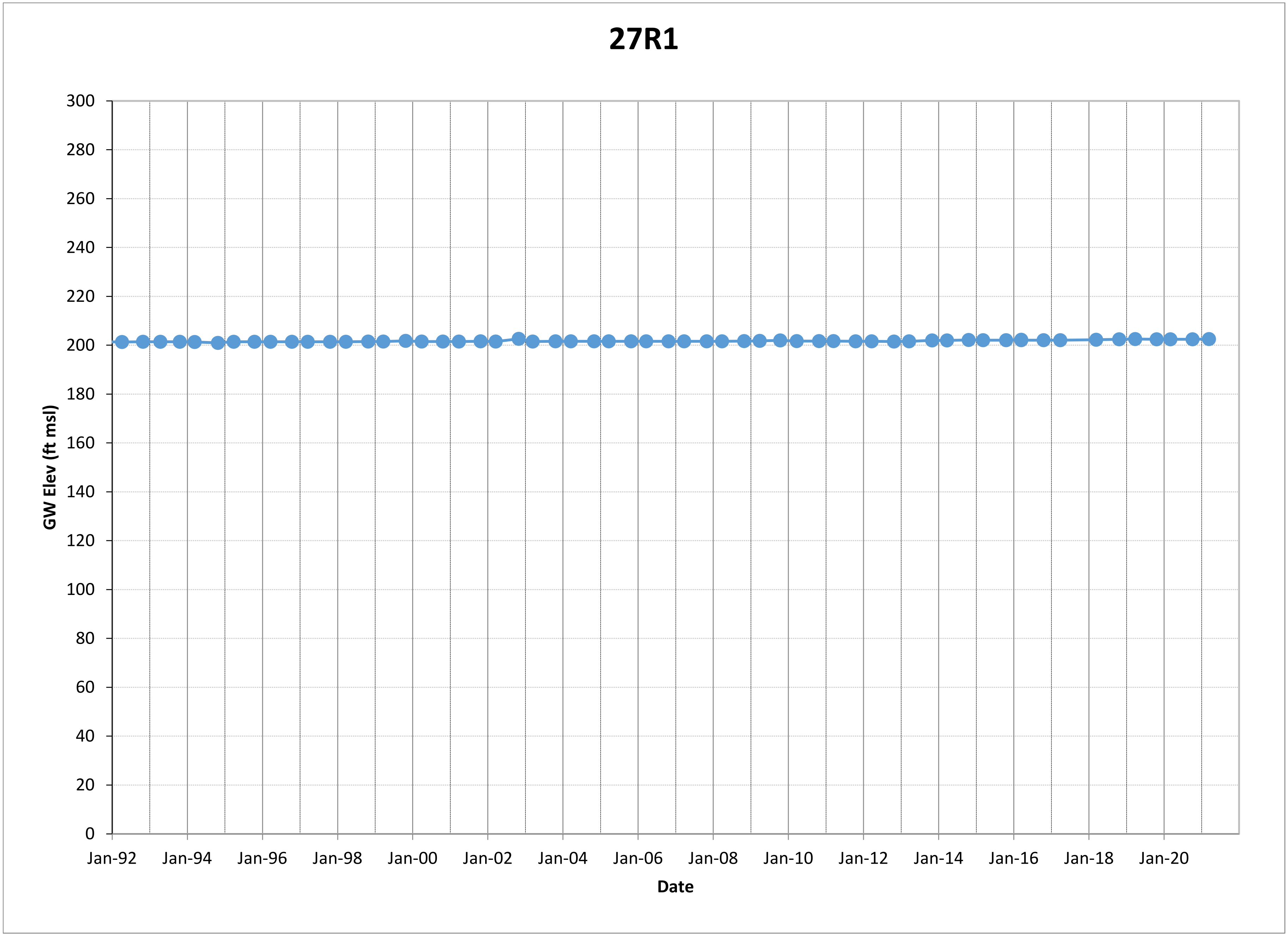
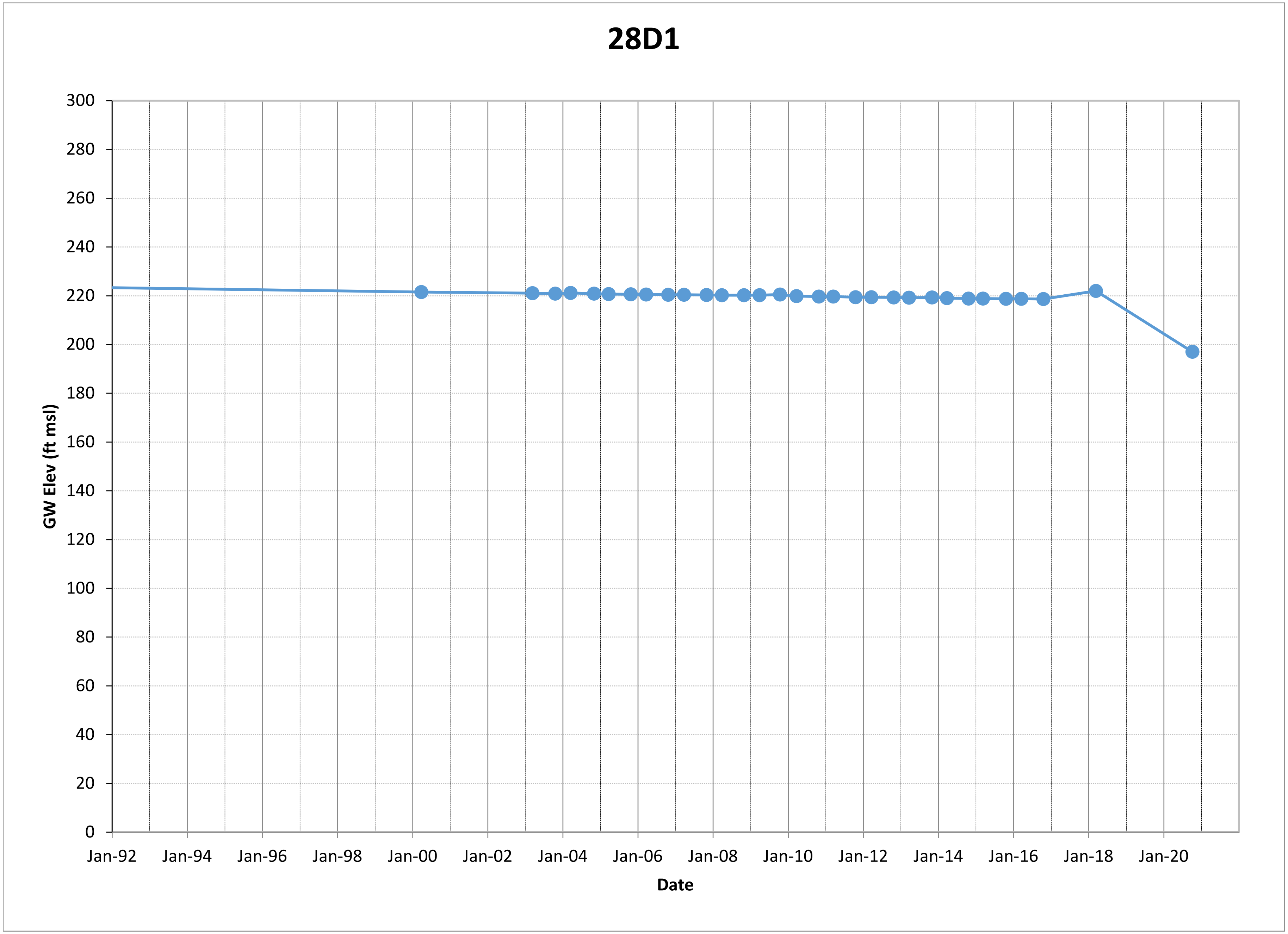
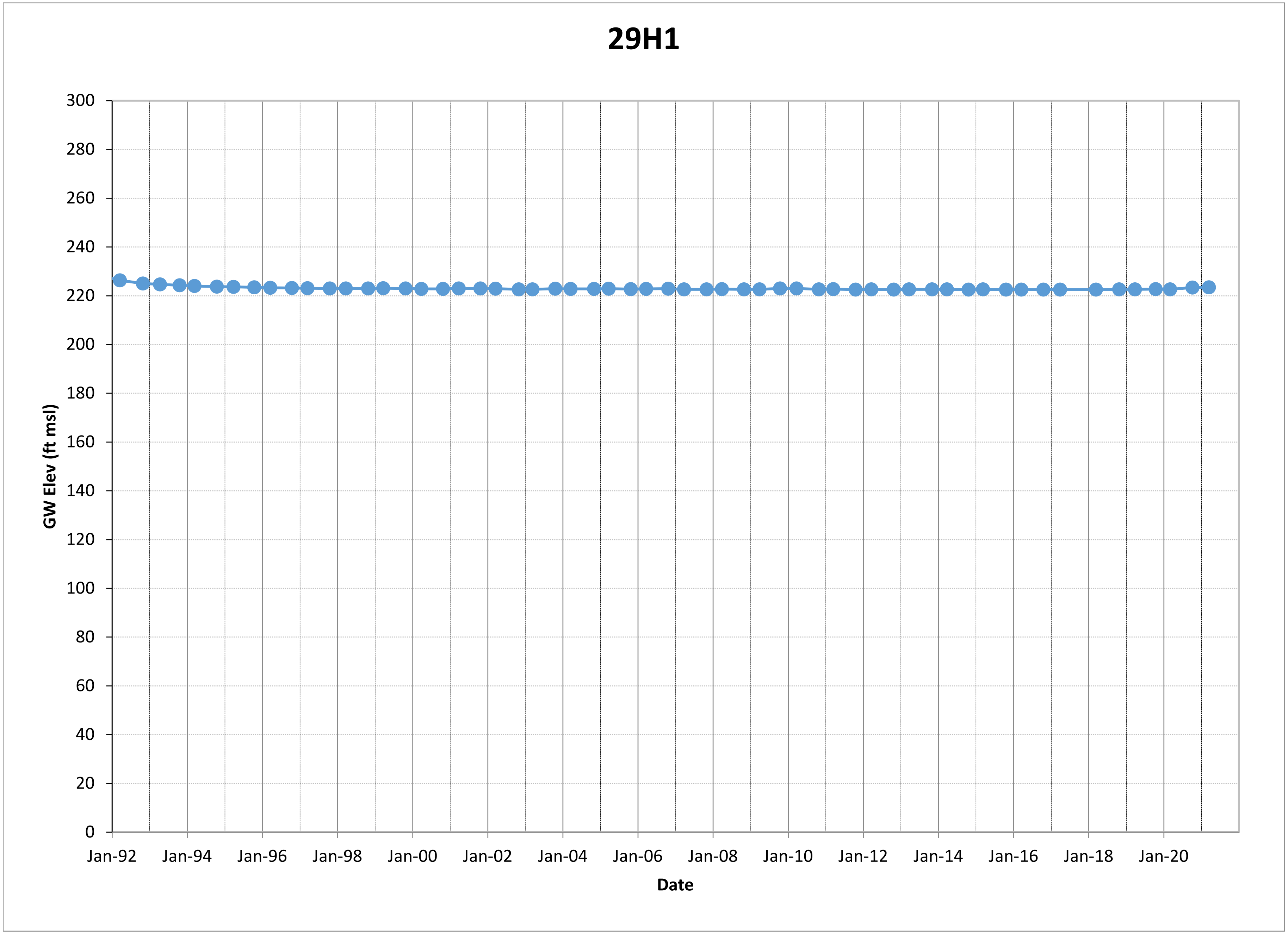
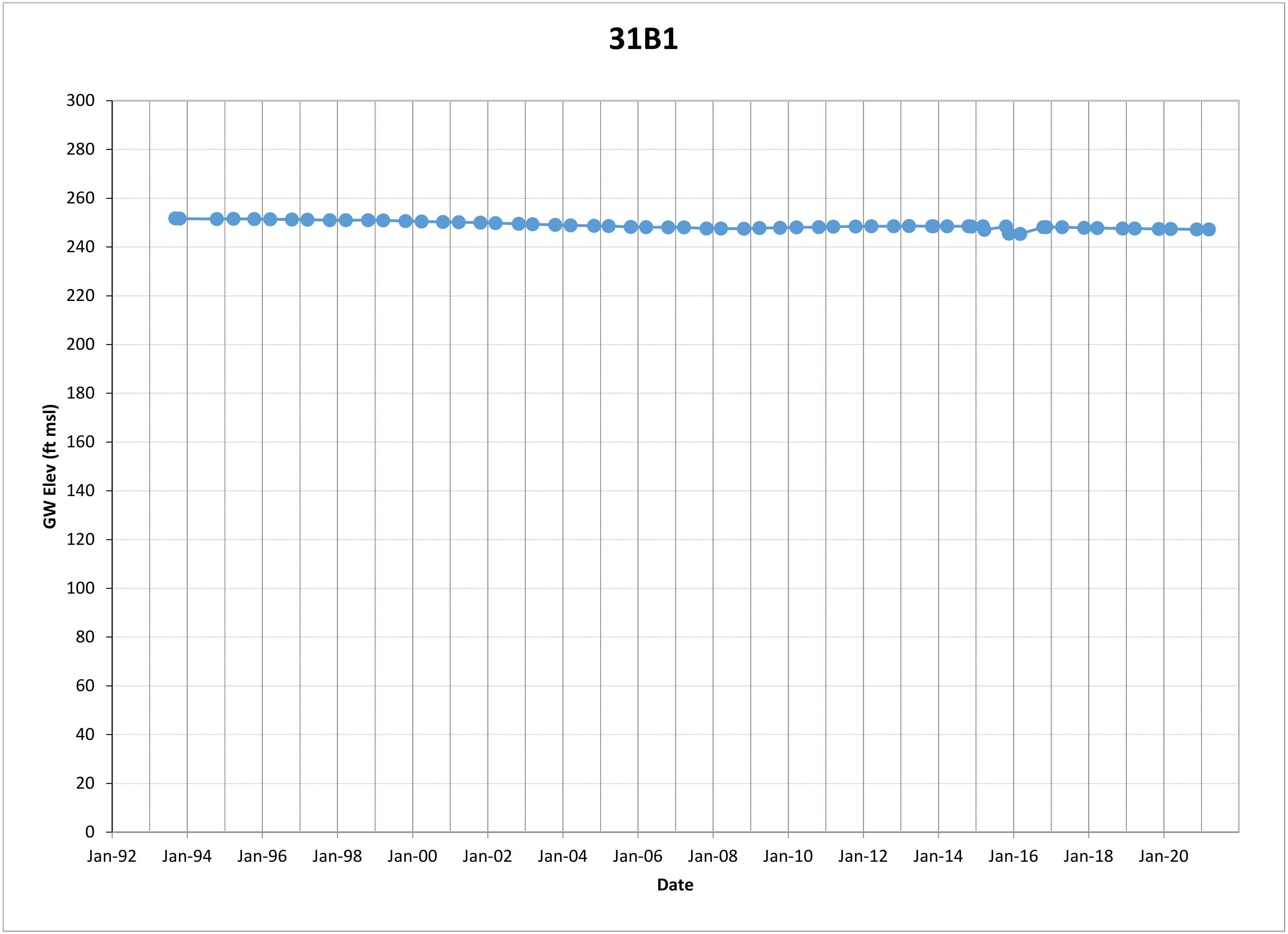
Jan-18
Jan-20
Date



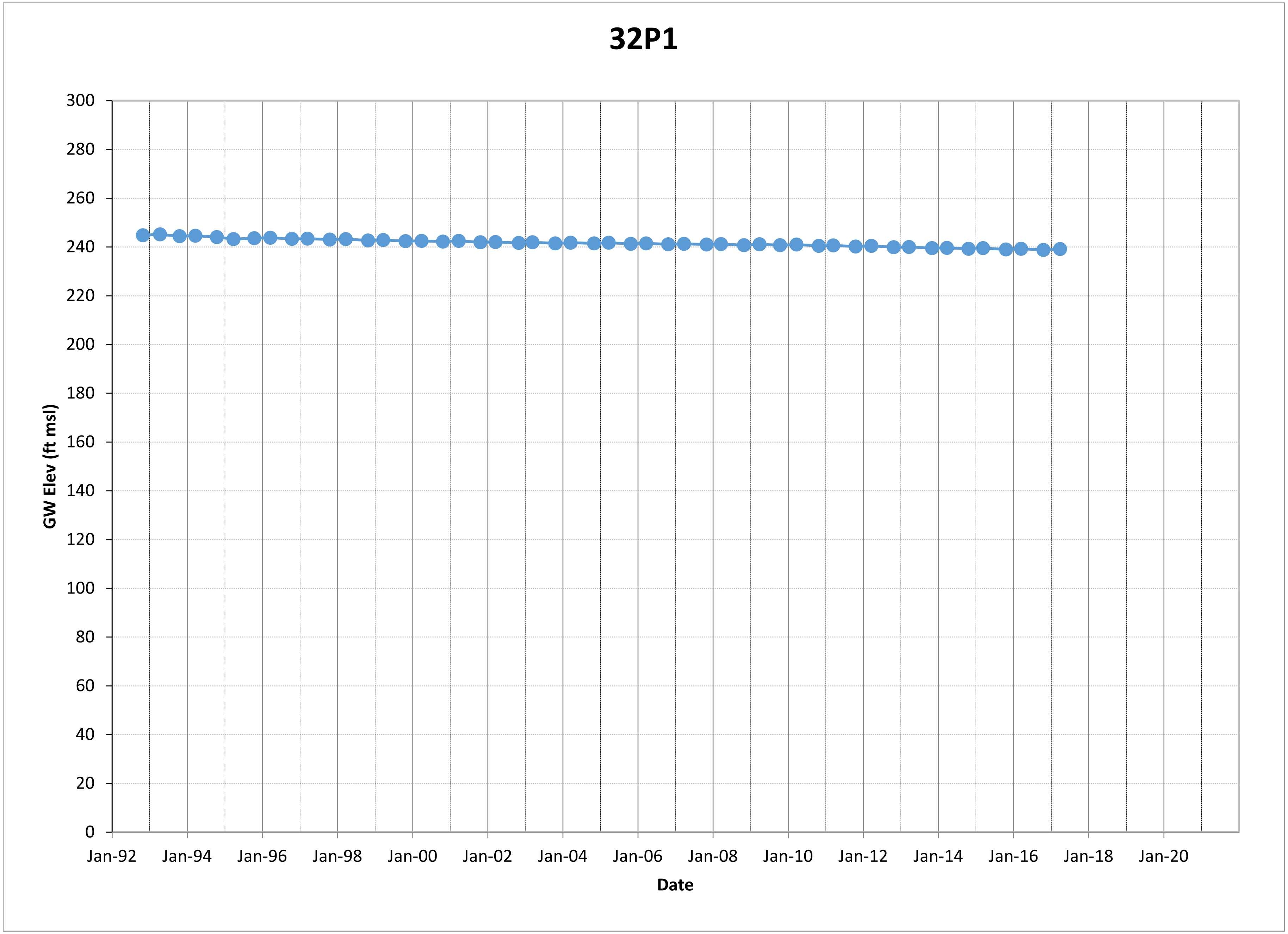
27R1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


28D1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


29H1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



31B1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



32P1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
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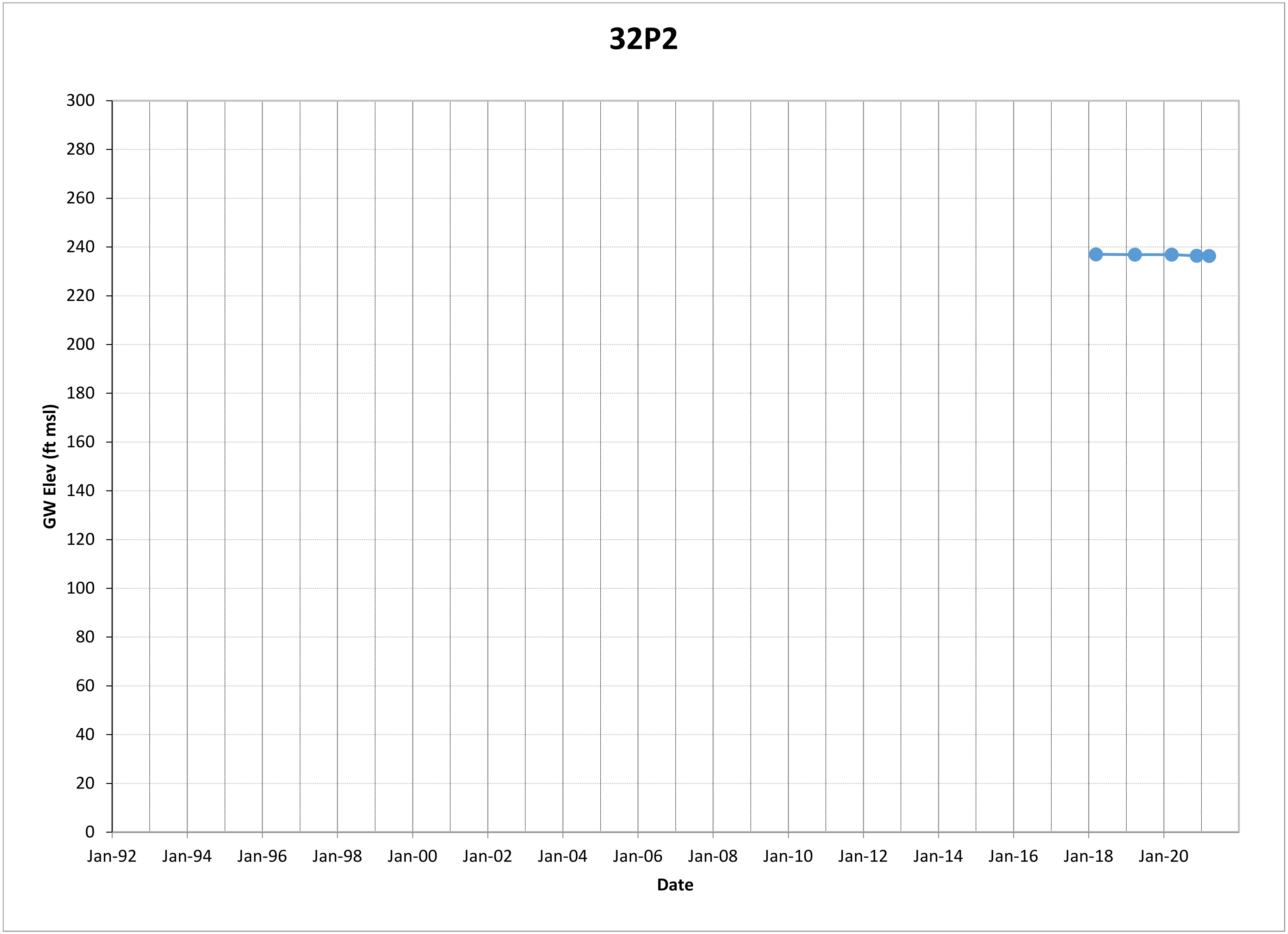
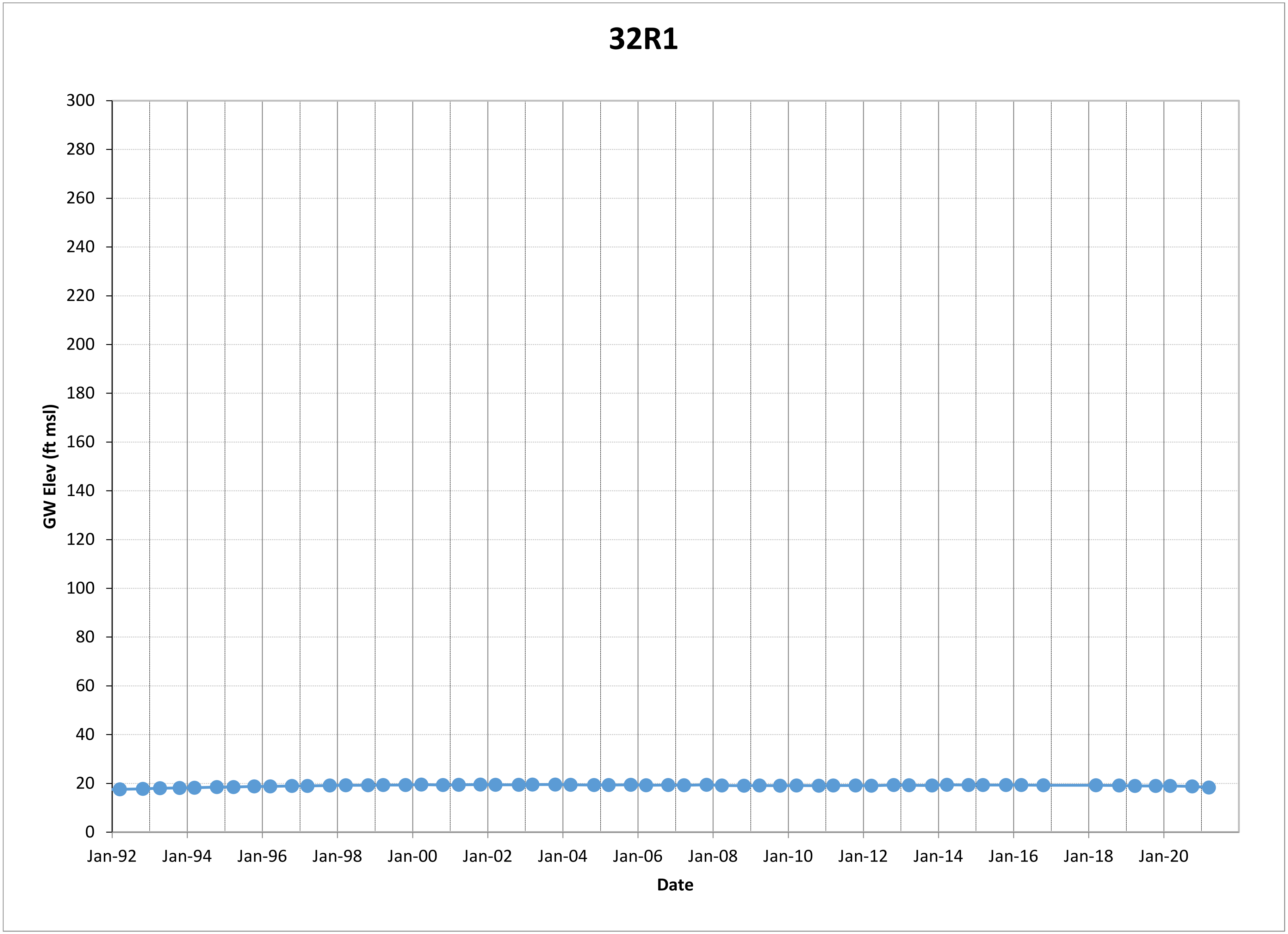
Jan-18
Jan-20
Date


32P2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



32R1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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Jan-06
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Jan-12
Jan-14
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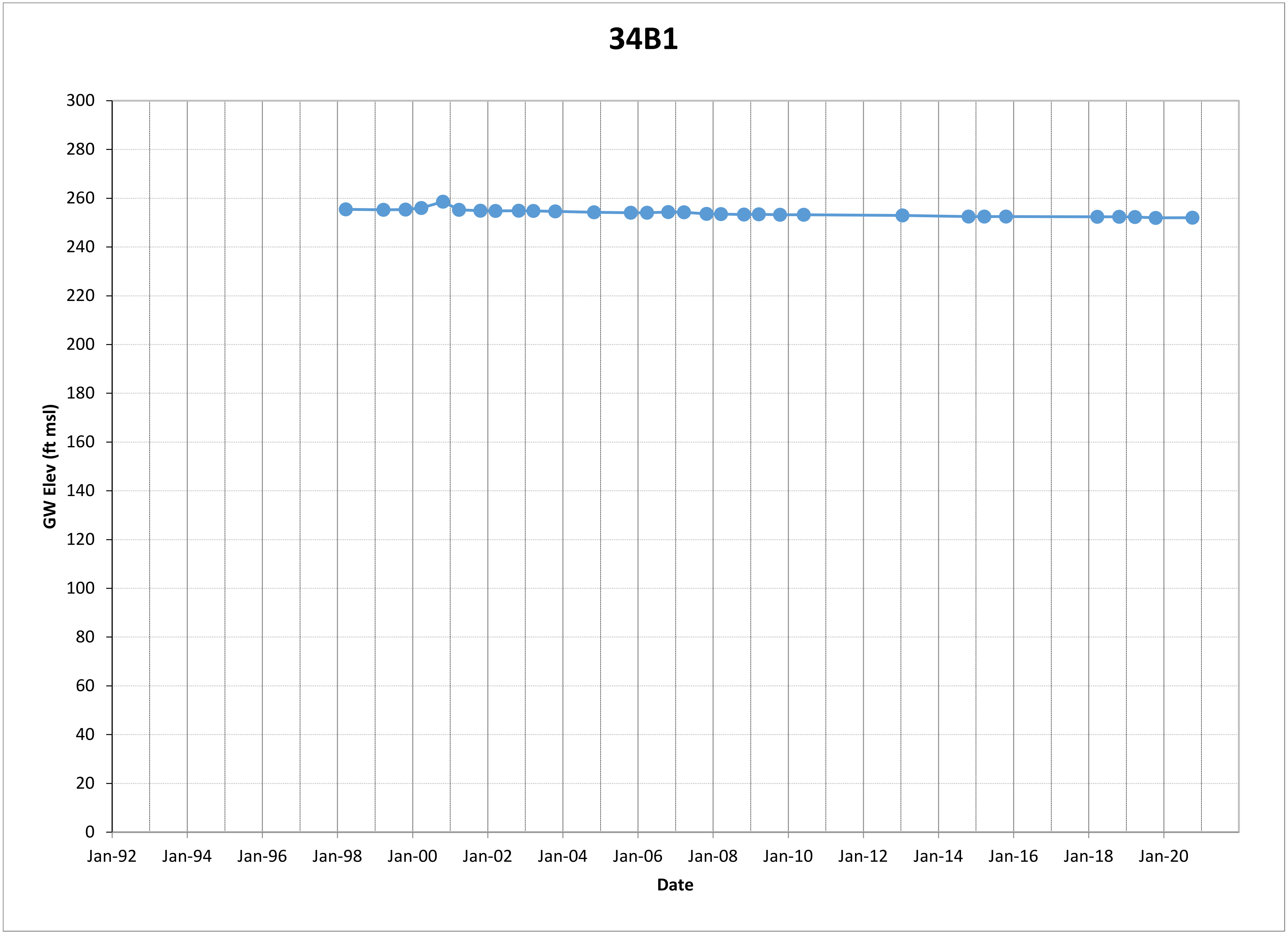
Jan-18
Jan-20
Date



