Sierra Valley Groundwater Basin GSP Annual Report April 2022

Sierra Valley Groundwater Management District

PLUMAS COUNTY 1854 CALIFORNIA

Certification

The Sierra Valley Groundwater Basin Groundwater Sustainability Plan Annual Report for water year 2021 was prepared in accordance with generally accepted professional hydrogeologic principles and practices and makes no other warranties, either expressed or implied as to the professional advice or data included in it. The Annual Report has not been prepared for use by parties or projects other than those named or described herein and may not contain sufficient information for other parties or purposes.

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Date signed: April 1, 2022

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Acronyms and Abbreviations

Acronym	Definition
AF	acre-feet
AFY	acre-feet per year
amsl	above mean sea level
Basin	Sierra Valley groundwater basin
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
DBS&A	Daniel B. Stephens & Associates, Inc.
DWR	[CA] Department of Water Resources
ft	feet
GSA	Groundwater Sustainability Agency
GDE	Groundwater Dependent Ecosystem
GSP	Groundwater Sustainability Plan
LWA	Larry Walker Associates
MFFR	Middle Fork Feather River
mi	mile
MO	Measureable Objective
MT	Minimum Threshold
PLSS	Public Land Survey System
PMA	Project and Management Action
RMP	Representative Monitoring Point
SGMA	Sustainable Groundwater Management Act
SMC	Sustainable Management Criteria
SVGMD	Sierra Valley Groundwater Management District
SVHSM	Sierra Valley Hydrogeologic System Model
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
WLE	water level elevation
WCR	Well Completion Report
WY	water year

Executive Summary

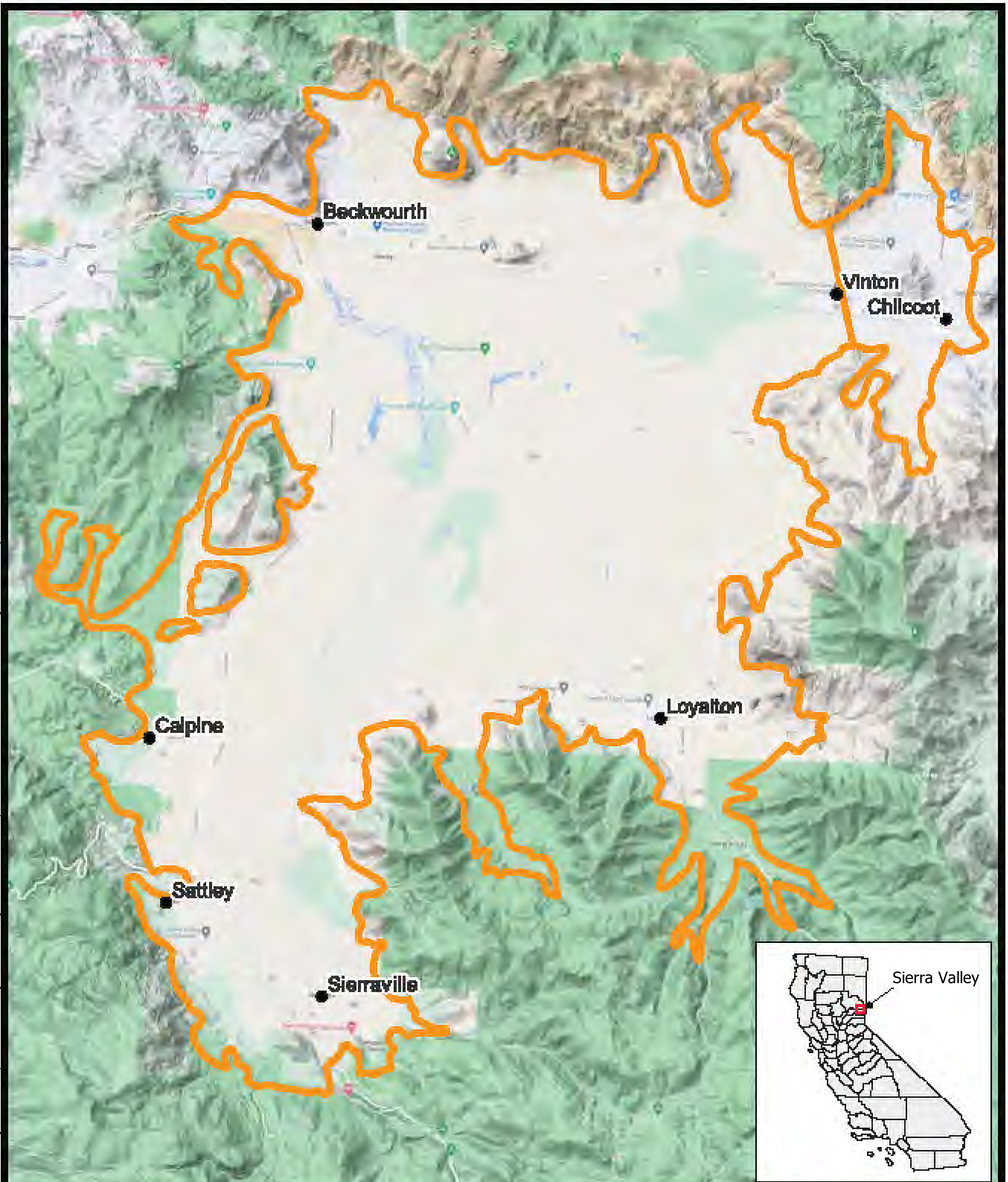
Water year (WY) 2021 was a critically dry year for California. Precipitation for WY 2021 was approximately 53% of the historical average in the Sierra Valley groundwater basin (the Basin), resulting in heavy reliance on groundwater supplies to meet demand. Change in observed water levels in the upper and lower aquifers in the Basin from October 2020 to October 2021 was -5.89 ft and -5.97 ft, respectively. Change in groundwater in storage was estimated to be -7,600 acre-ft (AF) using the Sierra Valley Hydrogeologic System Model (SVHSM). Groundwater extractions and surface water diversions were 15,702 AF and 14,786 AF, respectively, totaling 30,488 AF of water used beneficially in the basin during WY 2021. Surface water use and the reported total volume of water use in the Basin for WY 2021 is underestimated due to lack of flow and diversion data for most streams that enter Sierra Valley. Improvement of surface water diversion observations from local streams would help fill this data gap.

To date, progress has been made on multiple Project and Management Actions (PMAs) that move the basin towards implementation of the Groundwater Sustainability Plan (GSP). These activities include expansion of the area where no new high-capacity wells can be installed in the Basin, evaluation and improvement of agricultural pump metering, and investigation of potential irrigation efficiency improvements. In addition, a grant application was submitted to California Department of Fish and Wildlife (CDFW) that will support filling of data gaps, refinement of basin characterization, and management scenario analysis using SVHSM.

1. Introduction

The Sierra Valley groundwater basin (the Basin) is comprised of the Sierra Valley subbasin (5-012.01) and Chilcoot subbasin (5-012.02). Both subbasins are managed as a single basin cooperatively by the Sierra Valley Groundwater Management District (SVGMD) and Plumas County, which act as the Groundwater Sustainability Agencies (GSAs) for the Basin. Following the submittal of the Sierra Valley Groundwater Sustainability Plan (GSP) on January 28, 2022, the GSAs are required to submit an annual report for the preceding water year (October 1 through September 30) to DWR by April 1 (23 CCR §356.2).

The annual report provides a summary of hydrologic conditions and water use in the Basin (Figure 1) using observed data from monitoring networks and/or estimated using best available methods. This WY 2021 annual report provides a brief summary of Basin water use and changes in groundwater storage during the period from October 1, 2020 to September 30, 2021 and context for conditions relative to sustainable management criteria.



Explanation

● City or Town
Groundwater Basin Boundary

0 1 2 mi

N

Sierra Valley Groundwater Management District

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Sierra Valley Annual Report WY 2021
Groundwater Basin Boundary

Figure 1

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This document has been prepared in accordance with the requirements for annual reports as identified in the Sustainable Groundwater Management Act (SGMA). More detailed analysis and discussion of long-term hydrologic trends will be included in the periodic evaluation of the GSP the GSAs are required to perform at least every five years (23 CCR §356.2).

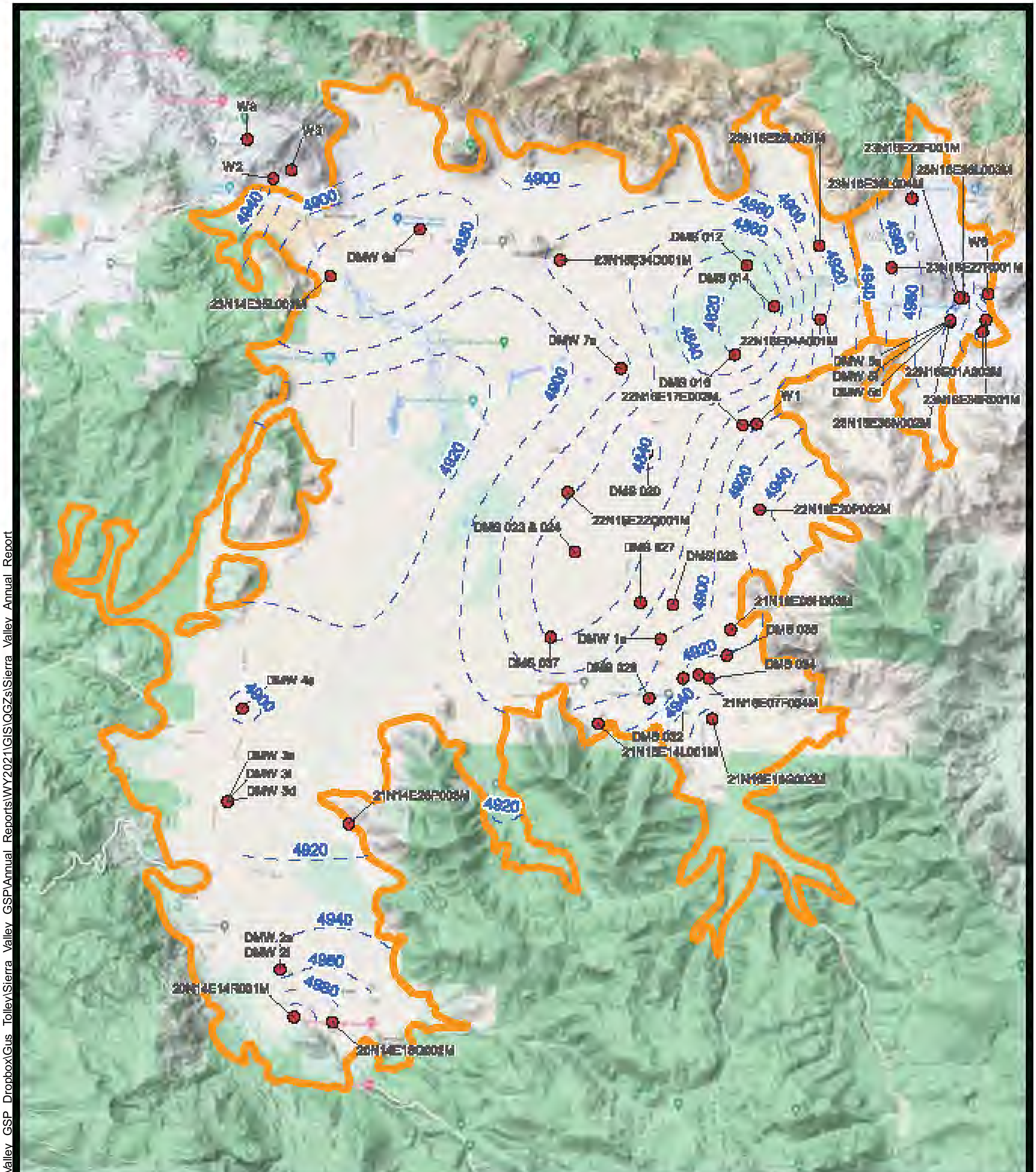
For additional clarification or more detailed information on the basin plan area or conditions, please refer to the Sierra Valley GSP (https://sgma.water.ca.gov/portal/gsp/preview/125). It is important to note that there are still some data gaps and missing information as the GSAs continues to gather information for better analysis and decisions.

2. Groundwater Elevations

Groundwater elevation contour maps for the upper and lower aquifers in the spring of 2021 are shown in Figure 2 and Figure 3, respectively, and for the upper and lower aquifers in the fall of 2021 in Figure 4 and Figure 5, respectively. These maps depict the seasonal high (spring) and low (fall) water level elevations for the two principal aquifers (upper and lower) in the Basin. Spring and fall water level elevations are defined as observations within a six-week timeframe centered on April 1st or October 1st. If a well has multiple observations within this period, then the value collected nearest to April 1st or October 1st is used.

Observed spring groundwater elevations in the upper aquifer (Figure 2) ranged from 4,818.88 to 5,175.41 ft above mean sea level (amsl), with an average elevation of 4,931.36 ft amsl. Spring groundwater elevations for the lower aquifer (Figure 3) ranged from 4,798.09 to 5,088.93 ft amsl, with an average elevation of 4,902.02 ft amsl. Groundwater elevations in the fall for the upper aquifer (Figure 4) ranged from 4,746.38 to 5,169.91 ft amsl, with an average elevation of 4,916.48 ft amsl. Fall observations from the lower aquifer (Figure 5) showed groundwater elevations ranged from 4,731.36 to 5,085.93 ft amsl, with an average elevation of 4,876.88 ft amsl.

Flow patterns in the Basin are complex and heavily influenced by the spatial distribution of recharge, spatial distribution of aquifer hydraulic properties, location and orientation of faults that act as groundwater flow barriers, and groundwater pumping. On the west side of the Basin flow is generally from south to north, towards the surface water outlet of the Basin located to the northwest, which is the headwaters of the of the Middle Fork Feather River (MFFR). Flow on the east side of the Basin is generally from the margins of the Basin towards the pumping center located in the vicinity of wells W5 and DMW 7 (see Figure 3 for location or search via the online database management system (DMS) at https://sierra-valley.gladata.com/).



Explanation

Monitoring Well

Groundwater Basin Boundary

Water Level Contour (ft amsl)

0 1 2 mi

N

Sierra Valley Annual Report WY 2021

Groundwater Elevations
Upper Aquifer Spring 2021

Sierra Valley Groundwater Management District

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Figure 2

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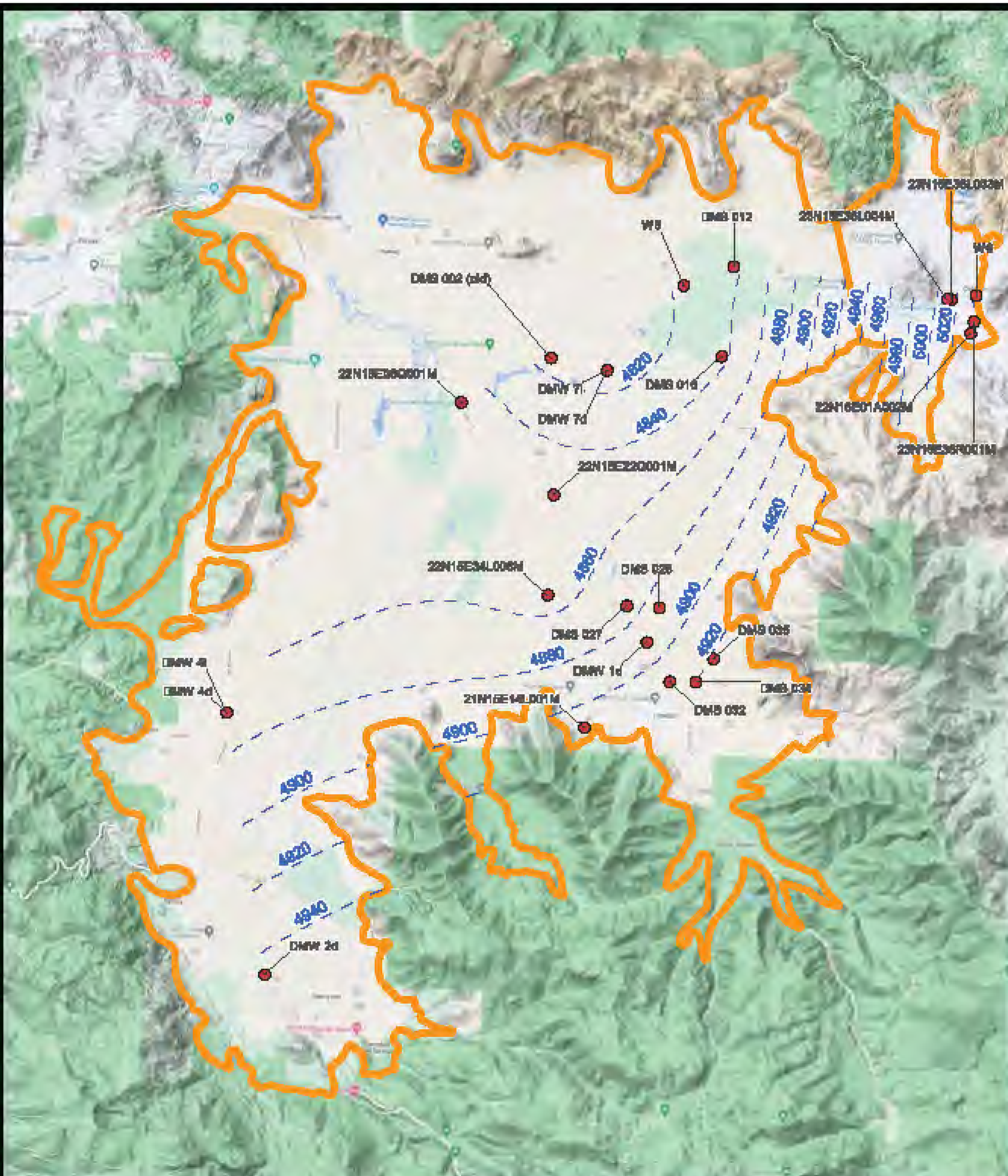

Explanation

- Monitoring Well
- Water Level Contour (ft amsl)
- Groundwater Basin Boundary

0 1 2 mi

N

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Groundwater Elevations
Lower Aquifer Spring 2021

Figure 3

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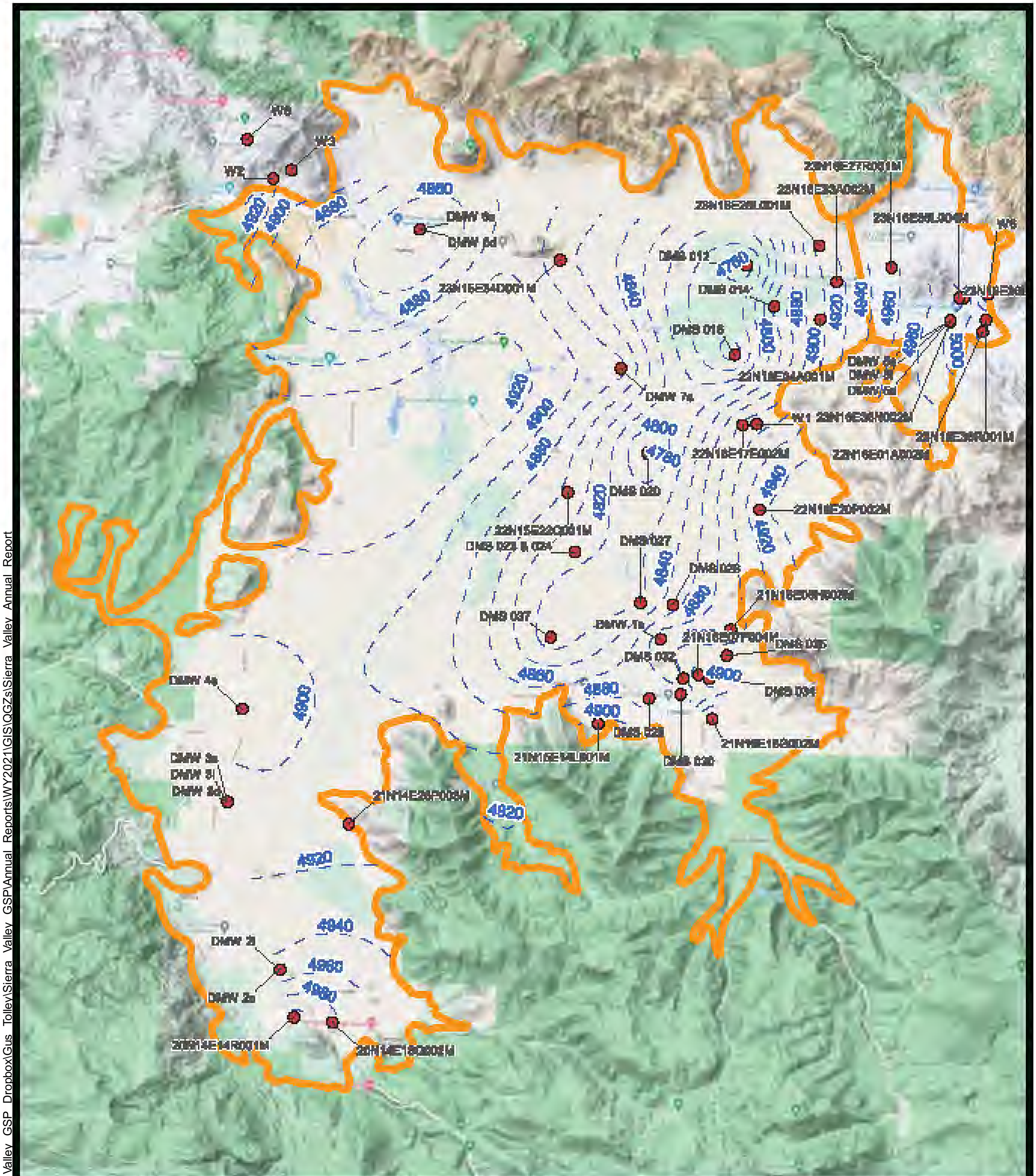

Explanation

- Monitoring Well
- Water Level Contour (ft amsl)
- Groundwater Basin Boundary

0 1 2 mi

N

Sierra Valley Annual Report WY 2021

Groundwater Elevations
Upper Aquifer Fall 2021

Figure 4

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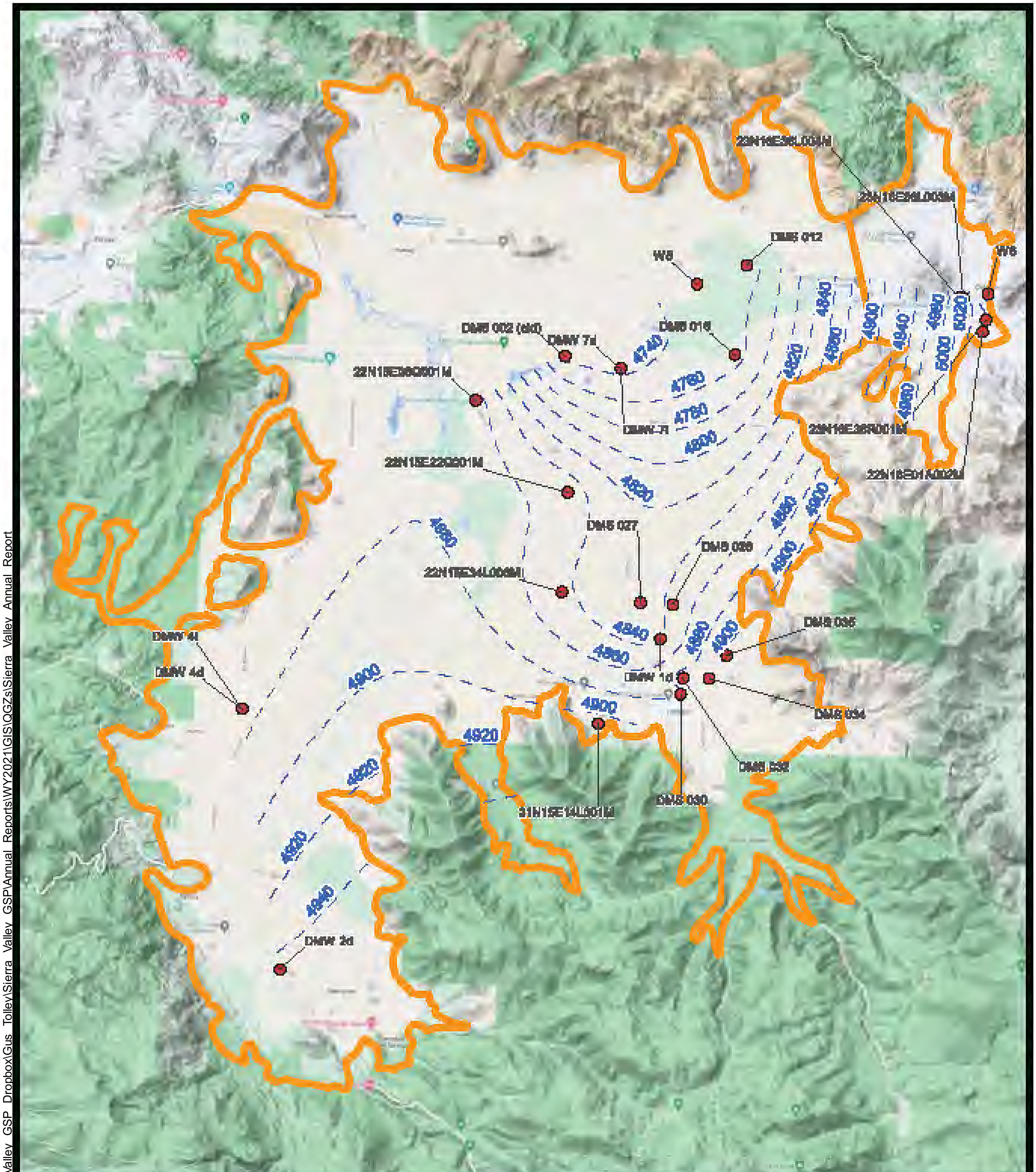

Explanation

Monitoring Well

Water Level Contour (ft amsl)

Groundwater Basin Boundary

0 1 2 mi

N

Sierra Valley Annual Report WY 2021

Groundwater Elevations
Lower Aquifer Fall 2021

Figure 5

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Observed groundwater elevation changes from October 2020 to October 2021 in the upper aquifer ranged from -19.30 to +3.20 ft with an average change of -5.89 ft. For the lower aquifer groundwater elevation changes ranged from -21.88 to +8.30 ft with an average of -5.97 ft.

A new reporting metric was developed to better compare groundwater elevations observed at representative monitoring points (RMP) in the context of their unique SMC. This metric, which is referred to as the "SMC Status," describes groundwater elevations relative to the "operational range" of the well and allows for normalized reporting of groundwater elevations at RMPs. The operational range is defined as the elevation range between the measurable objective (MO) and minimum threshold (MT) for each RMP. SMC Status was classified into the following categories:

- Near or Above MO: Water levels equal to or greater than 75% of the operational range
- Within Central Operational Range: Water levels within 25% to 75% of operational range
- Near MT: Water levels less than 25% of operational range but above MT
- At or Below MT: Water levels at or below MT

Figure 6 shows an example of this metric applied to the hydrograph of well 22N15E34L006M. Figure 7 and Figure 8 show the spatial distribution of SMC Status for spring water level observations in the upper and lower aquifer, respectively. Fall SMC Status for the upper and lower aquifer is shown in Figure 9 and Figure 10, respectively. Hydrographs for all RMPs can be found in Appendix A.

Groundwater conditions in the spring were generally near or above the MO for each RMP in both the upper and lower aquifers. Decreases in groundwater levels due to the critically dry water year resulted in fall conditions for the upper aquifer where 14% of RMPs were near or above the MO, 52% were within the central operational range, 21% were near the MT, and 14% of RMPs were at or below the MT.

Fall conditions for the lower aquifer showed 29% of RMPs were near or above the MO, 36% were within the central operational range, 21% near the MT, and 14% of RMPs were at or below the MT.

There did not appear to be a definitive spatial pattern in SMC Status in the spring or fall nor for the upper or lower aquifer.

3. Groundwater Extractions

The Sierra Valley Groundwater Management District (SVGMD) meters all active large-capacity non-municipal wells (defined as wells that produce 100+ gallons per minute or wells with a casing diameter of 6 inches or greater) in the Basin.

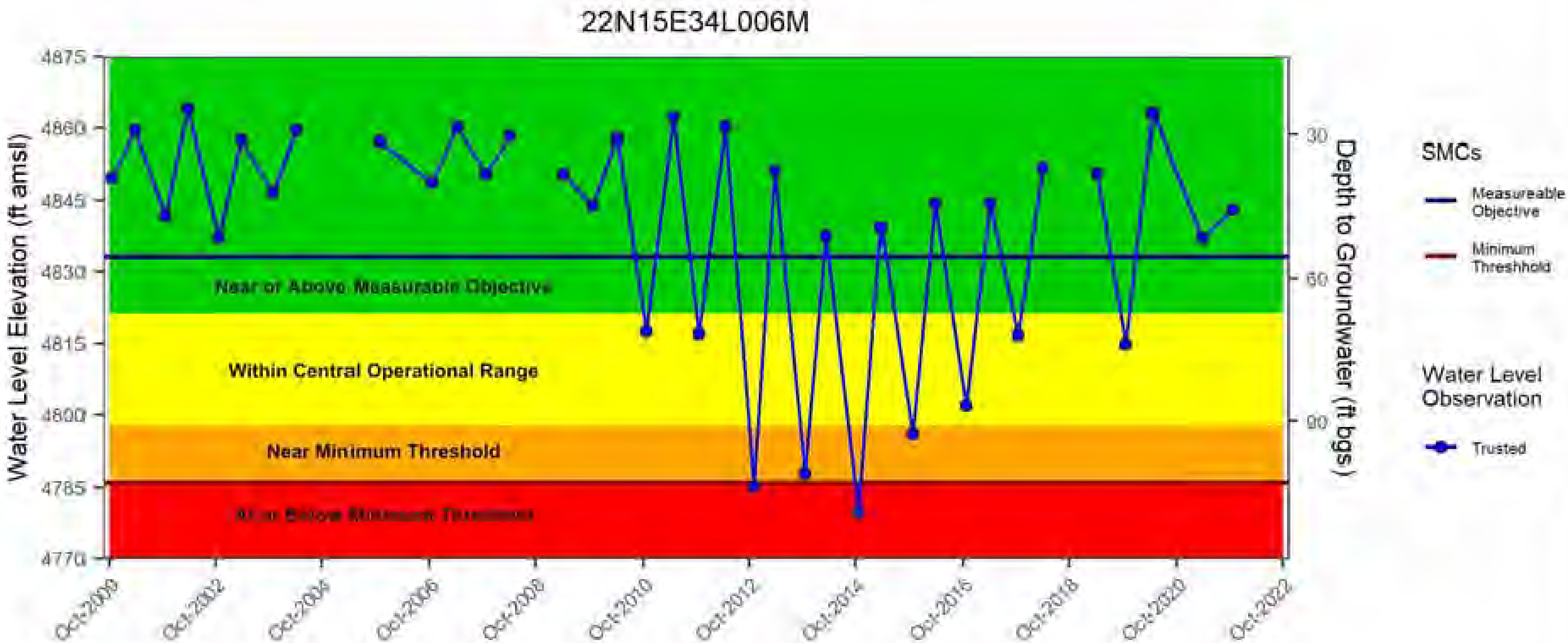

Figure 6

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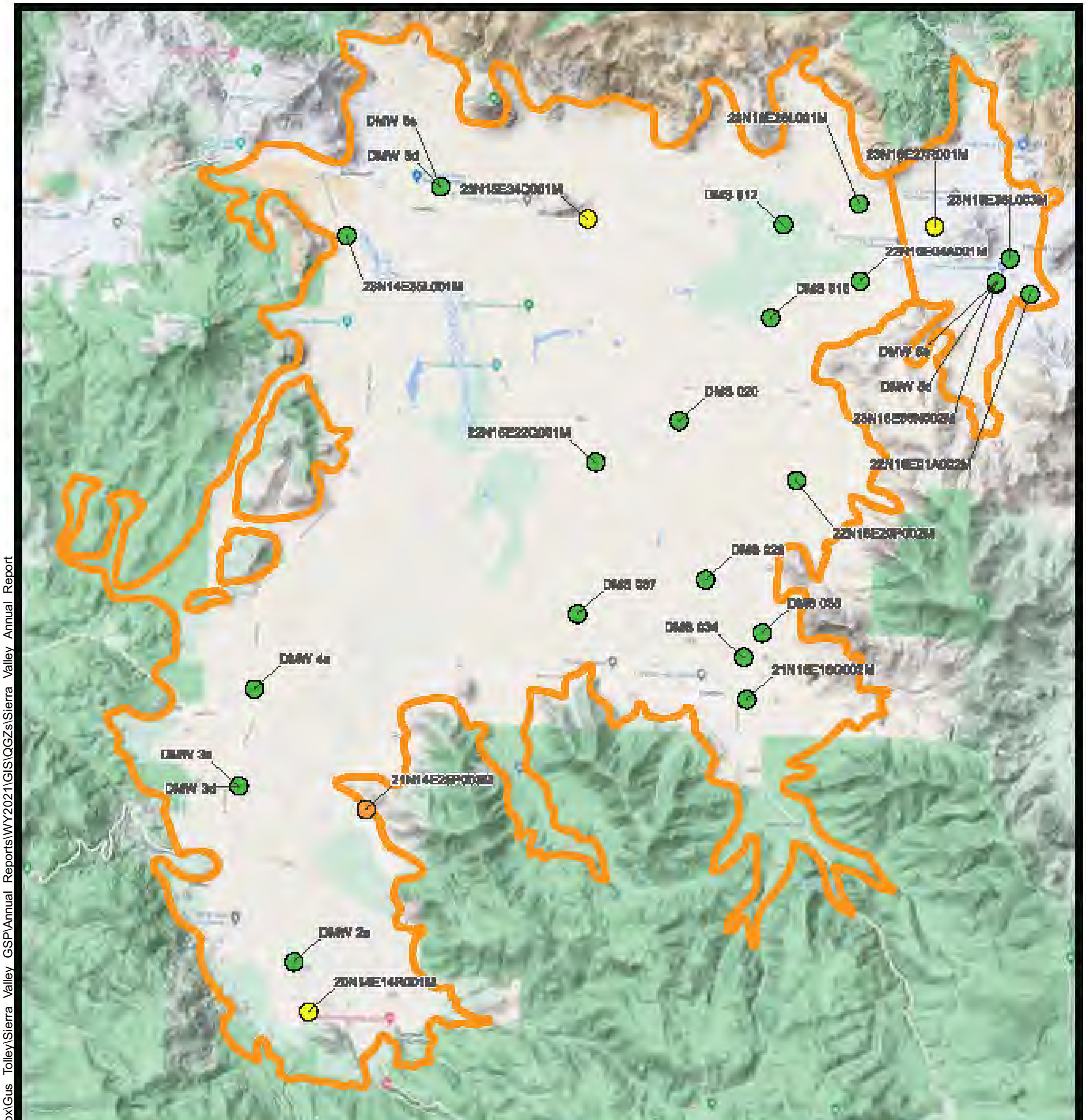
Example SMC Status Categories



Explanation

SMC Status

- Near or Above Measureable Objective
- Within Central Operational Range
- Near Minimum Threshold
- At or Below Minimum Threshold

Groundwater Basin Boundary

0 1 2 mi

N

Sierra Valley Groundwater Management District

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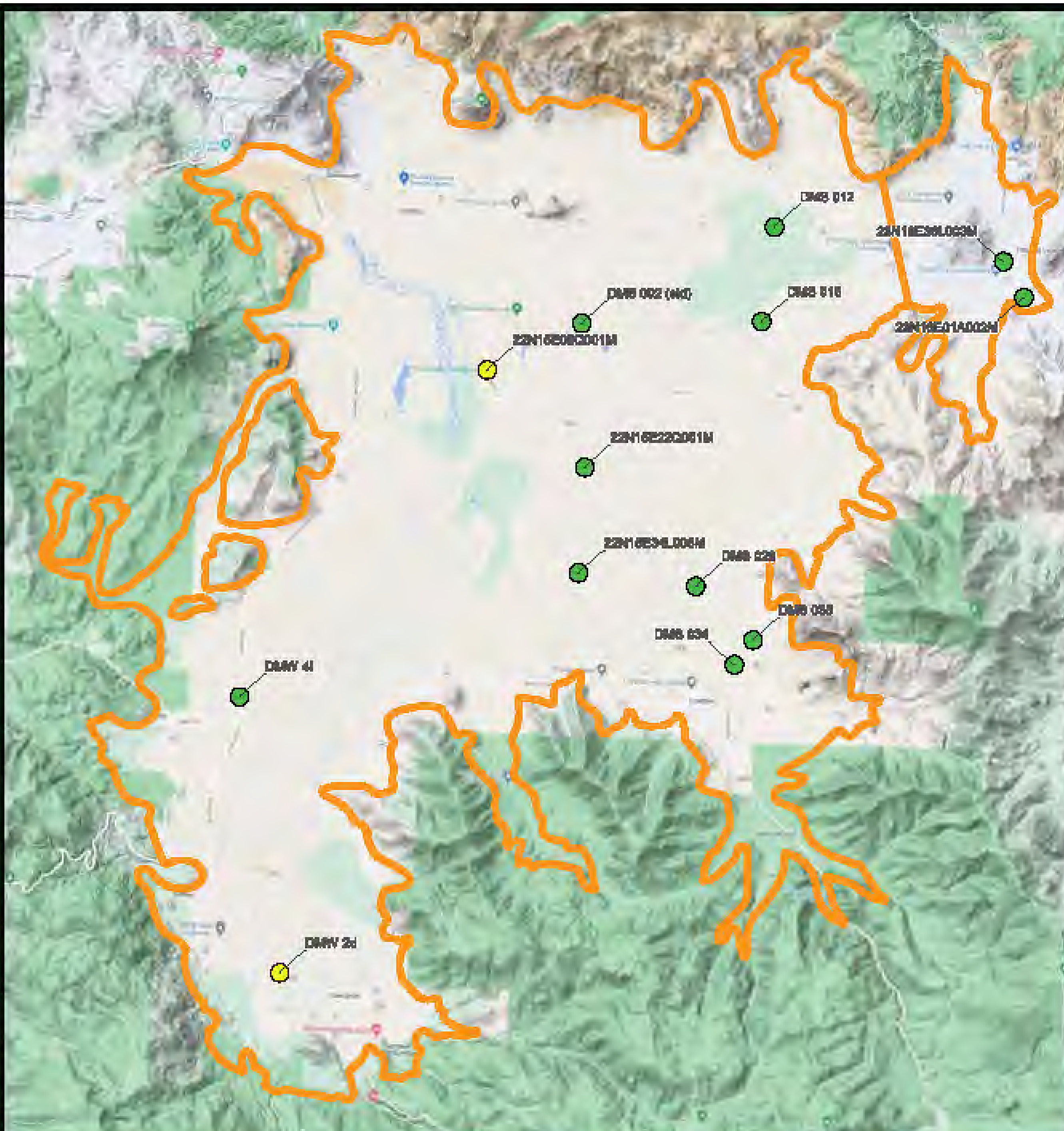
Sustainable Management Criteria Status
Upper Aquifer Spring 2021

Figure 7



Explanation

SMC Status

- Near or Above Measureable Objective
- Within Central Operational Range
- Near Minimum Threshold
- At or Below Minimum Threshold

Groundwater Basin Boundary

0 1 2 mi

N

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Sustainable Management Criteria Status
Lower Aquifer Spring 2021

Figure 8

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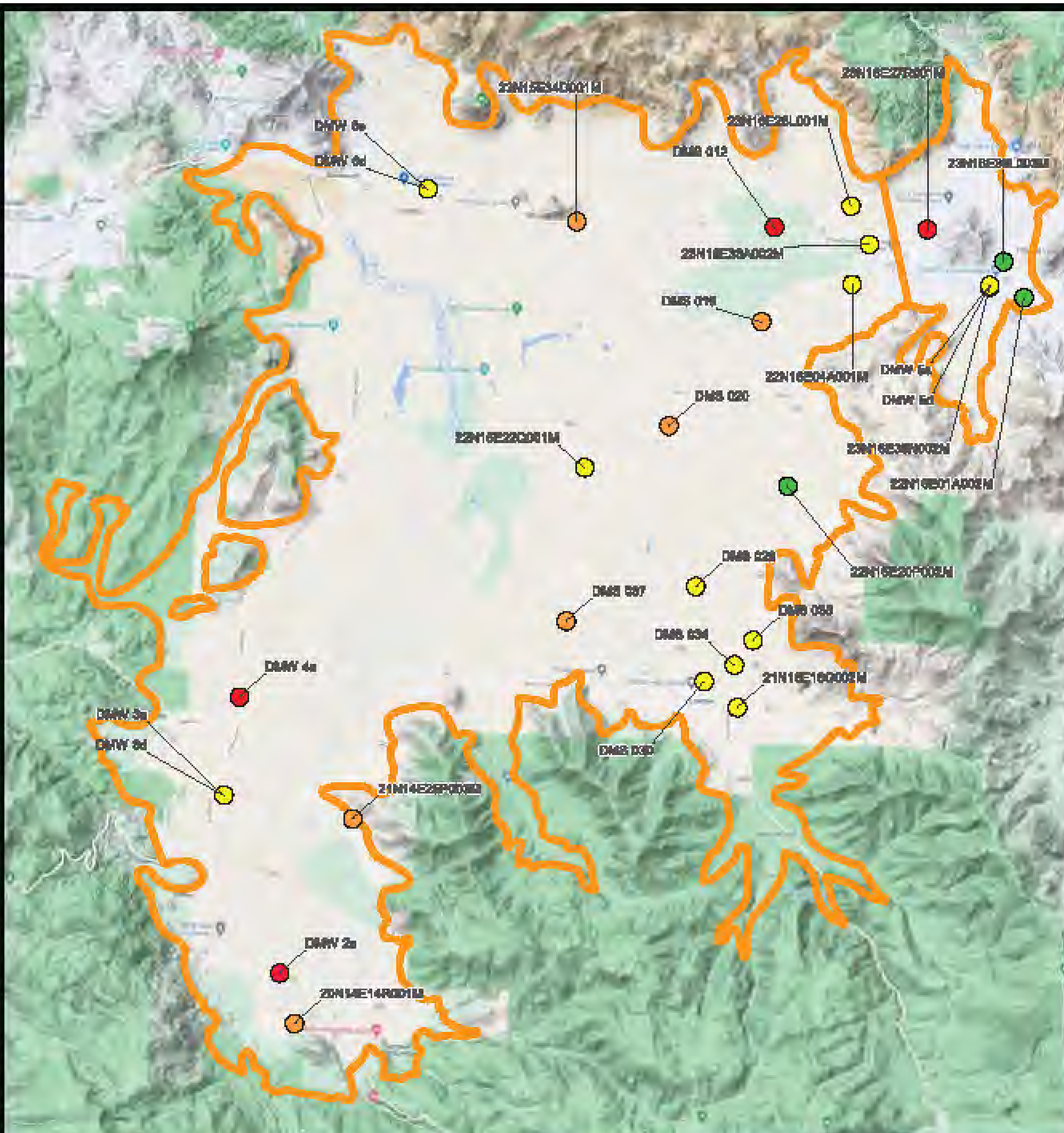

Explanation

SMC Status

- Near or Above Measureable Objective
- Within Central Operational Range
- Near Minimum Threshold
- At or Below Minimum Threshold

Groundwater Basin Boundary

0 1 2 mi

N

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Sustainable Management Criteria Status
Upper Aquifer Fall 2021