34B1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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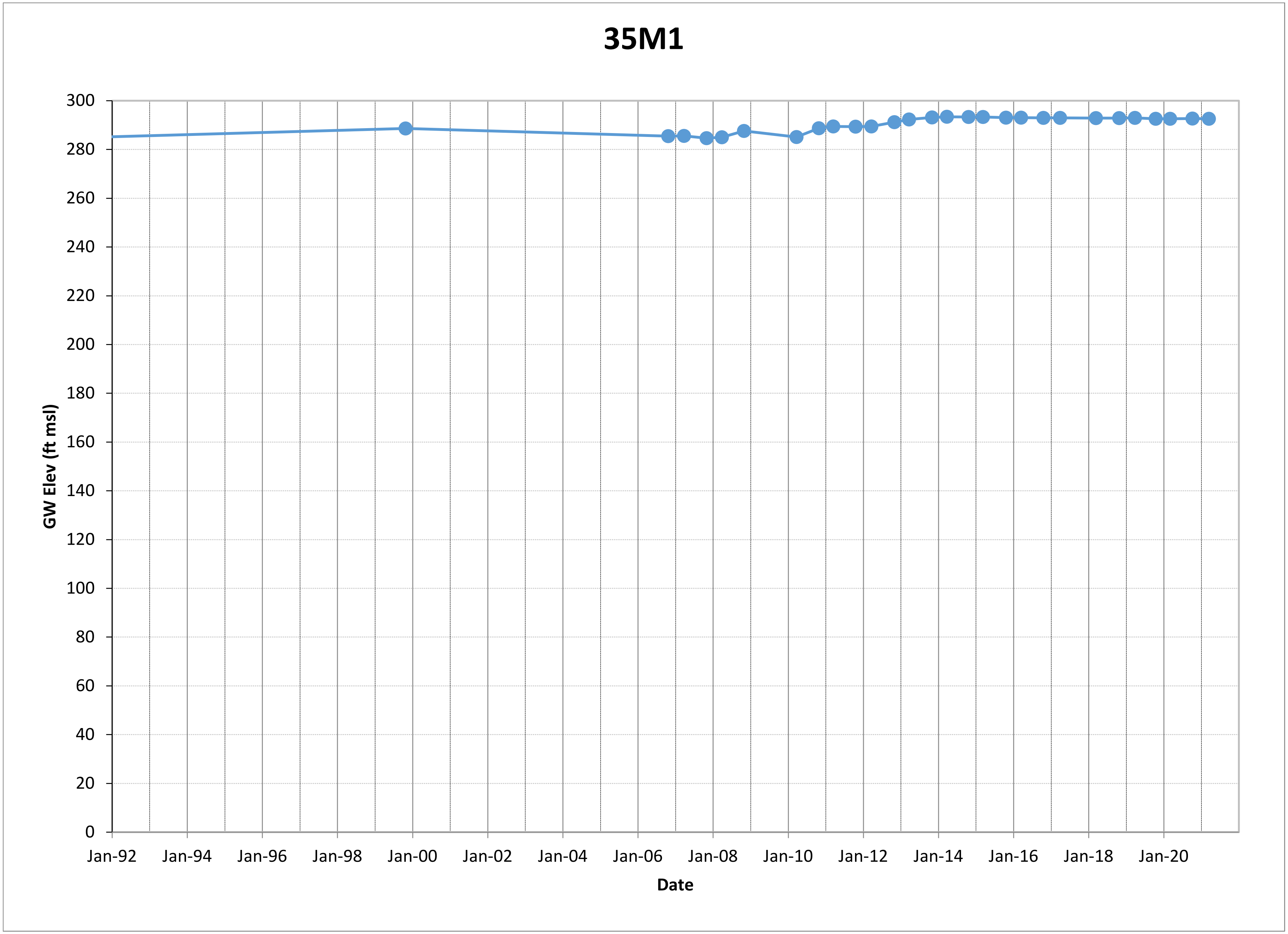
Jan-18
Jan-20
Date


35M1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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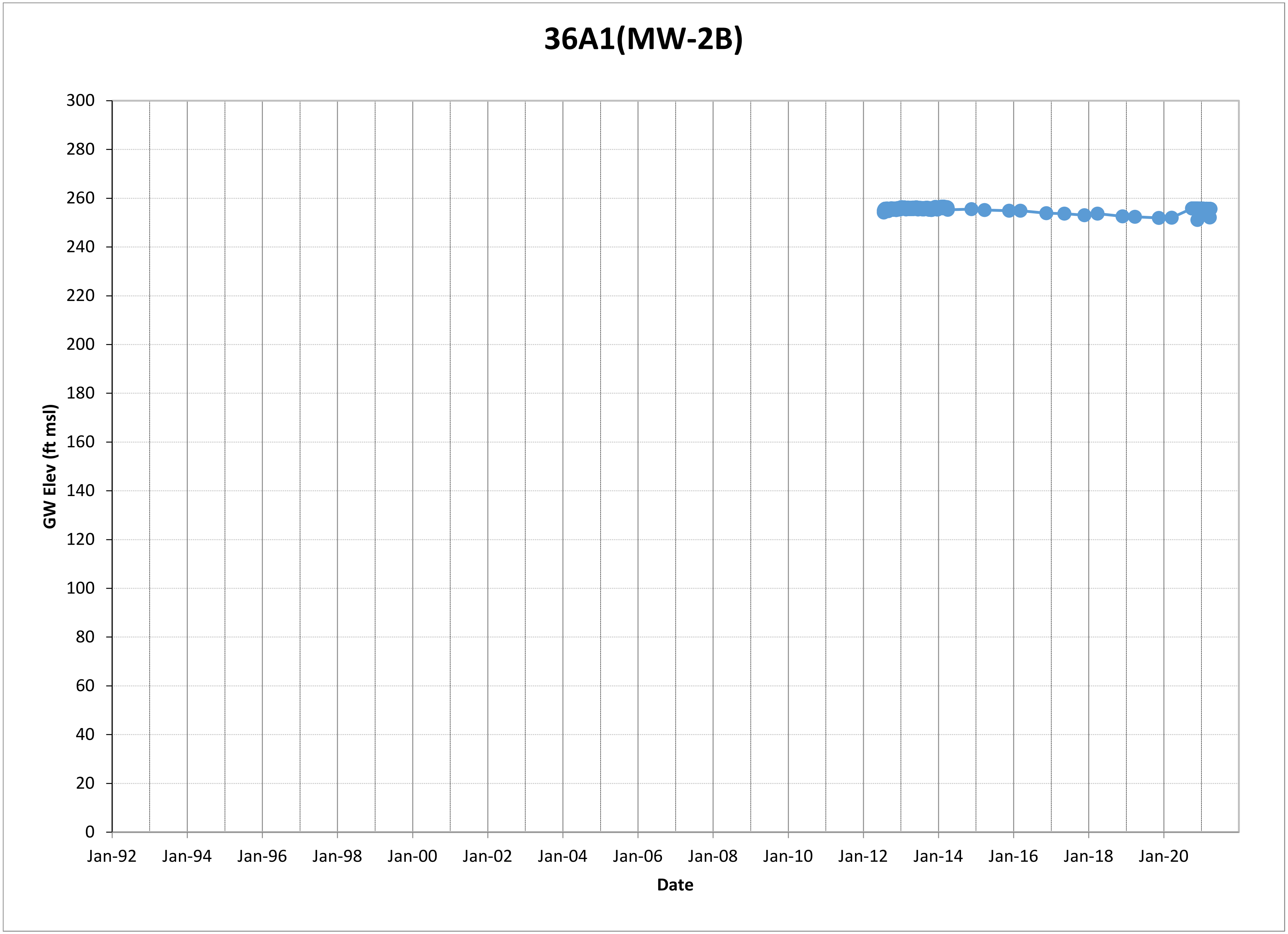
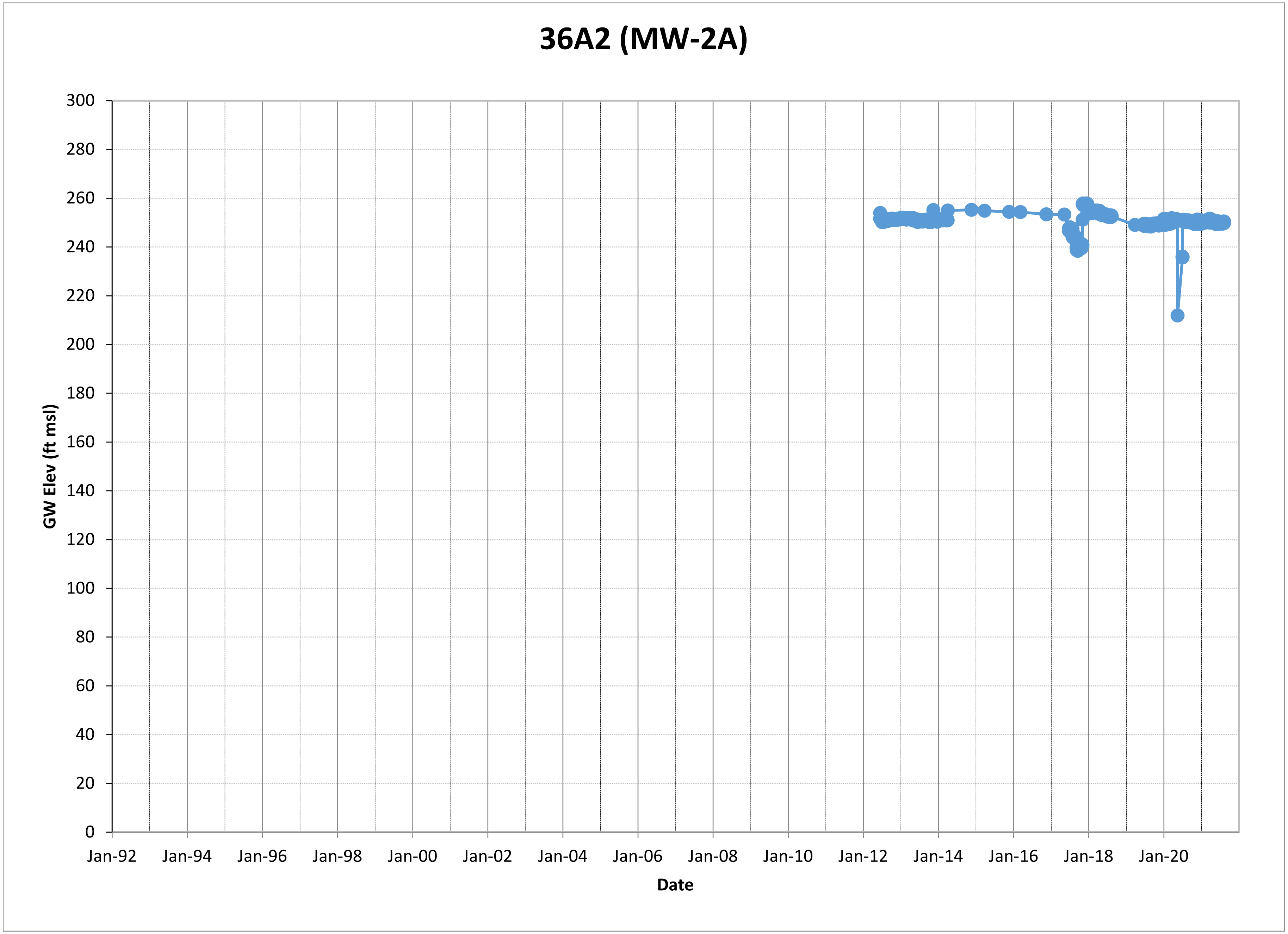
Jan-18
Jan-20
Date



36A1(MW-2B)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



36A2 (MW-2A)
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
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Jan-04
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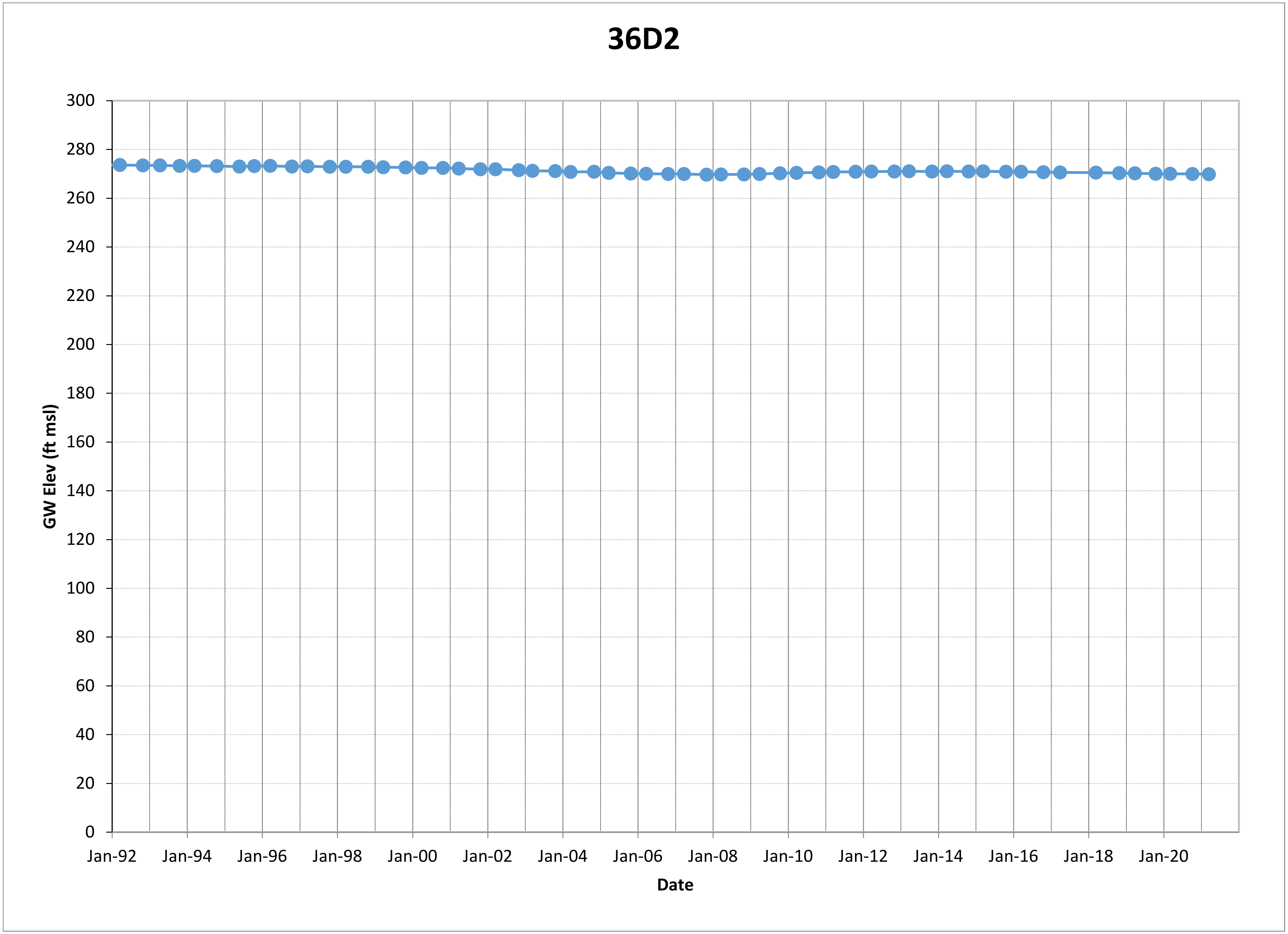
Jan-18
Jan-20
Date


36D2
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
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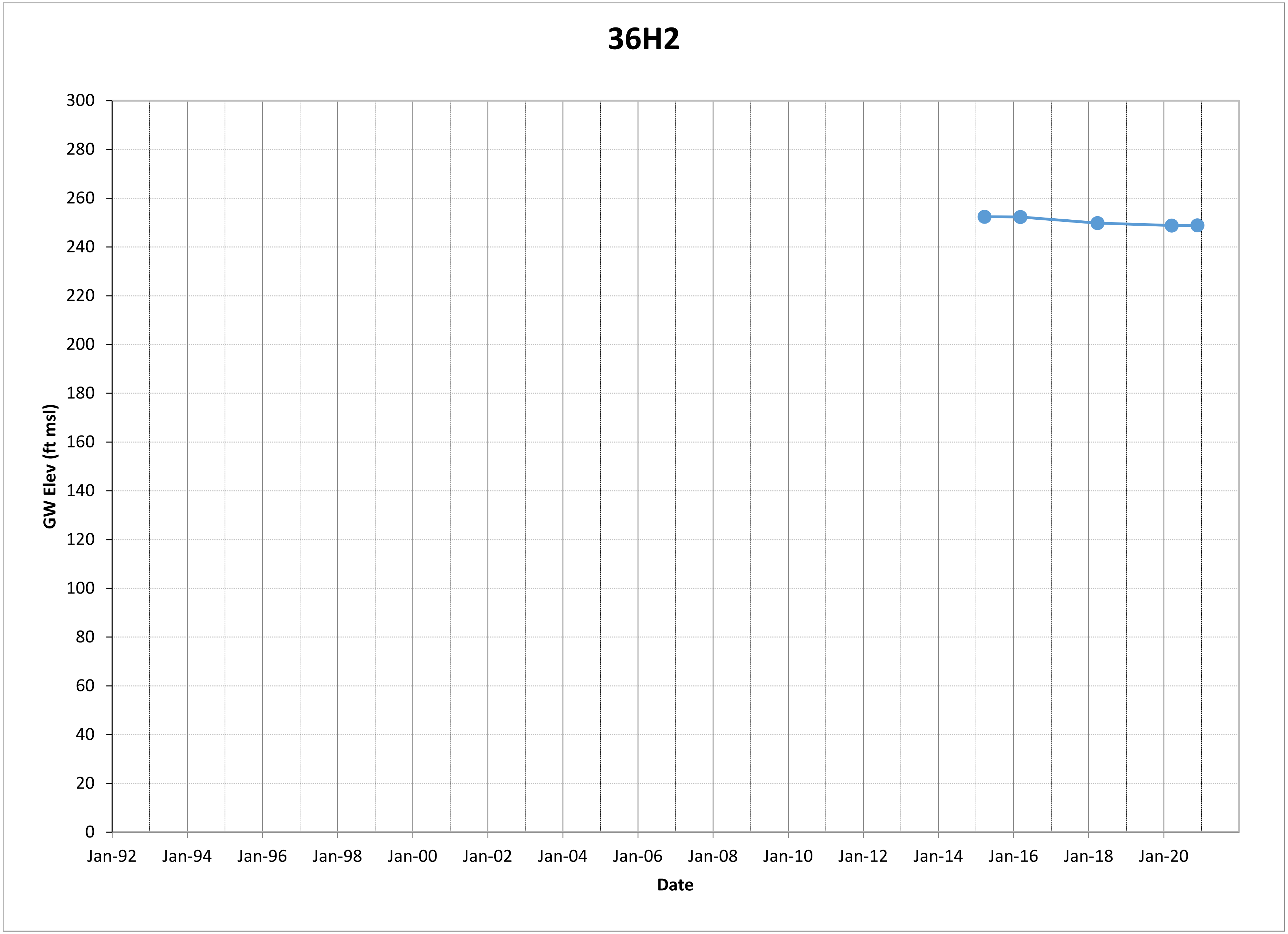
Jan-18
Jan-20
Date



36H2
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
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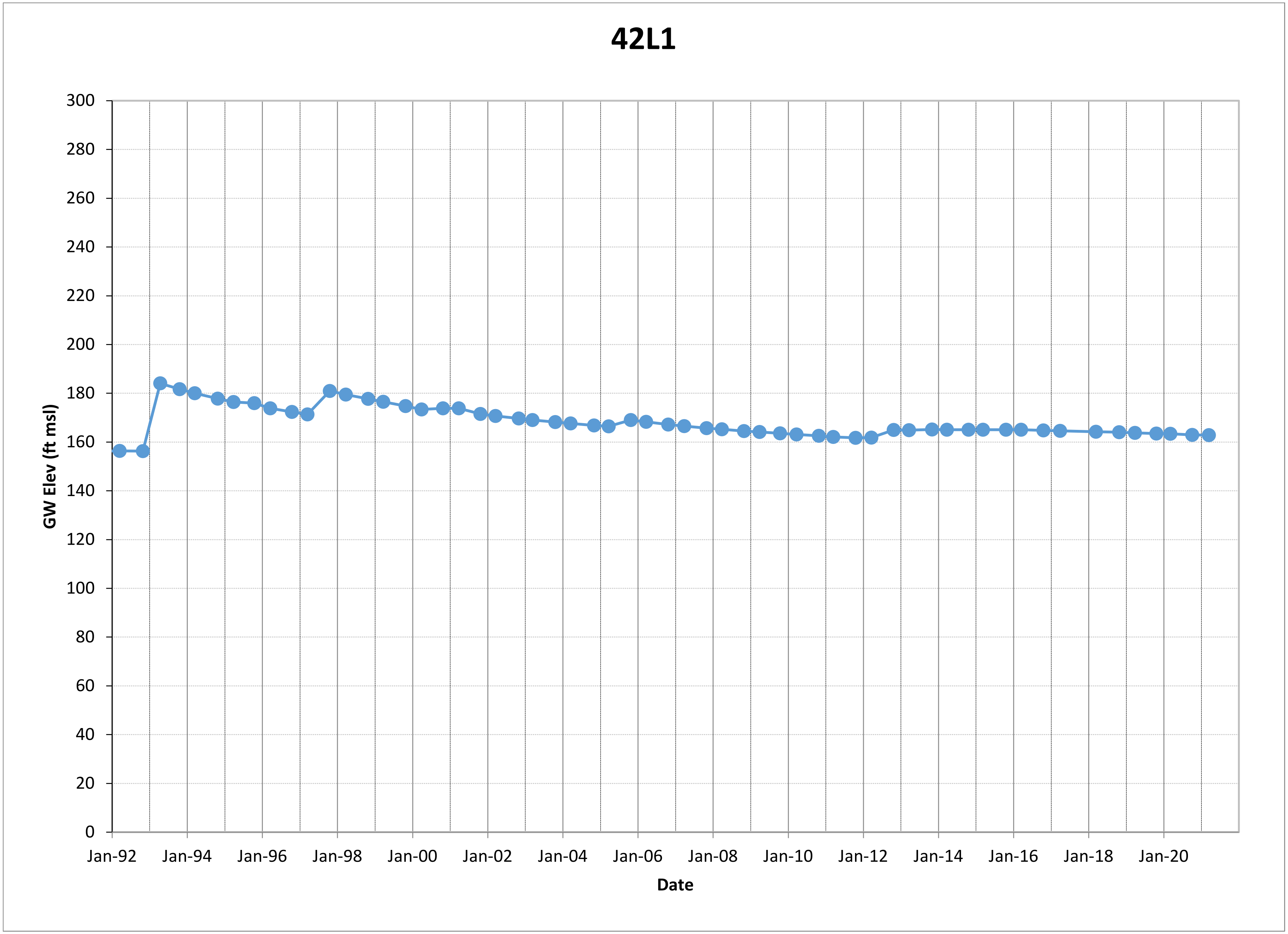
Jan-18
Jan-20
Date


42L1
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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Jan-14
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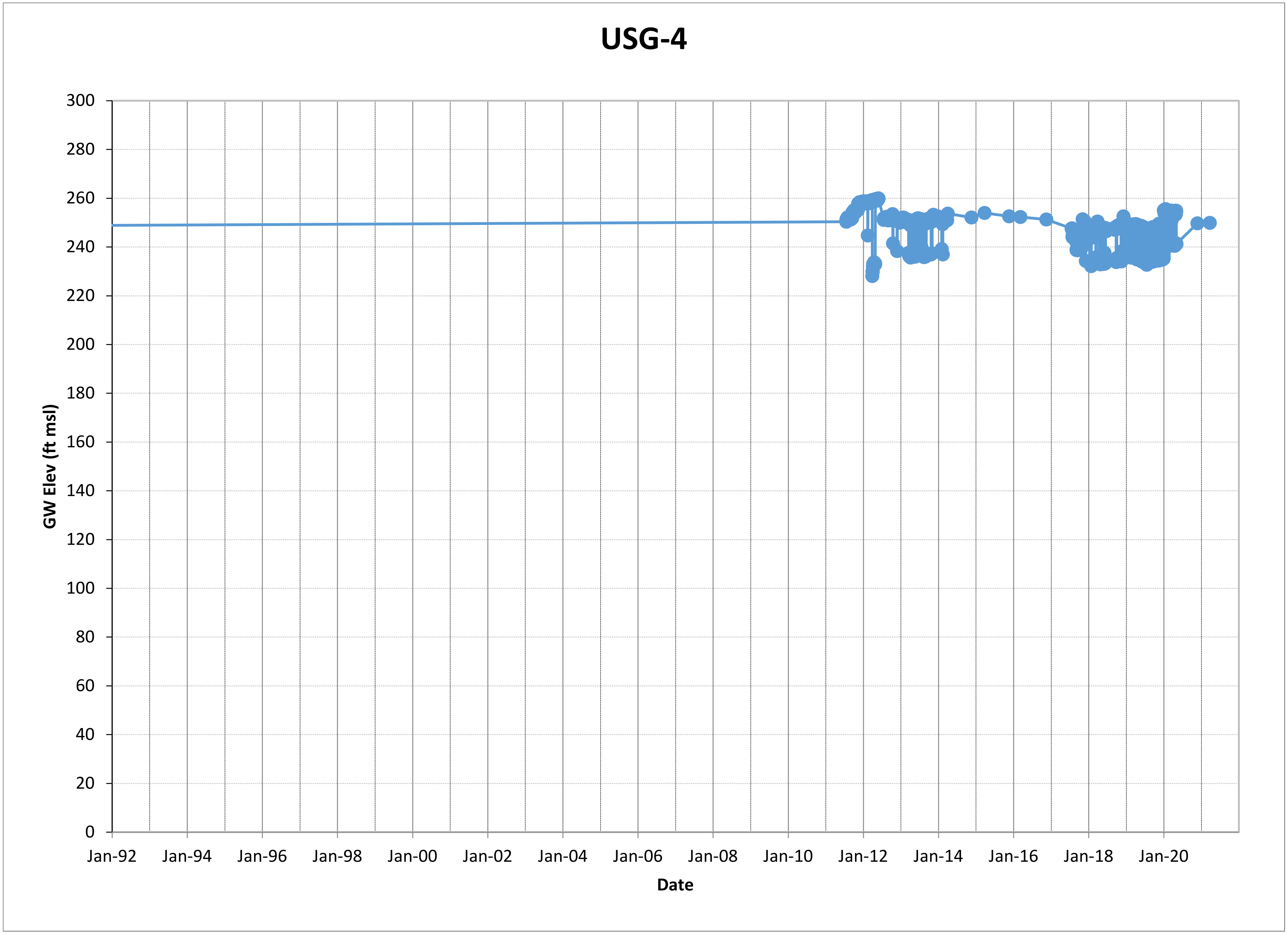
Jan-18
Jan-20
Date



USG-4
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
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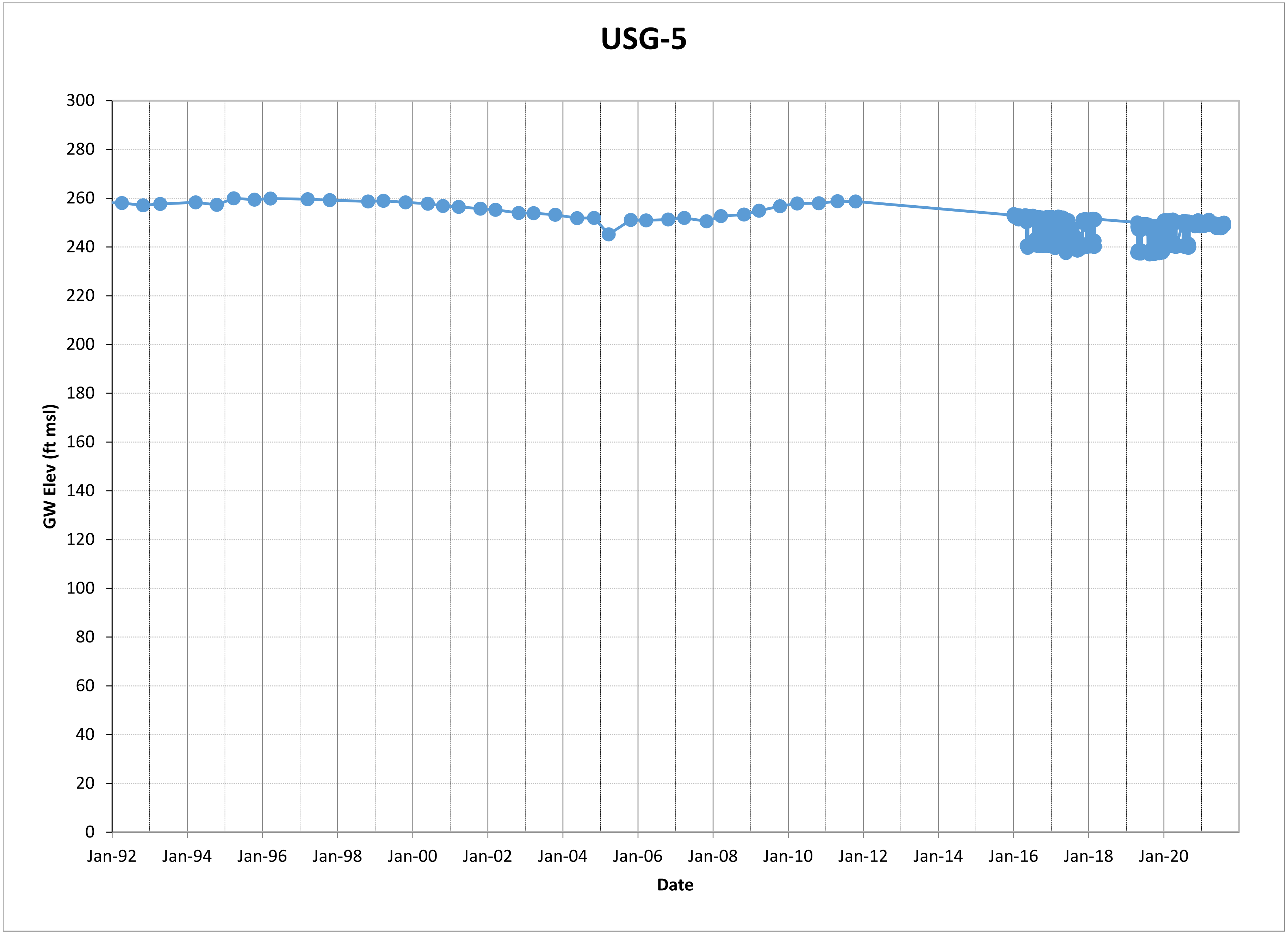
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