Sierra Valley Groundwater Management District

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Figure 9

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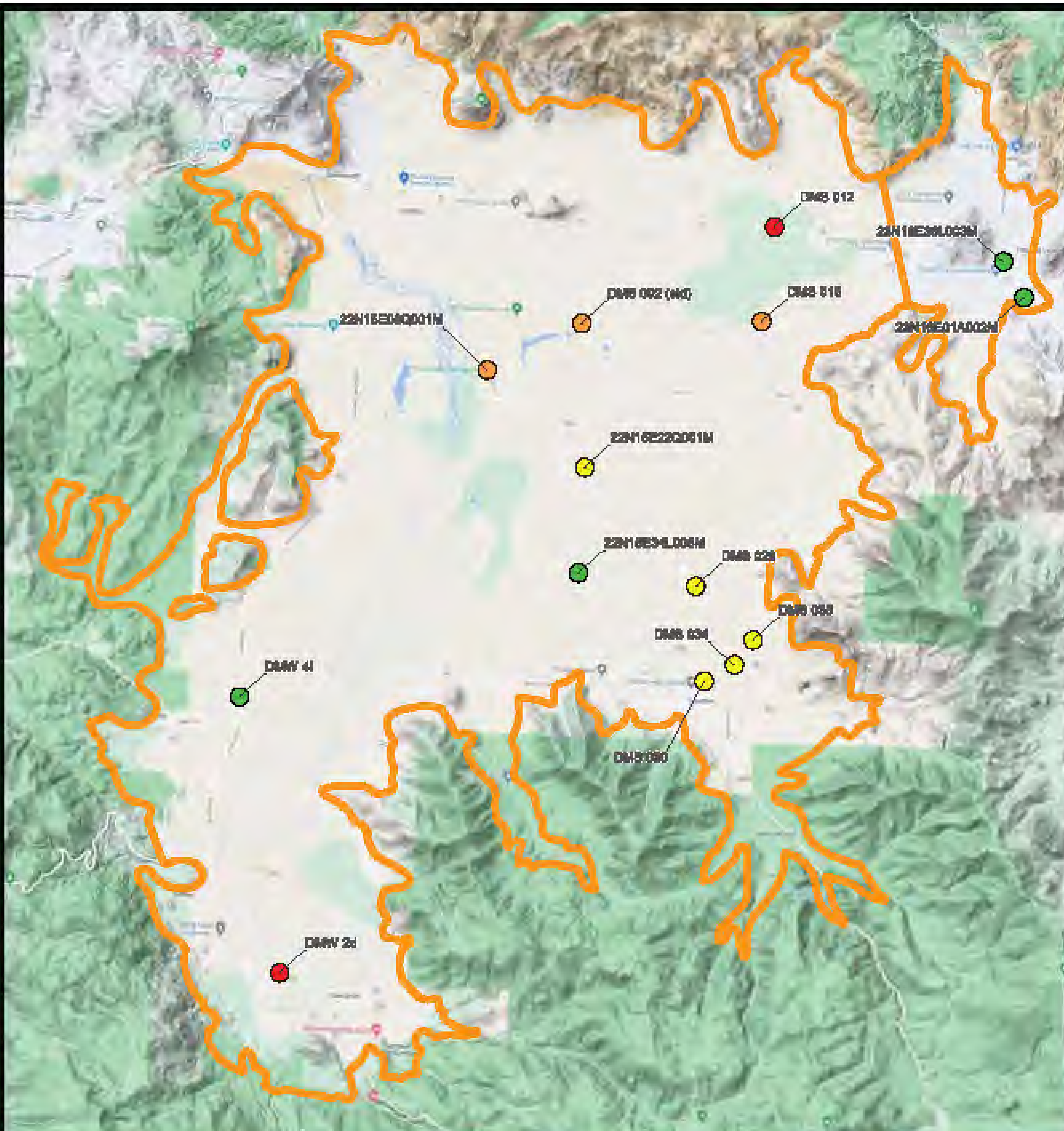

Explanation

SMC Status

- Near or Above Measureable Objective
- Within Central Operational Range
- Near Minimum Threshold
- At or Below Minimum Threshold

Groundwater Basin Boundary

0 1 2 mi

N

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Sustainable Management Criteria Status
Lower Aquifer Fall 2021

Figure 10

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Table 1. Groundwater Extractions

Sector	Method	GW Extraction Volume (AF)	Accuracy (%)	Range (AF)
Agriculture	Totalizer	14,853	± 5	14,110 - 15,596
Municipal and Industrial	Totalizer	849	± 5	807 - 892
Total Reported Volume		**15,702**		**14,917 - 16,488**

Municipal pumping is measured on a monthly basis by the respective entity and reported to SVGMD. Municipal pumping from Sierra County Water Works District #1 (Calpine) is included in the groundwater extraction volumes presented in this Annual Report despite the wells being located just outside of the Basin boundary and predominantly screened in bedrock. Inclusion or exclusion of annual groundwater extractions from the Calpine wells would not materially change any conclusions due to the relatively small annual extraction volume of approximately 50 acre-ft/yr (AFY).

The number of domestic wells has been estimated using two methods:

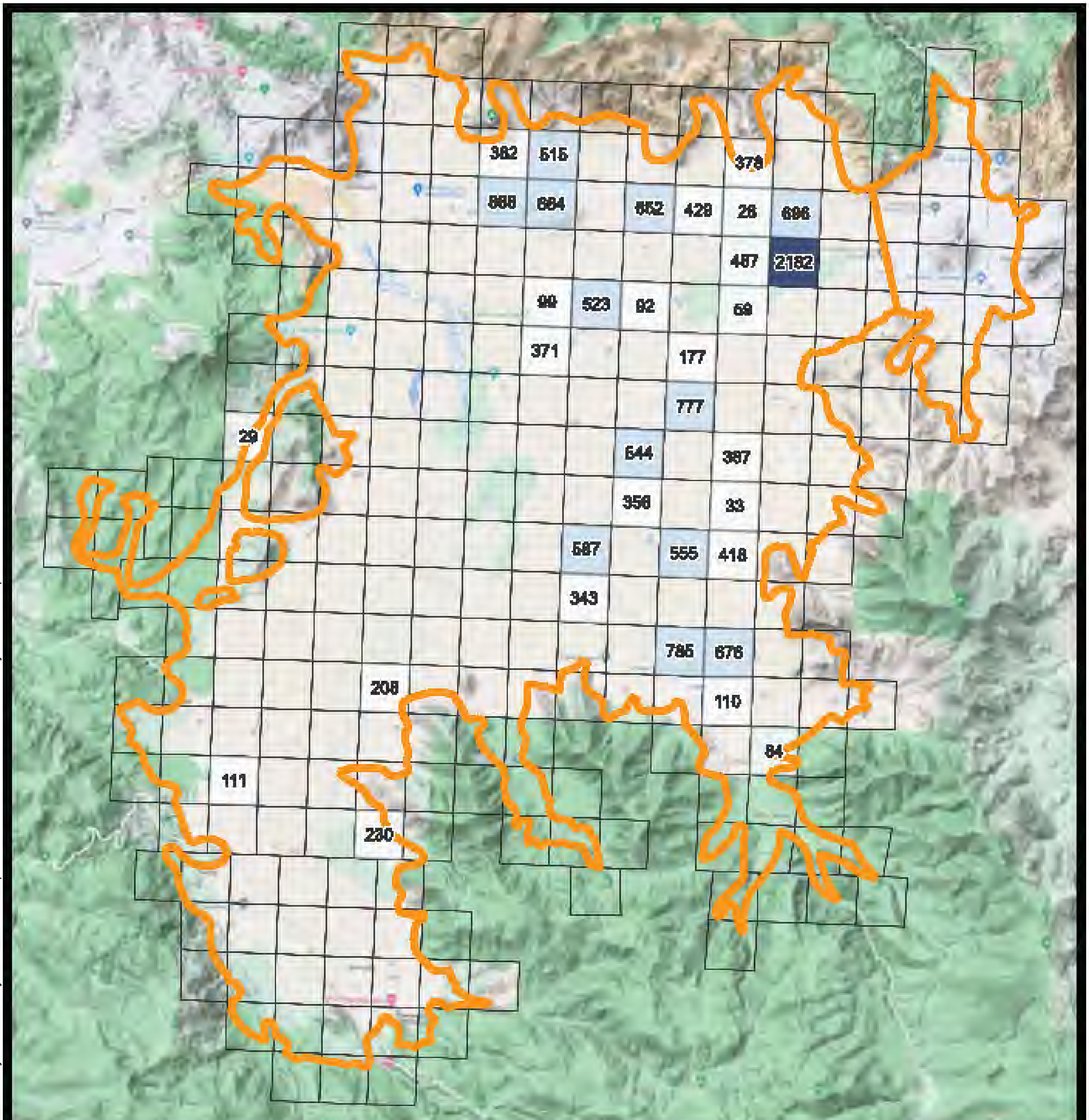
- Well Completion Reports (WCRs) – available from DWR
- County Parcel Coverage with Use Code Indicator and Description

For the first method, some assumptions were made because the well completion reports do not differentiate between inactive and active wells. The number of wells has been assessed based on assumed useful well life of 31 and 40 years.

For the second method, county parcel coverage was provided by Sierra and Plumas counties and it identifies 'residential' parcels. Assumptions included counting for one domestic well per residential parcel. Parcels within a public water supply system boundary have been excluded.

Comparing the two methods, a preliminary estimate of domestic wells provided about 500 domestic wells active in the basin. The majority of domestic wells are located along the margins of the valley and based on available well log information, typically screened in fractured bedrock. Therefore, estimated domestic groundwater extraction volume was not included in the groundwater or total water use calculations. Using the assumption of 2 AFY of water use (maximum amount to be classified as a de minimis user), the estimated domestic water use is about 1000 af/yr in the valley. This number and the underlying assumptions will need to be further refined during GSP implementation.

Estimated groundwater extractions for WY 2021 grouped by water use sector and measurement method are shown in Table 1. Groundwater pumping within each public land survey system (PLSS) section (1 mi^2) shows the spatial distribution of agricultural (Figure 11), municipal and industrial (Figure 12), and total (Figure 13) groundwater extractions within the Basin. In total, groundwater



Explanation

Groundwater Extractions (AF)

- < 500
- 500 - 1,000
- 1,000 - 1,500
- 1,500 - 2,000
- 2,000 - 2,500

GroundwaterBasin Boundary

0 1 2 mi

N

Notes:
1. Annual groundwater pumping aggregated by 1 mi^2 PLSS sections
2. Labels indicate volume pumped in AF
3. Total agricultural pumping totaled 14,853 AF

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Agricultural Groundwater Extractions

Figure 11

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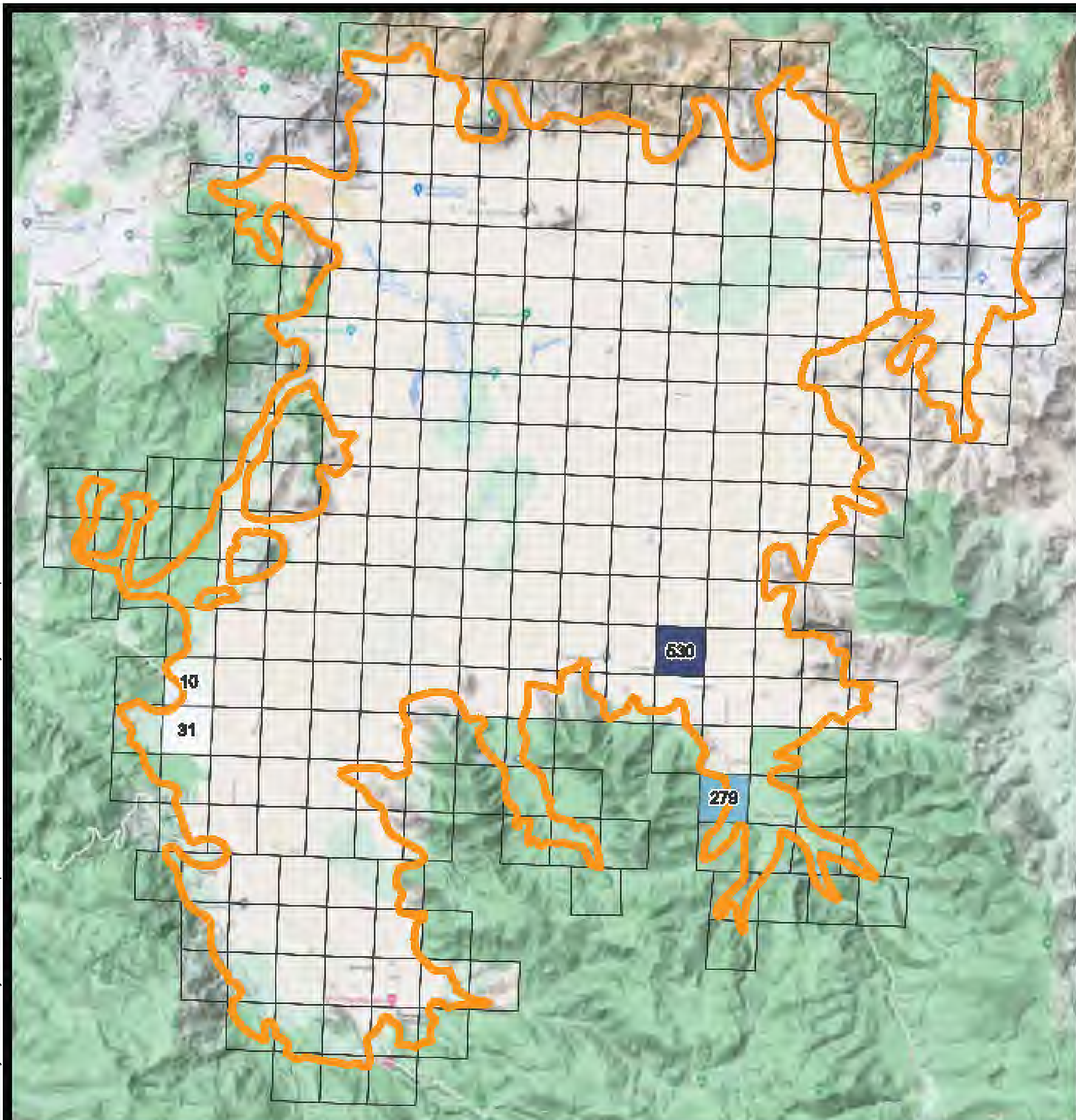

Explanation

Pumping (Muni)

- 0 - 200
- 200 - 400
- 400 - 530

GroundwaterBasin Boundary

0 1 2 mi

N

Notes:
1. Annual groundwater pumping aggregated by 1 mi^2 PLSS sections
2. Labels indicate volume pumped in AF
3. Total municipal and industrtial pumping totaled 849 AF

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Municipal and Industrial Groundwater Extractions

Figure 12

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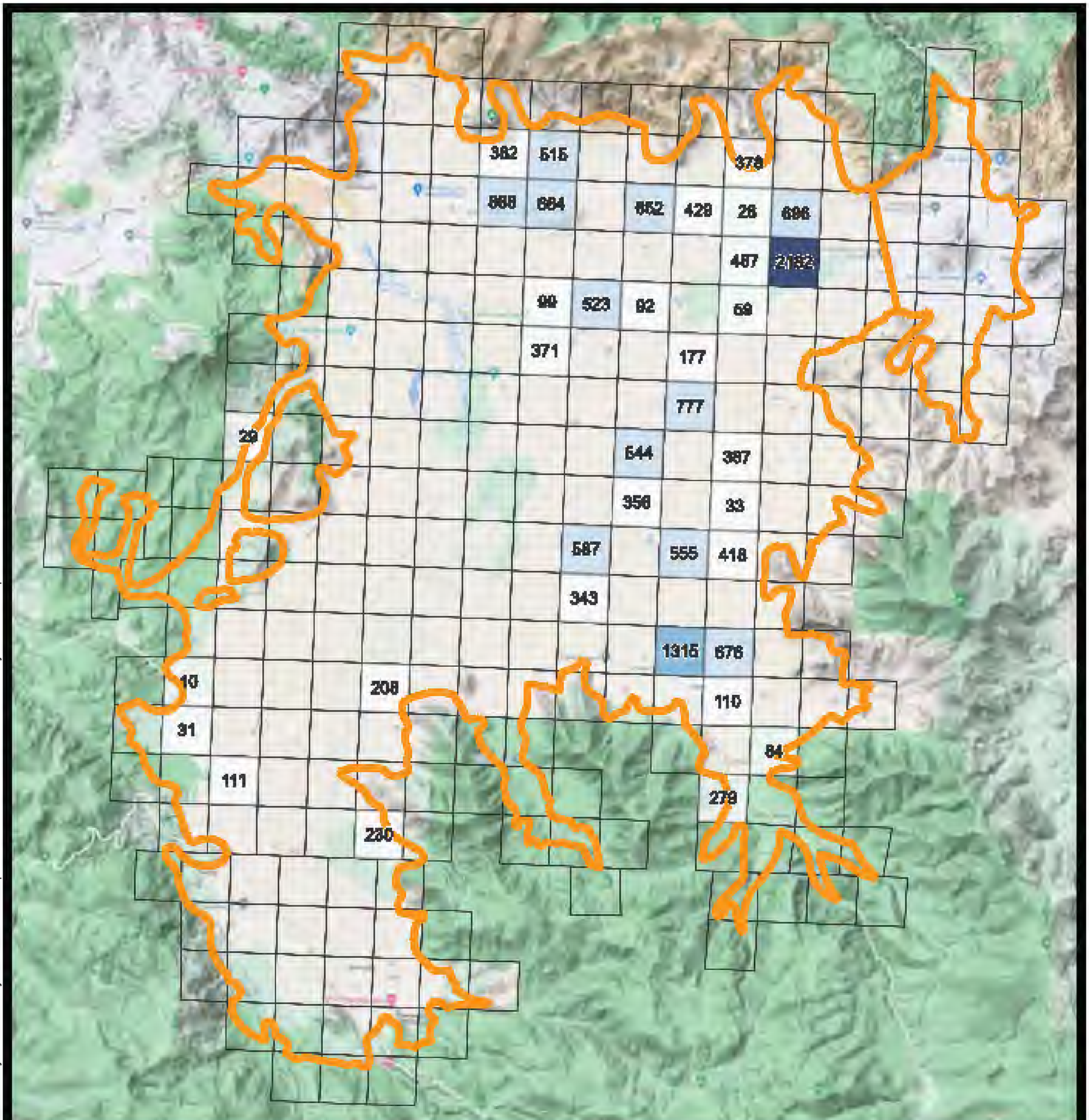

Explanation

Pumping (Total)

- 0 - 500
- 500 - 1000
- 1000 - 1500
- 1500 - 2000
- 2000 - 2500

GroundwaterBasin Boundary

0 1 2 mi

N

Notes:
1. Annual groundwater pumping aggregated by 1 mi^2 PLSS sections
2. Labels indicate volume pumped in AF
3. Total groundwater pumping totaled 15,702 AF

Sierra Valley Groundwater Management District

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Total Groundwater Extractions

Figure 13

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Table 2. Surface Water Use[1]

Surface Water Source	Method	Annual Volume Used (AF)	Accuracy (%)	Range (AF)
Local Imported Supplies	Weir	7,396	± 5 %	7,026 - 7,766
Local Supplies	Weir	6,590	± 5 %	6,261 - 6,920
Local Supplies	Estimated from previously reported diversions	800	± 33 %	536 - 800[a]
Total Reported Volume		**14,786**		**13,823 - 15,485**

1. Values presented in this table do not include diversions from ungaged streams that enter the groundwater basin, and therefore the total underestimates surface water use in the Basin.
a. Upper limit established as 800 AFY

pumping equaled 15,702 AF . Agricultural beneficial uses accounted for about 95% of total groundwater extractions for WY 2021.

4. Surface Water Supply

Surface water used in the Basin grouped by source and measurement method is summarized in Table 2. Surface water is sourced from streams that enter Sierra Valley along the margin, releases from Frenchman Reservoir and Lake Davis, and imported water from the Little Truckee River. Observed flow rates for releases from Lake Davis and Frenchman Reservoir, and imports from the Little Truckee River are available from the Sierra Valley Watermaster.

All imported water from the Little Truckee River diversion is used beneficially for agricultural purposes, as well as all contract and water right releases from Frenchman Reservoir (diverted from Little Last Chance Creek). Up to 800 AFY is diverted from Big Grizzly Creek (fed by releases from Lake Davis) to flood irrigate the Ramelli Ranch, owned by the Plumas National Forest. Specific diversion data for Ramelli Ranch are not currently available, but reduction of the diversion volume is not common (Joe Hoffman, personal communication).

Flow data for streams entering Sierra Valley is sporadic and diversion volumes are not well-reported. Therefore, surface water diverted from the local streams is not included in the applied surface water volume calculations and the reported surface water volume used is underestimated. Improvement of diversion observations from local streams would help fill this data gap.

Imports from the Little Truckee River diversion totaled approximately 7,396 AF for WY 2021, while contract and water right releases from Frenchman Reservoir and Lake Davis were about 6,590 AF and

Table 3. Total Water Use[1]

Sector	Method	Total Annual Volume (AF)	Accuracy (%)	Range (AF)
Agriculture	Totalizer	14,853	± 5 %	14,110 - 15,596
	Weir	13,986	± 5 %	13,287 - 14,685
	Estimated from previously reported diversions	800	± 33 %	536 - 800[a]
Agriculture Subtotal	-	29,639	-	27,933 - 31,081
Municipal and Industrial	Totalizer	849	± 5 %	807 - 892
Total Reported Volume		**30,448**		**28,740 - 31,973**

1. Values presented in this table do not include diversions from ungaged streams that enter the groundwater basin, and therefore the total underestimates water use in the Basin.
a. Upper limit established as 800 AFY

800 AF, respectively. Total reported surface water used in the Basin during WY 2021 was estimated to be 14,786 AF.

5. Total Water Use

Total water use in the Basin grouped by water use sector and measurement method is shown in Table 3. Total estimated water volume used in the Basin during WY 2021 was 30,488 AF.