USG-5
GW Elev (ft msl)
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
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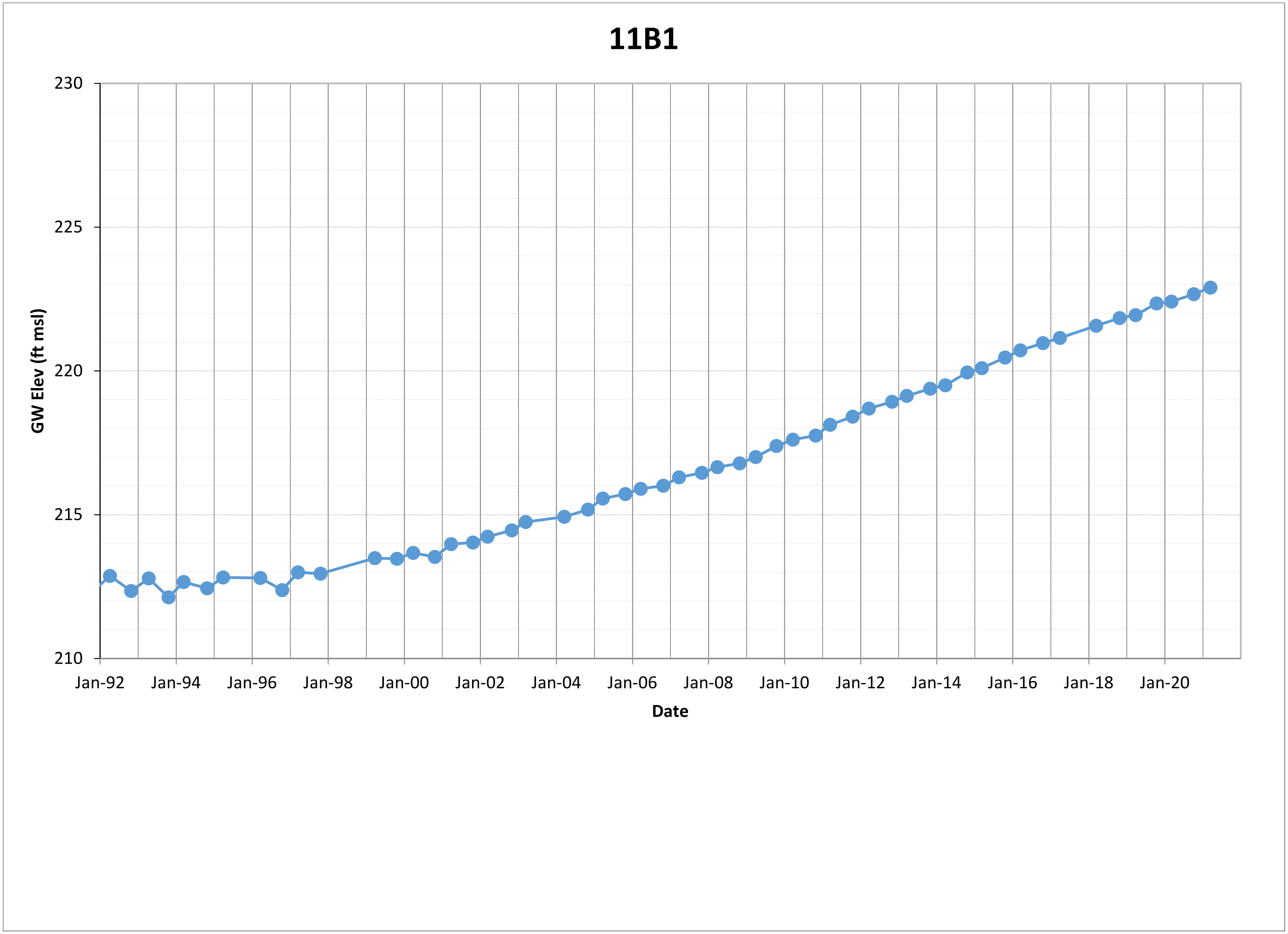
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date



11B1
230
225
220
215
210
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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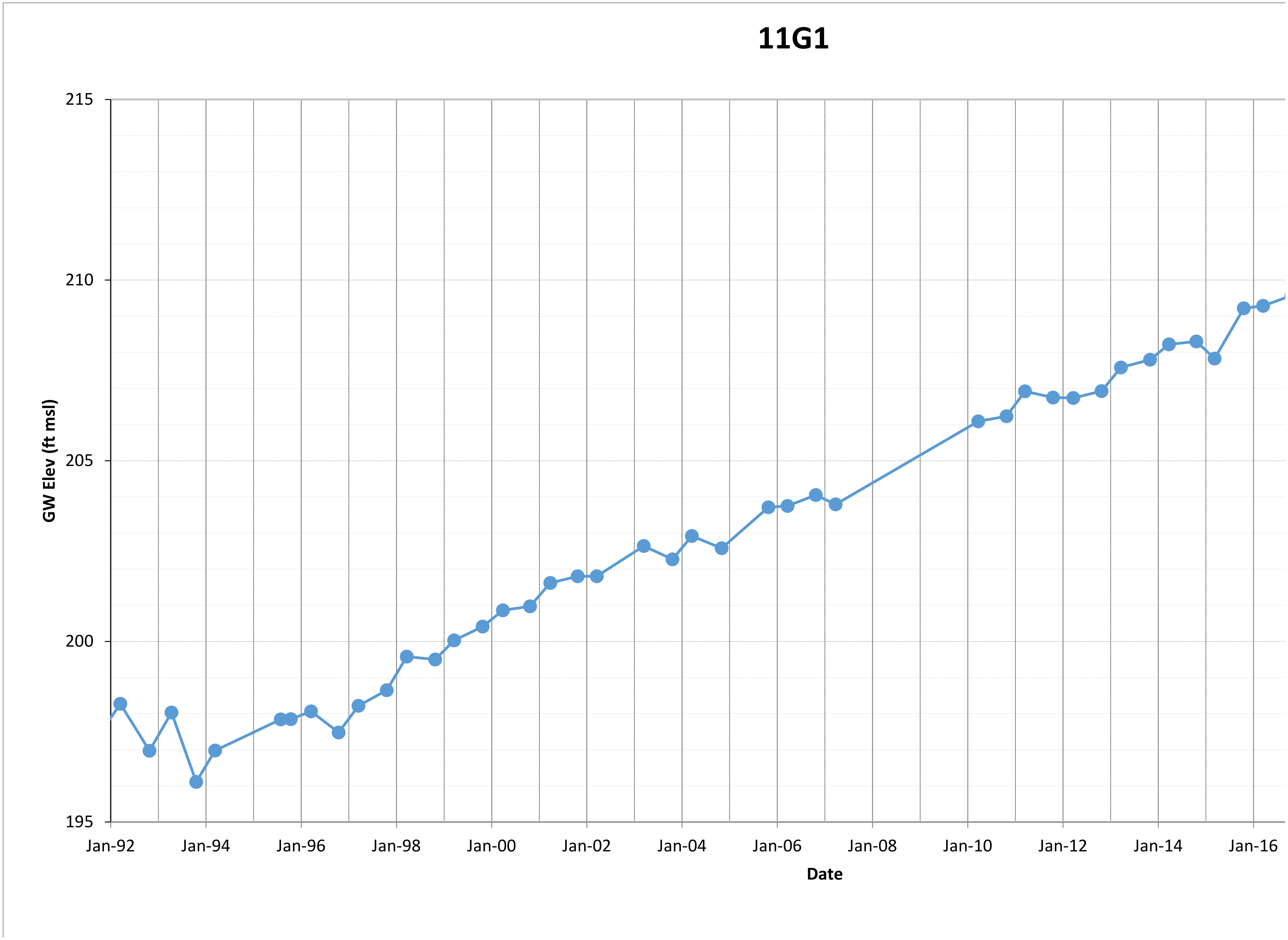
Jan-14
Jan-16
Jan-18
Jan-20
Date


11G1
GW Elev (ft msl)
215
210
205
200
195
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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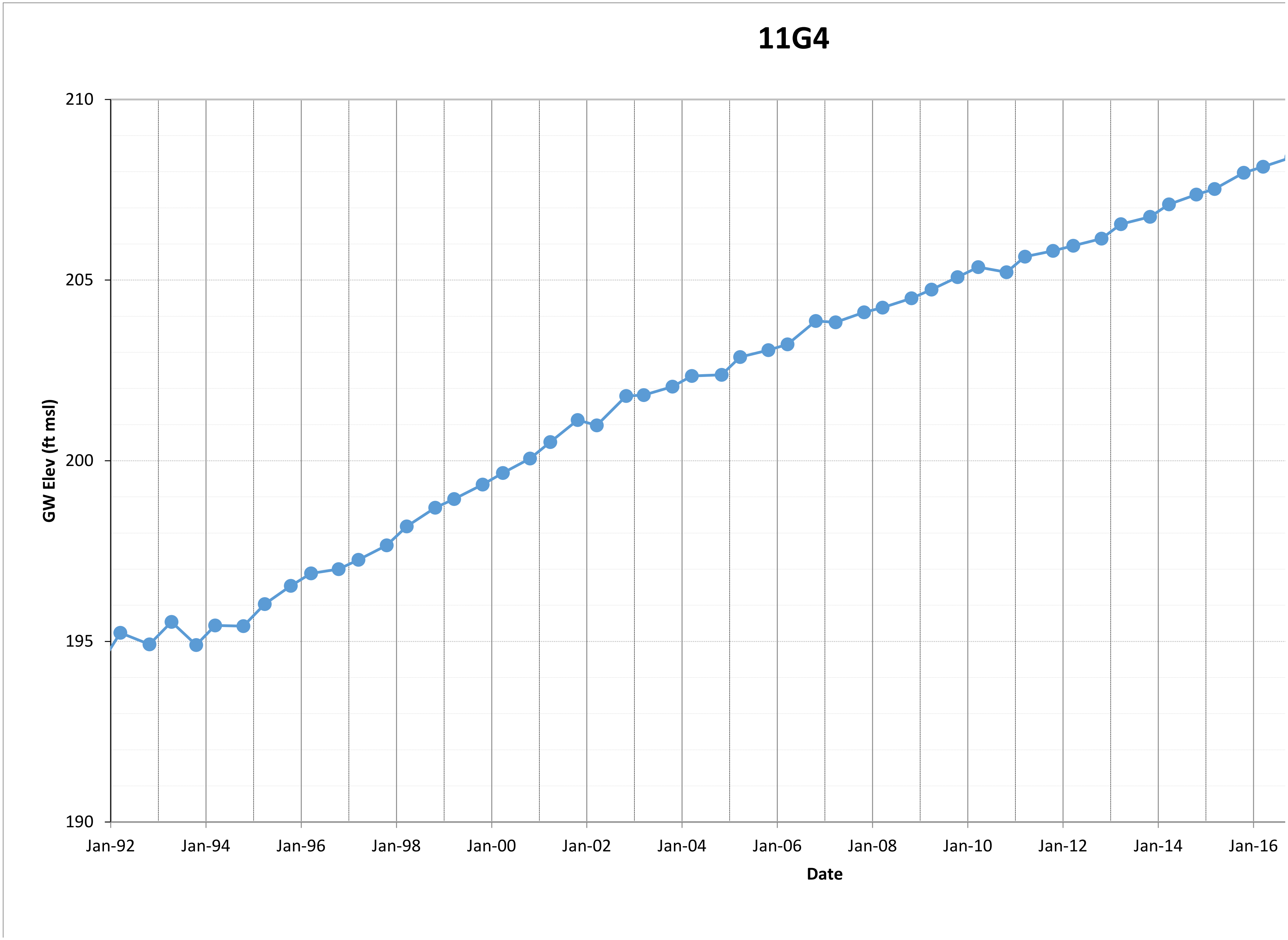
Jan-14
Jan-16
Date


11G4
GW Elev (ft msl)
210
205
200
195
190
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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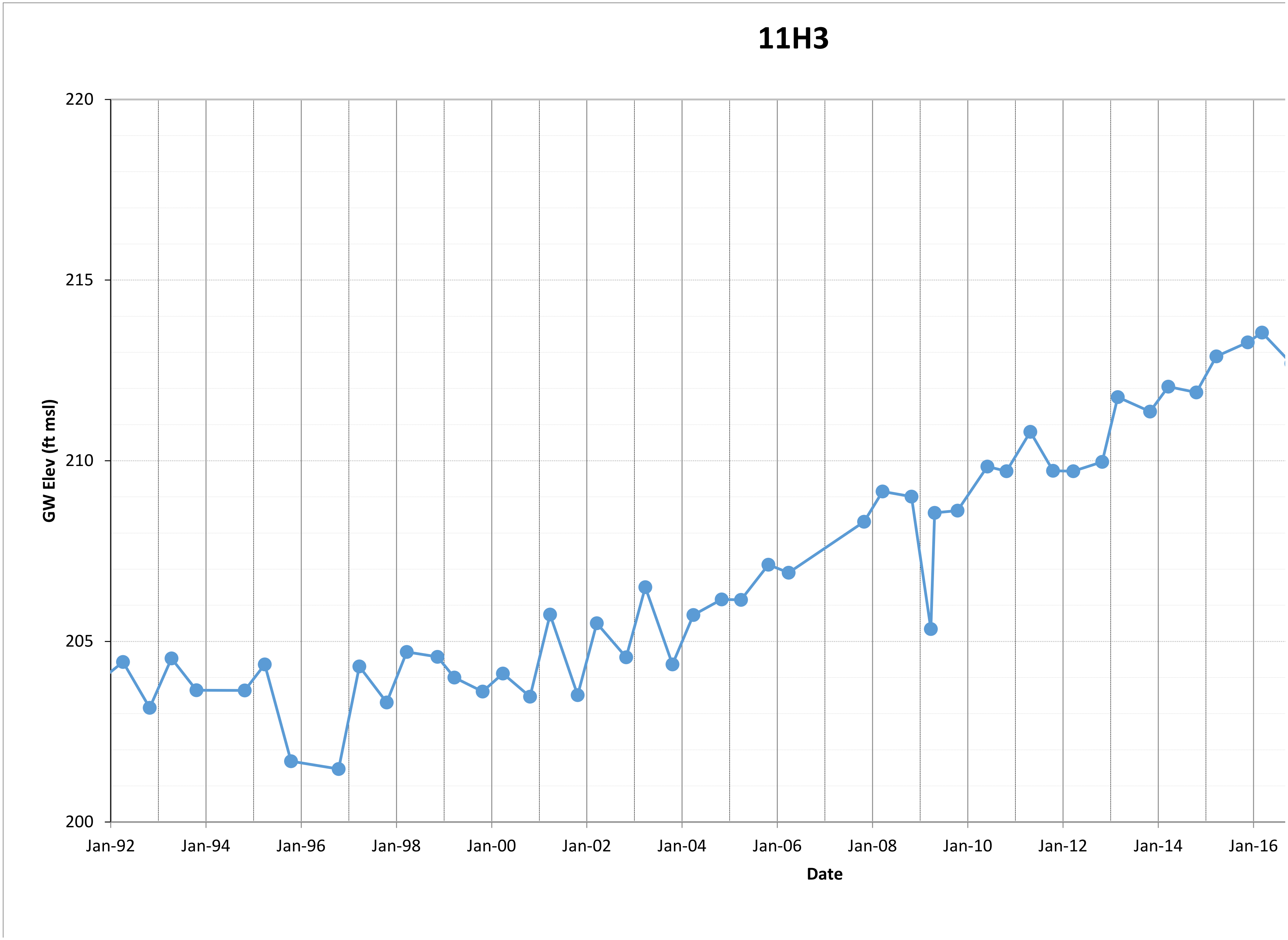
Jan-14
Jan-16
Date


11H3
GW Elev (ft msl)
220
215
210
205
200
Jan-92
Jan-94
Jan-96
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Jan-00
Jan-02
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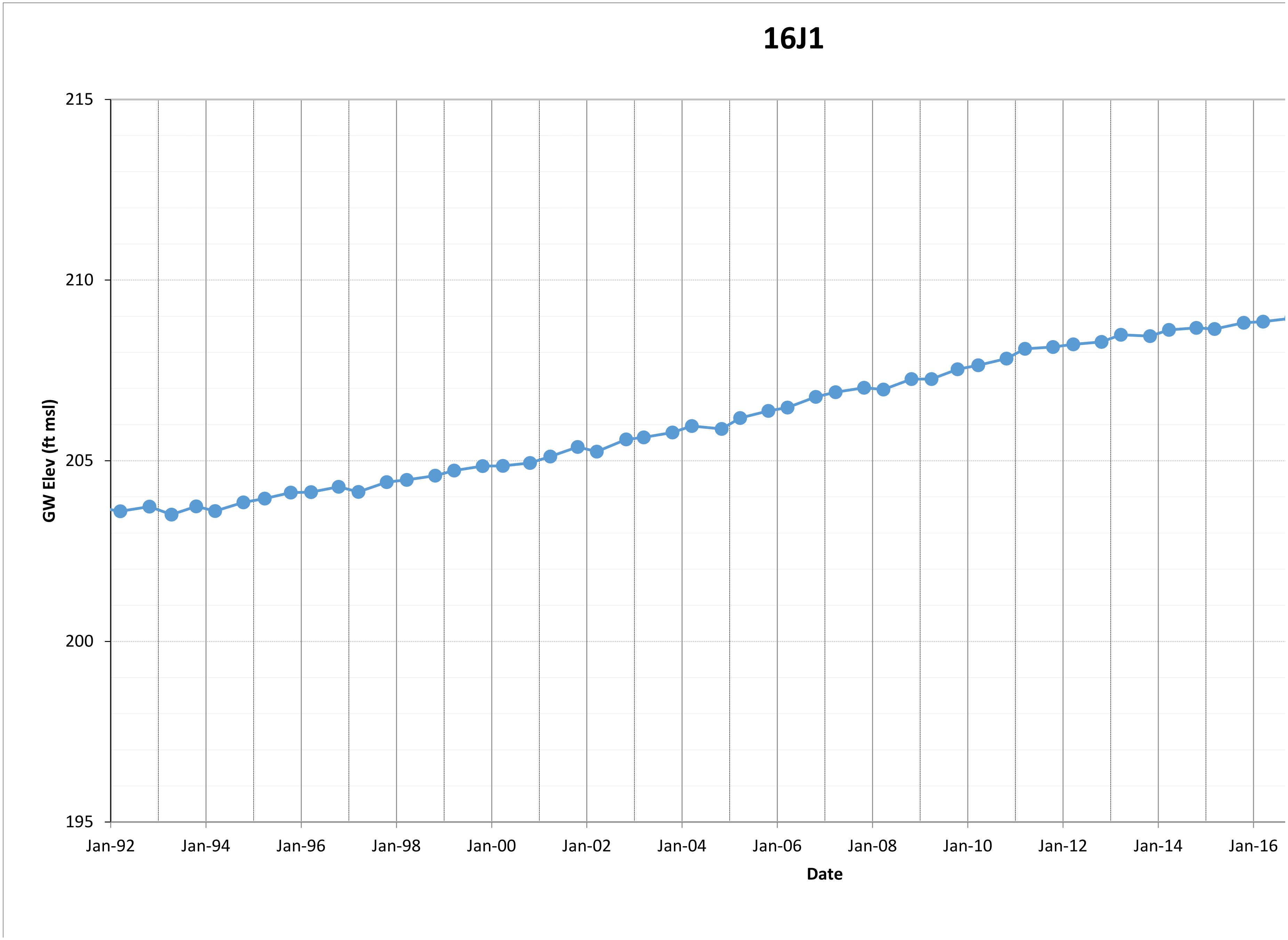
Jan-14
Jan-16
Date



16J1
215
210
205
200
195
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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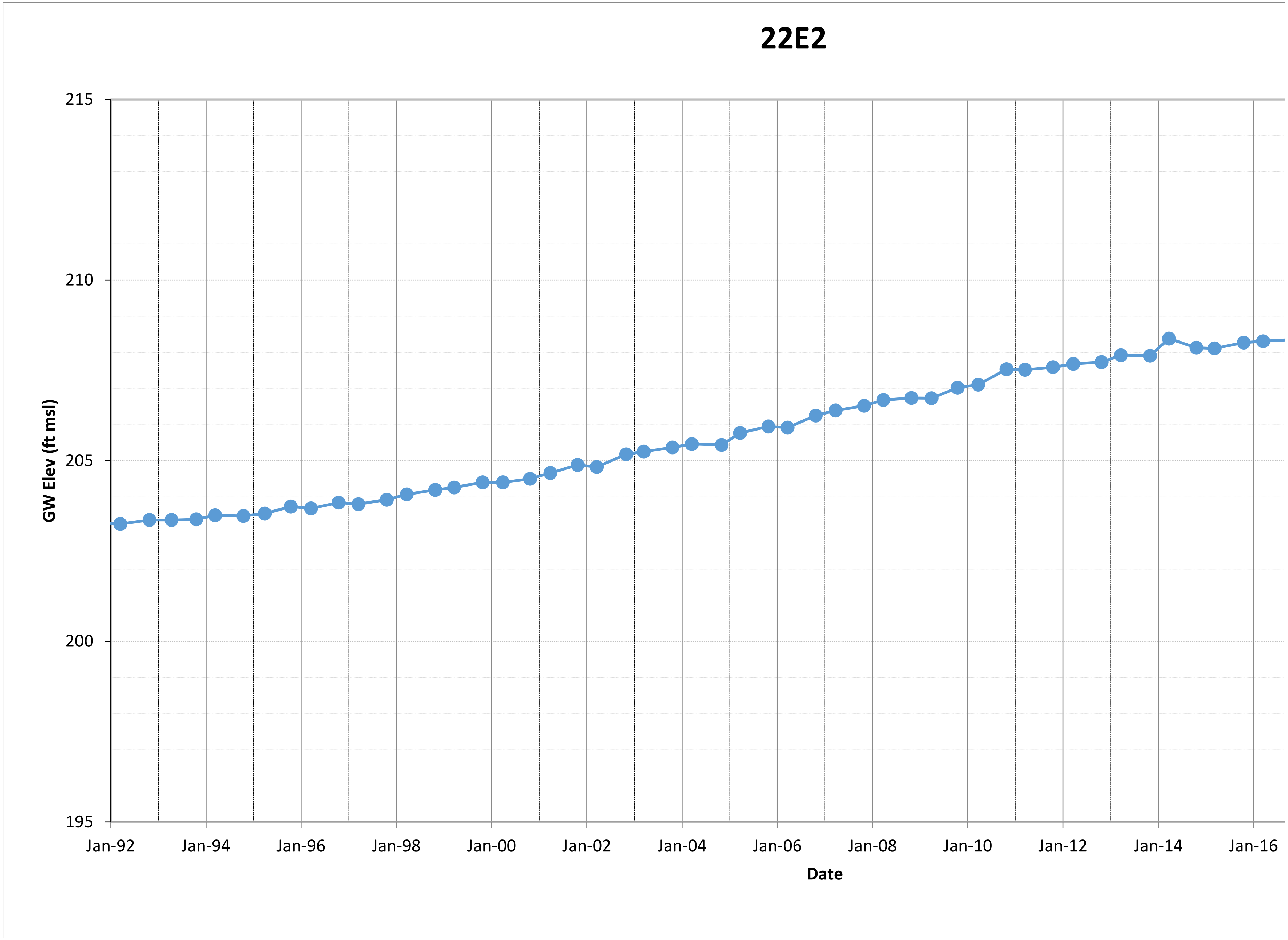
Jan-14
Jan-16
Date


22E2
215
210
205
200
195
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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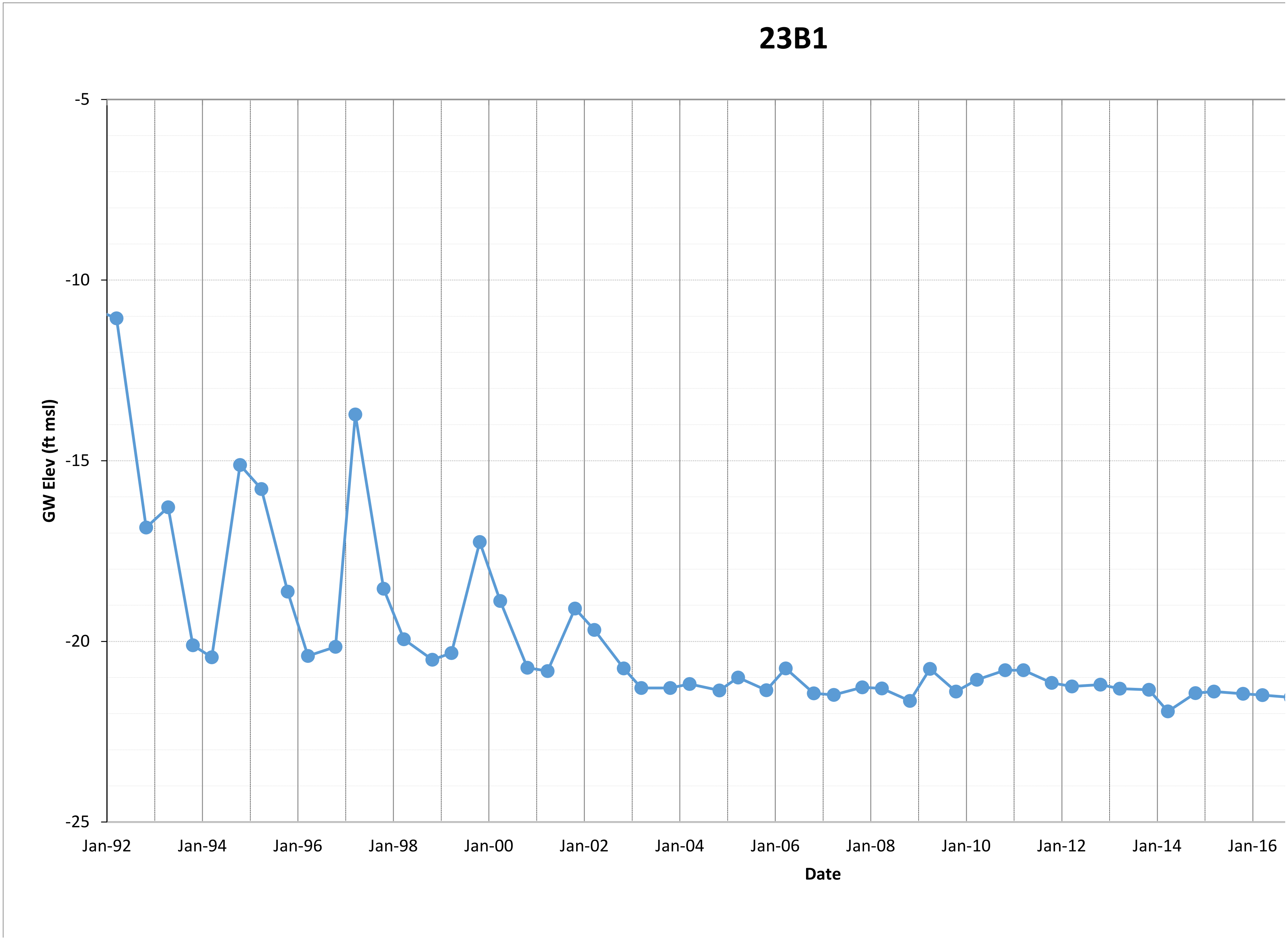
Jan-14
Jan-16
Date


23B1
GW Elev (ft msl)
-5
-10
-15
-20
-25
Jan-92
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Jan-96
Jan-98
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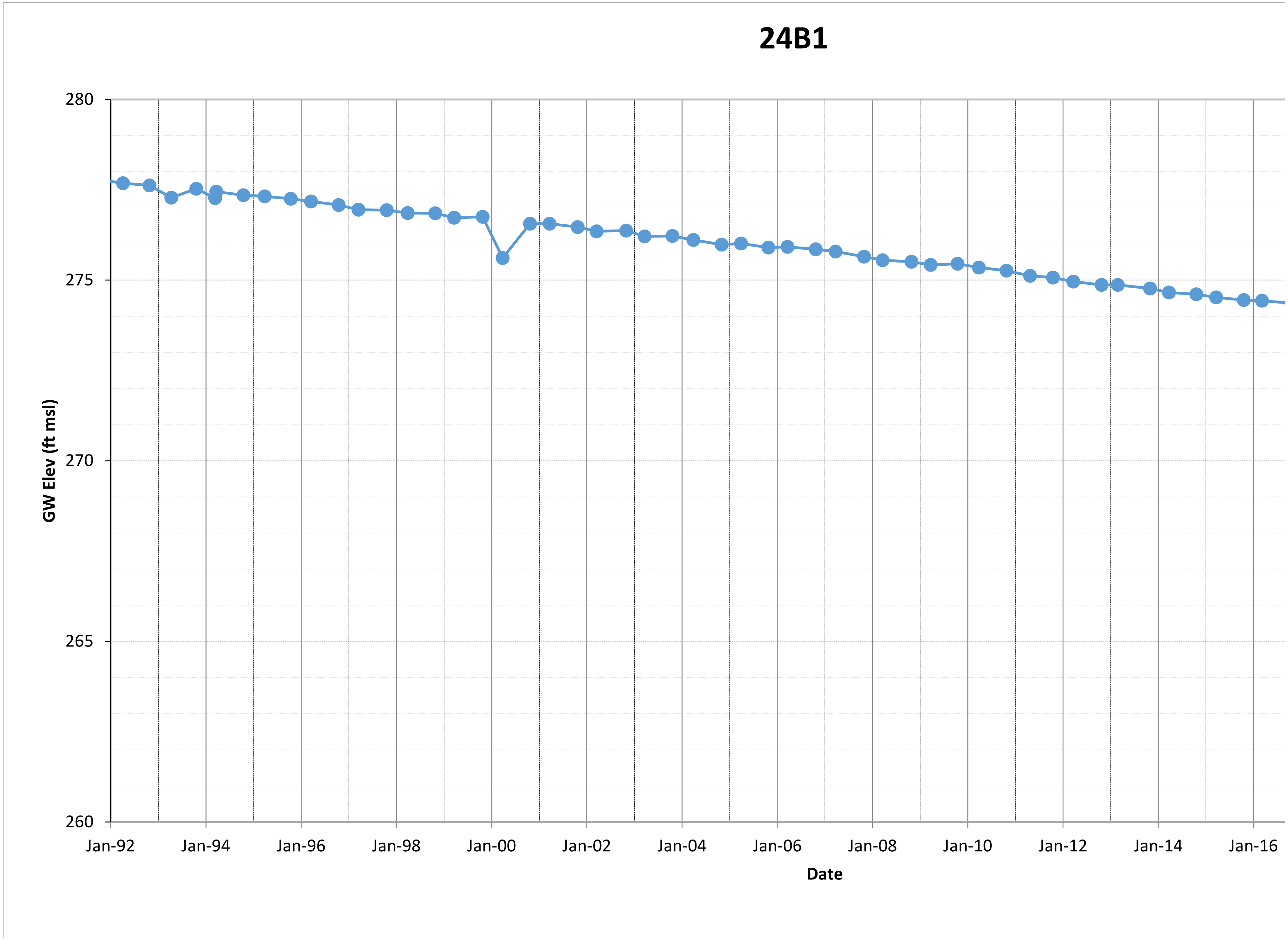
Jan-16
Date



24B1
GW Elev (ft msl)
280
275
270
265
260
Jan-92
Jan-94
Jan-96
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Jan-00
Jan-02
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Jan-10
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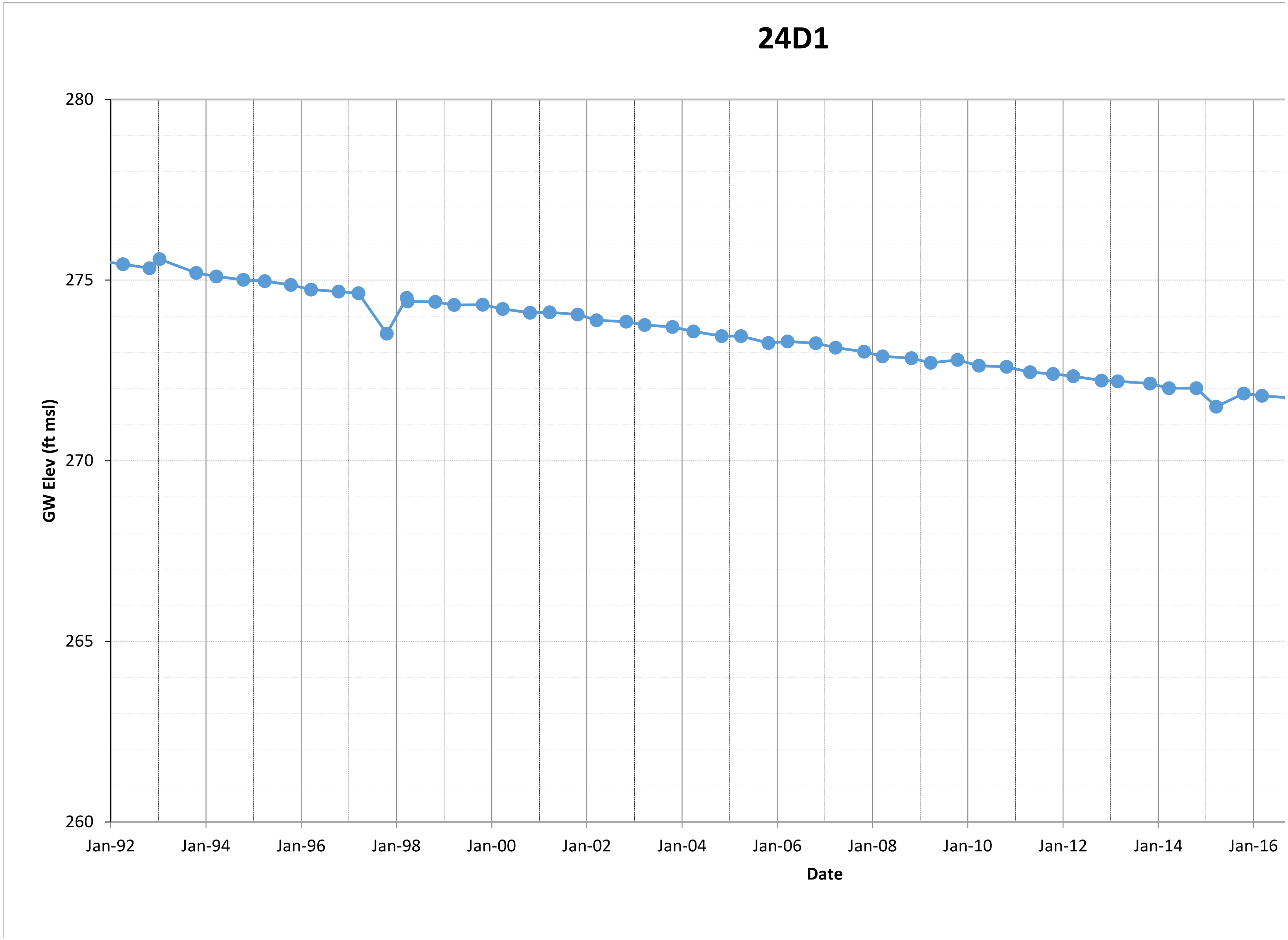
Jan-14
Jan-16
Date


24D1
GW Elev (ft msl)
280
275
270
265
260
Jan-92
Jan-94
Jan-96
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Jan-00
Jan-02
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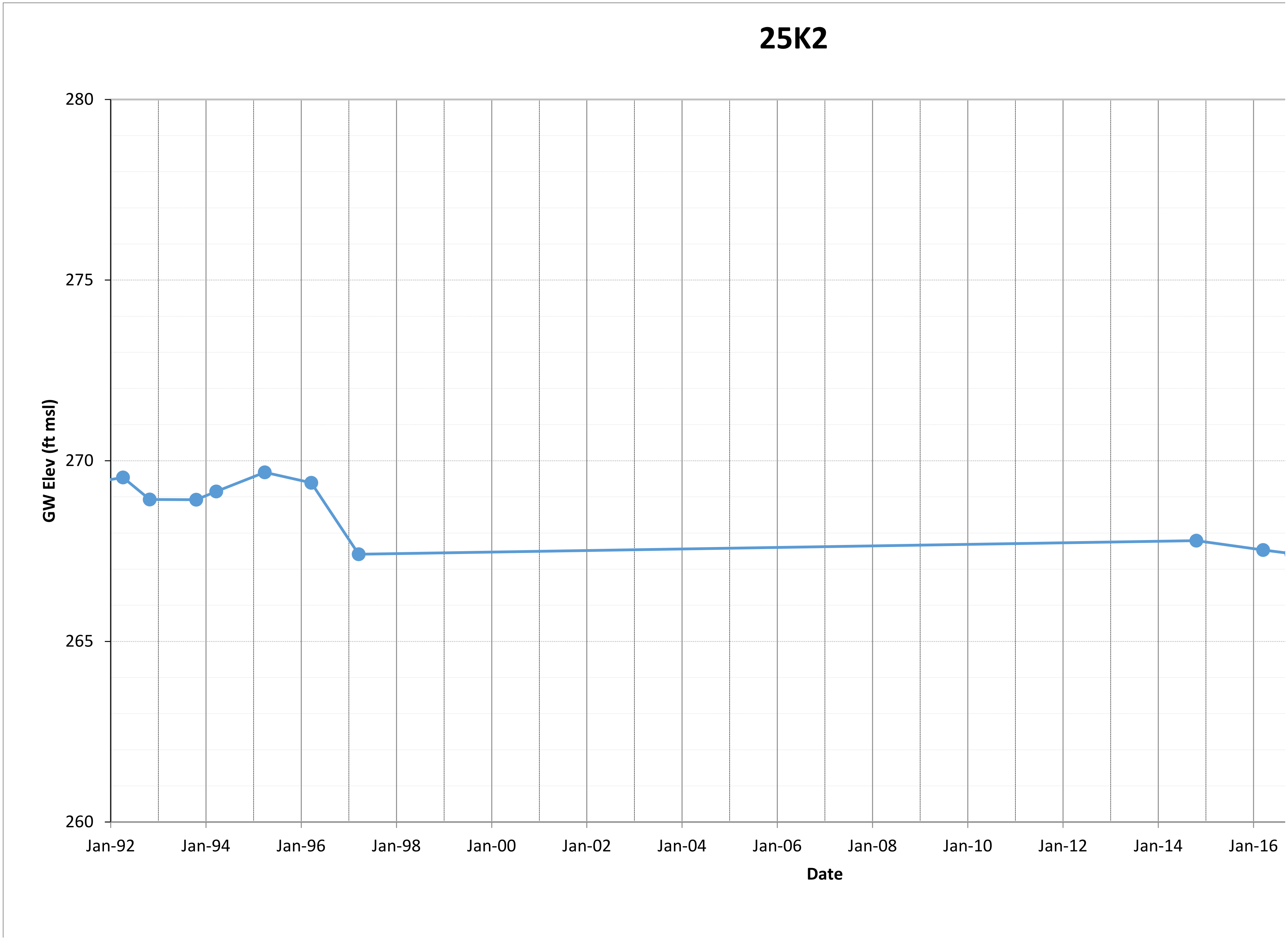
Jan-14
Jan-16
Date


25K2
280
275
270
265
260
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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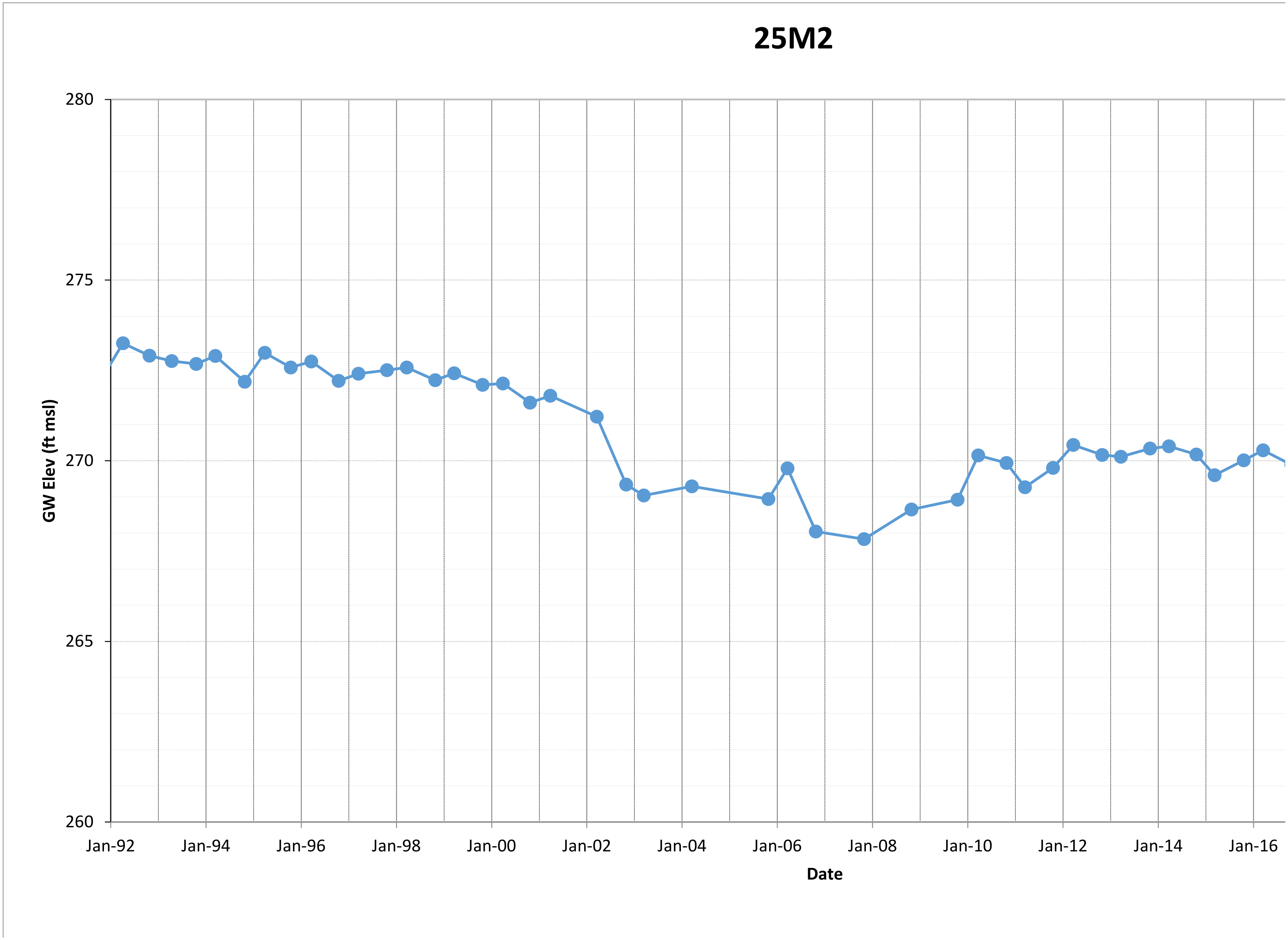
Jan-14
Jan-16
Date


25M2
280
275
270
265
260
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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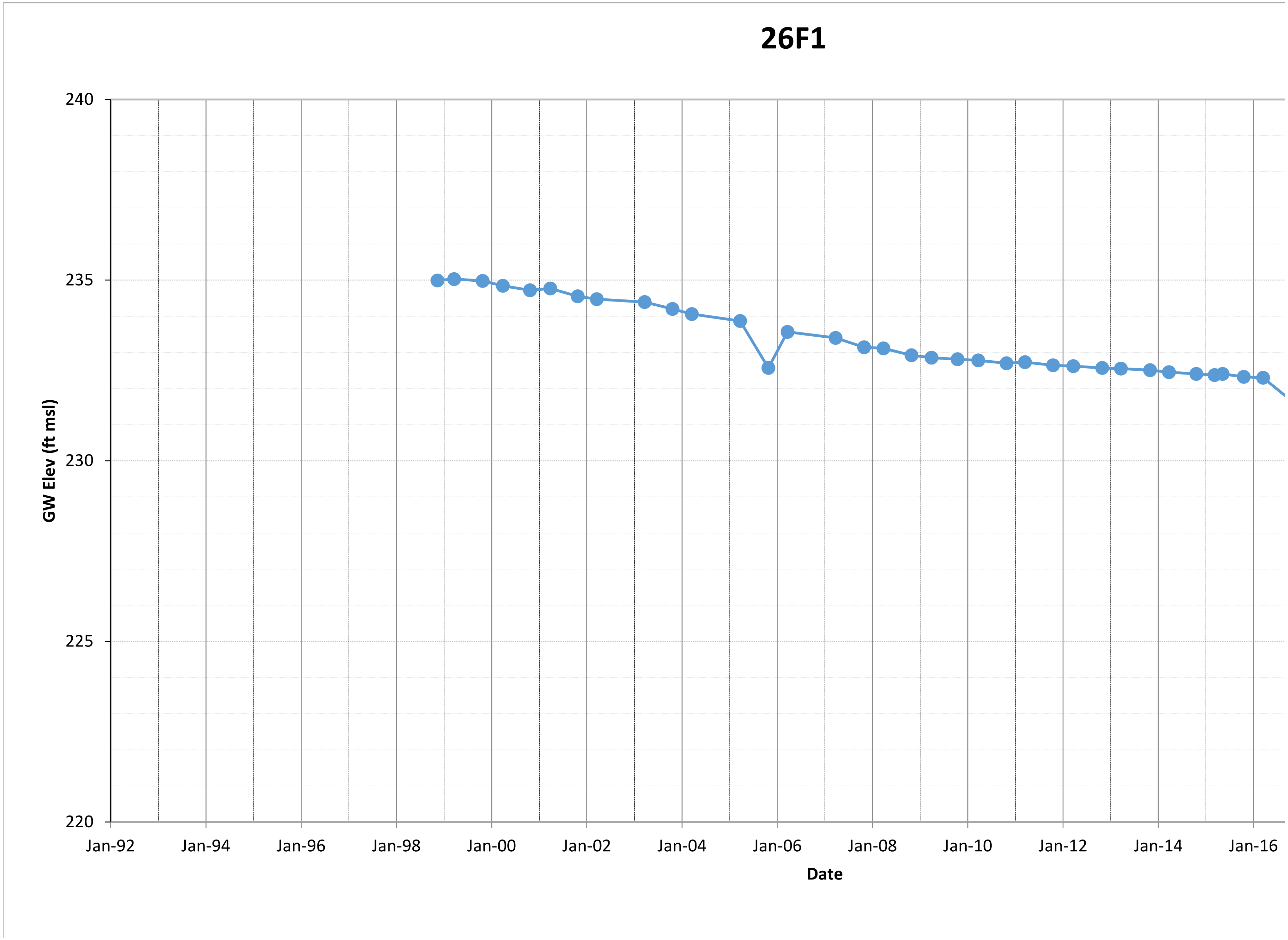
Jan-14
Jan-16
Date


26F1
GW Elev (ft msl)
240
235
230
225
220
Jan-92
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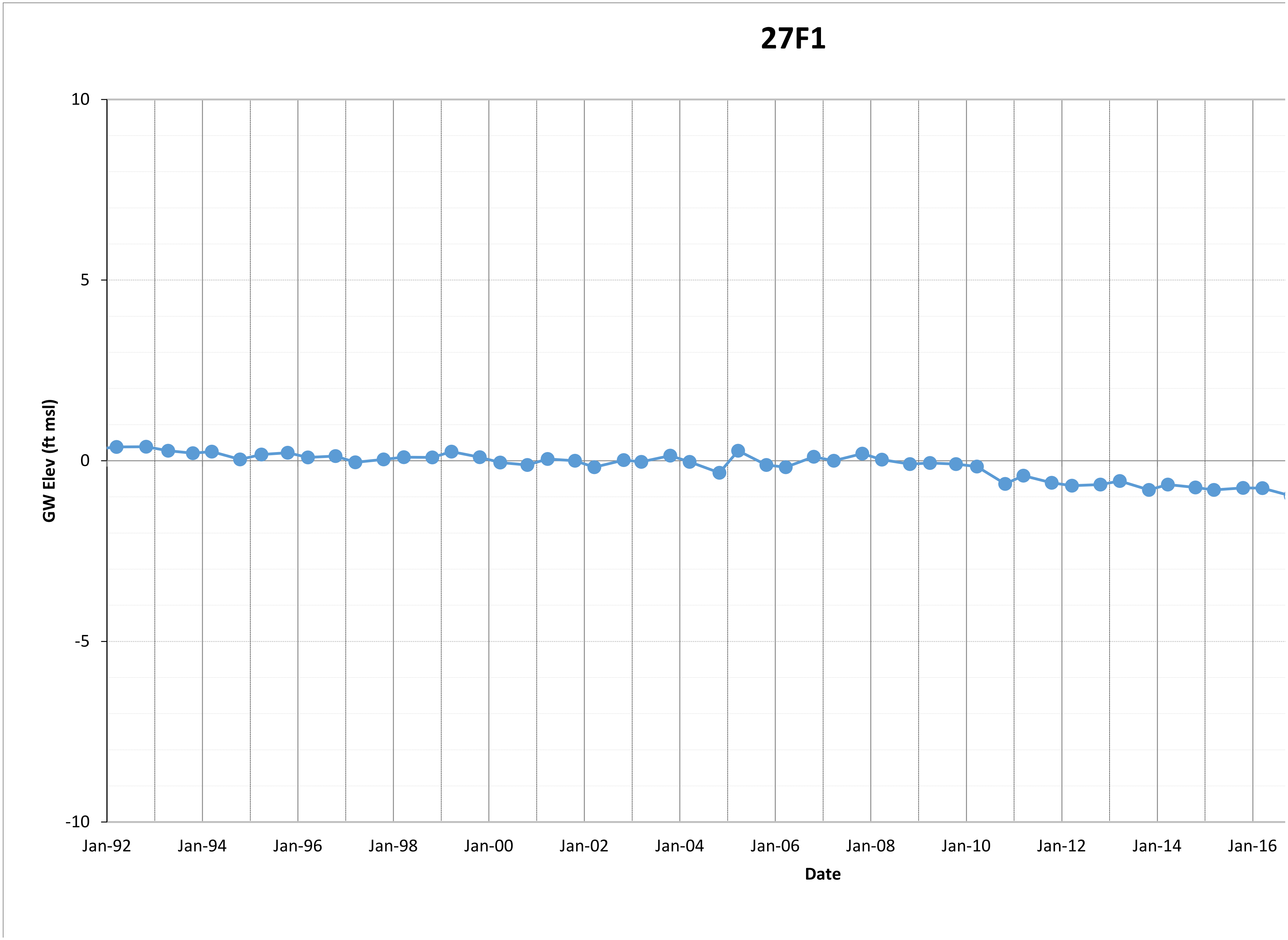
Jan-16
Date


27F1
10
5
0
-5
-10
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
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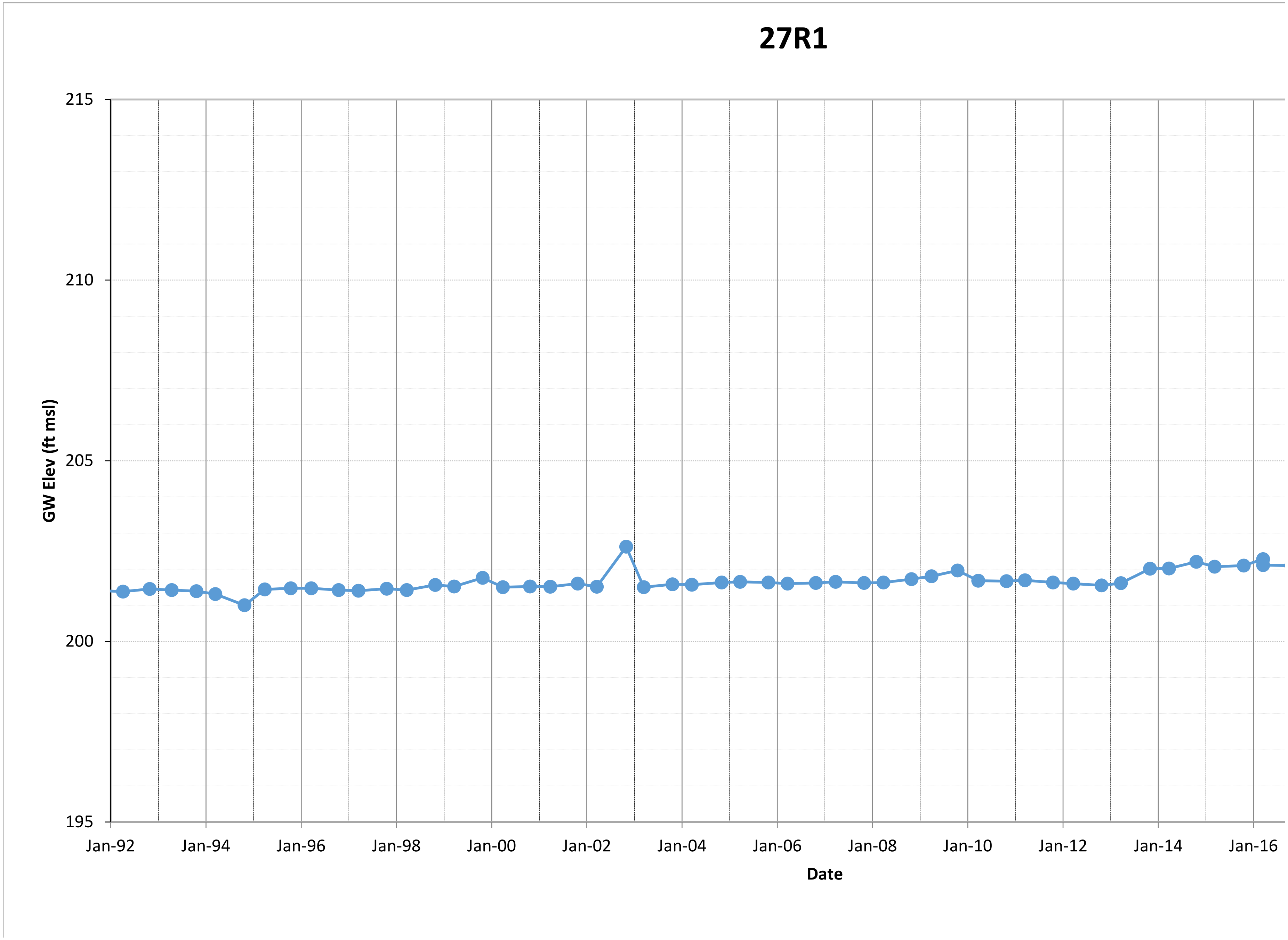
Jan-14
Jan-16
Date



27R1
GW Elev (ft msl)
215
210
205
200
195
Jan-92
Jan-94
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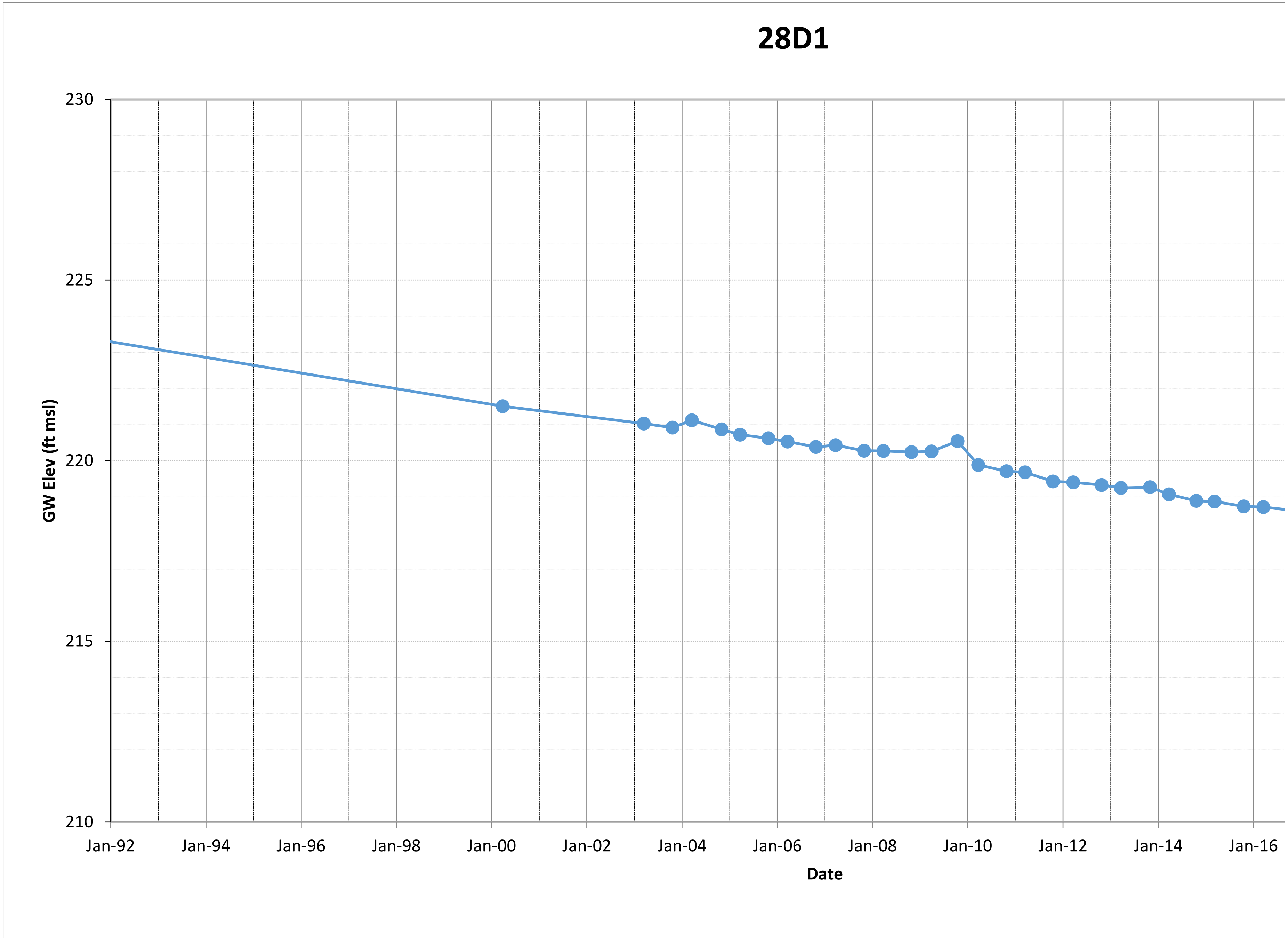
Jan-14
Jan-16
Date