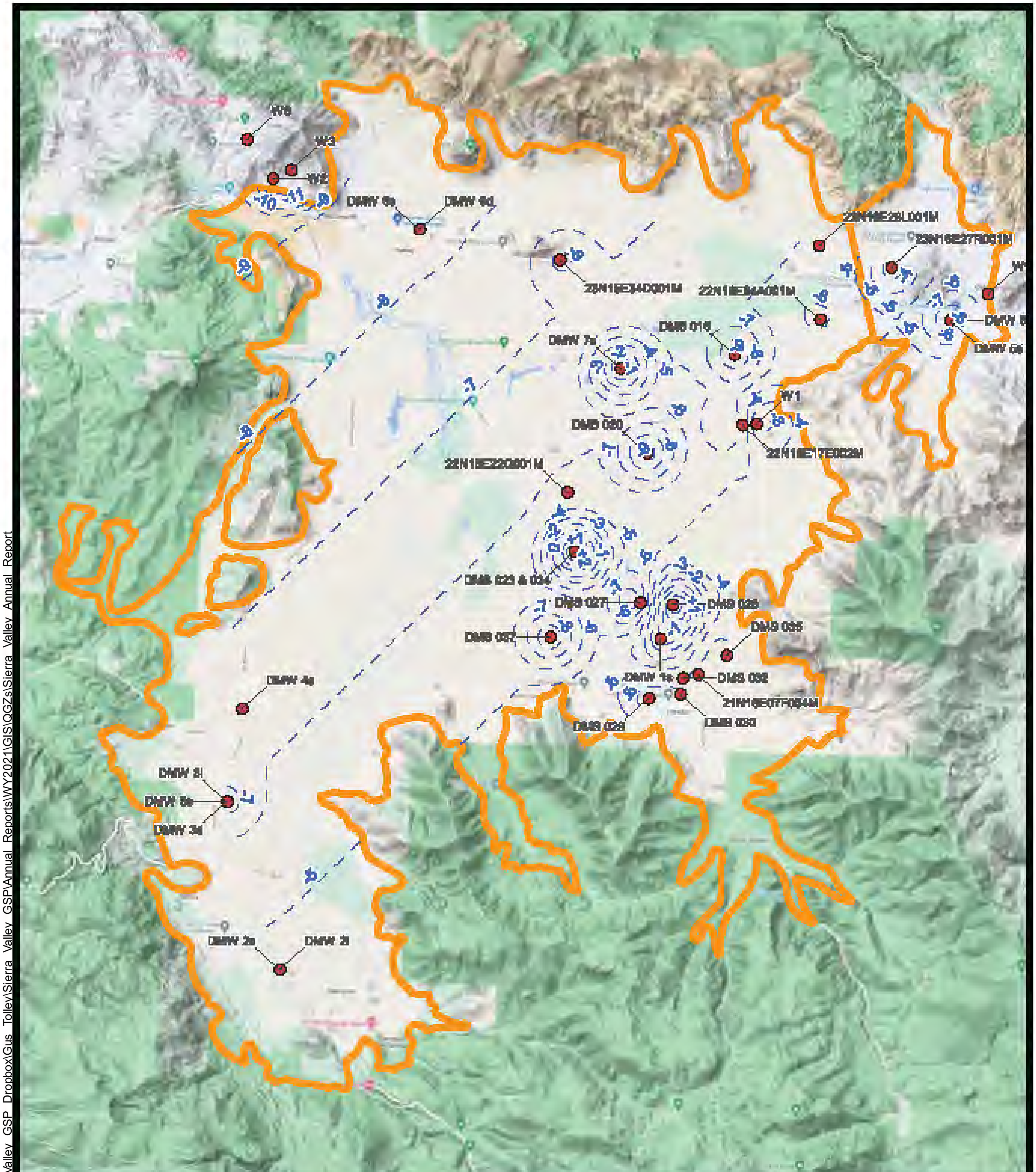
As discussed in Section 4 above, flow data for streams entering Sierra Valley is sporadic and surface water diversion volumes are not well-reported. Therefore, total water use is underestimated.

6. Change in Groundwater Storage

Observed changes in water levels from Fall 2020 to Fall 2021 for the upper and lower aquifers are shown in Figure 14 and Figure 15, respectively. Volumetric change in groundwater storage for the Basin was estimated using the Sierra Valley Hydrogeologic System Model (SVHSM).

Total change in groundwater in storage in the Basin over WY 2021 was estimated to be -7,600 AF. A aegative change in annual storage is expected due to critically dry conditions for WY 2021.

Figure 16 shows annual groundwater pumping and change in storage, along with cumulative storage since WY 2000. Cumulative storage is reported as the total change in storage relative to WY 1990,



Explanation

Monitoring Well

Water Elevation Change (ft)

Groundwater Basin Boundary

0 1 2 mi

Sierra Valley Annual Report WY 2021

Change in Groundwater Elevations
Upper Aquifer Fall 2020 - Fall 2021

Figure 14

Sierra Valley Groundwater Management District

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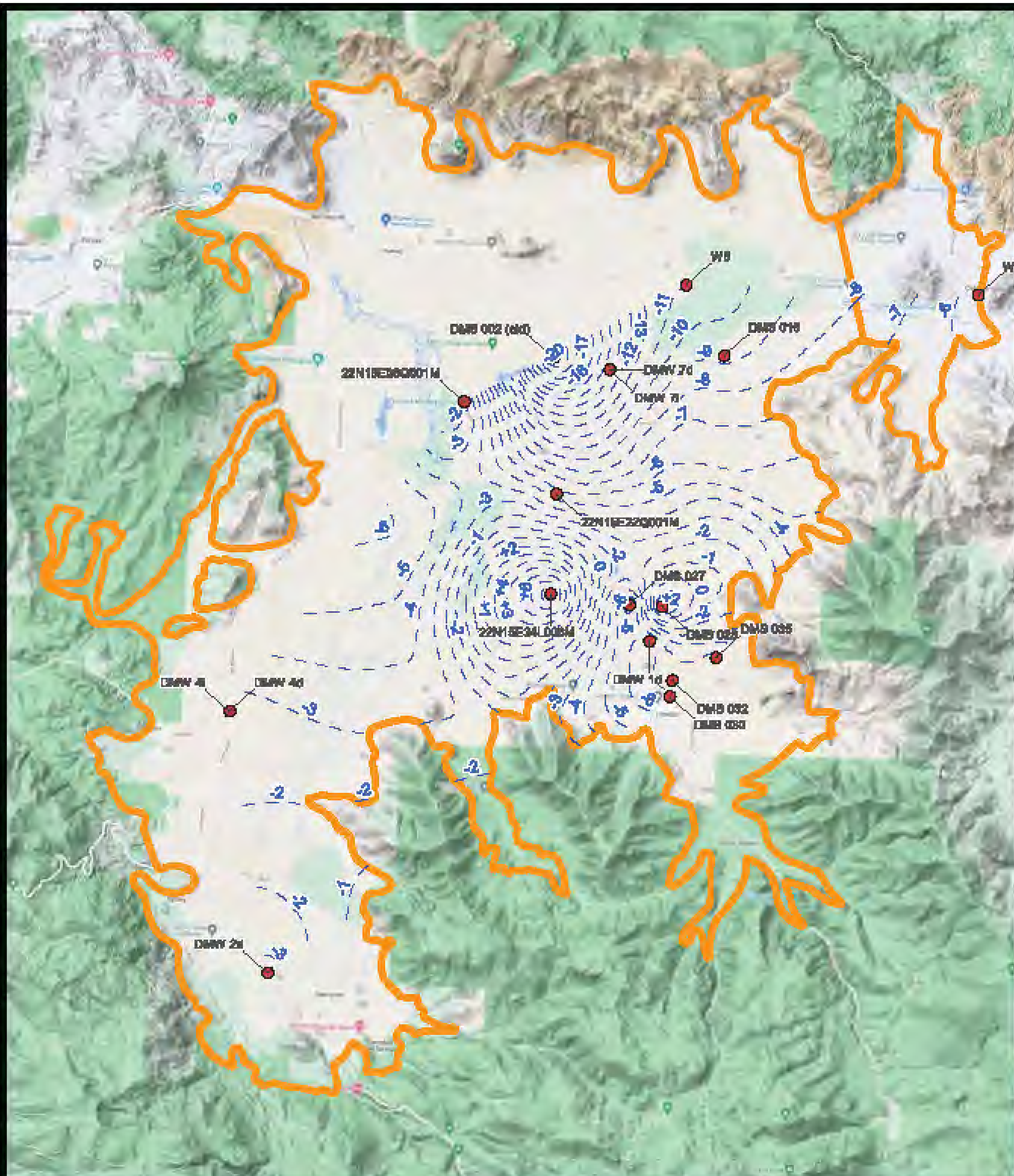

Explanation

Monitoring Well

Water Elevation Change (ft)

Groundwater Basin Boundary

0 1 2 mi

N

Sierra Valley Groundwater Management District

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Sierra Valley Annual Report WY 2021

Change in Groundwater Elevations
Lower Aquifer Fall 2020 - Fall 2021

Figure 15

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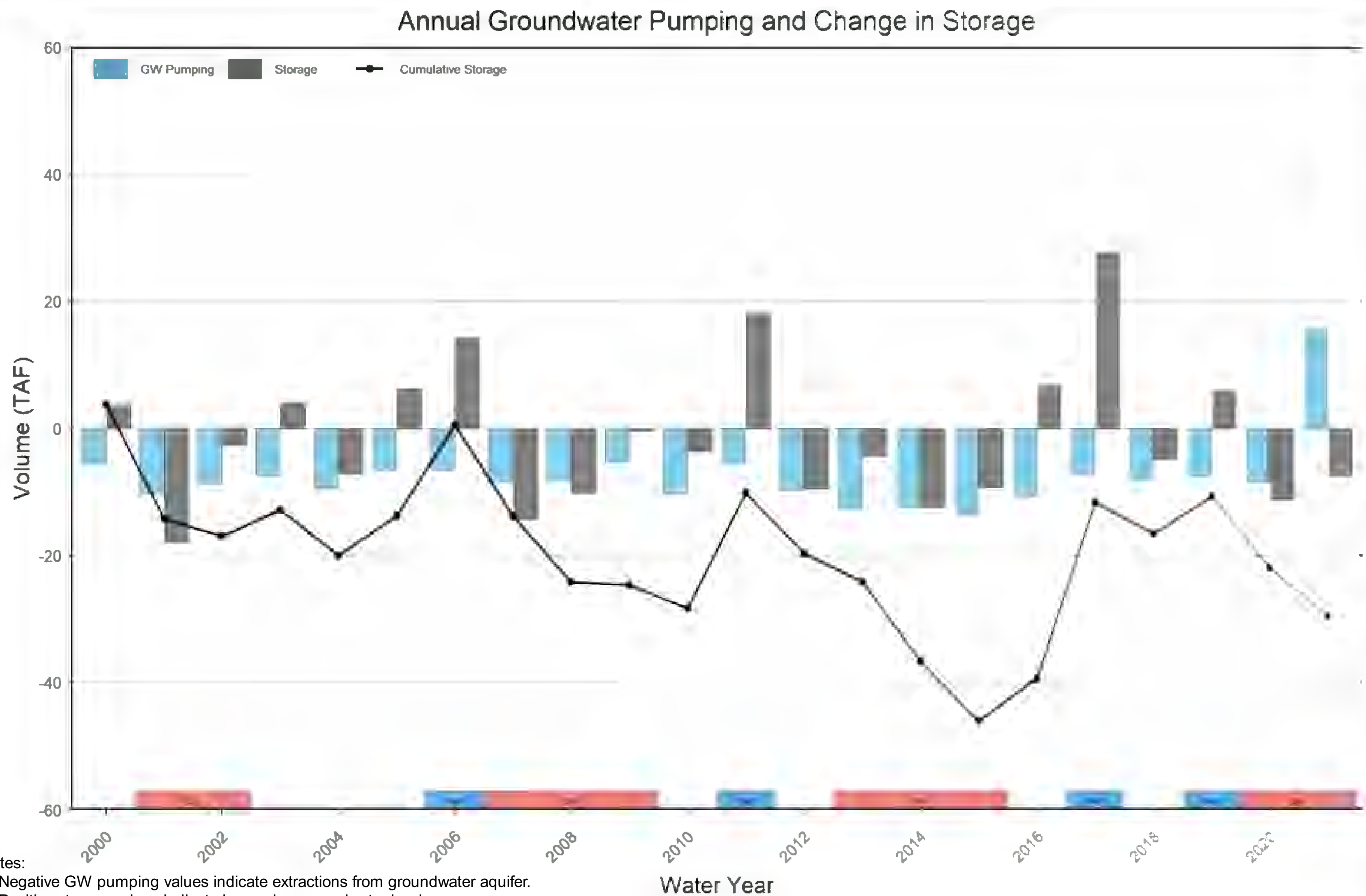

Notes:
1. Negative GW pumping values indicate extractions from groundwater aquifer.
2. Positive storage values indicate increasing groundwater levels.
3. Change in storage values estiamted using Sierra Valley Hydrogeologic System Model (SVHSM)

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Groundwater Pumping and Change in Storage

WY 2000-2021

Sierra Valley Groundwater Management District

03/30/2022

Figure 16

which is the first year simulated by SVHSM. Through WY 2021, cumulative change in groundwater in storage since WY 1990 is estimated to be -29,600 AF.

7. Progress Towards GSP Implementation

The Sierra Valley GSP provided seven Tier I (existing) and 12 Tier II (potential) Projects and Management Actions (PMAs) to achieve sustainability goals (see Chapter 4 of the Sierra Valley GSP: https://www.sierravalleygmd.org/files/e88626a57/Chapter+4+Projects+and+Management+Actions.pdf). While the GSP was only recently approved and submitted, implementation progress is underway.

7.1 Area Expansion for Moratorium on New Large-Capacity Wells

In May 2021, the SVGMD amended ordinance 18-01 (https://www.sierravalleygmd.org/files/ea2824af1/18-01+Ordinance+%28Requirements+for+New+Water+Well+Permits+%2B+Amended+map%29+%28signed%29.pdf) to expand the area covered by the moratorium on new large-capacity wells. The moratorium area previously covered 90.4 mi^2 and was located on the eastern side of the basin. The new moratorium zone is an extension of the original to the north and east and covers a total of 152.4 mi^2, with 101.7 mi^2 overlying the Basin.

7.2 High Capacity Agricultural Wells Metering

Flow meter installations at each high-capacity agricultural wells were inspected for conformance to operating specifications. While SVGMD has had large-capacity agricultural wells fitted with flow meters for many years, over the last year, all sites have been quality control evaluated for installation according to meter specifications. Through this effort, the District is actively bringing all sites up to specification, including minor adjustments to some sites and engineered designs to replace 18 flow meters. Meter replacement will occur in WY 2022.

7.3 Agricultural Efficiency Improvements

In the summer of WY 2021, irrigation practices at major farms/ranches in the valley were observed. Many ranches are using center-pivot sprinkler irrigation systems, with a mid-elevation sprinkler height at approximately 4-5 ft above land surface. Opportunities for potential irrigation water application efficiency improvements were discussed with the Technical Advisory Committee (TAC), GSA Board members, and with local farmers/ranchers. Research and planning for a LEPA (Low Energy Spray Application) irrigation system demonstration project was begun and is being pursued for startup in WY 2022, with plans to continue for several growing seasons. Potential irrigation efficiency improvements will be summarized in WY 2022, including a work plan for LEPA demonstration project.

7.4 Grant Application

To support implementation of the PMAs, SVGMD has applied for grant funding from California Department of Fish and Wildlife (CDFW) for the Sierra Valley Watershed Hydrologic Characterization and Multi-Benefit Planning Project. The proposed project builds on the findings of the Groundwater Sustainability Plan and will better refine characterization of the Sierra Valley watershed hydrology, including montane wet meadow and marsh habitat health, upland conditions and groundwater recharge opportunities. Through this project, SVGMD is seeking opportunities and additional funds to fill data gaps and identify recharge areas that can benefit both the shallow and the deep groundwater aquifers. With recharge, both groundwater recharge through winter water diversion and enhancement of recharge through upland management are considered. Efforts will include expanding the existing monitoring network to better characterize the surface and groundwater hydrology of the basin. This improved understanding will inform mitigation and restoration projects designed to sustain and restore the region's water supply, including to support mountain meadows and other sensitive species habitat in Sierra Valley. Evaluation of upland management practices with tracer studies and numerical modeling will be key to understanding available water sources for all beneficial uses and users in the valley. The region is facing another critically dry year, and groundwater levels are expected to drop below historical lows.

As an initial effort, SVGMD has obtained the support of the following groups who will participate in different aspects of project development:

- Sierra County
- Plumas County
- Feather River Land Trust
- Tahoe National Forest
- Upper Feather River Integrated Regional Water Management Group
- University of California (UC) Cooperative Extension

Specific tasks include:

- Field Monitoring: Collection of field data (i.e., groundwater levels, temperature, EC) and optimizing the existing monitoring network with a focus on monitoring to better characterize groundwater-dependent ecosystems (GDEs).

- Watershed and Upland Management Characterization: Characterization of watershed and upland management practices including a post-fire hydrology assessment quantifying changes in groundwater storage due to fire and upland management projects (e.g., forest thinning) that may result in increased runoff and infiltration and reduced forest evapotranspiration.

- Planning for Groundwater Recharge Projects: Data collected through field monitoring and watershed and upland characterization will be incorporated into the integrated hydrologic model. Model scenarios will be evaluated to improve the understanding of the Sierra Valley hydrogeologic system. This improved understanding will be used to identify the most promising locations for groundwater recharge. The model and data collected as part of this Project are expected to provide information on locations where additional recharge contributes to the shallow and deep aquifers in the Sierra Valley.

These efforts will support implementation of the following PMAs:

- Data Management and Modeling Updates

- Watershed and Upland Management and Restoration

- Assessment of Post-fire Hydrology – Water Supply Augmentation

8. References

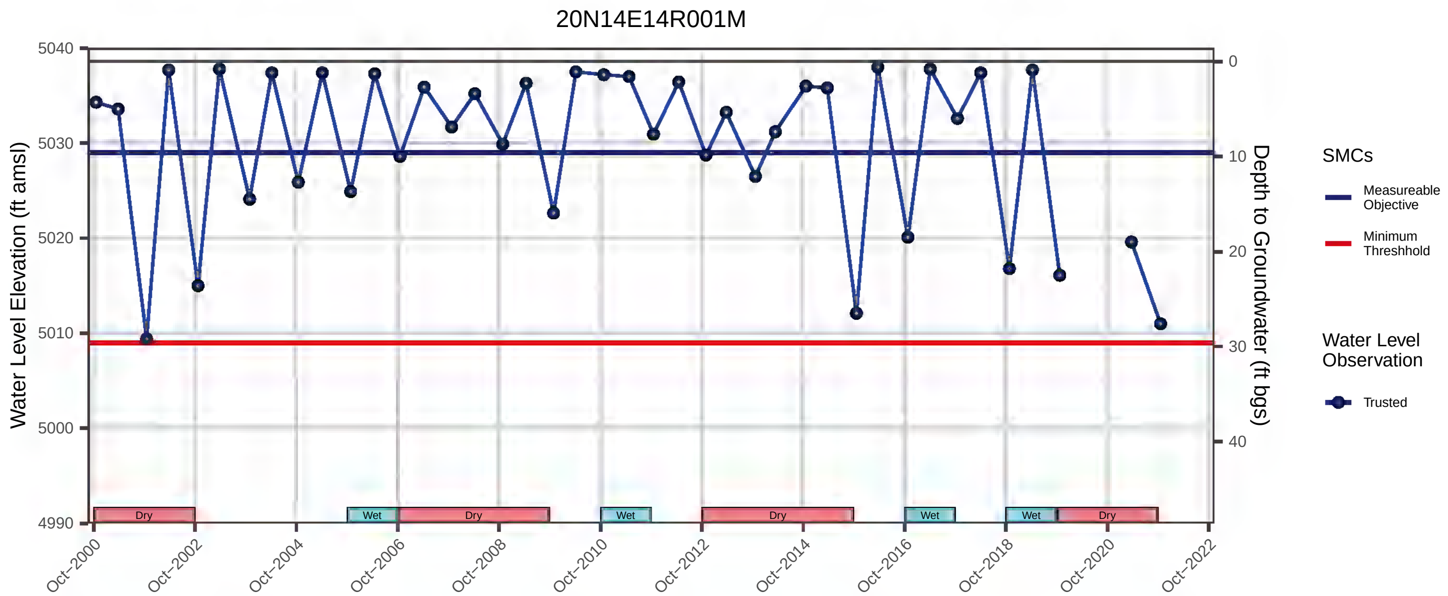
Sierra Valley Groundwater Management District (SVGMD). 2022a. Sierra Valley Subbasin Groundwater Sustainability Plan. https://sgma.water.ca.gov/portal/gsp/preview/125

Sierra Valley Groundwater Management District (SVGMD). 2022b. DMS Technical Memorandum. Appendix 2-1 of Sierra Valley Subbasin Groundwater Sustainability Plan. https://www.sierravalleygmd.org/files/51e7b778f/Appendix+2-1+DMS+Tech+Memo.pdf

Sierra Valley Groundwater Management District (SVGMD). 2022c. Sierra Valley Hydrogeologic System Model and Water Budget Report. Appendix 2-7 of Sierra Valley Subbasin Groundwater Sustainability Plan. https://www.sierravalleygmd.org/files/5e6d7e8c6/Appendix+2-7+SVHSM+Model_Water+Budget+Report.pdf