28D1
230
225
220
215
210
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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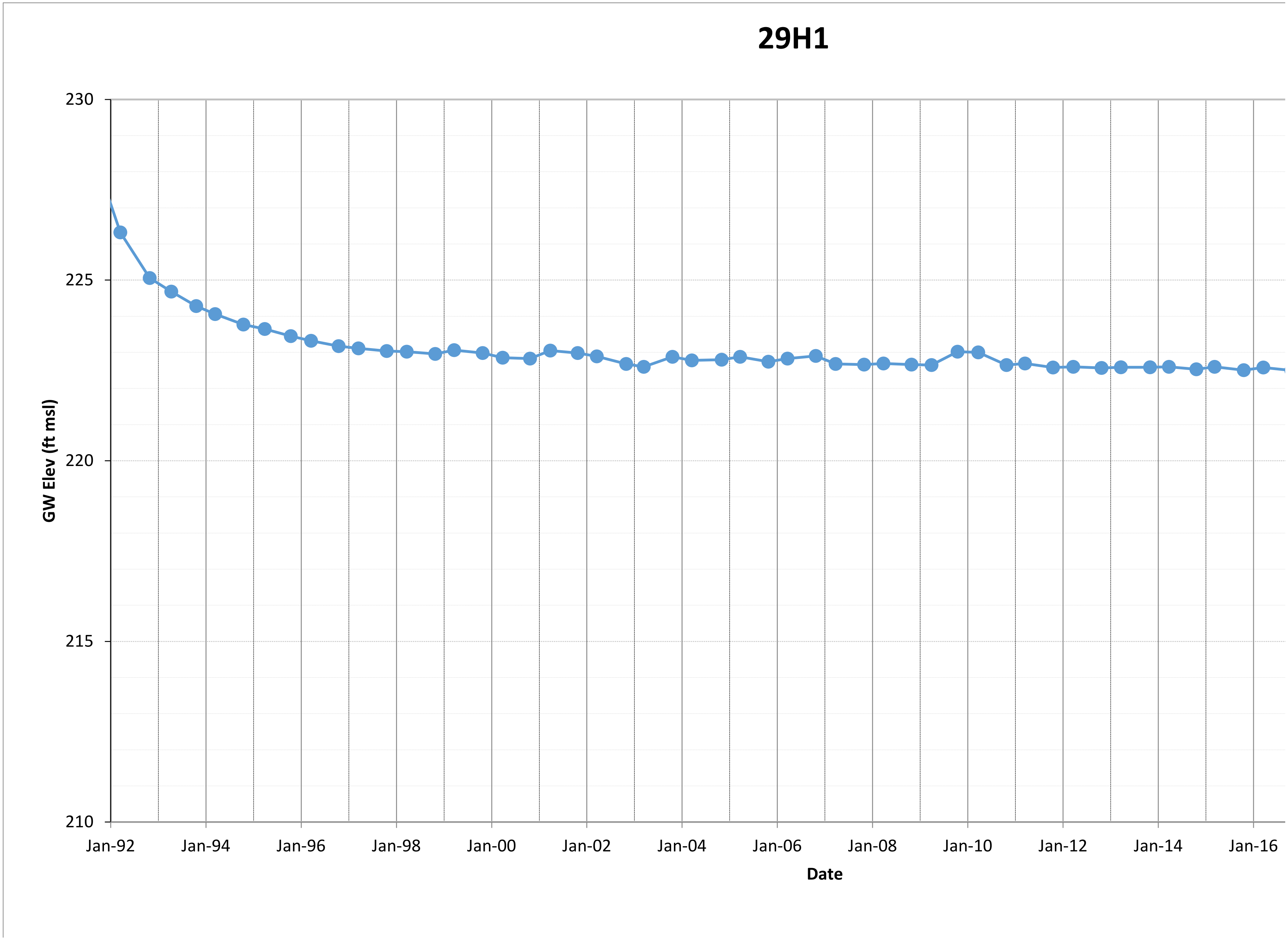
Jan-16
Date



29H1
230
225
220
215
210
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
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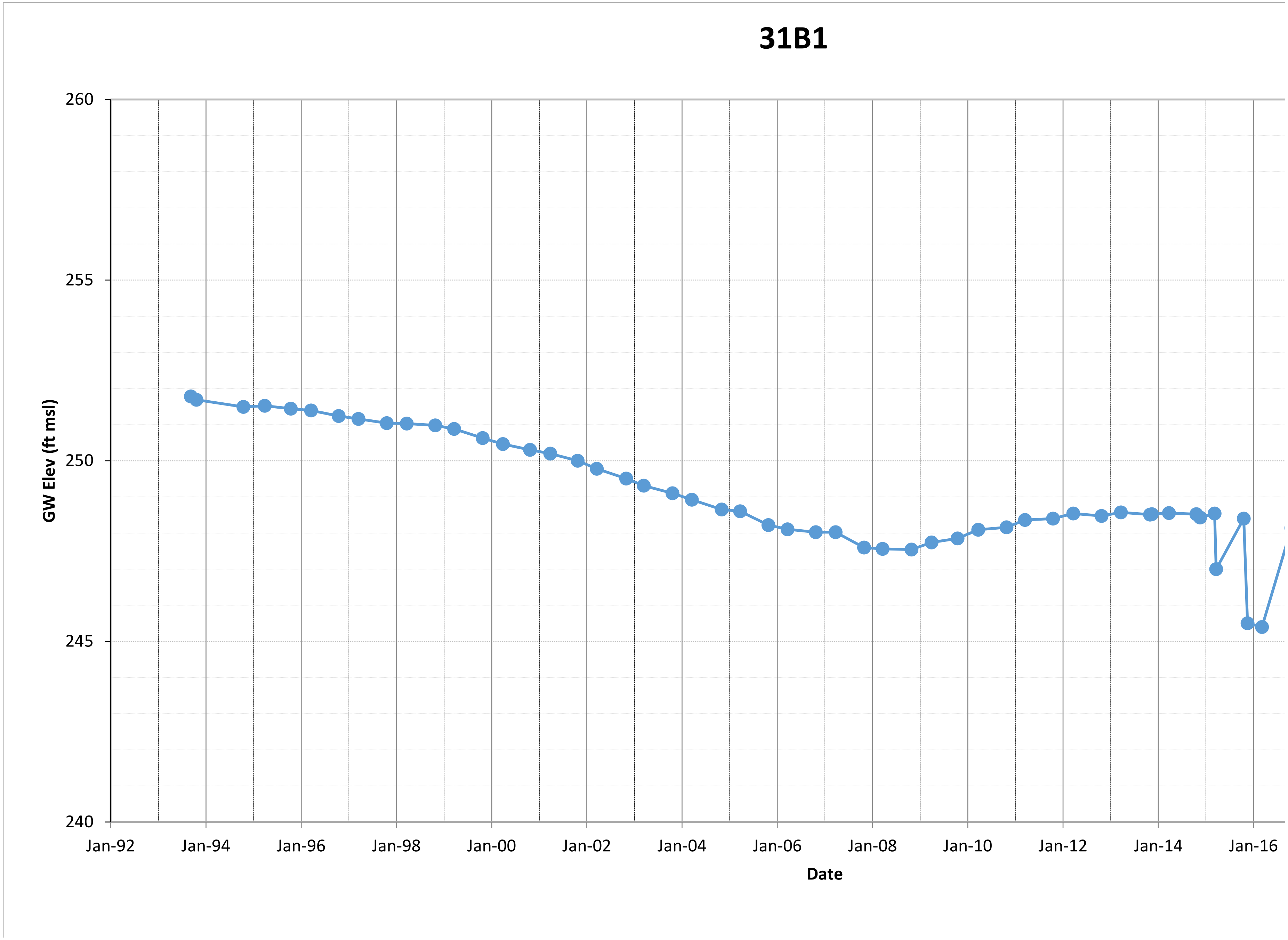
Jan-16
Date


31B1
260
255
250
245
240
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
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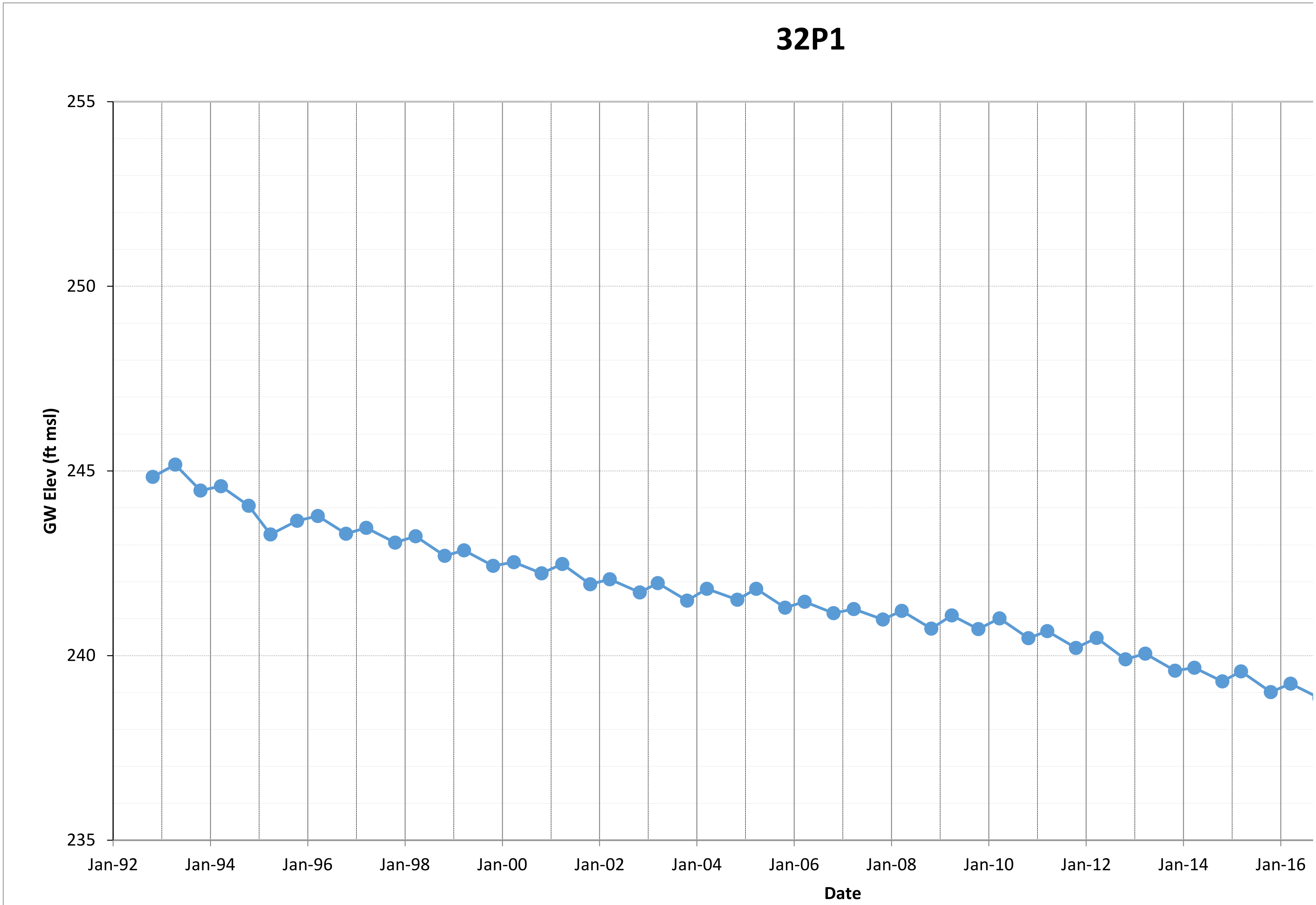
Jan-14
Jan-16
Date



32P1
GW Elev (ft msl)
255
250
245
240
235
Jan-92
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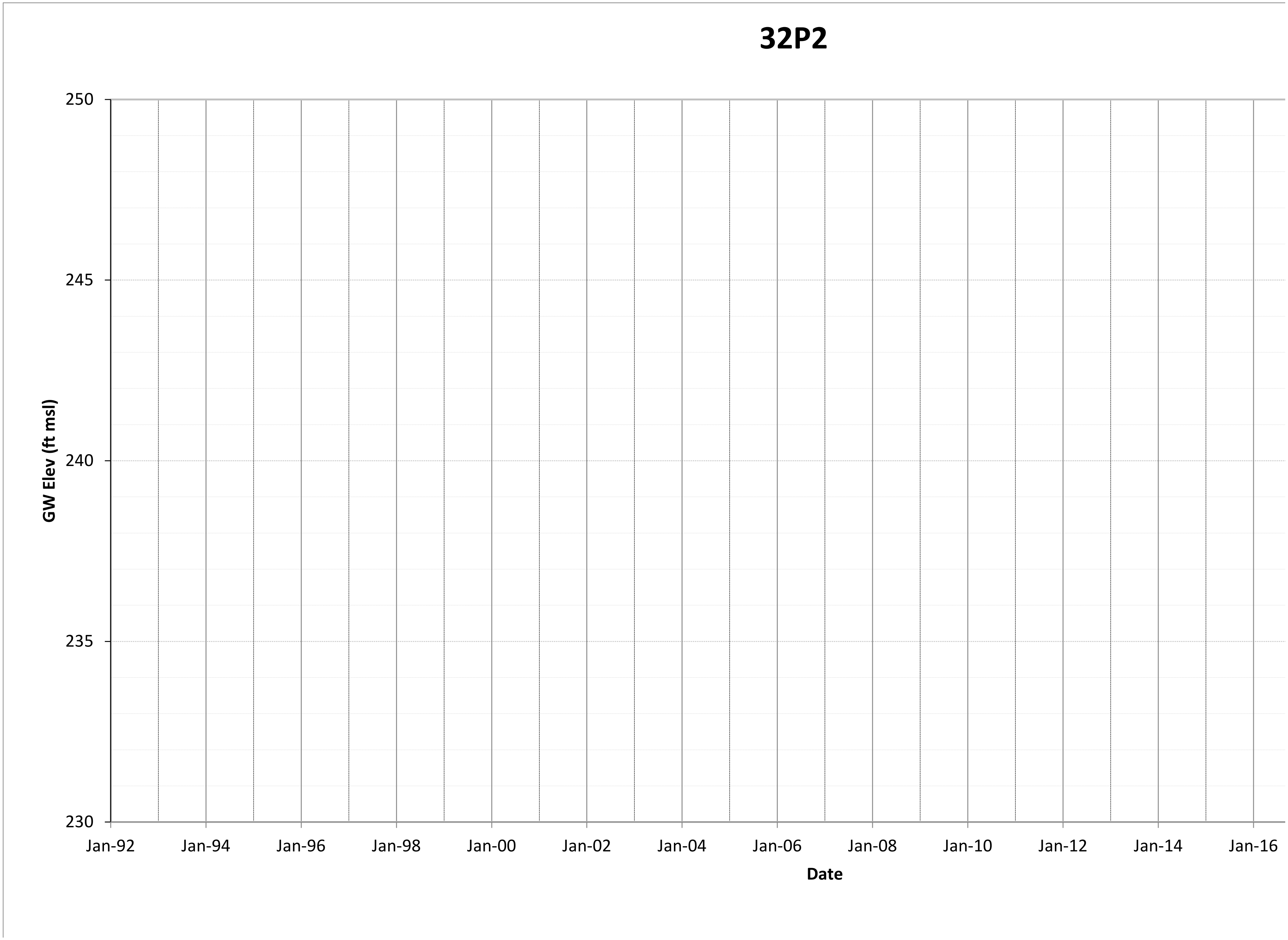
Jan-14
Jan-16
Date


32P2
GW Elev (ft msl)
250
245
240
235
230
Jan-92
Jan-94
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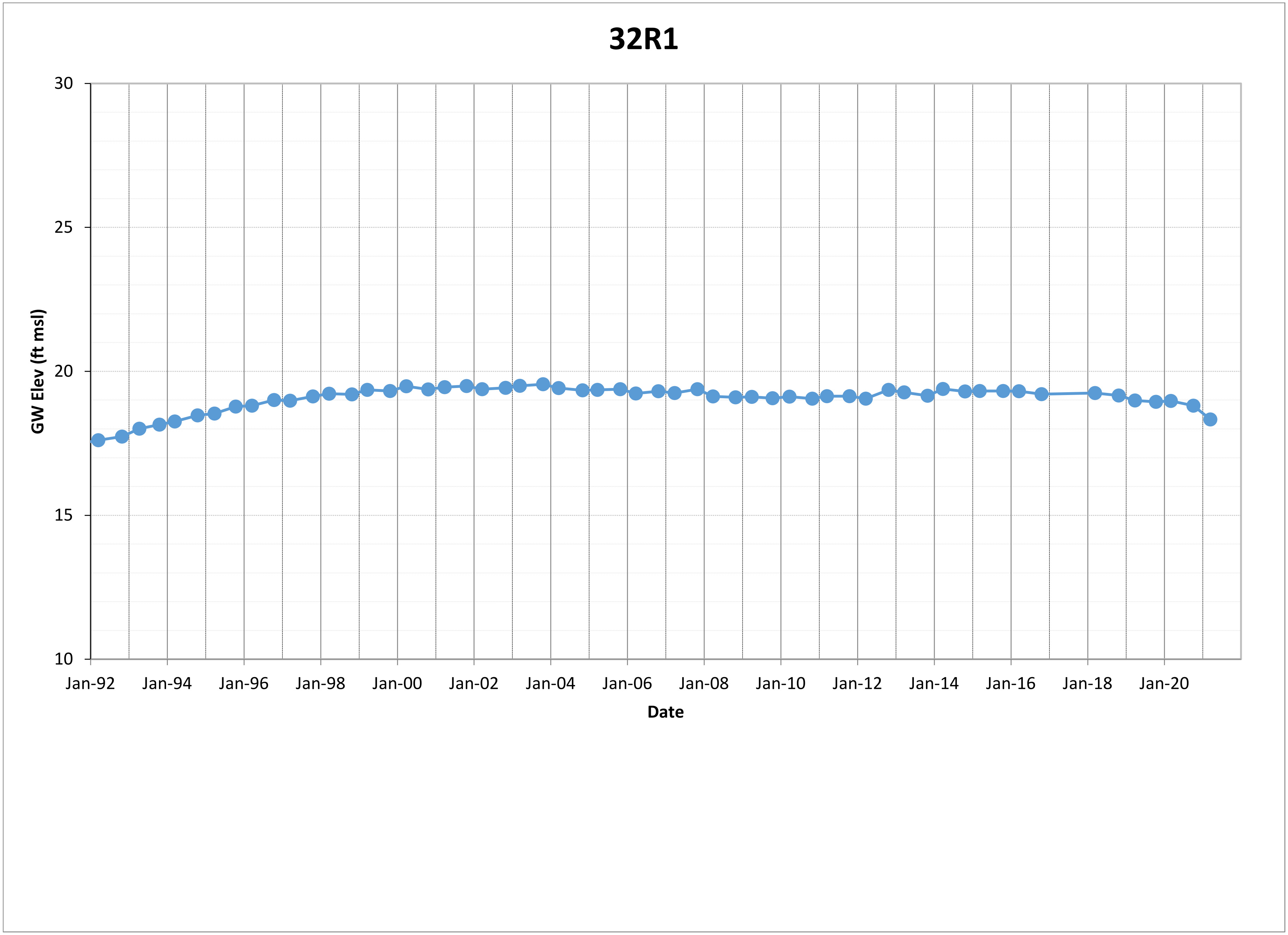
Jan-16
Date



32R1
GW Elev (ft msl)
30
25
20
15
10
Jan-92
Jan-94
Jan-96
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Jan-00
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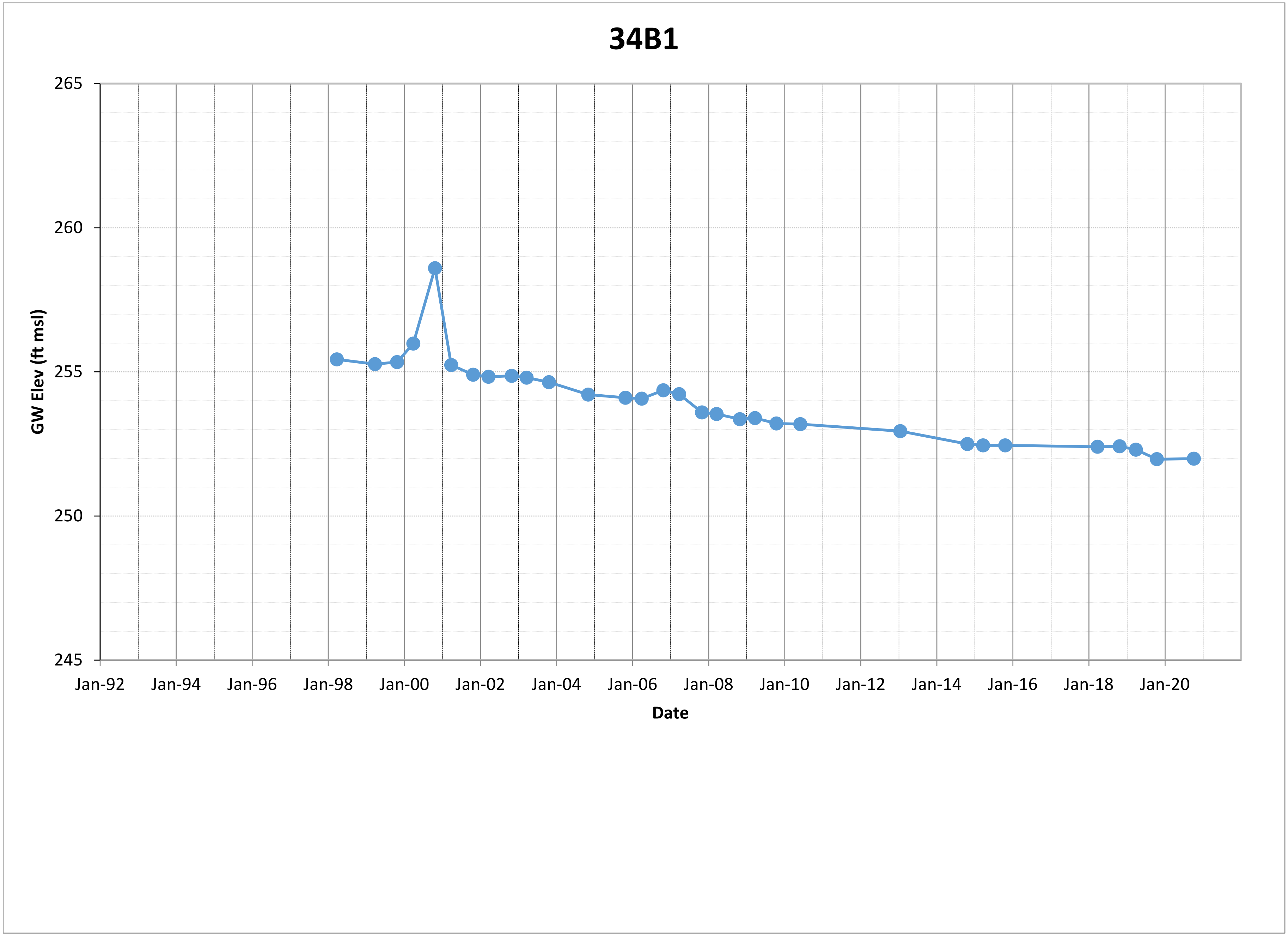
Date


34B1
GW Elev (ft msl)
265
260
255
250
245
Jan-92
Jan-94
Jan-96
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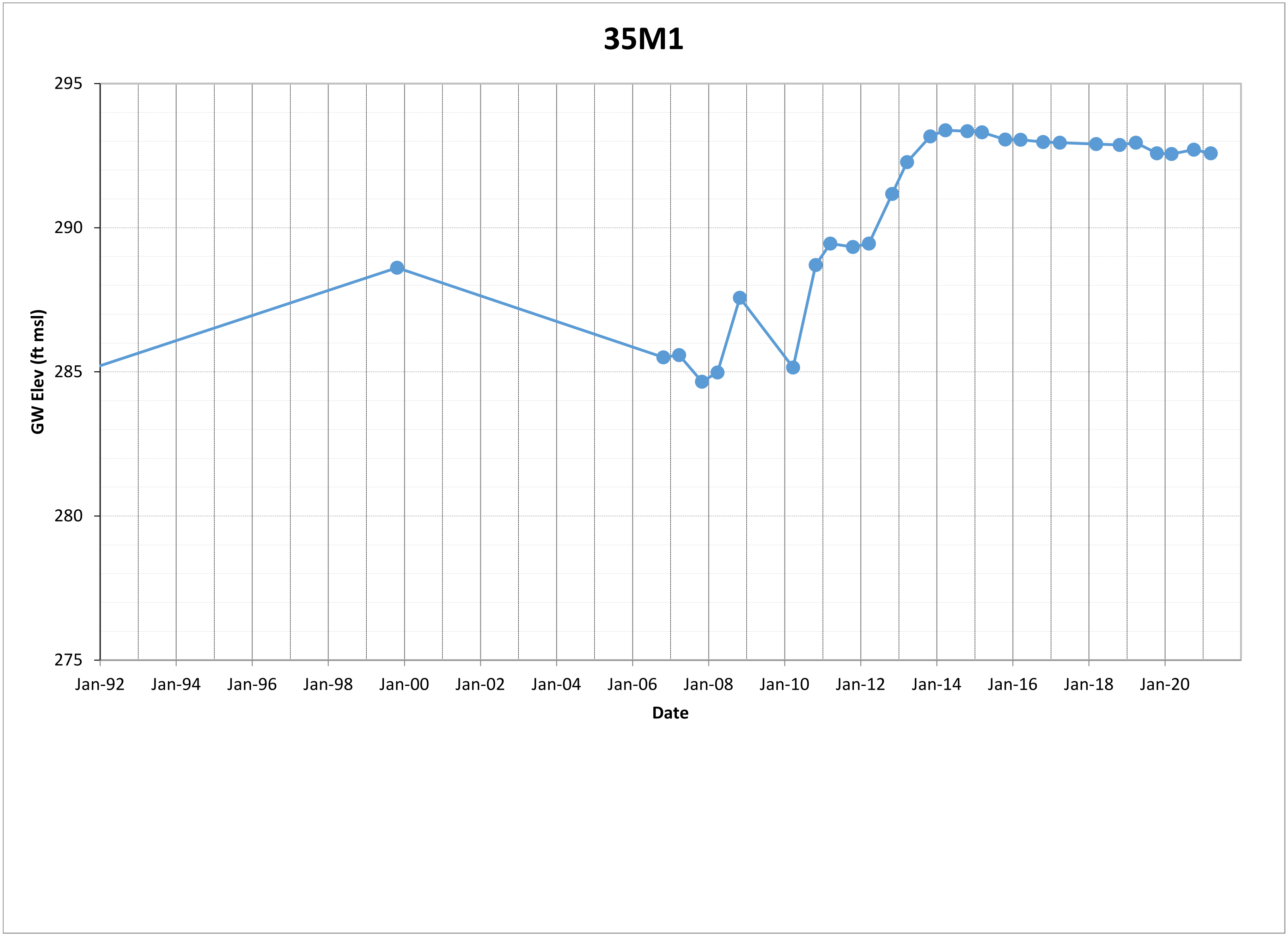
Jan-20
Date



35M1
GW Elev (ft msl)
295
290
285
280
275
Jan-92
Jan-94
Jan-96
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Jan-00
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Jan-04
Jan-06
Jan-08
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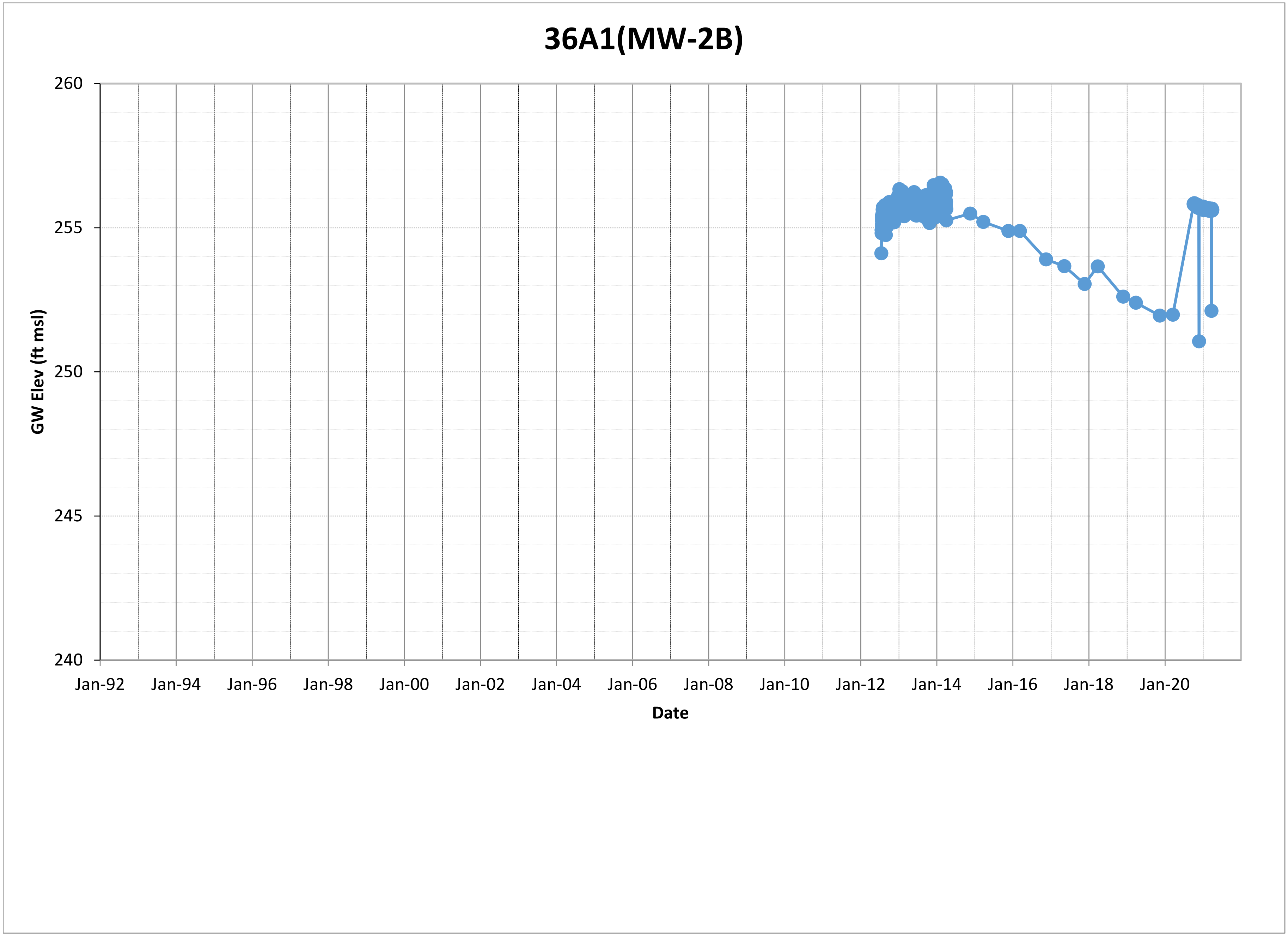
Jan-20
Date