Appendix A

Representative Monitoring Point Hydrographs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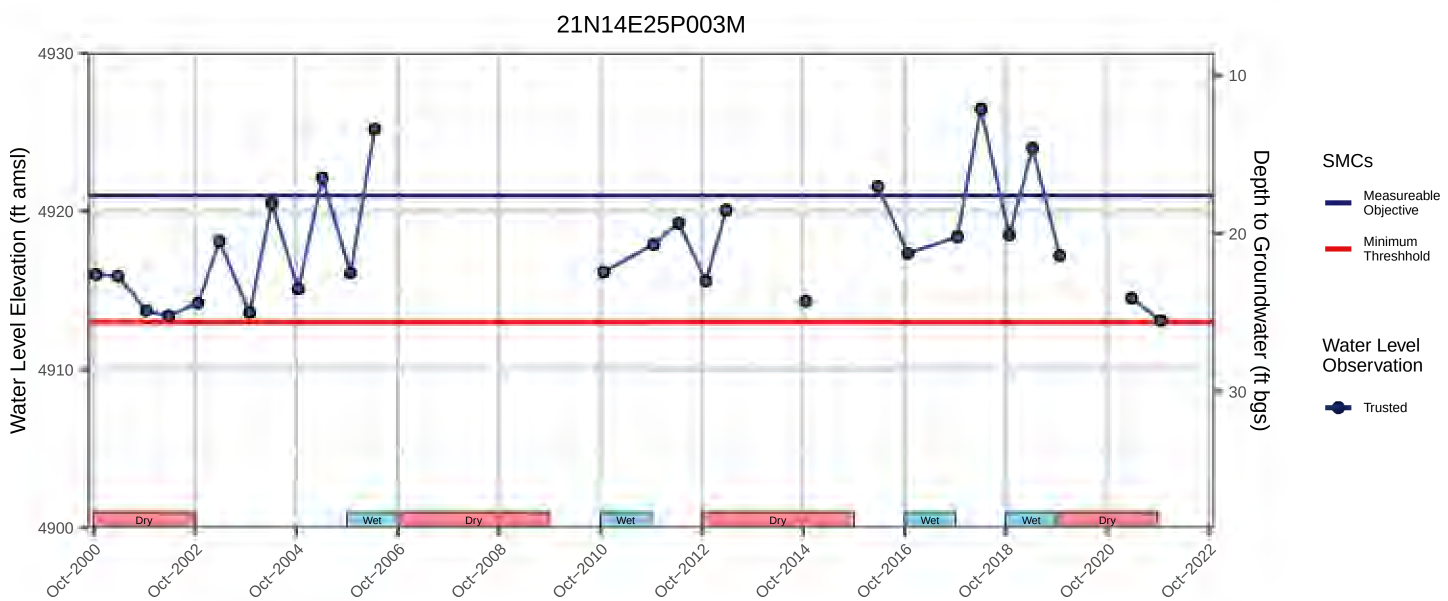
Depth to Groundwater (ft bgs)
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Dry
Wet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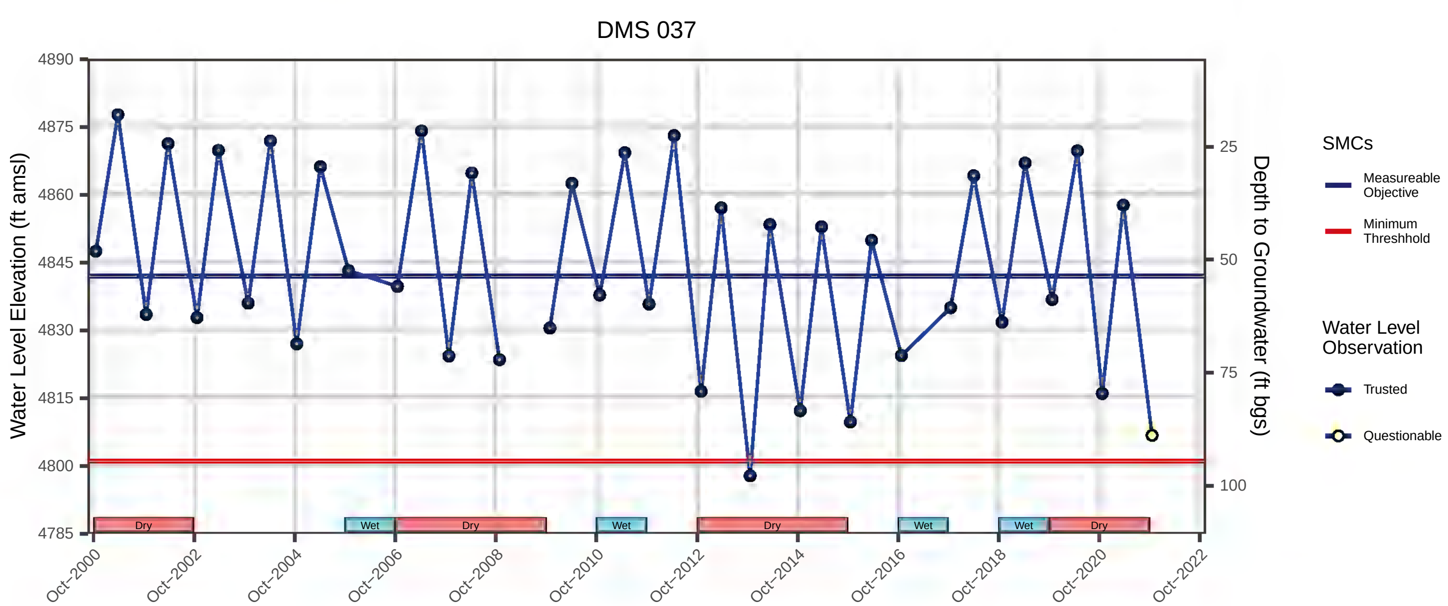
Depth to Groundwater (ft bgs)
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Dry
Wet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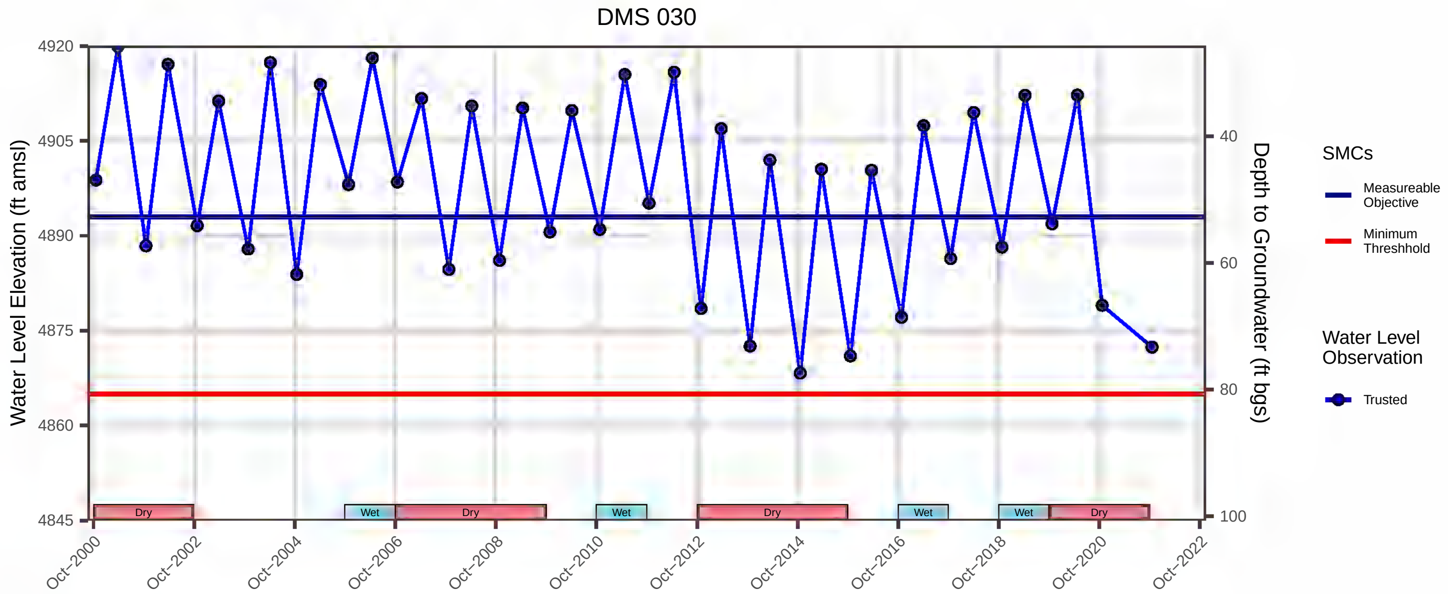
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable
Dry
Wet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4905
4890
4875
4860
4845
40
60
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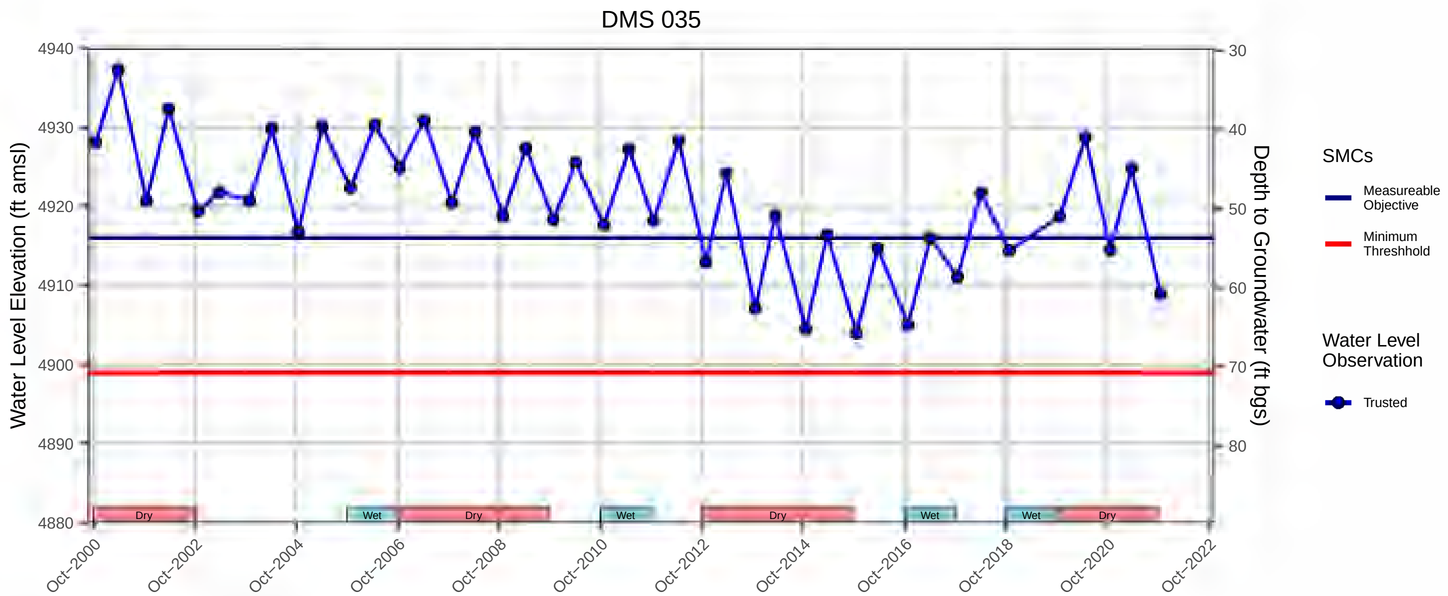
100
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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4930
4920
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4890
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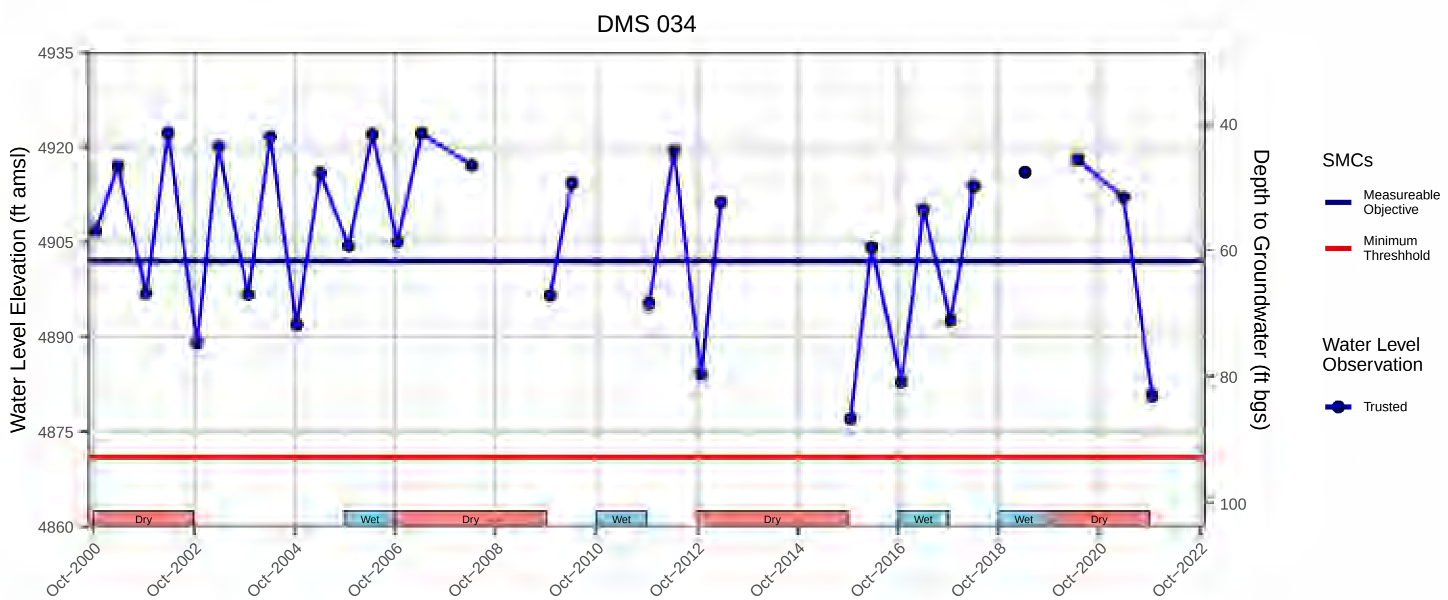
60
70
80
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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Depth to Groundwater (ft bgs)
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4920
4905
4890
4875
4860
40
60
80
100
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted

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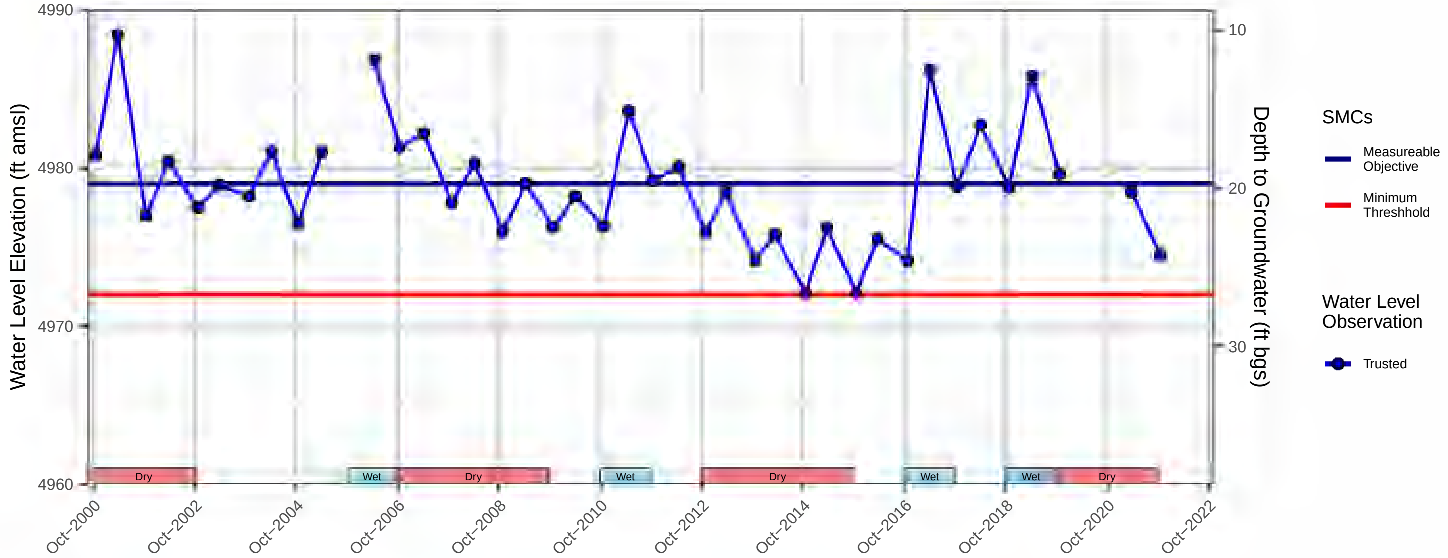

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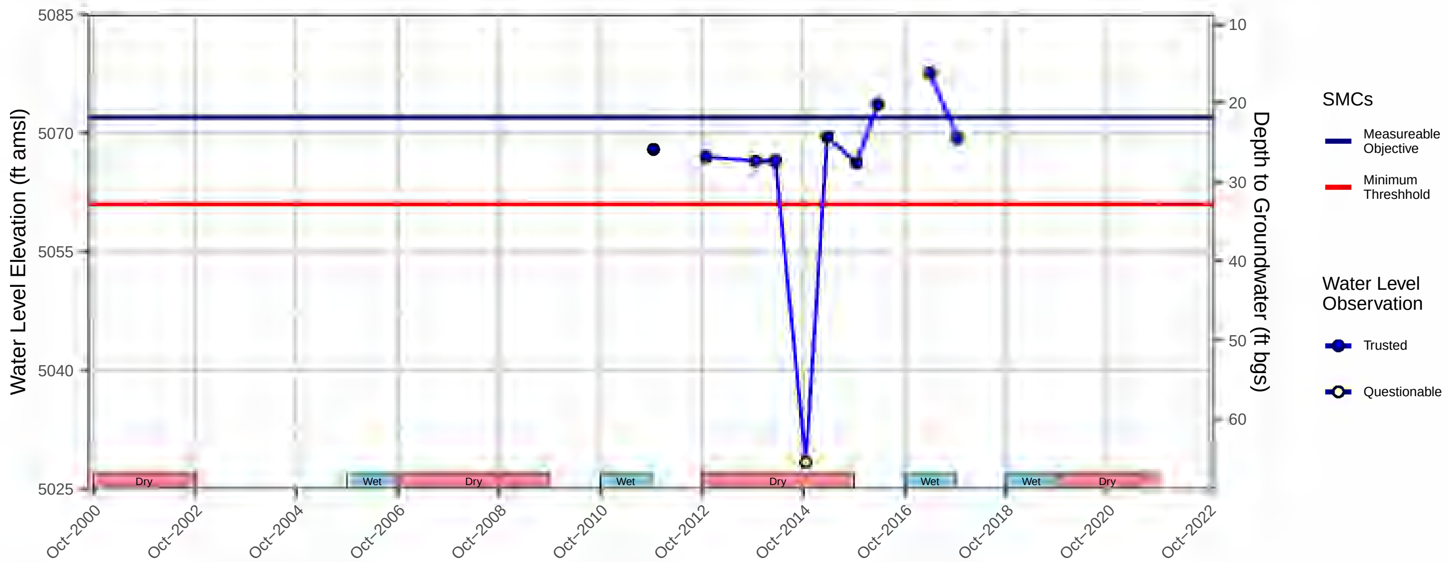

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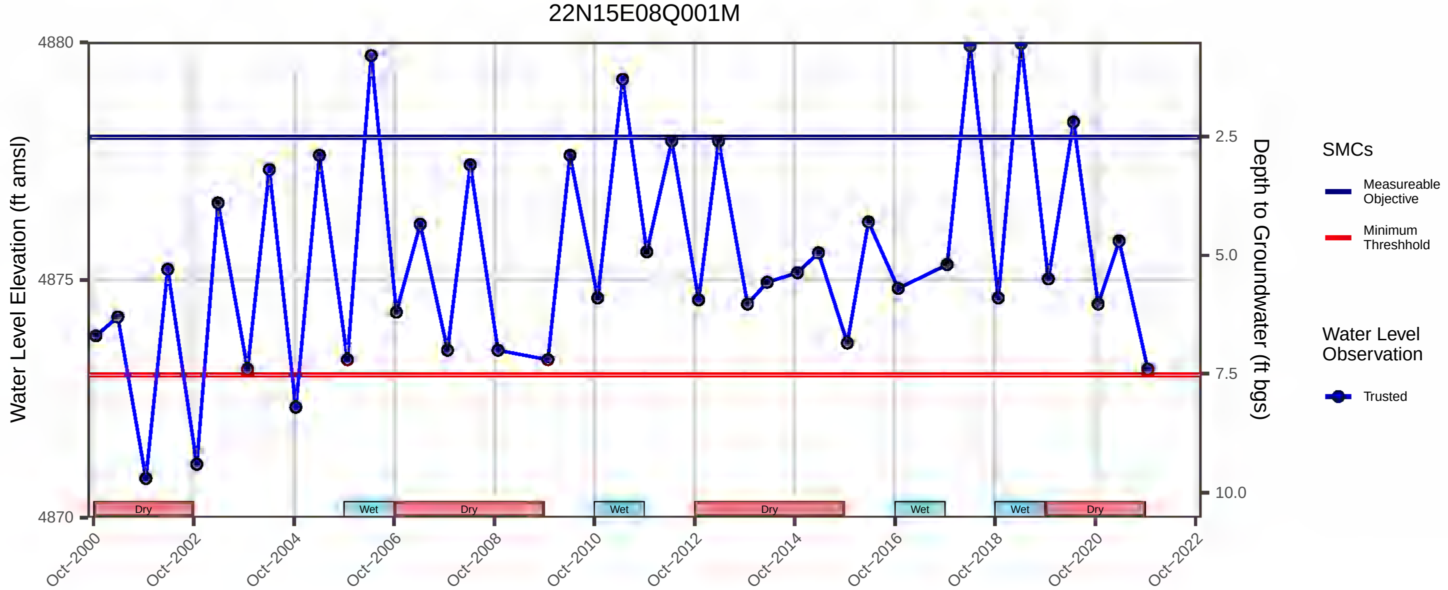

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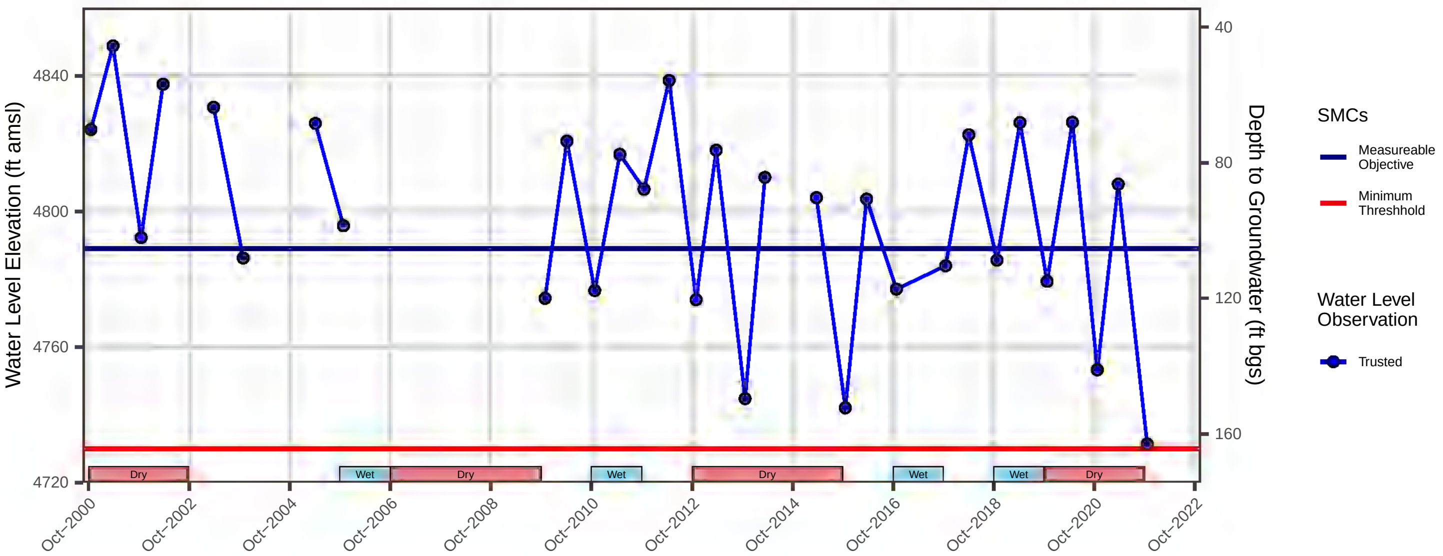

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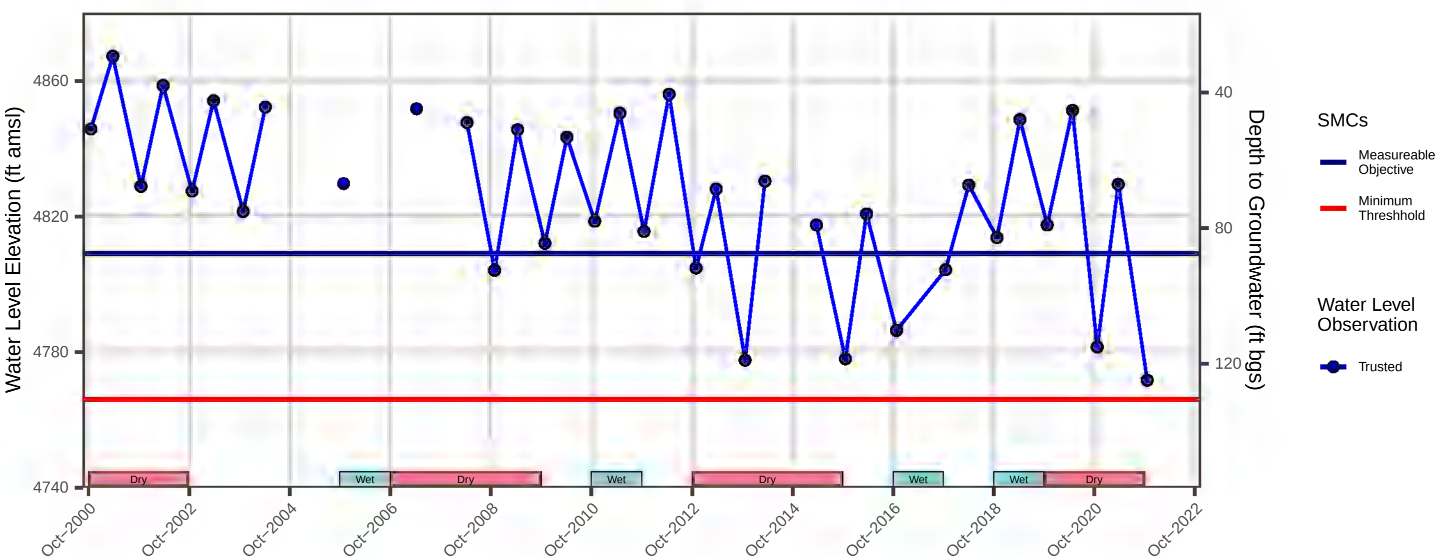

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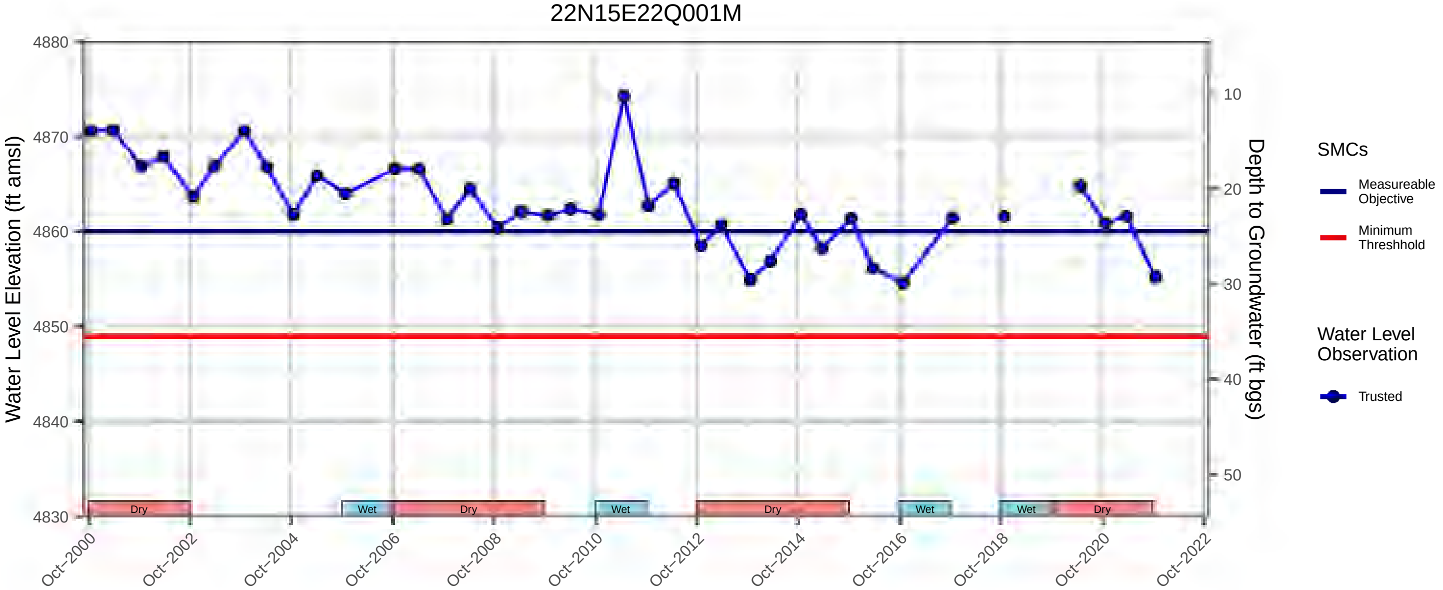