36A1(MW-2B)
260
255
250
245
240
GW Elev (ft msl)
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
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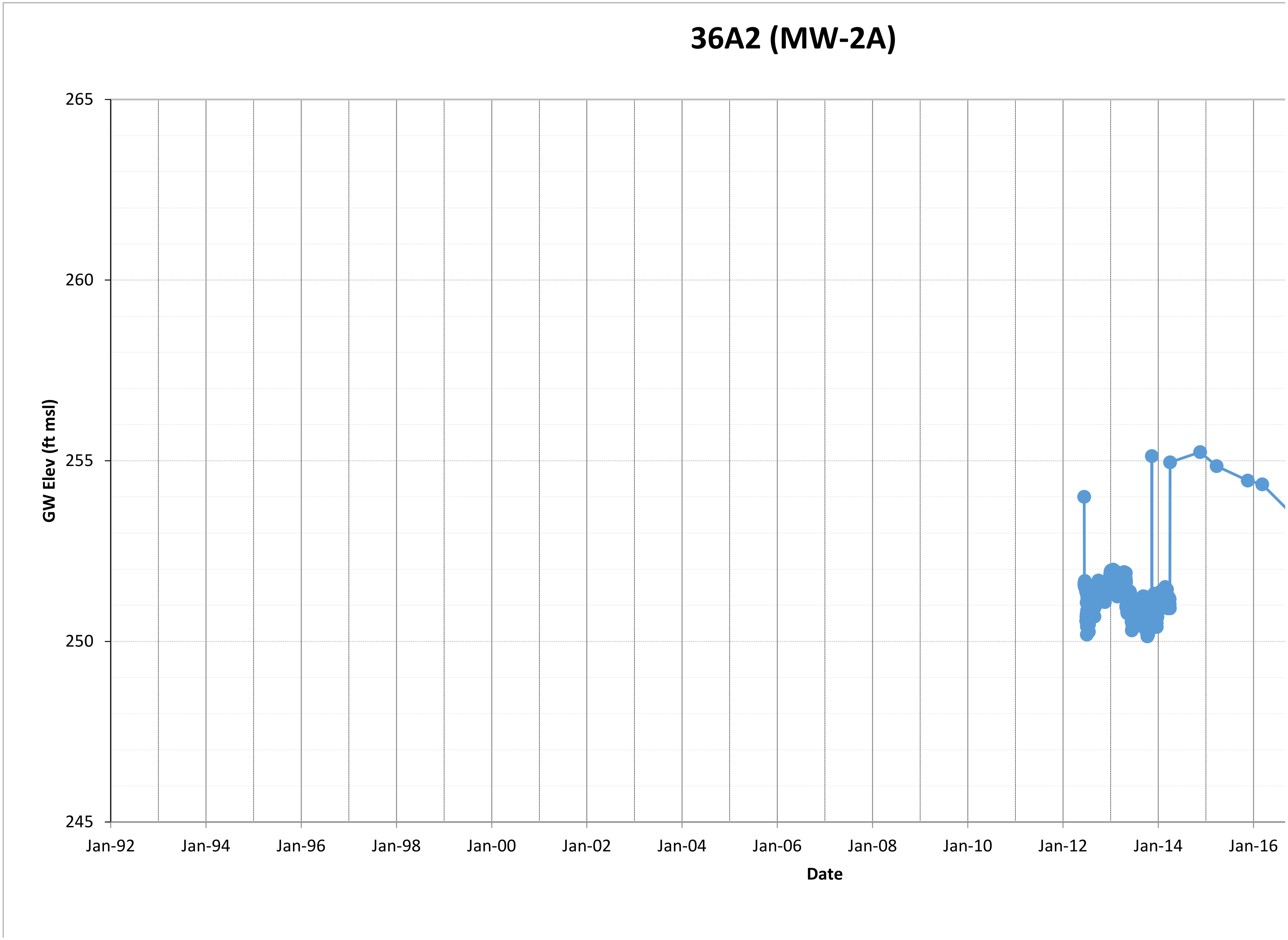
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


36A2 (MW-2A)
GW Elev (ft msl)
265
260
255
250
245
Jan-92
Jan-94
Jan-96
Jan-98
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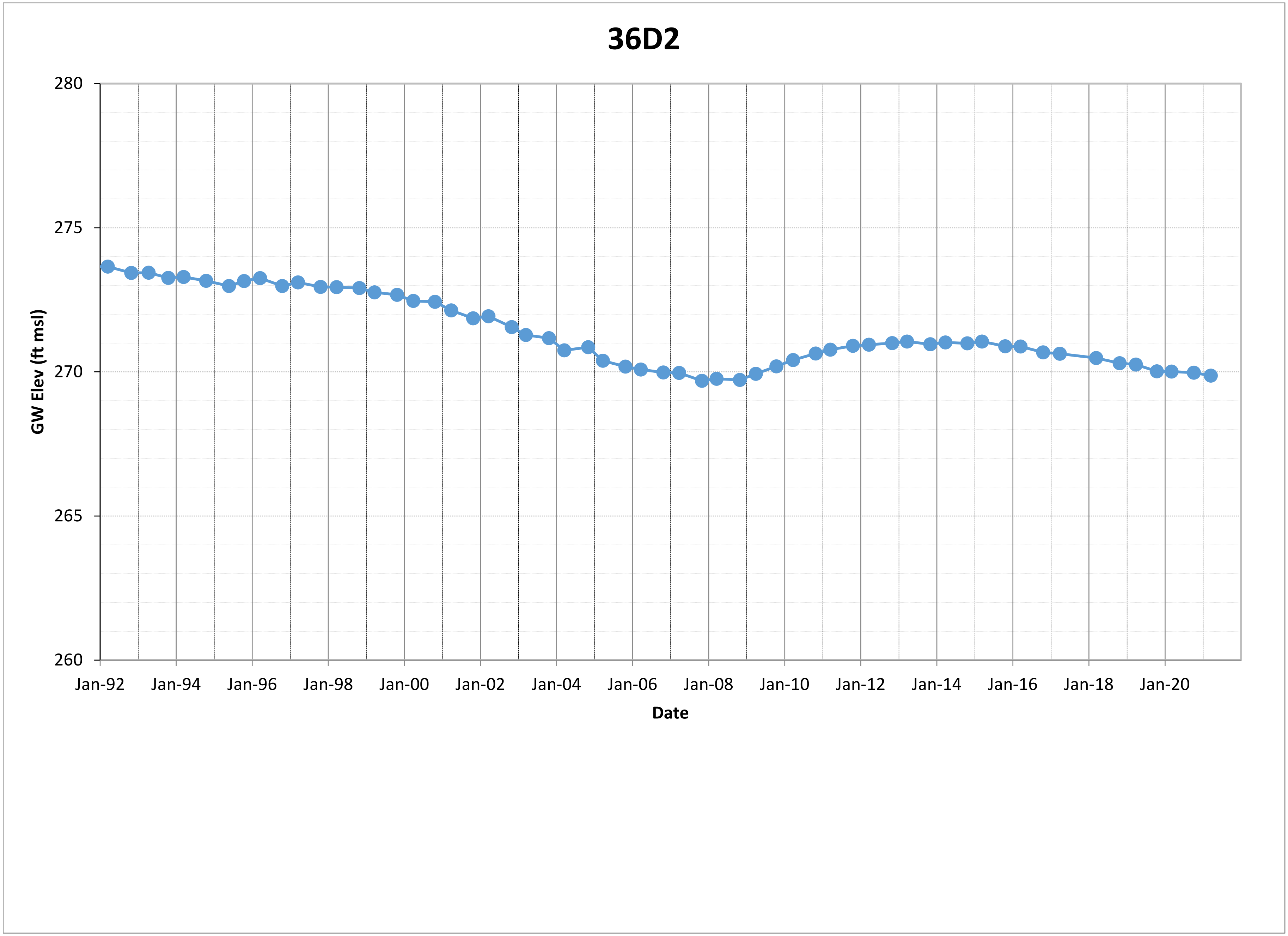
Jan-14
Jan-16
Date


36D2
GW Elev (ft msl)
280
275
270
265
260
Jan-92
Jan-94
Jan-96
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Jan-00
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Jan-06
Jan-08
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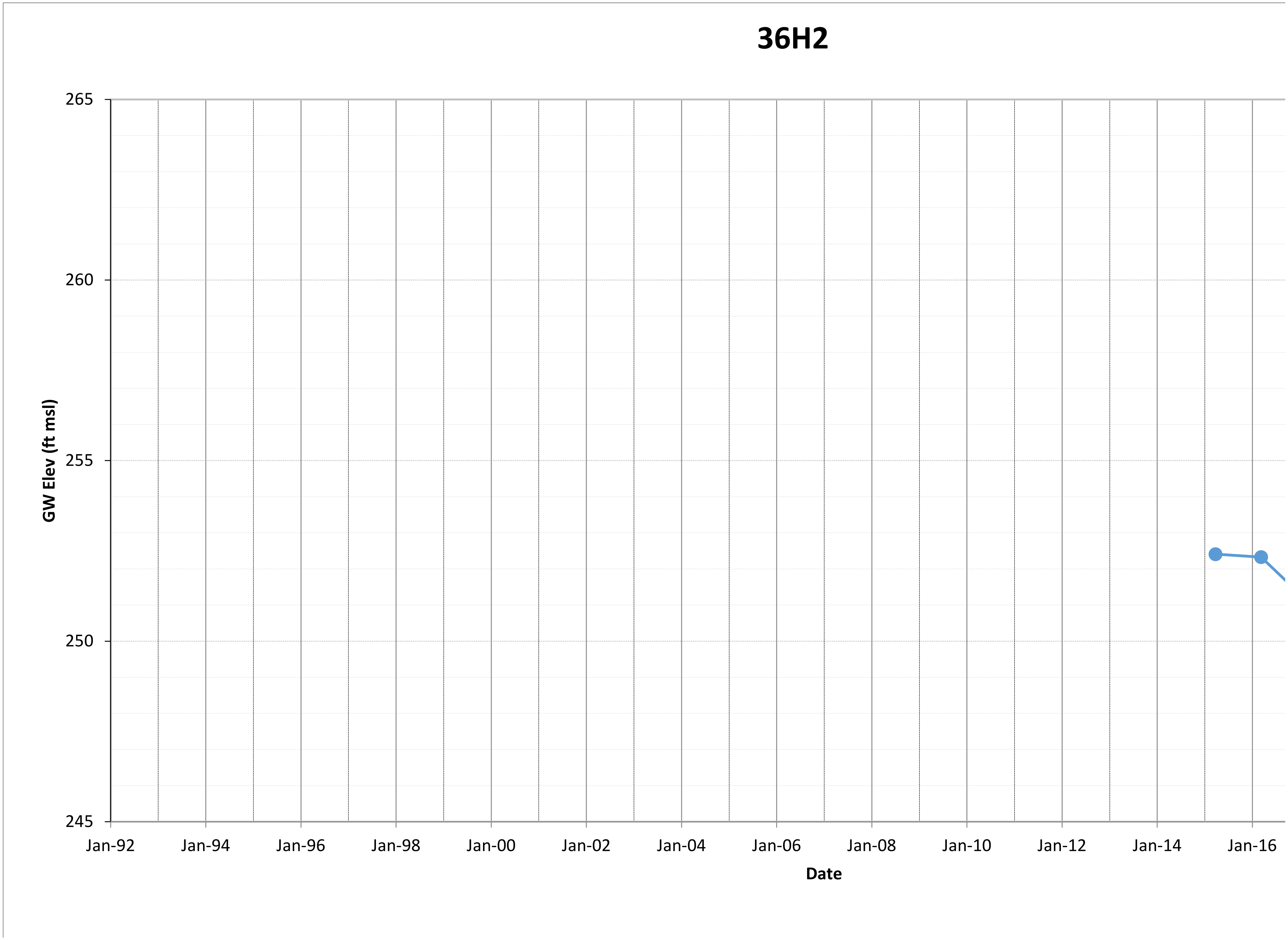
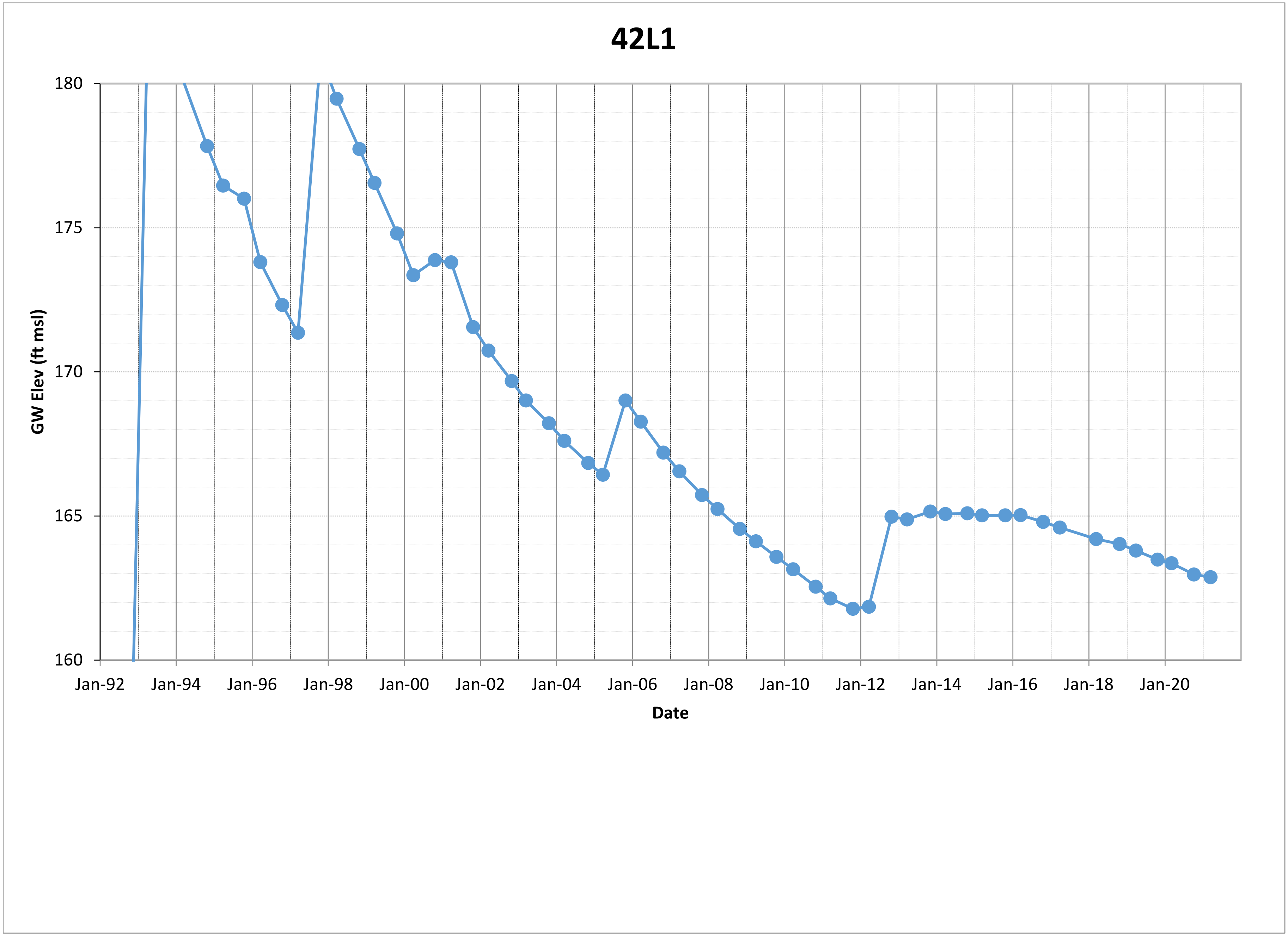
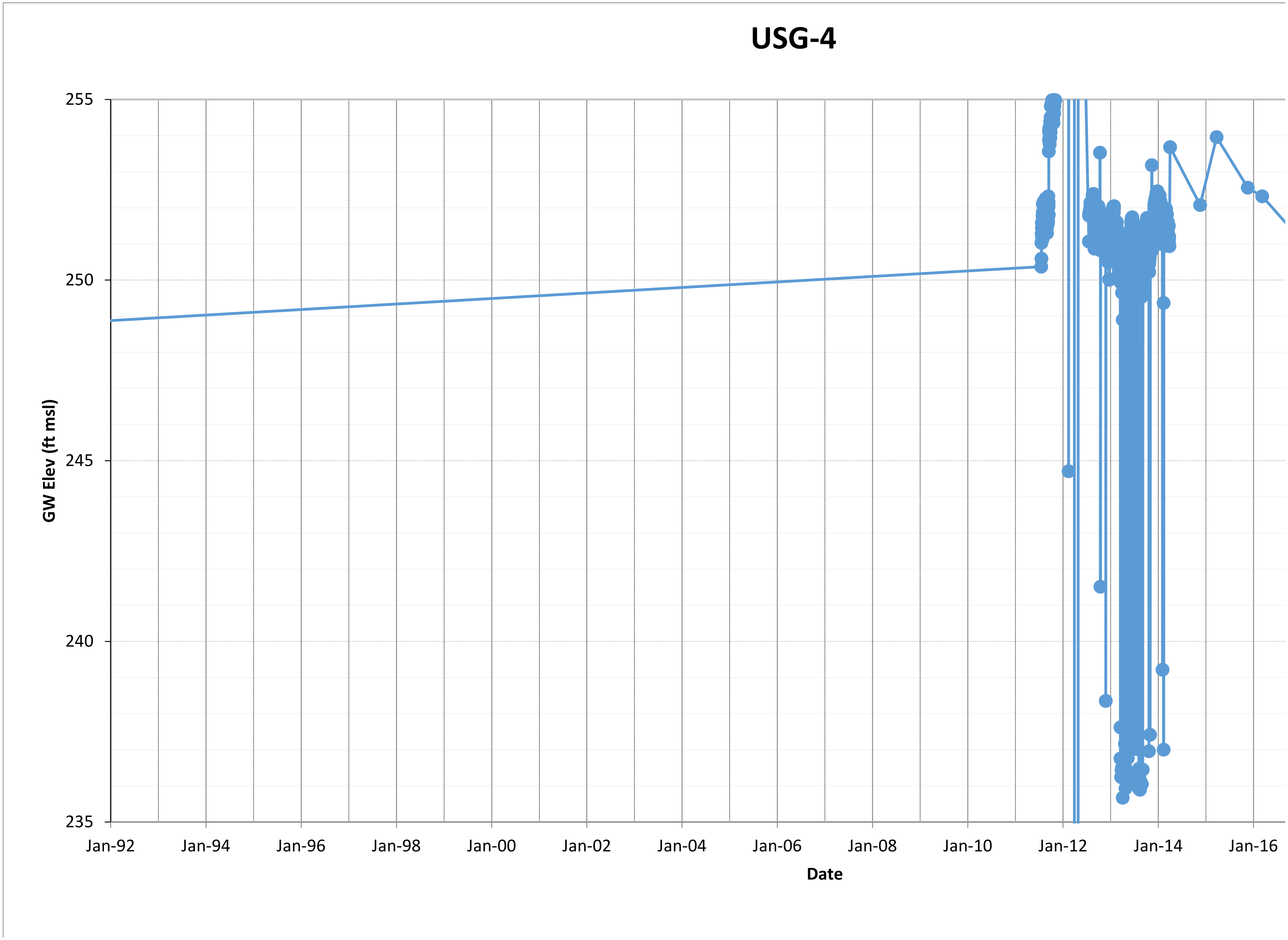
Jan-20
Date

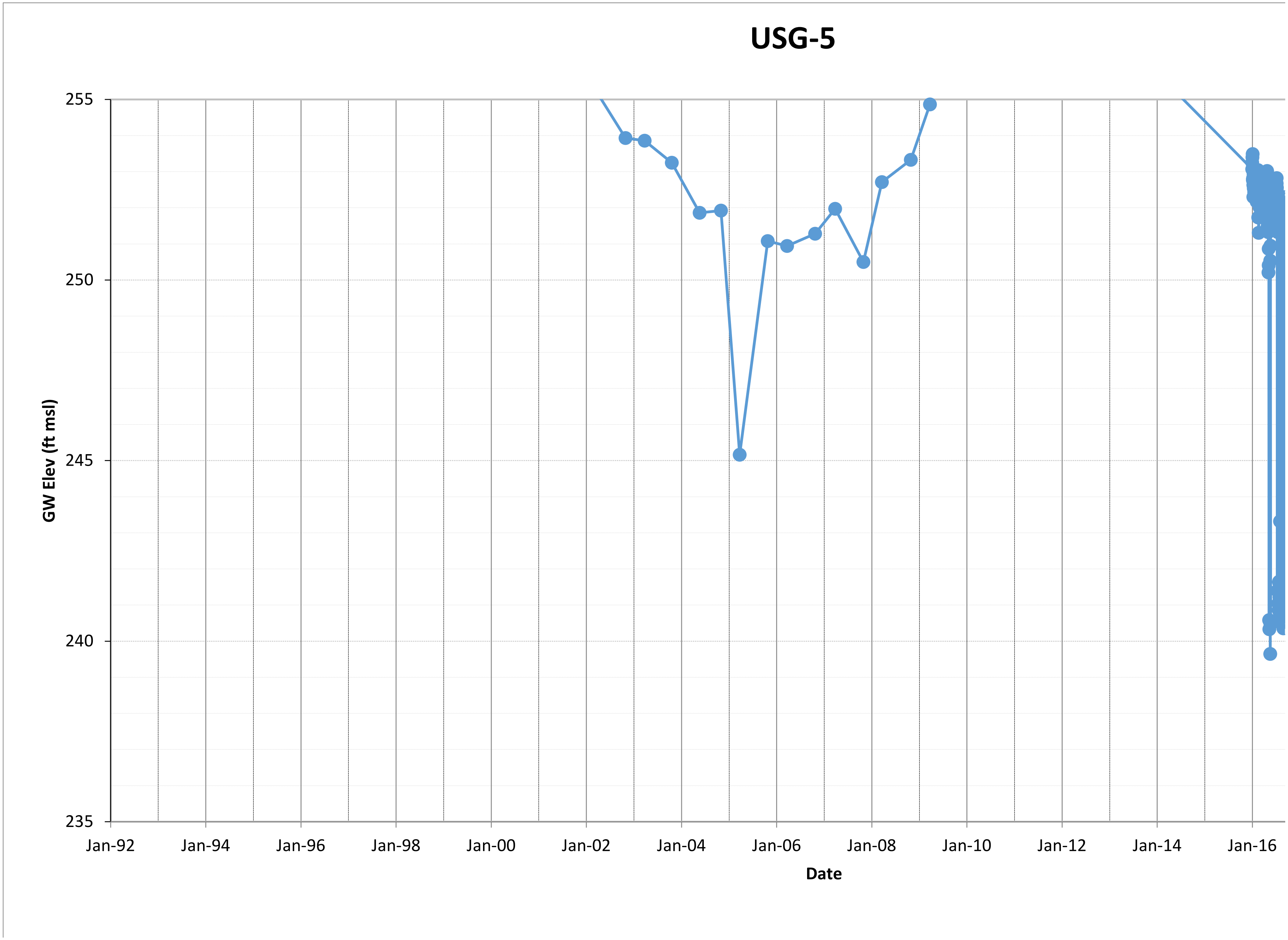


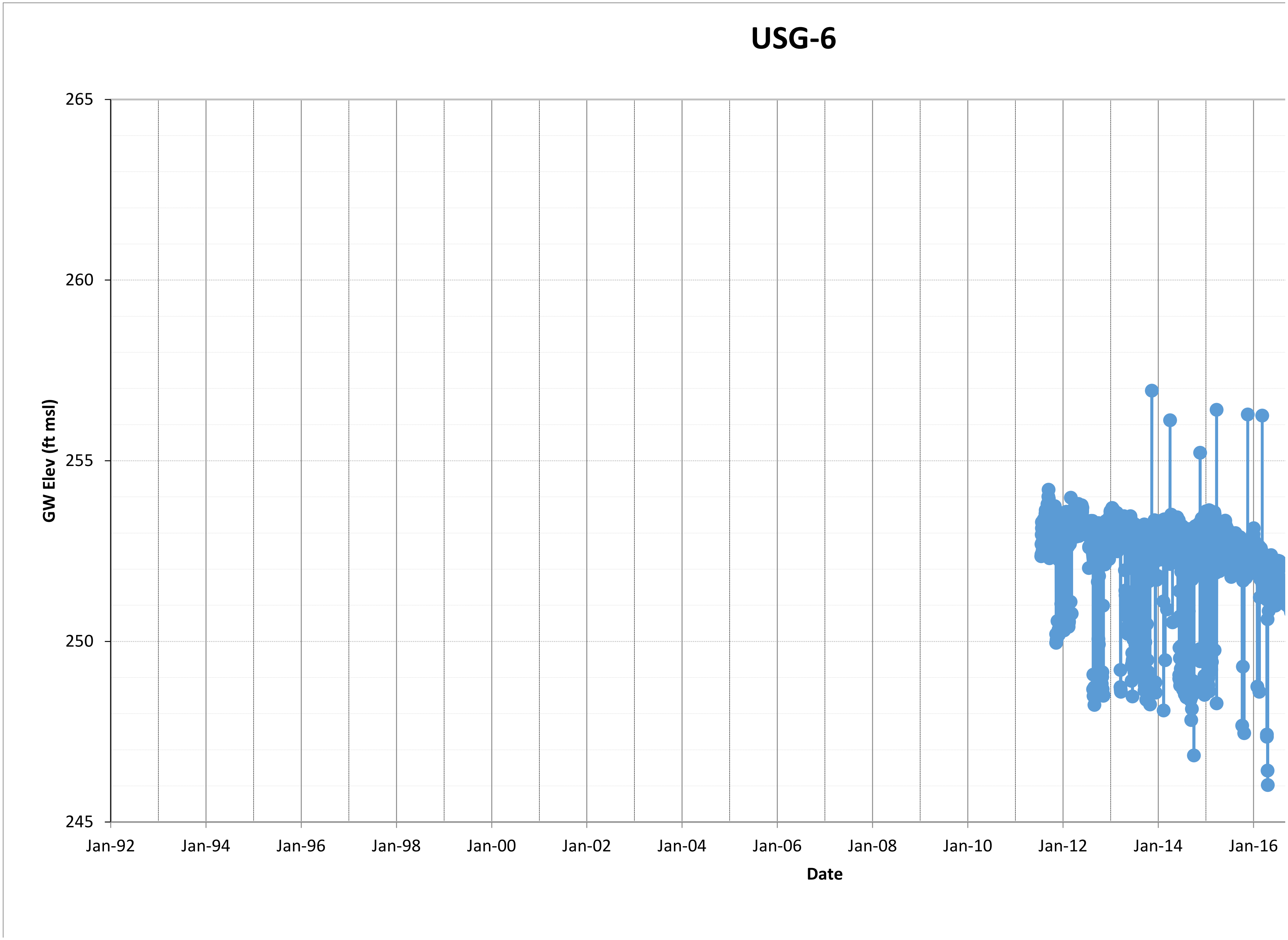
36H2
GW Elev (ft msl)
265
260
255
250
245
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Date



42L1
GW Elev (ft msl)
180
175
170
165
160
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Jan-18
Jan-20
Date


USG-4
GW Elev (ft msl)
255
250
245
240
235
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Date


USG-5
GW Elev (ft msl)
255
250
245
240
235
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Date


USG-6
GW Elev (ft msl)
265
260
255
250
245
Jan-92
Jan-94
Jan-96
Jan-98
Jan-00
Jan-02
Jan-04
Jan-06
Jan-08
Jan-10
Jan-12
Jan-14
Jan-16
Date

# APPENDIX C

## WATER QUALITY RESULTS AND STATISTICAL ANALYSES

Table C-1. Alkalinity results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Alkalinity | 122 | 173 | 101 | 126 | | | 131 | | | | | | 109 | | | | 131 | 157 | 107 | | 218 | | | |
| spring-10 | Alkalinity | 112 | 177 | 98.1 | 118 | | | 114 | | | | | | 108 | | | | 128 | 148 | 102 | | 217 | | | |
| spring-11 | Alkalinity | 124 | 177 | 98.9 | 121 | | | 114 | | | | | | 107 | | | | 128 | 150 | 102 | | 234 | | | |
| spring-12 | Alkalinity | 113 | 184 | 97.7 | | | | 113 | | | | | | 106 | | | | 128 | | 103 | | 219 | | | |
| spring-13 | Alkalinity | 126 | | | | | 127 | | | | | | | | | | | | | | | 208 | | | |
| spring-14 | Alkalinity | 124 | 180 | 98.6 | 121 | | 126 | 113 | 108 | | | | | 105 | 98.3 | | 116 | 128 | | 99.6 | | 210 | 123 | | 109 |
| spring-15 | Alkalinity | 122 | 203 | 98 | 117 | | 126 | 111 | 108 | | | | | 103 | 98.2 | | 118 | 127 | | | 99 | 206 | 132 | | 109 |
| spring-16 | Alkalinity | 124 | 201 | 99 | 120 | | 126 | 112 | 109 | | | | | 105 | 98.6 | | 120 | 128 | | | 102 | 205 | 123 | | 112 |
| spring-17 | Alkalinity | 121 | 193 | 97 | 117 | | 130 | 115 | 115 | | | | | 103 | 98.4 | | 121 | 127 | | | 103 | 194 | | | 110 |
| spring-18 | Alkalinity | 123 | 192 | 89 | 119 | 127 | 124 | 111 | 108 | 132 | | 172 | | 103 | 97.9 | | 121 | 128 | | | 104 | 192 | 119 | | |
| spring-19 | Alkalinity | 115 | 191 | 97.8 | 118 | 126 | 126 | 110 | 107 | 131 | | 176 | | 103 | 97.1 | | 121 | 127 | | | 104 | 193 | 119 | | 109 |
| spring-20 | Alkalinity | 126 | 189 | 85.2 | 114 | 128 | 126 | 112 | 108 | | 132 | | 202 | 101 | 98.8 | 120 | | 127 | | | 105 | 193 | 127 | | 110 |
| spring-21 | Alkalinity | 119 | 189 | 91.6 | 119 | 127 | 126 | 111 | 111 | | 132 | | 168 | 102 | 96.1 | 121 | | 128 | | | 104 | 198 | 119 | | 111 |
| | Mean | 120.8 | 187.4 | 96.0 | 119.1 | 127.0 | 126.3 | 113.9 | 109.3 | 131.5 | 132.0 | 174.0 | 185.0 | 104.6 | 97.9 | 120.5 | 119.5 | 127.9 | 151.7 | 102.7 | 103.0 | 206.7 | 123.1 | #DIV/0! | 110.0 |

Table C-2. Bicarbonate results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Bicarbonate | 146 | 178 | 108 | 147 | | | 142 | | | | | | 127 | | | | 152 | 174 | 120 | | 254 | | | |
| spring-10 | Bicarbonate | 128 | 188 | 113 | 139 | | | 136 | | | | | | 127 | | | | 152 | 170 | 120 | | 262 | | | |
| spring-11 | Bicarbonate | 141 | 181 | 112 | 144 | | | 128 | | | | | | 122 | | | | 144 | 172 | 115 | | 270 | | | |
| spring-12 | Bicarbonate | 132 | 192 | 113 | | | | 132 | | | | | | 123 | | | | 150 | | 121 | | 262 | | | |
| spring-13 | Bicarbonate | 148 | | | | | 145 | | | | | | | | | | | | | | | 241 | | | |
| spring-14 | Bicarbonate | 145 | 180 | 110 | 142 | | 147 | 127 | 126 | | | | | 120 | 105 | | 136 | 147 | | 116 | | 243 | 144 | | 126 |
| spring-15 | Bicarbonate | 136 | 226 | 108 | 136 | | 151 | 128 | 124 | | | | | 120 | 111 | | 139 | 153 | | | 116 | 234 | 155 | | 128 |
| spring-16 | Bicarbonate | 145 | 214 | 113 | 136 | | 144 | 129 | 123 | | | | | 121 | 107 | | 140 | 151 | | | 118 | 232 | 140 | | 131 |
| spring-17 | Bicarbonate | 144 | 206 | 107 | 127 | | 148 | 129 | 115 | | | | | 122 | 104 | | 139 | 149 | | | 121 | 230 | | | 128 |
| spring-18 | Bicarbonate | 140 | 200 | 102 | 139 | 147 | 150 | 131 | 124 | 157 | | 201 | | 120 | 104 | | 142 | 150 | | | 125 | 220 | 137 | | |
| spring-19 | Bicarbonate | 134 | 226 | 112 | 138 | 150 | 147 | 132 | 120 | 155 | | 207 | | 120 | 102 | | 146 | 149 | | | 125 | 227 | 140.5 | 120 | 131.5 |
| spring-21 | Bicarbonate | 132 | 216 | 104 | 140 | 148 | 142 | 131 | 127 | | 155 | | 195 | 118 | 100 | 142 | | 155 | | | 122 | 235 | 141 | | 128 |
| | Mean | 139.3 | 200.6 | 109.3 | 138.8 | 148.3 | 146.8 | 131.4 | 122.7 | 156.0 | 155.0 | 204.0 | 195.0 | 121.8 | 104.7 | 142.0 | 140.3 | 150.2 | 172.0 | 118.4 | 121.2 | 242.5 | 142.9 | 120.0 | 128.8 |

Table C-3. Boron results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Boron | 158 | 727 | 471 | 202 | | | 372 | | | | | | 238 | | | | 485 | 764 | 204 | | 1360 | | | |
| spring-10 | Boron | 176 | 766 | 430 | 208 | | | 374 | | | | | | 256 | | | | 358 | 475 | 191 | | 1500 | | | |
| spring-11 | Boron | 167 | 718 | 422 | 203 | | | 362 | | | | | | 247 | | | | 504 | 729 | 197 | | 1610 | | | |
| spring-12 | Boron | 166 | 761 | 421 | | | | 347 | | | | | | 262 | | | | 499 | | 192 | | 1270 | | | |
| spring-13 | Boron | 146 | | | | | 254 | | | | | | | | | | | | | | | 1010 | | | |
| spring-14 | Boron | 166 | 763 | 423 | 204 | | 276 | 378 | 231 | | | | | 266 | 188 | | 234 | 501 | | 200 | | 1030 | 491 | | 220 |
| spring-15 | Boron | 176 | 818 | 402 | 240 | | 286 | 342 | 229 | | | | | 258 | 210 | | 282 | 454 | | | 229 | 864 | 500 | | 249 |
| spring-16 | Boron | 172 | 840 | 420 | 200 | | 279 | 373 | 236 | | | | | 257 | 195 | | 243 | 508 | | | 209 | 938 | 470 | | 220 |
| spring-17 | Boron | 176 | 865 | 428 | 211 | | 284 | 396 | 231 | | | | | 279 | 200 | | 261 | 519 | | | 219 | 864 | | | 236 |
| spring-18 | Boron | 179 | 834 | 381 | 219 | 253 | 287 | 405 | 233 | 545 | | 780 | | 284 | 198 | | 254 | 517 | | | 221 | 843 | 459 | | |
| spring-19 | Boron | 178 | 855 | 446 | 214 | 241 | 280 | 396 | 231 | 535 | | 768 | | 265 | 193 | | 257 | 535 | | | 212 | 864 | 459 | | 232 |
| spring-20 | Boron | 172 | 829 | 388 | 215 | 230 | 292 | 389 | 253 | | 541 | | 762 | 268 | 189 | 252 | | 521 | | | 214 | 817 | 525 | | 233 |
| spring-21 | Boron | 172 | 816 | 410 | 211 | 237 | 280 | 403 | 243 | | 568 | | 704 | 270 | 184 | 263 | | 511 | | | 215 | 793 | 466 | | 236 |
| | Mean | 169.5 | 799.3 | 420.2 | 211.5 | 240.3 | 279.8 | 378.1 | 235.9 | 540.0 | 554.5 | 774.0 | 733.0 | 262.5 | 194.6 | 257.5 | 255.2 | 492.7 | 656.0 | 196.8 | 217.0 | 1058.7 | 481.4 | #DIV/0! | 232.3 |

Table C-4. Calcium results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Calcium | 18.7 | 3.62 | 12 | 23.3 | | | 36.1 | | | | | | 8 | | | | 18 | 7.36 | 18.4 | | 36.3 | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-10 | Calcium | 18.9 | 2.96 | 11.5 | 21.3 | | | 34.7 | | | | | | 7.91 | | | | 16.9 | 6.66 | 18.2 | | 55.8 | | | |
| spring-11 | Calcium | 19.4 | 2.87 | 11.6 | 22.1 | | | 37 | | | | | | 7.2 | | | | 17.7 | 7.12 | 19.4 | | 60.7 | | | |
| spring-12 | Calcium | 19.7 | 3.73 | 11.6 | | | | 36.3 | | | | | | 8.15 | | | | 17.9 | | 20.6 | | 34.1 | | | |
| spring-13 | Calcium | 18.7 | | | | | 19.9 | | | | | | | | | | | | | | | 22.7 | | | |
| spring-14 | Calcium | 19.5 | 3.01 | 11.2 | 20.7 | | 20.1 | 39.9 | 18.1 | | | | | 8.39 | 6.99 | | 30.5 | 17.4 | | 21.1 | | 21.2 | 19.1 | | 20.5 |
| spring-15 | Calcium | 20.7 | 5.27 | 12.2 | 22.4 | | 20.7 | 41.3 | 21.6 | | | | | 8.56 | 8.08 | | 34.4 | 19.1 | | | 23.2 | 19.8 | 22.4 | | 22.1 |
| spring-16 | Calcium | 21.4 | 4.11 | 12.1 | 21 | | 21.7 | 42.5 | 19.2 | | | | | 8.03 | 6.76 | | 34.5 | 18.4 | | | 24.5 | 18.6 | 19.4 | | 22.4 |
| spring-17 | Calcium | 20.4 | 3.66 | 11.9 | 20.9 | | 20.5 | 43.2 | 12.4 | | | | | 8.39 | 6.25 | | 33.5 | 18 | | | 23.1 | 14.7 | | | 22.1 |
| spring-18 | Calcium | 18.6 | 3.36 | 10.1 | 19.6 | 26.1 | 19.9 | 42.7 | 16.9 | 19.9 | | 23.2 | | 8.62 | 5.99 | | 30.9 | 17.5 | | | 21.6 | 13.1 | 17.2 | | |
| spring-19 | Calcium | 19.9 | 3.97 | 11.3 | 19.9 | 27.7 | 21.2 | 44.6 | 14.8 | 20.5 | | 23.9 | | 8.61 | 5.48 | | 33.1 | 17.9 | | | 22.2 | 13.5 | 17.95 | 22 | 21.7 |
| spring-20 | Calcium | 19.8 | 4.12 | 10.1 | 20.3 | 27.2 | 20.9 | 44.5 | 22.3 | | 20 | | 29.4 | 8.12 | 5.02 | 33.2 | | 18.2 | | | 21.3 | 12.8 | 19.2 | | 21.1 |
| spring-21 | Calcium | 19.7 | 3.94 | 10.9 | 20.4 | 27.1 | 20.9 | 47.2 | 20.9 | | 20.5 | | 24.6 | 8.35 | 4.86 | 33.8 | | 18.2 | | | 22.2 | 14.1 | 18 | | 21.4 |
| | Mean | 19.6 | 3.7 | 11.4 | 21.1 | 27.0 | 20.6 | 40.8 | 18.3 | 20.2 | 20.3 | 23.6 | 27.0 | 8.2 | 6.2 | 33.5 | 32.8 | 17.9 | 7.0 | 19.5 | 22.6 | 26.0 | 19.0 | 22.0 | 21.6 |

Table C-5. Carbonate results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Carbonate | | 11 | 3 | | | | | | | | | | | | | | | | | | | | | |
| spring-10 | Carbonate | 1.2 | 8.9 | 1.7 | 0.9 | | | 0.6 | | | | | | 0.8 | | | | 1.3 | 2.1 | 1.2 | | 0.8 | | | |
| spring-11 | Carbonate | 0.7 | 7.6 | 1.1 | 0.7 | | | 0.6 | | | | | | 1.1 | | | | 0.9 | 0.7 | 0.7 | | 0.9 | | | |
| spring-12 | Carbonate | 0.9 | 10.7 | 1.8 | | | | | | | | | | 0.8 | | | | 1 | | 0.8 | | 0.8 | | | |
| spring-13 | Carbonate | 1 | | | | | 0.6 | | | | | | | | | | | | | | | 1.4 | | | |
| spring-14 | Carbonate | 1 | 13.9 | 2.5 | 1 | | 0.9 | 0.6 | 1.3 | | | | | 1.3 | 5.7 | | 0.9 | 1.1 | | 0.9 | | 1.2 | 1.1 | | 1 |
| spring-15 | Carbonate | 0.9 | 7.2 | 1.7 | 0.8 | | 0.8 | 0.6 | 0.6 | | | | | 0.9 | 3.1 | | 0.5 | 1 | | | 0.6 | 1.2 | 0.8 | | 0.7 |
| spring-16 | Carbonate | 0.9 | 10.9 | 1.4 | 0.7 | | 0.8 | 0.6 | 0.8 | | | | | 1 | 4 | | 0.5 | 1.2 | | | 0.6 | 1.6 | 0.9 | | 0.7 |
| spring-17 | Carbonate | 0.8 | 7 | 1.6 | 0.5 | | 0.6 | 0.5 | 4 | | | | | 0.7 | 5.1 | | 0.6 | 0.9 | | | 0.7 | 1.4 | | | 0.8 |
| spring-18 | Carbonate | 0.7 | 11 | 1.7 | 0.9 | 0.9 | 0.6 | 0.6 | 1.6 | 1.4 | | 1.1 | | 0.6 | 4.8 | | 0.7 | 1.1 | | | 0.9 | 1.9 | 1.2 | | |
| spring-19 | Carbonate | 1.1 | 7.9 | 1.9 | 1.1 | 0.8 | 0.7 | 0.5 | 2.1 | 0.9 | | 1.3 | | 0.6 | 6.5 | | 0.8 | 0.9 | | | 1 | 1.9 | 1.1 | | 1.1 |
| spring-21 | Carbonate | 0.6 | 6.1 | 0.7 | 0.5 | 0.7 | 0.6 | 0.4 | 0.6 | | 0.8 | | 1 | 0.5 | 5.4 | 0.6 | | 1.2 | | | 0.8 | 1.3 | 0.9 | | 1 |
| | Mean | 0.9 | 9.3 | 1.7 | 0.8 | 0.8 | 0.7 | 0.6 | 1.6 | 1.2 | 0.8 | 1.2 | 1.0 | 0.8 | 4.9 | 0.6 | 0.7 | 1.1 | 1.4 | 0.9 | 0.8 | 1.3 | 1.0 | #DIV/0! | 0.9 |

Table C-6. Chloride results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Chloride | 42.8 | 382 | 92.8 | 69.2 | | | 170 | | | | | | 66.3 | | | | 83.8 | 79.2 | 64.2 | | 268 | | | |
| spring-10 | Chloride | 60.9 | 393 | 96.6 | 62.5 | | | 179 | | | | | | 68.5 | | | | 84.6 | 82.9 | 66.9 | | 393 | | | |
| spring-11 | Chloride | 41.7 | 388 | 96.1 | 67 | | | 188 | | | | | | 69.3 | | | | 96.3 | 81.1 | 67.7 | | 417 | | | |
| spring-12 | Chloride | 60.6 | 392 | 95.9 | | | | 181 | | | | | | 69.1 | | | | 85.4 | | 71.8 | | 262 | | | |
| spring-13 | Chloride | 41.7 | | | | | 70.6 | | | | | | | | | | | | | | | 196 | | | |
| spring-14 | Chloride | 43.7 | 403 | 93.6 | 58.2 | | 70.3 | 191 | 56.2 | | | | | 70.8 | 57.8 | | 115 | 82 | | 76.6 | | 183 | 85 | | 66 |
| spring-15 | Chloride | 46.9 | 398 | 92 | 58.1 | | 71.7 | 189 | 63.6 | | | | | 72.2 | 59.9 | | 109 | 83.4 | | | 86.7 | 149 | 97.8 | | 68.2 |
| spring-16 | Chloride | 44.1 | 394 | 92.7 | 58.3 | | 71.7 | 198 | 58.2 | | | | | 71.5 | 59.5 | | 108 | 82.5 | | | 82.3 | 152 | 83 | | 68.2 |
| spring-17 | Chloride | 47.8 | 408 | 94.8 | 56.9 | | 70.7 | 206 | 57.4 | | | | | 70.7 | 58.5 | | 118 | 81.7 | | | 76.9 | 130 | | | 67.3 |
| spring-18 | Chloride | 44.7 | 410 | 84 | 57.2 | 81.3 | 71.1 | 202 | 56.4 | 116 | | 168 | | 71.9 | 58.4 | | 115 | 82.1 | | | 74.7 | 116 | 78.8 | | |
| spring-19 | Chloride | 32.75 | 206.35 | 50.9 | 32.75 | 46.6 | 40.8 | 92.9 | 32.8 | 61.5 | | 88.4 | | 40.15 | 33.6 | | 62.4 | 45.45 | | | 41.25 | 57.55 | 44.28 | 43.04 | 37.6775 |
| spring-20 | Chloride | 41.3 | 403 | 45.15 | 32.55 | 82.9 | 40 | 202 | 35.65 | | 113 | | 188 | 39.5 | 57.2 | 116 | | 83.6 | | | 70.5 | 104 | 83.5 | | 64.8 |
| spring-21 | Chloride | 51.2 | 397 | 87 | 57.2 | 81.4 | 71.7 | 214 | 59.2 | | 116 | | 168 | 73 | 58.4 | 119 | | 84.9 | | | 74 | 107 | 78 | | 66.1 |
| | Mean | 46.2 | 381.2 | 85.1 | 55.4 | 73.1 | 64.3 | 184.4 | 52.4 | 88.8 | 114.5 | 128.2 | 178.0 | 65.2 | 55.4 | 117.5 | 104.6 | 81.3 | 81.1 | 69.4 | 72.3 | 195.0 | 78.6 | 43.0 | 62.6 |

Table C-7. Fluroide results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Fluoride | 0.49 | 1.56 | 0.93 | 0.75 | | | 0.87 | | | | | | 1.72 | | | | 1.61 | 2.77 | 0.63 | | 1.52 | | | |
| spring-10 | Fluoride | 0.56 | 1.69 | 0.98 | 0.82 | | | 0.85 | | | | | | 1.78 | | | | 1.69 | 2.93 | 0.67 | | 1.53 | | | |
| spring-11 | Fluoride | 0.52 | 1.59 | 0.98 | 0.79 | | | 0.83 | | | | | | 1.69 | | | | 1.61 | 2.81 | 0.67 | | 1.43 | | | |
| spring-12 | Fluoride | 0.52 | 1.59 | 0.98 | | | | 0.81 | | | | | | 1.71 | | | | 1.61 | | 0.65 | | 1.67 | | | |
| spring-13 | Fluoride | 0.45 | | | | | 0.85 | | | | | | | | | | | | | | | 1.8 | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-14 | Fluoride | 0.53 | 1.61 | 1.02 | 0.78 | | 0.91 | 0.87 | 0.77 | | | | | 1.89 | 0.75 | | 0.68 | 1.7 | | 0.64 | | 2.28 | 1.3 | | 0.74 |
| spring-15 | Fluoride | 0.48 | 1.48 | 0.94 | 0.72 | | 4.4 | 0.76 | 0.73 | | | | | 2 | 0.69 | | 0.6 | 1.77 | | | 4.265 | 1.91 | 1.27 | | 0.7 |
| spring-16 | Fluoride | 4.31 | 5.14 | 4.735 | 4.47 | | 4.345 | 4.29 | 4.48 | | | | | 5.09 | 4.715 | | 4.2 | 4.895 | | | 4.33 | 5.075 | 4.645 | | 4.37 |
| spring-17 | Fluoride | 0.47 | 5.055 | 4.685 | 4.26 | | 4.325 | 4.285 | 4.685 | | | | | 4.9 | 0.69 | | 0.61 | 1.71 | | | 0.62 | 5.18 | | | 0.71 |
| spring-18 | Fluoride | 0.46 | 1.54 | 0.87 | 0.71 | 0.69 | 0.83 | 0.72 | 0.7 | 0.7 | | 1.64 | | 1.78 | 0.72 | | 0.6 | 1.7 | | | 0.6 | 2.34 | 1.23 | | |
| spring-19 | Fluoride | 0.48 | 1.57 | 0.98 | 0.74 | 0.69 | 0.86 | 0.61 | 0.7 | 0.82 | | 1.71 | | 1.7 | 0.72 | | 0.63 | 1.66 | | | 0.64 | 2.17 | 2.33 | 0.6 | 0.72 |
| spring-20 | Fluoride | 0.48 | 1.58 | 0.85 | 0.75 | 0.66 | 0.89 | 0.73 | 0.76 | | 0.83 | | 1.49 | 1.84 | 0.66 | 0.63 | | 1.79 | | | 0.61 | 2.28 | 1.25 | | 0.7 |
| spring-21 | Fluoride | 0.49 | 1.56 | 0.92 | 0.75 | 0.7 | 0.88 | 0.71 | 0.77 | | 0.84 | | 1.69 | 1.87 | 0.74 | 0.64 | | 1.73 | | | 0.66 | 2.89 | 1.35 | | 0.76 |
| | Mean | 0.8 | 2.2 | 1.6 | 1.4 | 0.7 | 2.0 | 1.4 | 1.7 | 0.8 | 0.8 | 1.7 | 1.6 | 2.3 | 1.2 | 0.6 | 1.2 | 2.0 | 2.8 | 0.7 | 1.7 | 2.5 | 1.9 | 0.6 | 1.2 |

Table C-8. Iron results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Iron | 2.8 | 130 | 4.4 | 13.1 | | | 26.6 | | | | | | 14.2 | | | | 34.4 | 3.4 | 7.7 | | 27.3 | | | |
| spring-10 | Iron | -6 | -6 | -6 | 17.3 | | | 79.1 | | | | | | 27.6 | | | | 4.5 | -6 | 4 | | 73.9 | | | |
| spring-11 | Iron | -3.2 | 14.7 | -3.2 | -3.2 | | | 49 | | | | | | 101 | | | | 8.3 | -3.2 | -3.2 | | 119 | | | |
| spring-12 | Iron | -3.2 | -6.4 | -3.2 | | | | 61.1 | | | | | | 16.4 | | | | 5.7 | | 13.5 | | 57.7 | | | |
| spring-13 | Iron | 6.9 | | | | | 14.5 | | | | | | | | | | | | | | | 96.6 | | | |
| spring-14 | Iron | -4 | -8 | -4 | 9.8 | | 13.3 | 57.8 | 31.1 | | | | | 24.4 | -4 | | 6.9 | 8.5 | | 6.6 | | 83.1 | 5.3 | | 4.9 |
| spring-15 | Iron | 42.3 | 9 | -4 | 14.8 | | 7.5 | 31.5 | 10.3 | | | | | 12.9 | 5.7 | | 13.2 | 10.2 | | | 32.7 | 43.2 | 4.4 | | 10 |
| spring-16 | Iron | 6.2 | -8 | -4 | 15.9 | | -8 | 66.5 | 12.3 | | | | | 53.7 | -4 | | 190 | -8 | | | 5 | 22 | -4 | | -4 |
| spring-17 | Iron | 6.6 | 12.2 | -5 | 17 | | -5 | 42.2 | 71.7 | | | | | 11.6 | -5 | | 5 | -5 | | | 17.4 | 65 | | | 5.3 |
| spring-18 | Iron | -5 | -10 | -5 | 21.5 | -5 | -5 | 73 | 75 | 118 | | 14.3 | | 23.4 | -5 | | -5 | -5 | | | 12.4 | 87.1 | -5 | | |
| spring-19 | Iron | -10 | -20 | -10 | 12.1 | -10 | -10 | 48.4 | 176 | 18.2 | | -10 | | 19.5 | -10 | | 10.8 | -10 | | | -10 | 61.5 | -30 | 75 | 745 |
| spring-20 | Iron | -10 | -20 | -10 | 29.8 | -10 | 13.4 | 66.1 | -10 | | 104 | | 58 | 34.3 | -10 | 16.2 | | -10 | | | 22.8 | 56.4 | -10 | | -10 |
| spring-21 | Iron | -5 | -10 | -5 | 20.2 | 5.1 | 6.9 | 37.1 | -5 | | 69.1 | | 8.2 | 14 | 7.5 | 16.8 | | 10.9 | | | 14.3 | 78.8 | -5 | | -5 |
| | Mean | 1.4 | 6.5 | -4.6 | 15.3 | -5.0 | 3.1 | 53.2 | 45.2 | 68.1 | 86.6 | 2.2 | 33.1 | 29.4 | -3.1 | 16.5 | 36.8 | 3.7 | -1.9 | 5.7 | 13.5 | 67.0 | -6.3 | 75.0 | 106.6 |

Table C-9. Magnesium results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Magnesium | 4.16 | 1.59 | 3.84 | 5.58 | | | 11 | | | | | | 1.51 | | | | 3.17 | 4.41 | 3.98 | | 13.4 | | | |
| spring-10 | Magnesium | 3.67 | 1.31 | 3.36 | 4.56 | | | 11.2 | | | | | | 1.51 | | | | 2.76 | 1.24 | 3.5 | | 21 | | | |
| spring-11 | Magnesium | 4.2 | 1.28 | 3.7 | 5 | | | 12 | | | | | | 1.46 | | | | 3.07 | 1.39 | 3.98 | | 22.8 | | | |
| spring-12 | Magnesium | 4.27 | 1.57 | 3.72 | | | | 11.7 | | | | | | 1.65 | | | | 3.16 | | 4.27 | | 12.3 | | | |
| spring-13 | Magnesium | 4.27 | | | | | 3.85 | | | | | | | | | | | | | | | 8.63 | | | |
| spring-14 | Magnesium | 4.31 | 1.38 | 3.69 | 4.7 | | 4.19 | 12.8 | 4.84 | | | | | 1.66 | 0.621 | | 7.65 | 3.12 | | 4.39 | | 7.6 | 3.46 | | 3.95 |
| spring-15 | Magnesium | 4.55 | 2.04 | 3.8 | 5.16 | | 4.17 | 13 | 5.25 | | | | | 1.68 | 0.797 | | 8.2 | 3.7 | | | 4.61 | 7.03 | 4.06 | | 4.15 |
| spring-16 | Magnesium | 4.38 | 1.78 | 3.65 | 4.92 | | 4.2 | 13 | 4.99 | | | | | 1.61 | 0.575 | | 8.01 | 3.15 | | | 4.57 | 6.26 | 3.28 | | 4.17 |
| spring-17 | Magnesium | 4.2 | 1.7 | 3.53 | 4.66 | | 4.05 | 13.2 | 3.55 | | | | | 1.64 | 0.506 | | 7.79 | 2.97 | | | 4.28 | 5.01 | | | 3.91 |
| spring-18 | Magnesium | 4.05 | 1.77 | 3.13 | 4.54 | 5.17 | 3.81 | 14.6 | 4.55 | 5.1 | | 7.21 | | 1.66 | 0.46 | | 7.9 | 2.98 | | | 4.3 | 4.82 | 3.07 | | |
| spring-19 | Magnesium | 3.92 | 1.9 | 3.52 | 4.37 | 5.29 | 4.13 | 14.3 | 4.21 | 4.86 | | 6.96 | | 1.66 | 0.408 | | 7.77 | 2.9 | | | 4.24 | 4.54 | 3.085 | 4.3 | 4.05 |
| spring-20 | Magnesium | 4.12 | 2.03 | 3.21 | 4.71 | 5.38 | 4.22 | 14.4 | 5.65 | | 4.91 | | 8.6 | 1.58 | 0.356 | 7.76 | | 3.06 | | | 4.17 | 4.44 | 3.35 | | 3.88 |
| spring-21 | Magnesium | 4.01 | 1.9 | 3.28 | 4.63 | 5.25 | 4.03 | 14.8 | 5.17 | | 5 | | 7.23 | 1.64 | 0.338 | 7.81 | | 3.03 | | | 4.29 | 4.42 | 3.08 | | 3.9 |
| | Mean | 4.2 | 1.7 | 3.5 | 4.8 | 5.3 | 4.1 | 13.0 | 4.8 | 5.0 | 5.0 | 7.1 | 7.9 | 1.6 | 0.5 | 7.8 | 7.9 | 3.1 | 2.3 | 4.0 | 4.4 | 9.4 | 3.3 | 4.3 | 4.0 |

Table C-10. pH results and upper confidence interval test

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | pH | 8 | 8.8 | 8.3 | 7.8 | | | 7.7 | | | | | | 8.1 | | | | 8 | 8.1 | 8 | | 7.7 | | | |
| spring-10 | pH | 8.1 | 8.8 | 8.3 | 8 | | | 7.8 | | | | | | 8 | | | | 8.1 | 8.2 | 8.2 | | 7.6 | | | |
| spring-11 | pH | 7.9 | 8.8 | 8.3 | 7.9 | | | 7.8 | | | | | | 8.2 | | | | 8 | 8.1 | 8 | | 7.6 | | | |
| spring-12 | pH | 8 | 8.8 | 8.4 | | | | 7.9 | | | | | | 8 | | | | 8 | | 8 | | 7.6 | | | |
| spring-13 | pH | 8 | | | | | 7.9 | | | | | | | | | | | | | | | 7.9 | | | |
| spring-20 | pH | 8.3 | 8.7 | 8.4 | 8.4 | 8.2 | 8.2 | 8 | 8.1 | | 8.2 | | 8.2 | 8.4 | 9 | 8.1 | | 8.3 | | | 8.2 | 8.4 | 8.2 | | 8.2 |
| | Mean | 8.1 | 8.8 | 8.3 | 8.0 | 8.2 | 8.1 | 7.8 | 8.1 | #DIV/0! | 8.2 | #DIV/0! | 8.2 | 8.1 | 9.0 | 8.1 | #DIV/0! | 8.1 | 8.1 | 8.1 | 8.2 | 7.8 | 8.2 | #DIV/0! | 8.2 |