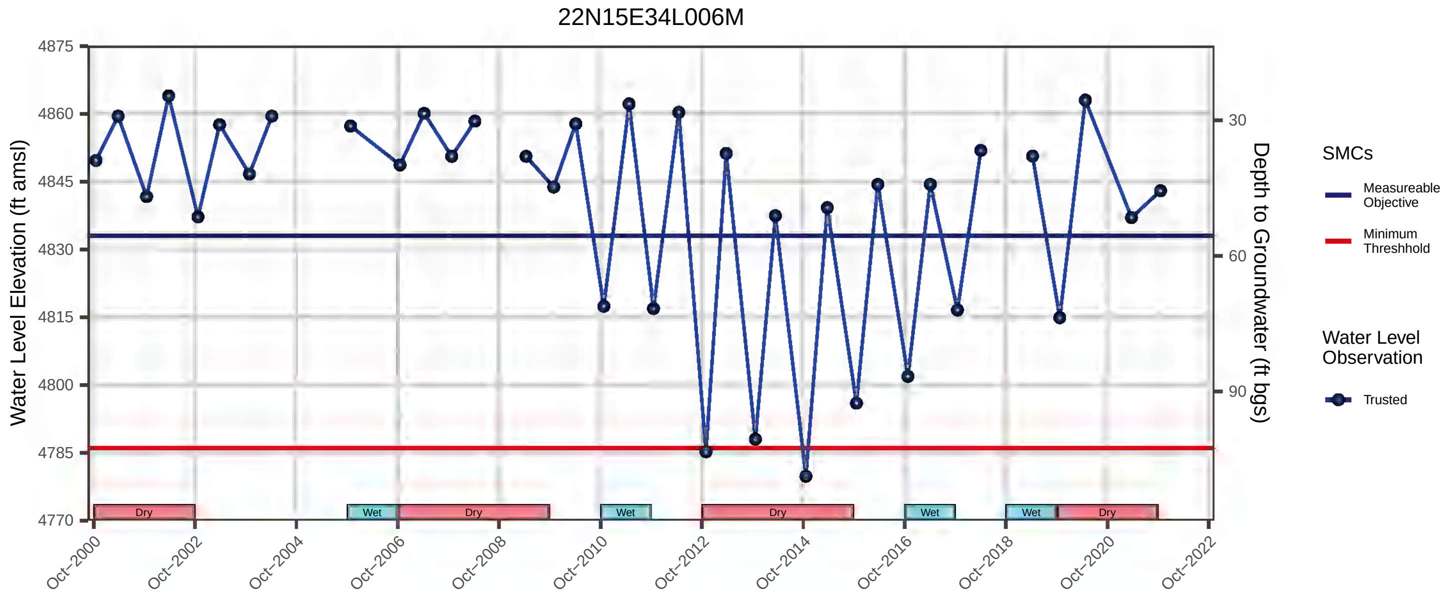
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4845
4830
4815
4800
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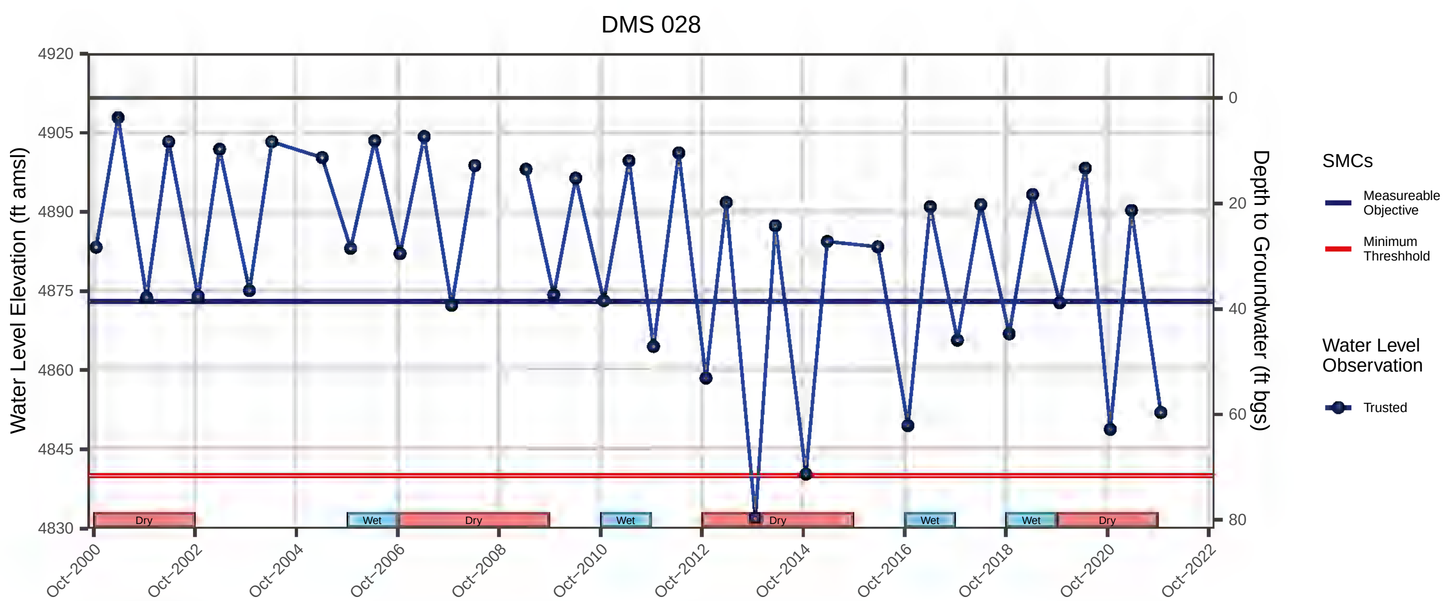
30
60
90
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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Depth to Groundwater (ft bgs)
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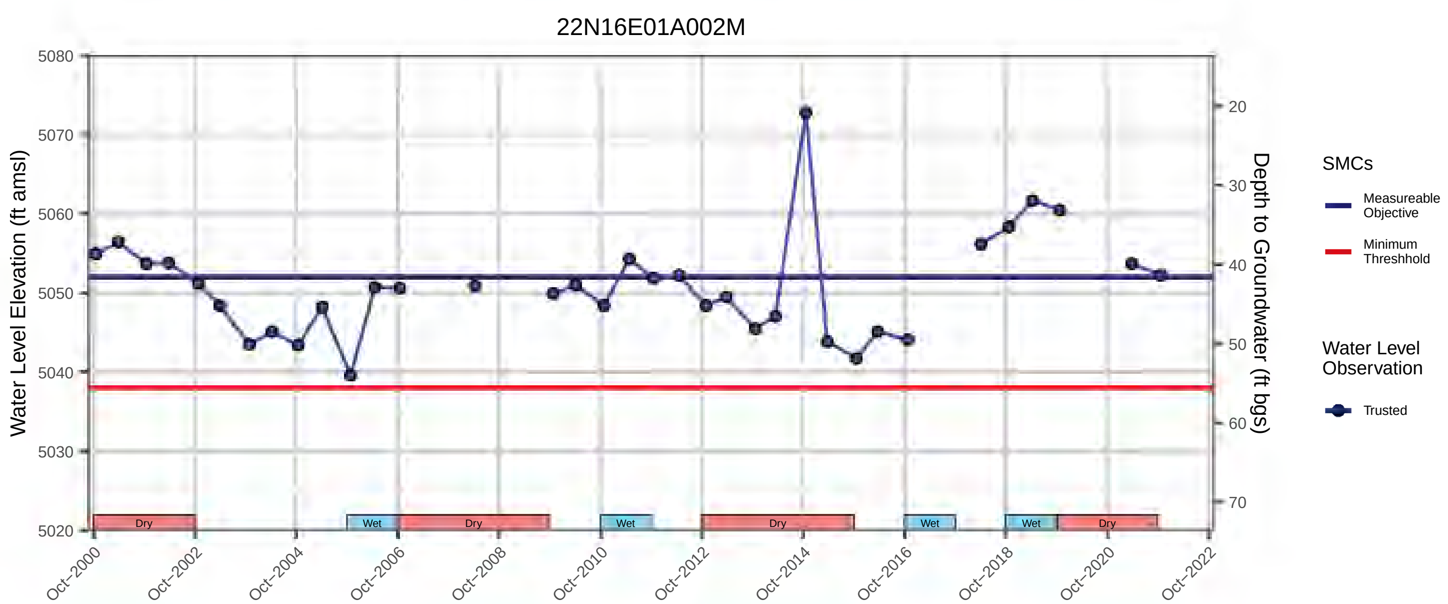
4905
4890
4875
4860
4845
4830
0
20
40
60
80
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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Depth to Groundwater (ft bgs)
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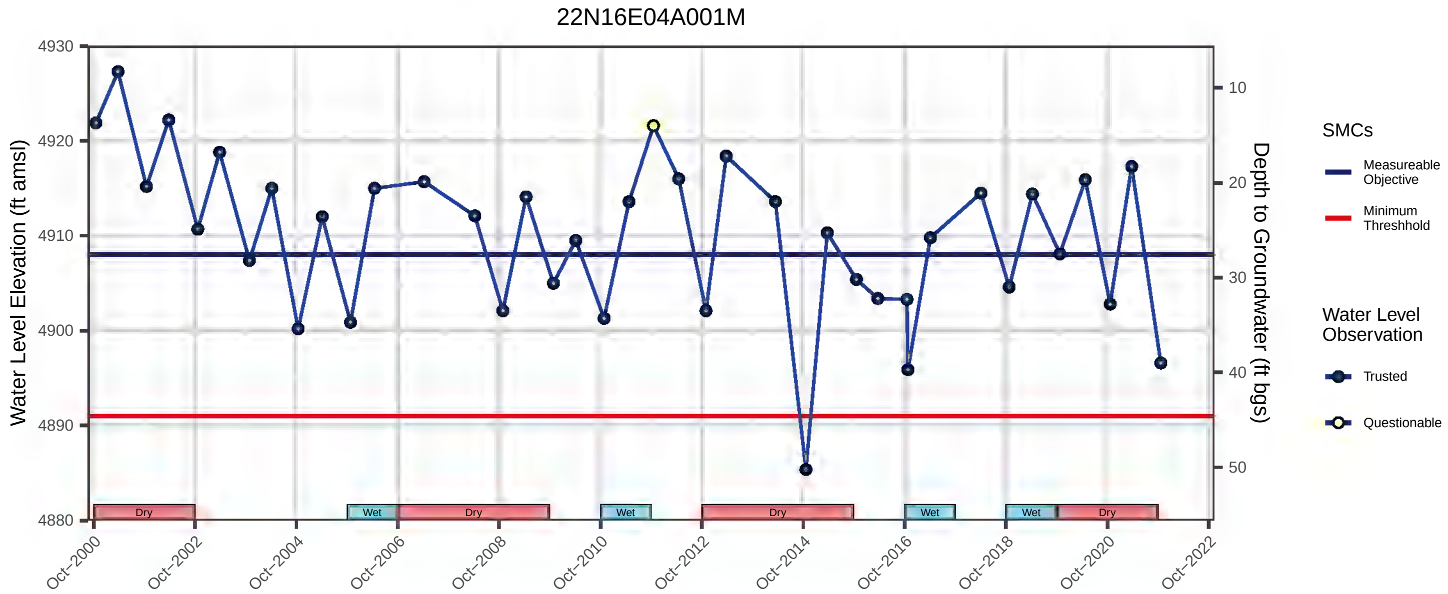
5070
5060
5050
5040
5030
5020
20
30
40
50
60
70
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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Depth to Groundwater (ft bgs)
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4920
4910
4900
4890
4880
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30
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50
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
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Oct-2016
Oct-2018
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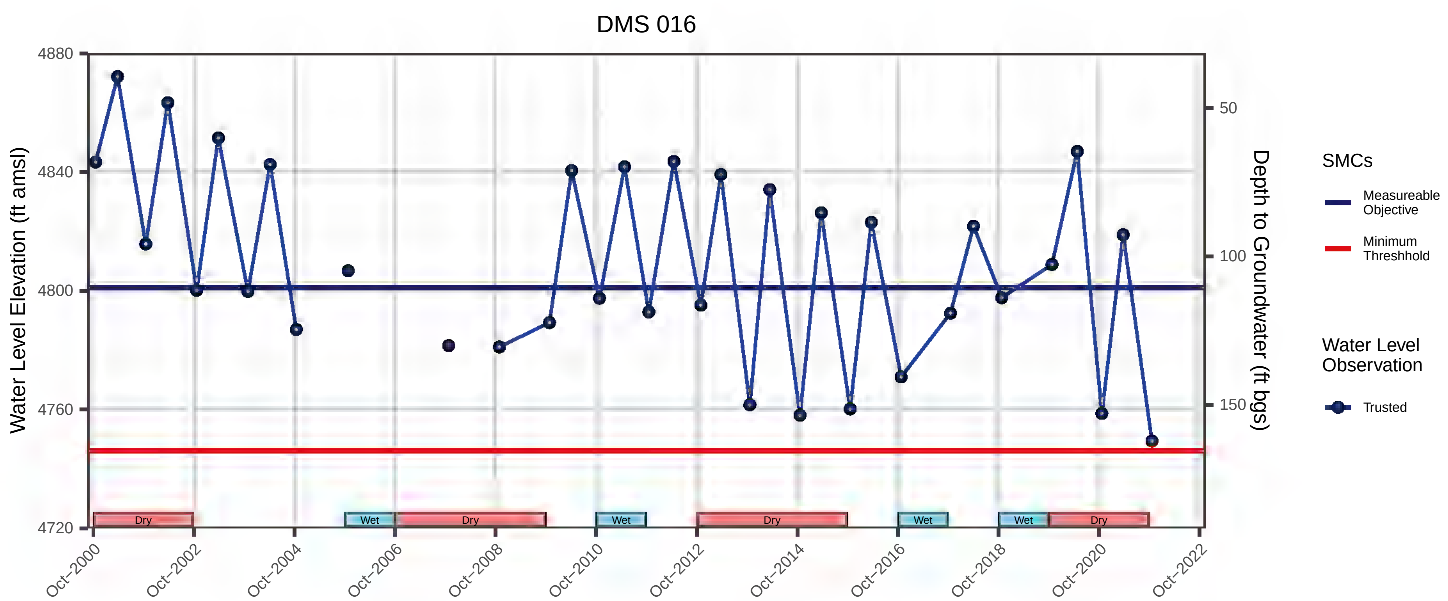
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable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Depth to Groundwater (ft bgs)
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4840
4800
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50
100
150
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Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
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Oct-2016
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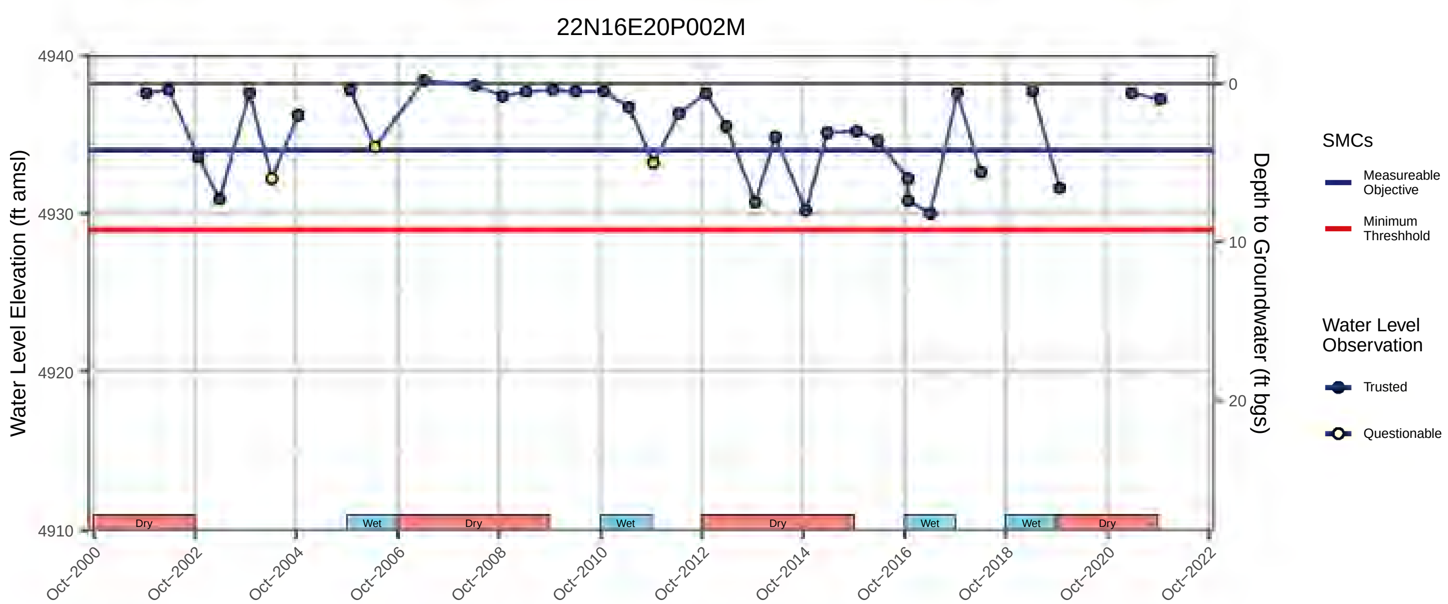
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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Depth to Groundwater (ft bgs)
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4920
4910
0
10
20
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Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
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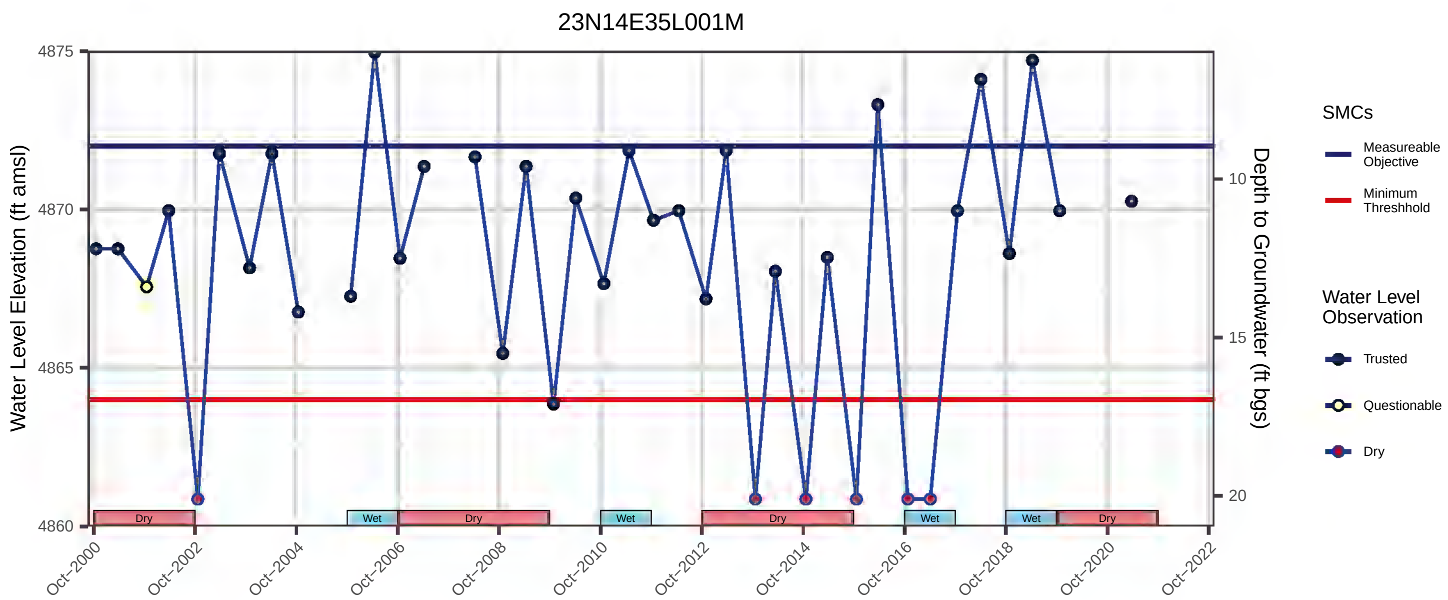
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable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Depth to Groundwater (ft bgs)
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4870
4865
4860
10
15
20
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Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
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Oct-2020
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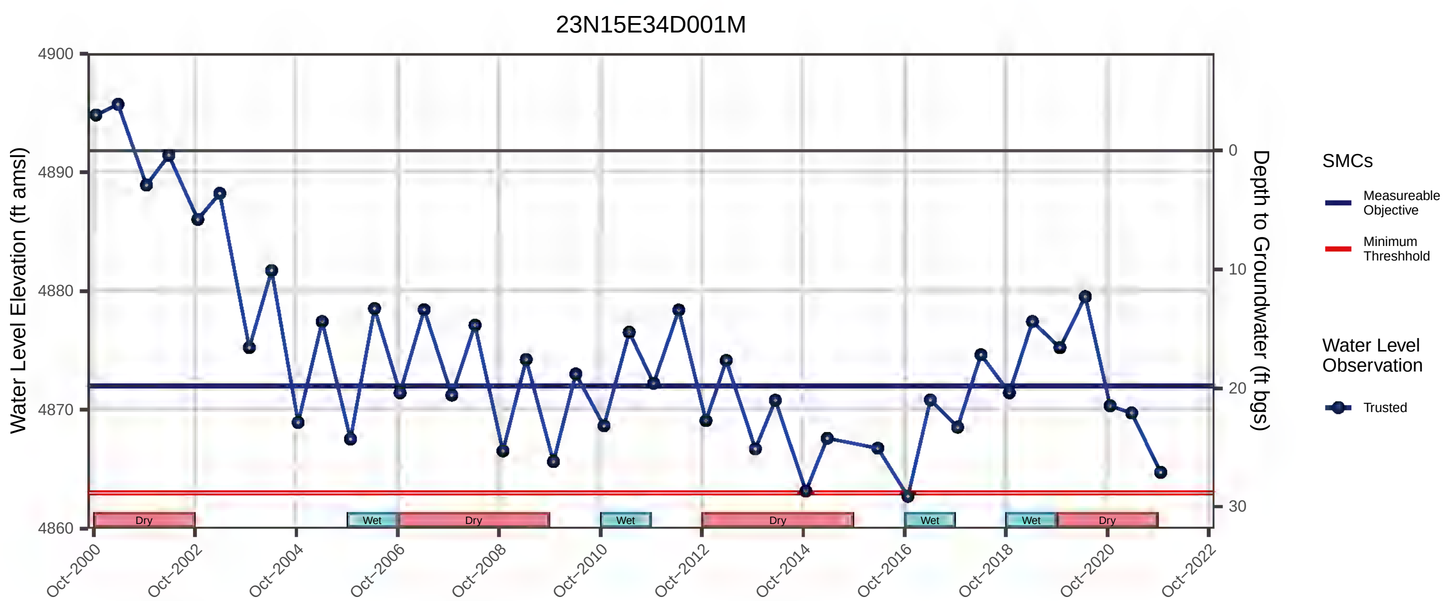
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable
Dry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Depth to Groundwater (ft bgs)
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4890
4880
4870
4860
0
10
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30
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
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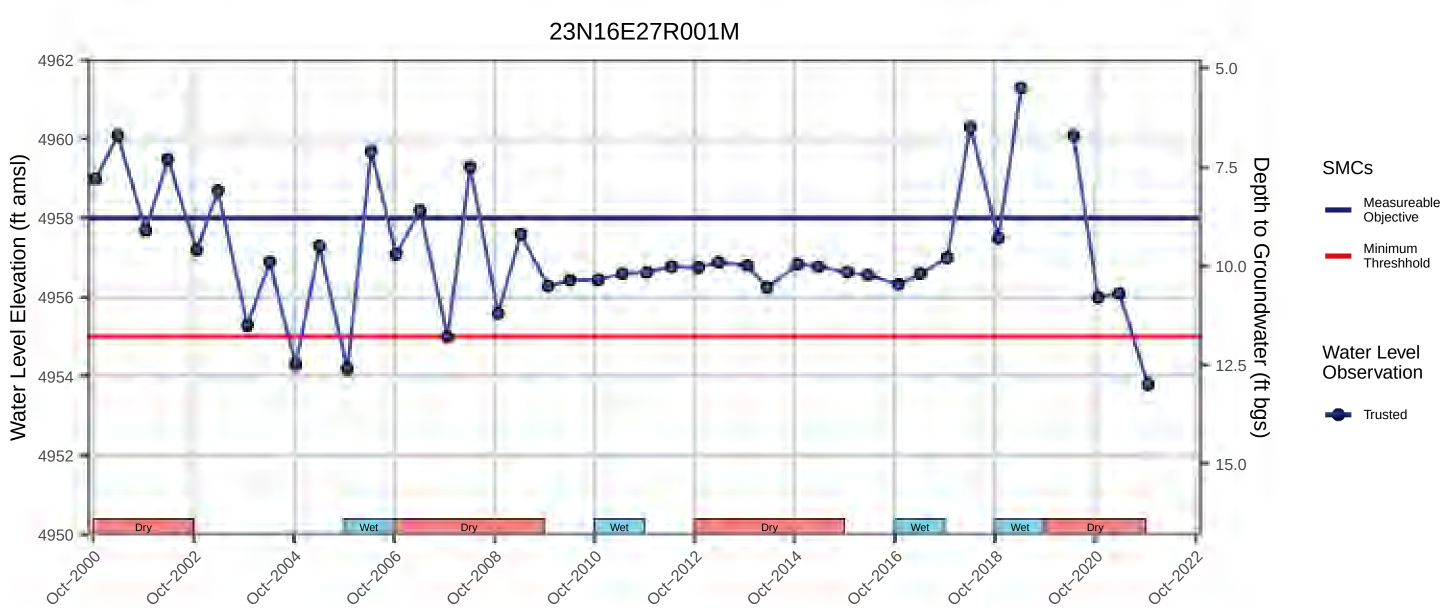
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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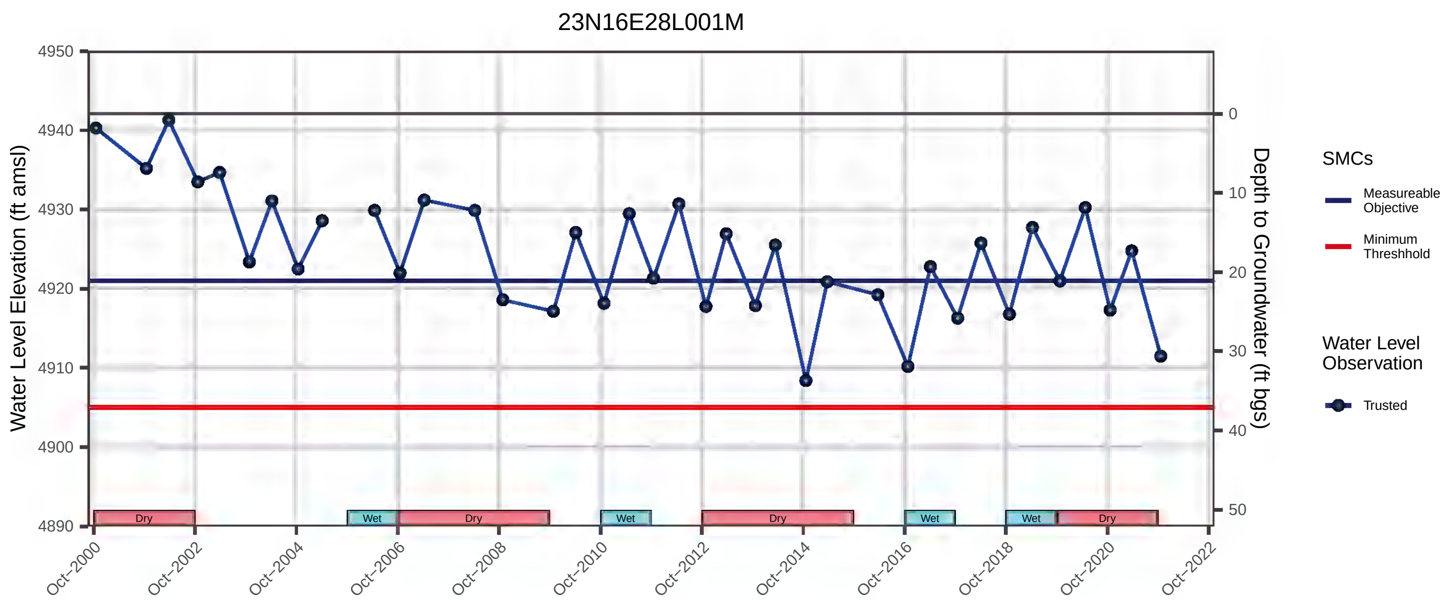
7.5
10.0
12.5
15.0
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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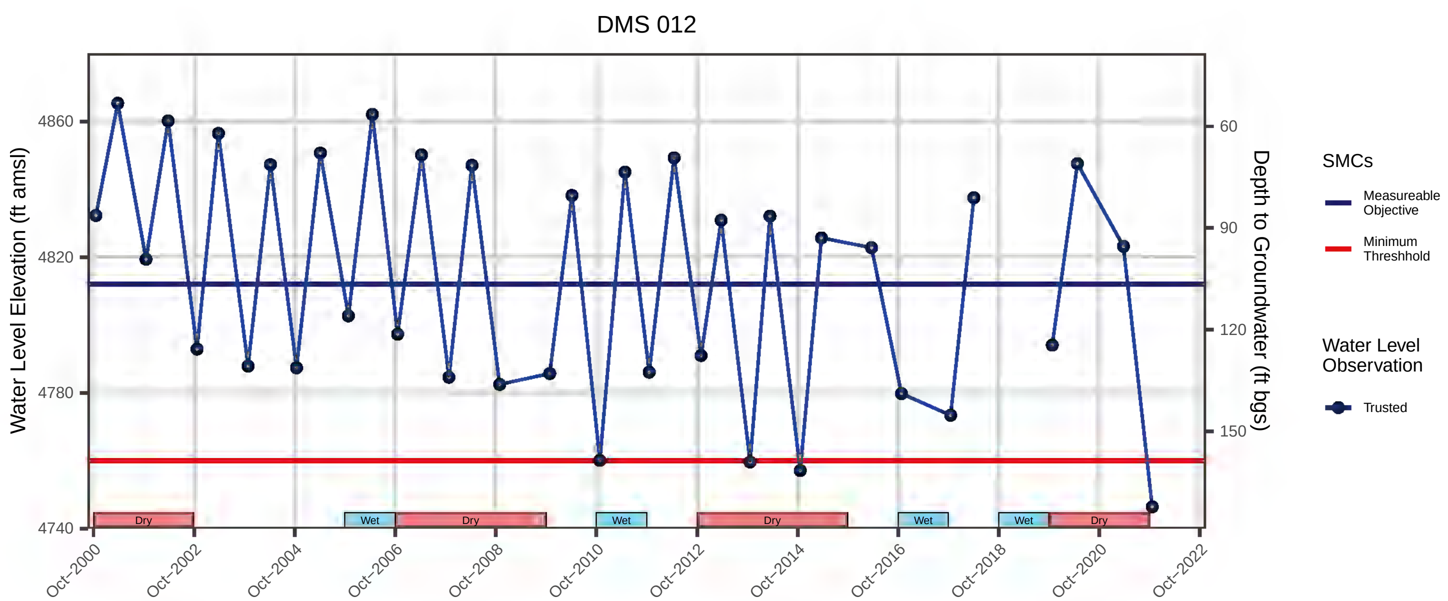
Minimum Threshhold
Water Level Observation
Trusted
Dry
Wet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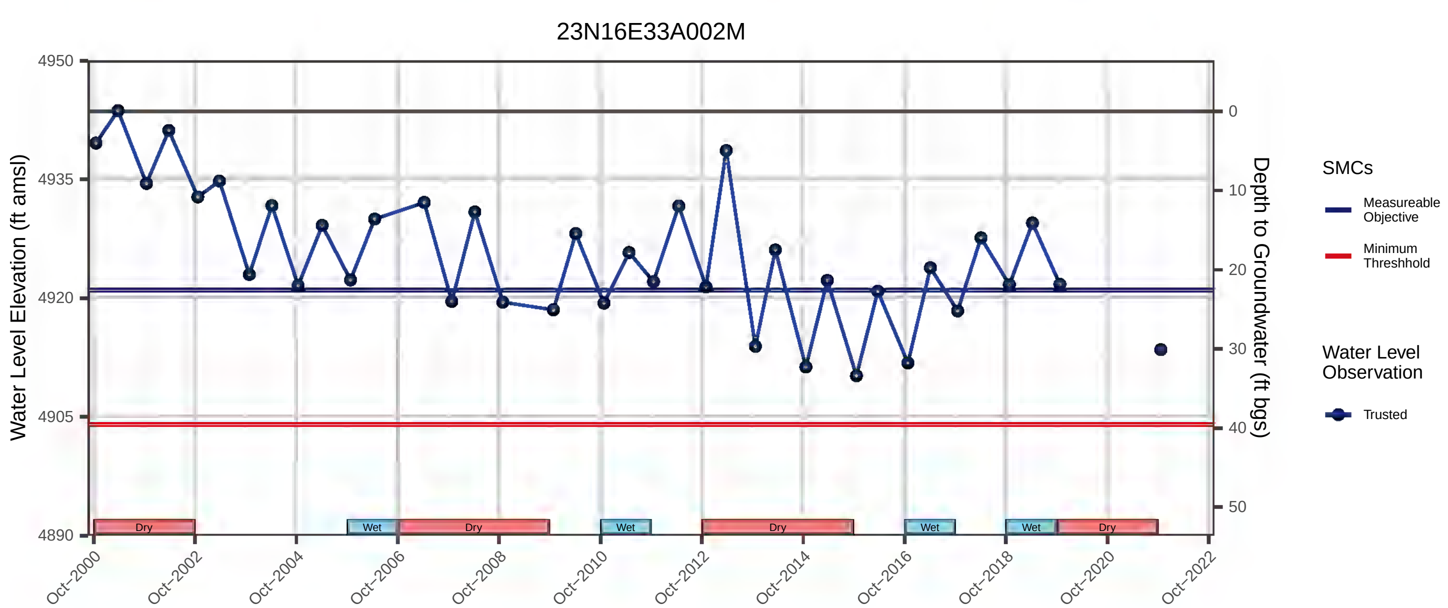
Water Level Observation
Trusted
Dry
Wet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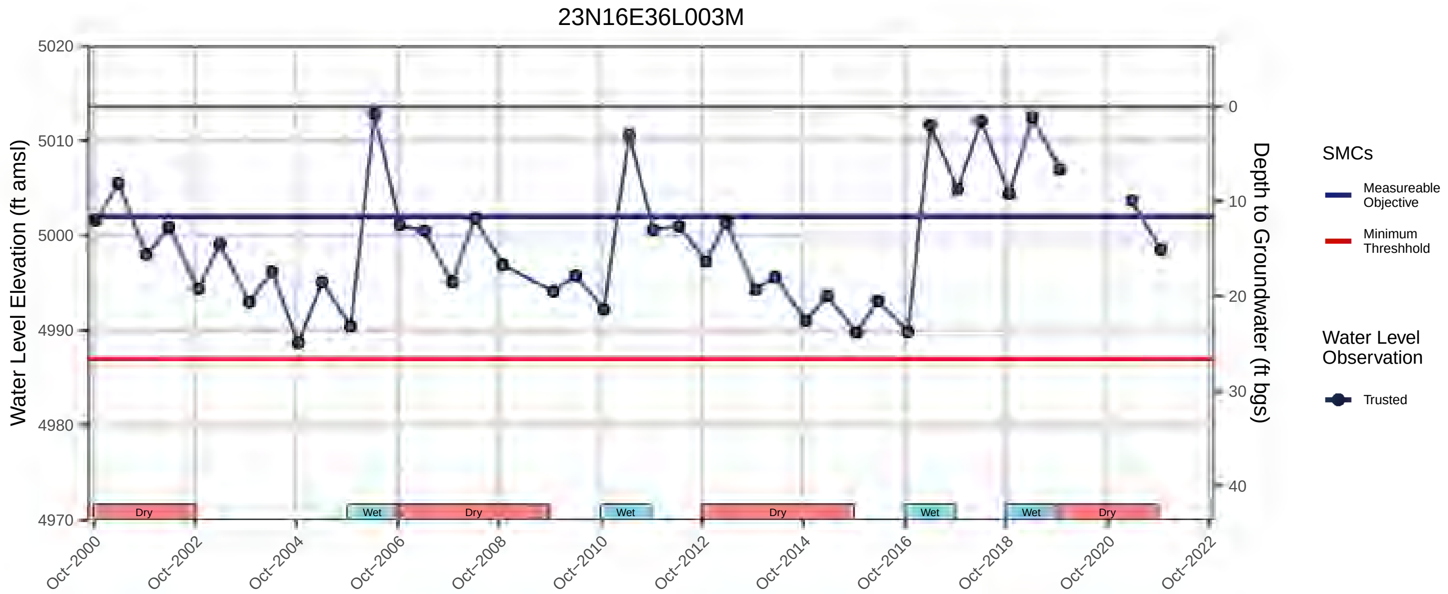
Minimum Threshhold
Water Level Observation
Trusted
Dry
Wet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5000
4990
4980
4970
0
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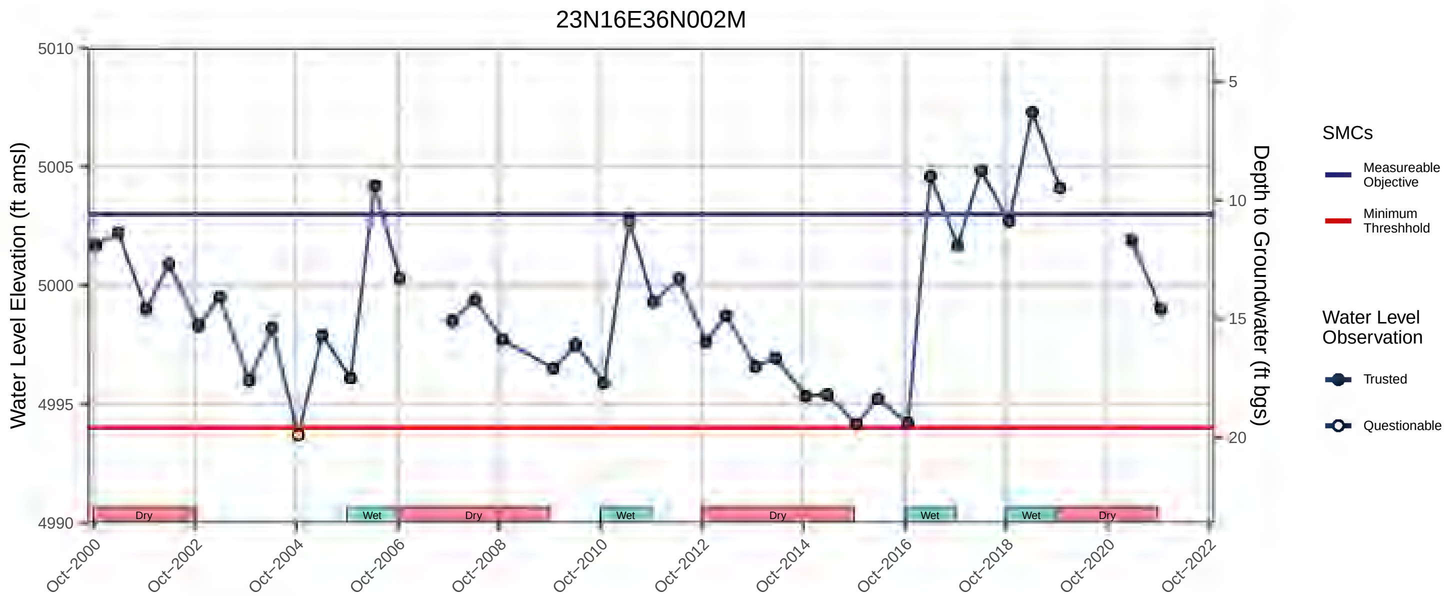
40
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted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Depth to Groundwater (ft bgs)
5010
5005
5000
4995
4990
5
10
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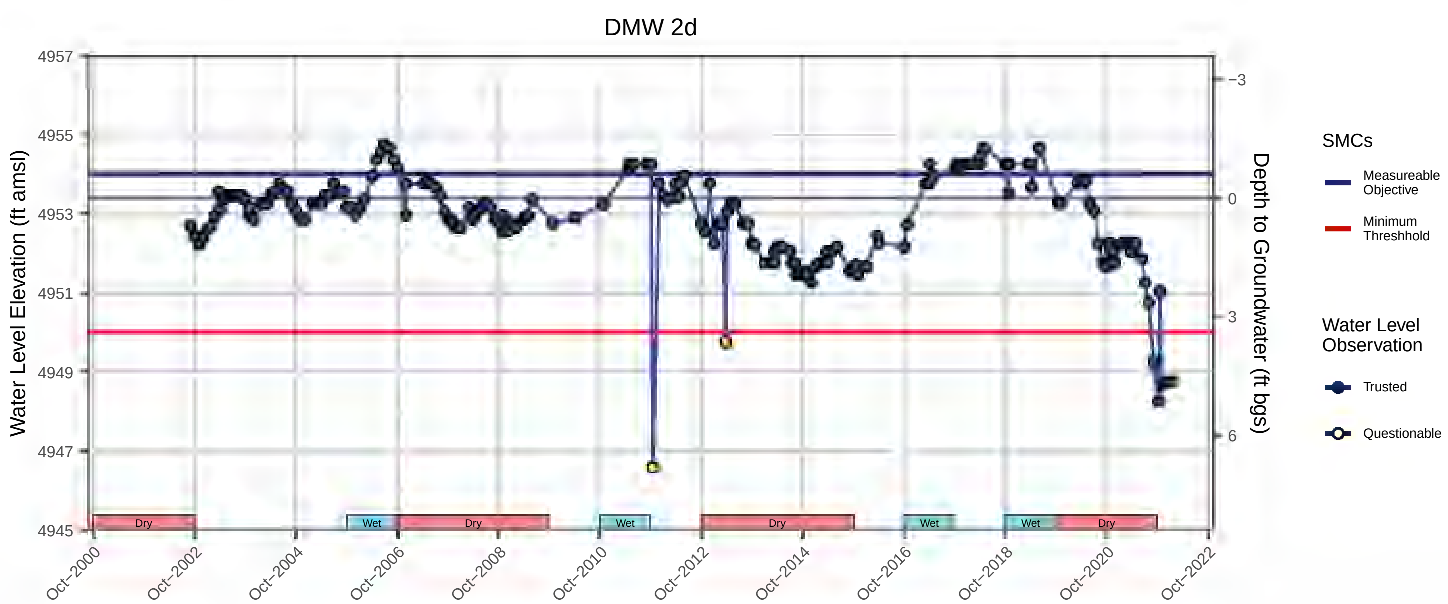
20
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable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4955
4953
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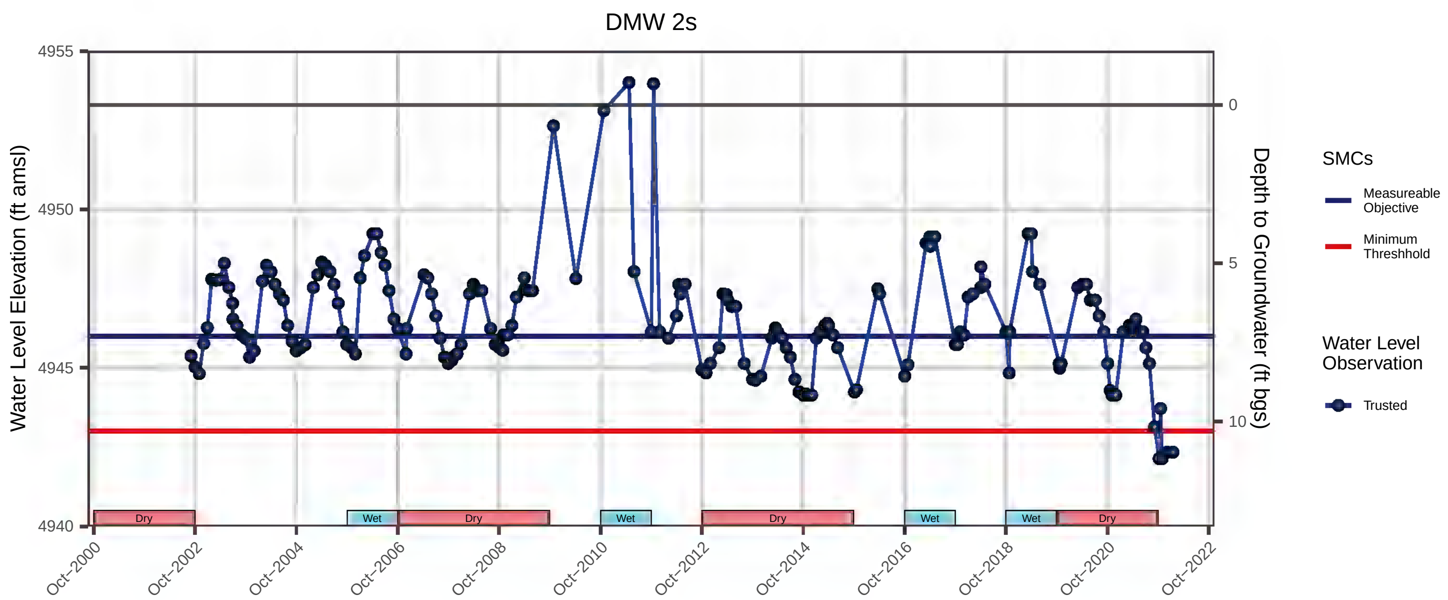
3
6
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable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Depth to Groundwater (ft bgs)
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Dry
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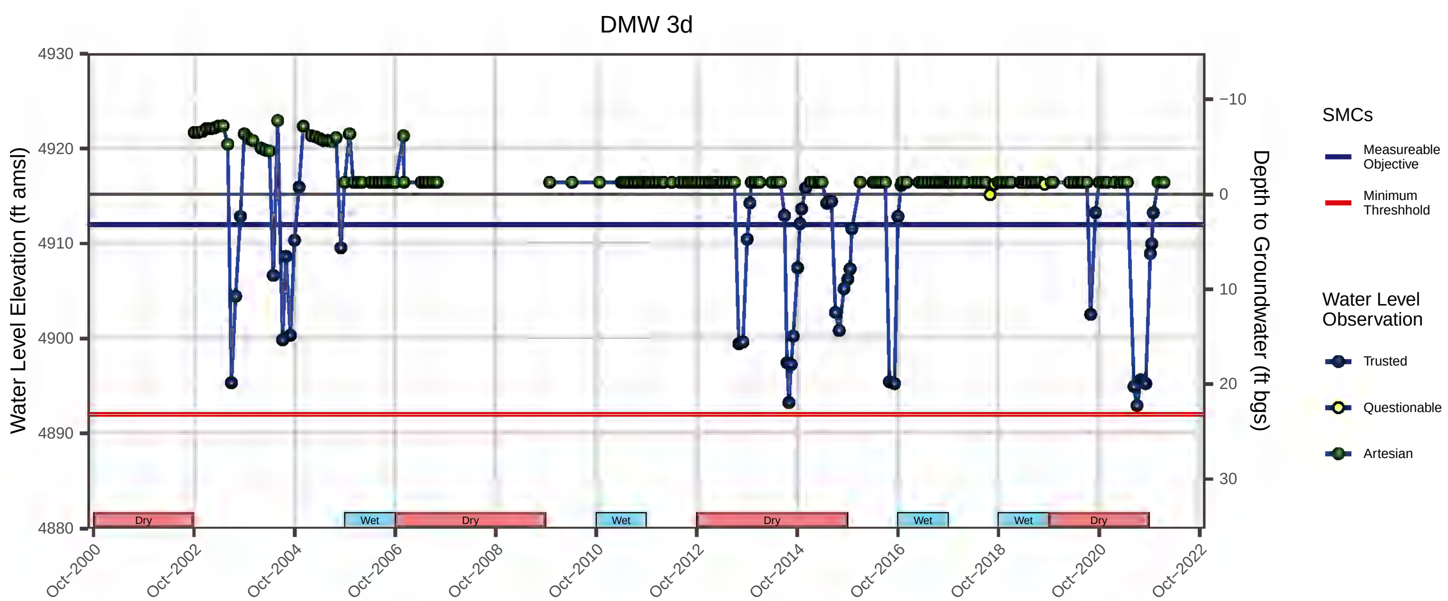
Oct-2020
Oct-2022