Table C-11. Potassium results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Potassium | 3.97 | 2.7 | 4.02 | 4.87 | | | 4.87 | | | | | | 3.28 | | | | 4.18 | 2.53 | 4.44 | | 4.58 | | | |
| spring-10 | Potassium | 3.98 | 2.63 | 3.85 | 4.67 | | | 4.77 | | | | | | 3.38 | | | | 3.98 | 2.36 | 4.21 | | 5.28 | | | |
| spring-11 | Potassium | 3.74 | 2.74 | 3.68 | 4.48 | | | 5.07 | | | | | | 3.22 | | | | 3.92 | 2.42 | 4.17 | | 5.49 | | | |
| spring-12 | Potassium | 3.96 | 2.44 | 3.59 | | | | 4.89 | | | | | | 3.16 | | | | 3.97 | | 4.35 | | 4.2 | | | |
| spring-13 | Potassium | 3.9 | | | | | 4.59 | | | | | | | | | | | | | | | 3.47 | | | |
| spring-14 | Potassium | 3.96 | 2.68 | 3.76 | 4.51 | | 4.58 | 5.06 | 4.06 | | | | | 3.29 | 2.05 | | 5.82 | 3.91 | | 4.46 | | 3.46 | 3.92 | | 4.44 |
| spring-15 | Potassium | 4.08 | 3.11 | 3.81 | 4.73 | | 4.82 | 5.26 | 4.27 | | | | | 3.62 | 2.19 | | 6.16 | 4.14 | | | 4.7 | 3.56 | 4.37 | | 4.78 |
| spring-16 | Potassium | 4.22 | 3.19 | 3.89 | 4.82 | | 5.07 | 5.52 | 4.25 | | | | | 3.58 | 1.89 | | 6.06 | 4.19 | | | 4.72 | 3.51 | 4.01 | | 4.81 |
| spring-17 | Potassium | 3.92 | 2.87 | 3.72 | 4.48 | | 4.82 | 5.27 | 3.85 | | | | | 3.41 | 1.67 | | 5.82 | 3.97 | | | 4.32 | 3.12 | | | 4.57 |
| spring-18 | Potassium | 4.03 | 3.5 | 3.39 | 4.57 | 5.26 | 4.62 | 5.53 | 4.19 | 4.07 | | 3.87 | | 3.61 | 1.69 | | 5.94 | 4.08 | | | 4.46 | 3.24 | 4.09 | | |
| spring-19 | Potassium | 3.78 | 2.76 | 3.68 | 4.51 | 5.28 | 4.83 | 5.29 | 3.91 | 3.9 | | 3.62 | | 3.45 | 1.55 | | 5.83 | 3.95 | | | 4.31 | 2.92 | 3.83 | | 4.79 |
| spring-20 | Potassium | 5.89 | 5.745 | 3.34 | 4.39 | 6.46 | 4.86 | 6.53 | 4.1 | | 5.9 | | 5.885 | 3.29 | 5.15 | 6.755 | | 6.08 | | | 6.115 | 5.53 | 5.895 | | 6.26 |
| spring-21 | Potassium | 5.9 | 5.755 | 5.715 | 6.135 | 5.11 | 6.325 | 6.54 | 5.94 | | 5.83 | | 5.74 | 5.585 | 5.24 | 6.805 | | 3.91 | | | 6.12 | 3.14 | 3.87 | | 4.46 |
| | Mean | 4.3 | 3.3 | 3.9 | 4.7 | 5.5 | 4.9 | 5.4 | 4.3 | 4.0 | 5.9 | 3.7 | 5.8 | 3.6 | 2.7 | 6.8 | 5.9 | 4.2 | 2.4 | 4.3 | 5.0 | 4.0 | 4.3 | #DIV/0! | 4.9 |

Table C-12. Sodium results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Sodium | 75 | 434 | 153 | 80.5 | | | 122 | | | | | | 88.5 | | | | 99.5 | 119 | 75.7 | | 265 | | | |
| spring-10 | Sodium | 77 | 408 | 136 | 68.4 | | | 106 | | | | | | 83.9 | | | | 90.4 | 104 | 73.2 | | 276 | | | |
| spring-11 | Sodium | 72.3 | 438 | 151 | 80.4 | | | 124 | | | | | | 90 | | | | 99.9 | 118 | 73.9 | | 335 | | | |
| spring-12 | Sodium | 84.9 | 426 | 142 | | | | 118 | | | | | | 89.5 | | | | 99.5 | | 79.7 | | 247 | | | |
| spring-13 | Sodium | 71.3 | | | | | 94.2 | | | | | | | | | | | | | | | 218 | | | |
| spring-14 | Sodium | 75.5 | 448 | 152 | 77.2 | | 93.9 | 130 | 67.5 | | | | | 97 | 95.1 | | 90.9 | 102 | | 78.1 | | 221 | 100 | | 73.7 |
| spring-15 | Sodium | 79.9 | 498 | 155 | 83.5 | | 94.8 | 131 | 69.8 | | | | | 96.3 | 99.4 | | 103 | 110 | | | 88.3 | 227 | 114 | | 81.1 |
| spring-16 | Sodium | 83.4 | 474 | 156 | 77.9 | | 102 | 130 | 70.8 | | | | | 95 | 96.2 | | 98.1 | 104 | | | 88 | 210 | 102 | | 78.9 |
| spring-17 | Sodium | 73.8 | 444 | 144 | 71.1 | | 94.4 | 130 | 74.9 | | | | | 93.6 | 91.7 | | 94.4 | 98.6 | | | 79.1 | 183 | | | 74.2 |
| spring-18 | Sodium | 76.2 | 470 | 135 | 74.9 | 87.3 | 94.2 | 133 | 72.6 | 133 | | 187 | | 96.6 | 95.3 | | 94 | 104 | | | 81.8 | 182 | 97.7 | | |
| spring-19 | Sodium | 80.9 | 453 | 148 | 74.4 | 87.8 | 93.9 | 131 | 70.9 | 126 | | 180 | | 94.1 | 92.3 | | 94.4 | 101 | | | 79.2 | 178 | 94.3 | 77 | 76.4 |
| spring-20 | Sodium | 72 | 455 | 133 | 76.1 | 86.7 | 96.6 | 130 | 72.3 | | 128 | | 197 | 94.9 | 92.3 | 93.3 | | 102 | | | 77.4 | 172 | 101 | | 74.3 |
| spring-21 | Sodium | 80.7 | 458 | 142 | 76.7 | 87 | 94.6 | 136 | 71.8 | | 132 | | 179 | 95.8 | 93.4 | 95.4 | | 103 | | | 80.6 | 170 | 96.7 | | 75.5 |
| | Mean | 77.1 | 450.5 | 145.6 | 76.5 | 87.2 | 95.4 | 126.8 | 71.3 | 129.5 | 130.0 | 183.5 | 188.0 | 92.9 | 94.5 | 94.4 | 95.8 | 101.2 | 113.7 | 76.1 | 82.1 | 221.8 | 100.8 | 77.0 | 76.3 |

Table C-13. Specific Conductance results and upper confidence interval test (µS/cm)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Specific conductance | 491.5 | 2120 | 840 | 624 | | | 920.5 | | | | | | 518.5 | | | | 613.5 | 608.5 | 505.5 | | 1575 | | | |
| spring-10 | Specific conductance | 537 | 2110 | 828 | 520.5 | | | 894.5 | | | | | | 510.5 | | | | 598.5 | 597.5 | 501.5 | | 1960 | | | |
| spring-11 | Specific conductance | 475.5 | 2090 | 833.5 | 553 | | | 890.5 | | | | | | 491.5 | | | | 603 | 596 | 493.5 | | 2110 | | | |
| spring-12 | Specific conductance | 537 | 2135 | 825 | | | | 887.5 | | | | | | 504 | | | | 604 | | 526.5 | | 1480 | | | |
| spring-13 | Specific conductance | 504.5 | | | | | 590 | | | | | | | | | | | | | | | 1290 | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-14 | Specific conductance | 474 | 2210 | 819.5 | 501.5 | | 589.5 | 937 | 462 | | | | | 502.5 | 477.5 | | 689 | 597.5 | | 530 | | 1190 | 621.5 | | 519.5 |
| spring-15 | Specific conductance | 494.5 | 2350 | 841.5 | 510 | | 595 | 969.5 | 493 | | | | | 519 | 485 | | 697 | 600 | | | 571.5 | 1150 | 682.5 | | 515.5 |
| spring-16 | Specific conductance | 483.5 | 2330 | 836.5 | 508 | | 593.5 | 979.5 | 472.5 | | | | | 510 | 488 | | 710.5 | 604.5 | | | 569 | 1105 | 603 | | 521 |
| spring-17 | Specific conductance | 542.5 | 2275 | 828.5 | 508 | | 594.5 | 999.5 | 470 | | | | | 519.5 | 488.5 | | 717.5 | 602.5 | | | 560.5 | 979 | | | 524.5 |
| spring-18 | Specific conductance | 499.5 | 2200 | 718.5 | 494 | 599.5 | 596 | 1015 | 465.5 | 771 | | 1045 | | 519.5 | 482.5 | | 699.5 | 604.5 | | | 542 | 944 | 585 | | |
| spring-19 | Specific conductance | 514 | 2265 | 842 | 505.5 | 634 | 609 | 1025 | 462.5 | 782 | | 1055 | | 526.5 | 488.5 | | 718.5 | 611 | | | 550.5 | 949.5 | 591 | 546 | 517.6667 |
| spring-20 | Specific conductance | 478 | 2245 | 718.5 | 492.5 | 603.5 | 602 | 1010 | 497.5 | | 756.5 | | 1140 | 513.5 | 476 | 711 | | 605.5 | | | 521.5 | 876.5 | 636 | | 508.5 |
| spring-21 | Specific conductance | 502.5 | 2175 | 753 | 494 | 600 | 581 | 1030 | 475 | | 758.5 | | 987.5 | 510.5 | 476.5 | 709.5 | | 607.5 | | | 537 | 898 | 576.5 | | 510 |
| | Mean | 502.6 | 2208.8 | 807.0 | 519.2 | 609.3 | 594.5 | 963.2 | 474.8 | 776.5 | 757.5 | 1050.0 | 1063.8 | 512.1 | 482.8 | 710.3 | 705.3 | 604.3 | 600.7 | 511.4 | 550.3 | 1269.8 | 613.6 | 546.0 | 516.7 |

Table C-14.Sulfate results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | Sulfate | 49.8 | 261 | 149 | 40.5 | | | 47.4 | | | | | | 21.9 | | | | 32.9 | 20.8 | 34.3 | | 144 | | | |
| spring-10 | Sulfate | 58.5 | 273 | 154 | 38.7 | | | 44.8 | | | | | | 21.4 | | | | 33.3 | 20.4 | 34.3 | | 171 | | | |
| spring-11 | Sulfate | 48.6 | 266 | 151 | 37.6 | | | 44.2 | | | | | | 20.5 | | | | 151 | 19.8 | 34 | | 189 | | | |
| spring-12 | Sulfate | 55.4 | 260 | 147 | | | | 42.8 | | | | | | 20.3 | | | | 31.6 | | 33.5 | | 146 | | | |
| spring-13 | Sulfate | 49.5 | | | | | 49.1 | | | | | | | | | | | | | | | 120 | | | |
| spring-14 | Sulfate | 51.5 | 306 | 154 | 35.1 | | 50.1 | 46.9 | 30.4 | | | | | 21.7 | 35.8 | | 43.9 | 34.5 | | 36.3 | | 119 | 40.2 | | 30 |
| spring-15 | Sulfate | 52.5 | 306 | 146 | 41.2 | | 50 | 45.2 | 31.8 | | | | | 21.4 | 36.2 | | 42.4 | 34.5 | | | 36.1 | 100 | 42.2 | | 29.9 |
| spring-16 | Sulfate | 52 | 300 | 147 | 39.4 | | 50.1 | 47.2 | 30.2 | | | | | 21 | 36.5 | | 40.3 | 34.6 | | | 37.1 | 108 | 38 | | 29.8 |
| spring-17 | Sulfate | 30.3 | 301 | 150 | 39.6 | | 48.7 | 48.1 | 24.6 | | | | | 20.9 | 22.25 | | 26.25 | 20.9 | | | 22.6 | 96.7 | | | 18.8 |
| spring-18 | Sulfate | 29.85 | 152.9 | 70.7 | 22.75 | 20.9 | 28.45 | 27 | 18.35 | 36.25 | | 44.25 | | 14.5 | 22.3 | | 26.05 | 21.15 | | | 22.5 | 48.8 | 22.2 | | |
| spring-19 | Sulfate | 58.1 | 293 | 148 | 38.7 | 34.5 | 50.2 | 39.9 | 27.3 | 64.8 | | 83.1 | | 21.4 | 35.6 | | 43.9 | 34.5 | | | 37 | 86 | 34.6 | 34 | 28.3 |
| spring-20 | Sulfate | 49.4 | 290 | 129 | 39.1 | 33.8 | 49.9 | 47.2 | 31.2 | | 63.4 | | 79.9 | 20.3 | 35.1 | 41.5 | | 34.1 | | | 36.3 | 83.7 | 36.6 | | 29.2 |
| spring-21 | Sulfate | 55 | 285 | 137 | 39.6 | 33.8 | 48.7 | 47.9 | 30.8 | | 66 | | 73.4 | 21.4 | 35.7 | 42.9 | | 35.1 | | | 37.1 | 88.6 | 36 | | 29.8 |
| | Mean | 49.3 | 274.5 | 140.2 | 37.5 | 30.8 | 47.3 | 44.1 | 28.1 | 50.5 | 64.7 | 63.7 | 76.7 | 20.6 | 32.4 | 42.2 | 37.1 | 41.5 | 20.3 | 34.5 | 32.7 | 115.4 | 35.7 | 34.0 | 28.0 |

Table C-15-Total Dissolved Solids results and upper confidence interval test (mg/L)

| Season-Yr | Simple_Nam | 11H3 | 24B1 | 24D1 | 25K2 | 25M2 | 26F1 | 30R1 | 31B1 | 32N01S | 32N1 | 32P03S | 32P3 | 34B1 | 36A1(MW-2B) | 36A2 (MW-2A) | 36A2(MW-2A) | 36C2 | 36D3 | 36H1 | 36H2 | 42A8 | USG-4 | USG-5 | USG-6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| spring-09 | TDS | 287 | 1230 | 508 | 338 | | | 523 | | | | | | 310 | | | | 359 | 364 | 307 | | 943 | | | |
| spring-10 | TDS | 322 | 1260 | 492 | 322 | | | 516 | | | | | | 310 | | | | 363 | 349 | 299 | | 1170 | | | |
| spring-11 | TDS | 278 | 1240 | 490 | 325 | | | 506 | | | | | | 284 | | | | 350 | 357 | 289 | | 1240 | | | |
| spring-12 | TDS | 320 | 1260 | 484 | | | | 502 | | | | | | 295 | | | | 355 | | 309 | | 891 | | | |
| spring-13 | TDS | 276 | | | | | 375 | | | | | | | | | | | | | | | 747 | | | |
| spring-14 | TDS | 285 | 1320 | 502 | 310 | | 361 | 552 | 284 | | | | | 321 | 312 | | 409 | 363 | | 338 | | 731 | 388 | | 318 |
| spring-15 | TDS | 283 | 1390 | 489 | 303 | | 342 | 553 | 291 | | | | | 308 | 296 | | 409 | 359 | | | 334 | 674 | 406 | | 302 |
| spring-16 | TDS | 280 | 1350 | 484 | 291 | | 356 | 559 | 271 | | | | | 303 | 298 | | 399 | 362 | | | 334 | 654 | 362 | | 309 |
| spring-17 | TDS | 298 | 1350 | 495 | 323 | | 347.5 | 567 | 283 | | | | | 300 | 303 | | 412 | 357 | | | 328 | 594 | | | 314 |
| spring-18 | TDS | 288 | 1310 | 439 | 304 | 352 | 342 | 565 | 274 | 469 | | 612 | | 305 | 291 | | 396 | 350 | | | 323 | 564 | 343 | | |
| spring-19 | TDS | 322 | 1310 | 503 | 309 | 373 | 365 | 583 | 273 | 477 | | 621 | | 322 | 307 | | 423 | 368 | | | 331 | 575 | 361 | | 317 |
| spring-20 | TDS | 289 | 1280 | 431 | 296 | 367 | 366 | 572 | 288 | | 474 | | 697 | 305 | 303 | 420 | | 369 | | | 324 | 555 | 372 | | 309 |
| spring-21 | TDS | 310 | 1280 | 464 | 304 | 359 | 358 | 598 | 293 | | 472 | | 618 | 319 | 308 | 409 | | 369 | | | 335 | 556 | 350 | | 314 |
| | Mean | 295.2 | 1298.3 | 481.8 | 311.4 | 362.8 | 356.9 | 549.7 | 282.1 | 473.0 | 473.0 | 616.5 | 657.5 | 306.8 | 302.3 | 414.5 | 408.0 | 360.3 | 356.7 | 308.4 | 329.9 | 761.1 | 368.9 | #DIV/0! | 311.9 |

# APPENDIX D

## Pumping Data 2020-2021

| | Total Wells | #4 Well | #5 Well | #6 Well |
|---|---|---|---|---|
| 12/30/2019 | | 51019652.0 | 157163323.0 | 214939971.0 |
| 1/6/2020 | | 51287684.0 | 157799760.0 | 215656731.0 |
| Acreft/wk | 5.0 | 0.8 | 2.0 | 2.2 |
| 1/13/2020 | | 51288122.0 | 158589307.0 | 216502600.0 |
| Acreft/wk | 5.0 | 0.0 | 2.4 | 2.6 |
| 1/20/2020 | | 51871541.0 | 159130270.0 | 217004854.0 |
| Acreft/wk | 5.0 | 1.8 | 1.7 | 1.5 |
| 1/27/2020 | | 52592028.0 | 159832962.0 | 217725593.0 |
| Acreft/wk | 6.6 | 2.2 | 2.2 | 2.2 |
| 2/3/2020 | | 53267244.0 | 160450927.0 | 218471854.0 |
| Acreft/wk | 6.3 | 2.1 | 1.9 | 2.3 |
| 2/10/2020 | | 53991887.0 | 161139523.0 | 219193903.0 |
| Acreft/wk | 6.6 | 2.2 | 2.1 | 2.2 |
| 2/17/2020 | | 54739677.0 | 161859497.0 | 220007663.0 |
| Acreft/wk | 7.0 | 2.3 | 2.2 | 2.5 |
| 2/24/2020 | | 55506984.0 | 161945278.0 | 220250844.0 |
| Acreft/wk | 3.4 | 2.4 | 0.3 | 0.7 |
| 3/2/2020 | | 56345517.0 | 161983817.0 | 221508316.0 |
| Acreft/wk | 6.6 | 2.6 | 0.1 | 3.9 |
| 3/9/2020 | | 56585981.0 | 162006258.0 | 222310802.0 |
| Acreft/wk | 3.3 | 0.7 | 0.1 | 2.5 |
| 3/16/2020 | | 56588534.0 | 162157234.0 | 223321678.0 |
| Acreft/wk | 3.6 | 0.0 | 0.5 | 3.1 |
| 3/23/2020 | | 57604686.0 | 162344991.0 | 224287567.0 |
| Acreft/wk | 6.7 | 3.1 | 0.6 | 3.0 |
| 3/30/2020 | | 58446702.0 | 162628234.0 | 225198994.0 |
| Acreft/wk | 6.3 | 2.6 | 0.9 | 2.8 |
| 4/6/2020 | | 59209165.0 | 162878036.0 | 226031847.0 |
| Acreft/wk | 5.7 | 2.3 | 0.8 | 2.6 |
| 4/13/2020 | | 59848279.0 | 163589364.0 | 226744883.0 |
| Acreft/wk | 6.3 | 2.0 | 2.2 | 2.2 |
| 4/20/2020 | | 60548425.0 | 164244698.0 | 227449178.0 |
| Acreft/wk | 6.3 | 2.1 | 2.0 | 2.2 |
| 4/27/2020 | | 61172174.0 | 164850625.0 | 228085920.0 |
| Acreft/wk | 5.7 | 1.9 | 1.9 | 2.0 |
| 5/4/2020 | | 61804602.0 | 165361698.0 | 228692964.0 |
| Acreft/wk | 5.4 | 1.9 | 1.6 | 1.9 |
| 5/11/2020 | | 62359122.0 | 165925906.0 | 229290521.0 |
| Acreft/wk | 5.3 | 1.7 | 1.7 | 1.8 |
| 5/18/2020 | | 63020818.0 | 166548825.0 | 229972582.0 |
| Acreft/wk | 6.0 | 2.0 | 1.9 | 2.1 |
| 5/25/2020 | | 63734695.0 | 167197528.0 | 230710359.0 |
| Acreft/wk | 6.4 | 2.2 | 2.0 | 2.3 |
| 6/1/2020 | | 64557247.0 | 168055095.0 | 231541398.0 |
| Acreft/wk | 7.7 | 2.5 | 2.6 | 2.6 |
| 6/8/2020 | | 65400505.0 | 168919628.0 | 232471937.0 |

| | | | | |
|---|---|---|---|---|
| Acreft/wk | 8.1 | 2.6 | 2.7 | 2.9 |
| 6/15/2020 | | 66261517.0 | 169755358.0 | 233382843.0 |
| Acreft/wk | 8.0 | 2.6 | 2.6 | 2.8 |
| 6/22/2020 | | 67075589.0 | 170554371.0 | 234146965.0 |
| Acreft/wk | 7.3 | 2.5 | 2.5 | 2.3 |
| 6/29/2020 | | 67805037.0 | 171208570.0 | 234855950.0 |
| Acreft/wk | 6.4 | 2.2 | 2.0 | 2.2 |
| 7/6/2020 | | 68592506.0 | 171971844.0 | 235676107.0 |
| Acreft/wk | 7.3 | 2.4 | 2.3 | 2.5 |
| 7/13/2020 | | 69200557.0 | 172612970.0 | 236327397.0 |
| Acreft/wk | 5.8 | 1.9 | 2.0 | 2.0 |
| 7/20/2020 | | 70052443.0 | 173482359.0 | 237221341.0 |
| Acreft/wk | 8.0 | 2.6 | 2.7 | 2.7 |
| 7/27/2020 | | 70863244.0 | 174284230.0 | 238010484.0 |
| Acreft/wk | 7.4 | 2.5 | 2.5 | 2.4 |
| 8/3/2020 | | 71685227.0 | 175074232.0 | 238885461.0 |
| Acreft/wk | 7.6 | 2.5 | 2.4 | 2.7 |
| 8/10/2020 | | 72470789.0 | 175814384.0 | 239777816.0 |
| Acreft/wk | 7.4 | 2.4 | 2.3 | 2.7 |
| 8/17/2020 | | 73425648.0 | 176565330.0 | 240780530.0 |
| Acreft/wk | 8.3 | 2.9 | 2.3 | 3.1 |
| 8/24/2020 | | 74119042.0 | 177292203.0 | 241428202.0 |
| Acreft/wk | 6.3 | 2.1 | 2.2 | 2.0 |
| 8/31/2020 | | 120132* | 178280222.0 | 242435439.0 |
| Acreft/wk | 6.1 | 0.4 | 3.0 | 3.1 |
| 9/7/2020 | | 880097.0 | 179135769.0 | 243172035.0 |
| Acreft/wk | 7.2 | 2.3 | 2.6 | 2.3 |
| 9/14/2020 | | 1874395.0 | 180040436.0 | 244105523.0 |
| Acreft/wk | 8.7 | 3.1 | 2.8 | 2.9 |
| 9/21/2020 | | 2641106.0 | 180830103.0 | 244906398.0 |
| Acreft/wk | 7.2 | 2.4 | 2.4 | 2.5 |
| 9/28/2020 | | 3584157.0 | 181664080.0 | 245780868.0 |
| Acreft/wk | 8.1 | 2.9 | 2.6 | 2.7 |
| 10/5/2020 | | 4573693.0 | 182506525.0 | 246660078.0 |
| Acreft/wk | 8.3 | 3.0 | 2.6 | 2.7 |
| 10/12/2020 | | 5531629.0 | 183457715.0 | 247635611.0 |
| Acreft/wk | 8.9 | 2.9 | 2.9 | 3.0 |
| 10/19/2020 | | 5967767.0 | 184458785.0 | 248607787.0 |
| Acreft/wk | 7.4 | 1.3 | 3.1 | 3.0 |
| 10/26/2020 | | 6177208.0 | 185479813.0 | 249748148.0 |
| Acreft/wk | 7.3 | 0.6 | 3.1 | 3.5 |
| 11/2/2020 | | 6983255.0 | 186237308.0 | 250622526.0 |
| Acreft/wk | 7.5 | 2.5 | 2.3 | 2.7 |
| 11/9/2020 | | 7550574.0 | 186786981.0 | 251234120.0 |
| Acreft/wk | 5.3 | 1.7 | 1.7 | 1.9 |
| 11/16/2020 | | 8380430.0 | 187584670.0 | 252117707.0 |
| Acreft/wk | 7.7 | 2.5 | 2.4 | 2.7 |

| | | | | | |
|---|---|---|---|---|---|
| 11/23/2020 | | 11521383.0 | 187779607.0 | 252291668.0 |
| Acreft/wk | 10.8 | 9.6 | 0.6 | 0.5 |
| 11/30/2020 | | 12237410.0 | 188591677.0 | 253117536.0 |
| Acreft/wk | 7.2 | 2.2 | 2.5 | 2.5 |
| 12/7/2020 | | 12237410.0 | 189777635.0 | 254465822.0 |
| Acreft/wk | 7.8 | 0.0 | 3.6 | 4.1 |
| 12/14/2020 | | 12425897.0 | 190816139.0 | 255640371.0 |
| Acreft/wk | 7.4 | 0.6 | 3.2 | 3.6 |
| 12/21/2020 | | 12425897.0 | 191598281.0 | 256461691.0 |
| Acreft/wk | 4.9 | 0.0 | 2.4 | 2.5 |
| 12/28/2020 | | 12631524.0 | 192400316.0 | 257287114.0 |
| Acreft/wk | 5.6 | 0.6 | 2.5 | 2.5 |
| 1/4/2021 | | 12631524.0 | 193457040.0 | 258597827.0 |
| Acreft/wk | 7.3 | 0.0 | 3.2 | 4.0 |
| 1/11/2021 | | 13448614.0 | 194316554.0 | 259607119.0 |
| Acreft/wk | 8.2 | 2.5 | 2.6 | 3.1 |
| 1/18/2021 | | 14330389.0 | 195307599.0 | 260496409.0 |
| Acreft/wk | 8.5 | 2.7 | 3.0 | 2.7 |
| 1/25/2021 | | 15196000.0 | 196040494.0 | 261225303.0 |
| Acreft/wk | 7.1 | 2.7 | 2.2 | 2.2 |
| 2/1/2021 | | 15810015.0 | 196720647.0 | 261811558.0 |
| Acreft/wk | 5.8 | 1.9 | 2.1 | 1.8 |
| 2/8/2021 | | 16676853.0 | 197509859.0 | 262748935.0 |
| Acreft/wk | 8.0 | 2.7 | 2.4 | 2.9 |
| 2/15/2021 | | 17475586.0 | 198175643.0 | 263481947.0 |
| Acreft/wk | 6.7 | 2.5 | 2.0 | 2.2 |
| 2/22/2021 | | 17677091.0 | 198420437.0 | 263749409.0 |
| Acreft/wk | 2.2 | 0.6 | 0.8 | 0.8 |
| 3/1/2021 | | 18242275.0 | 198960532.0 | 264347318.0 |
| Acreft/wk | 5.2 | 1.7 | 1.7 | 1.8 |
| 3/8/2021 | | 19067299.0 | 199785267.0 | 265172245.0 |
| Acreft/wk | 7.6 | 2.5 | 2.5 | 2.5 |
| 3/15/2021 | | 19948678.0 | 200626577.0 | 266095101.0 |
| Acreft/wk | 8.1 | 2.7 | 2.6 | 2.8 |
| 3/22/2021 | | 20841051.0 | 201520747.0 | 267041523.0 |
| Acreft/wk | 8.4 | 2.7 | 2.7 | 2.9 |
| 3/29/2021 | | 21862722.0 | 202293626.0 | 267918760.0 |
| Acreft/wk | 8.2 | 3.1 | 2.4 | 2.7 |
| 4/5/2021 | | 22704298.0 | 203065753.0 | 268690800.0 |
| Acreft/wk | 7.3 | 2.6 | 2.4 | 2.4 |
| 4/12/2021 | | 23494334.0 | 203805909.0 | 269436221.0 |
| Acreft/wk | 7.0 | 2.4 | 2.3 | 2.3 |
| 4/19/2021 | | 24310704.0 | 204662226.0 | 270197725.0 |
| Acreft/wk | 7.5 | 2.5 | 2.6 | 2.3 |
| 4/26/2021 | | 25014985.0 | 205325521.0 | 270946793.0 |
| Acreft/wk | 6.5 | 2.2 | 2.0 | 2.3 |
| 5/3/2021 | | 25865208.0 | 206200550.0 | 271867244.0 |

| | | | | |
|---|---|---|---|---|
| Acreft/wk | 8.1 | 2.6 | 2.7 | 2.8 |
| 5/10/2021 | | 26845038.0 | 207053433.0 | 272728251.0 |
| Acreft/wk | 8.3 | 3.0 | 2.6 | 2.6 |
| 5/17/2021 | | 27423336.0 | 208169409.0 | 273898358.0 |
| Acreft/wk | 8.8 | 1.8 | 3.4 | 3.6 |
| 5/24/2021 | | 27426283.0 | 209357903.0 | 275336757.0 |
| Acreft/wk | 8.1 | 0.0 | 3.6 | 4.4 |
| 5/31/2021 | | 28052496.0 | 210139071.0 | 276140300.0 |
| Acreft/wk | 6.8 | 1.9 | 2.4 | 2.5 |
| 6/7/2021 | | 28113753.0 | 211151709.0 | 277135245.0 |
| Acreft/wk | 6.3 | 0.2 | 3.1 | 3.1 |
| 6/14/2021 | | 28806572.0 | 212195535.0 | 278272654.0 |
| Acreft/wk | 8.8 | 2.1 | 3.2 | 3.5 |
| 6/21/2021 | | 29712196.0 | 213122721.0 | 279300444.0 |
| Acreft/wk | 8.8 | 2.8 | 2.8 | 3.2 |
| 6/28/2021 | | 30416809.0 | 214050510.0 | 280188141.0 |
| Acreft/wk | 7.7 | 2.2 | 2.8 | 2.7 |
| 7/5/2021 | | 30426917.0 | 215072964.0 | 281320033.0 |
| Acreft/wk | 6.6 | 0.0 | 3.1 | 3.5 |
| 7/12/2021 | | 30824694.0 | 216056958.0 | 282331586.0 |
| Acreft/wk | 7.3 | 1.2 | 3.0 | 3.1 |

*Power outage caused chart recorder to reset