DMW 3d
Water Level Elevation (ft amsl)
Depth to Groundwater (ft bgs)
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable
Artesian
Dry
Wet
Oct-2000
Oct-2002
Oct-2004
Oct-2006
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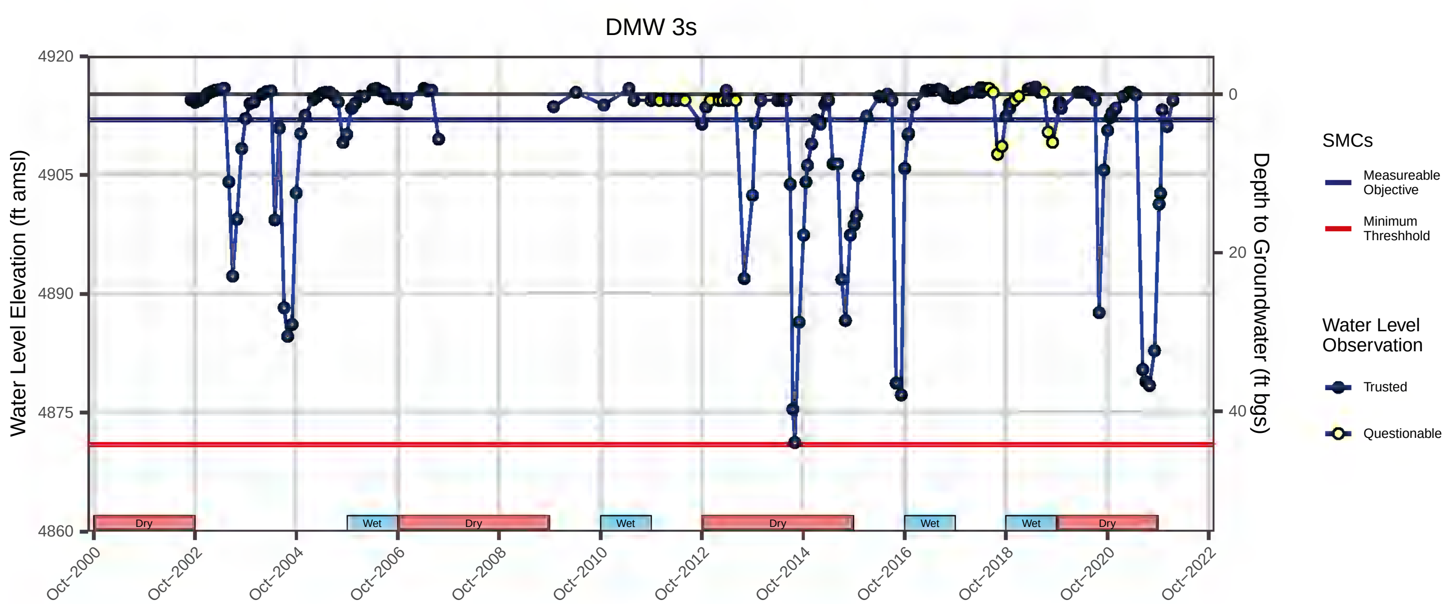
Oct-2018
Oct-2020
Oct-2022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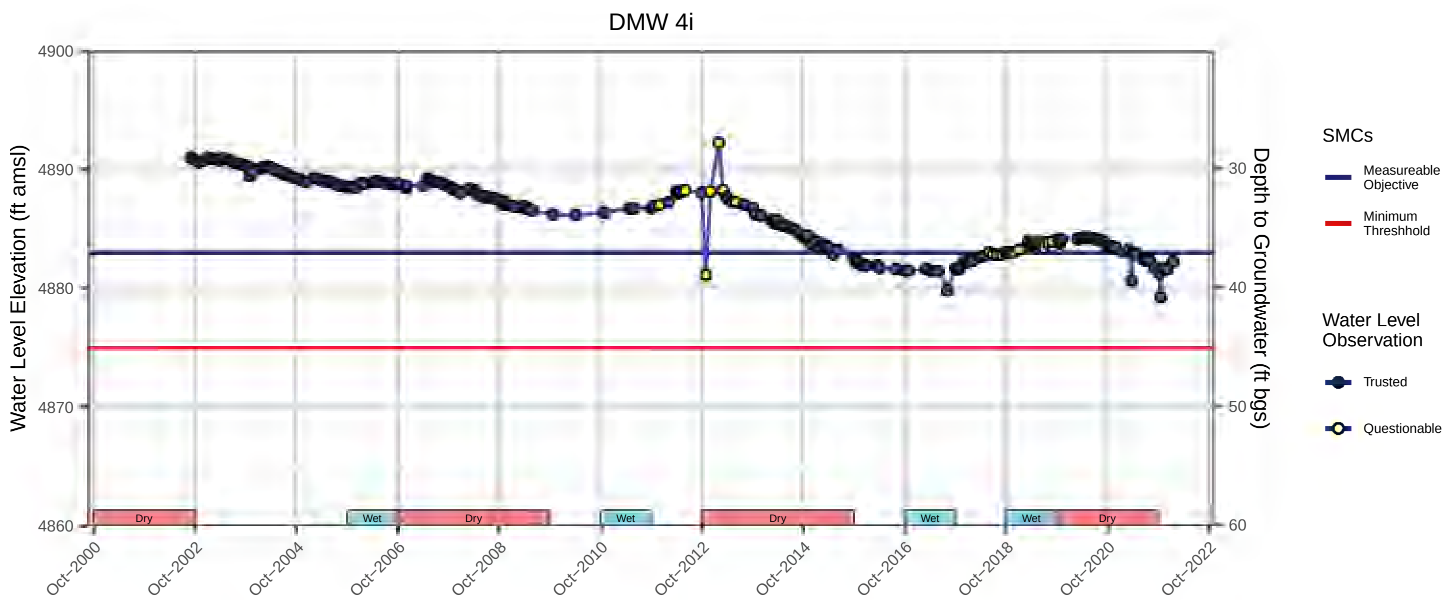
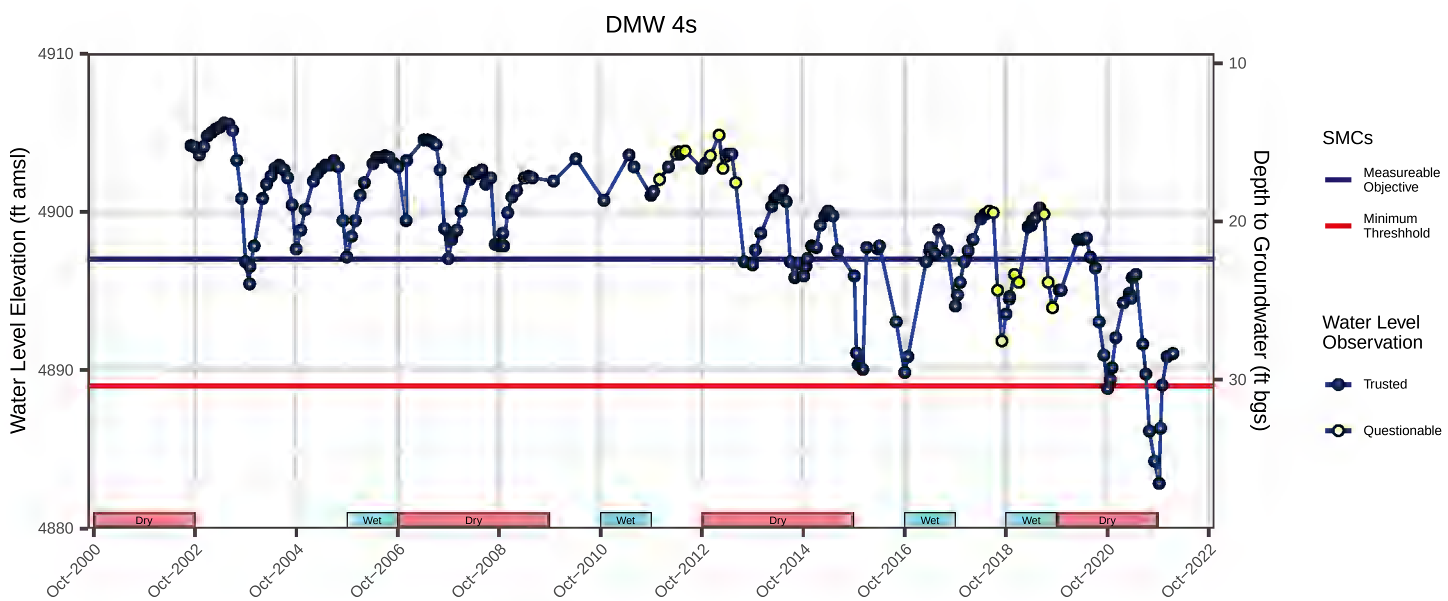
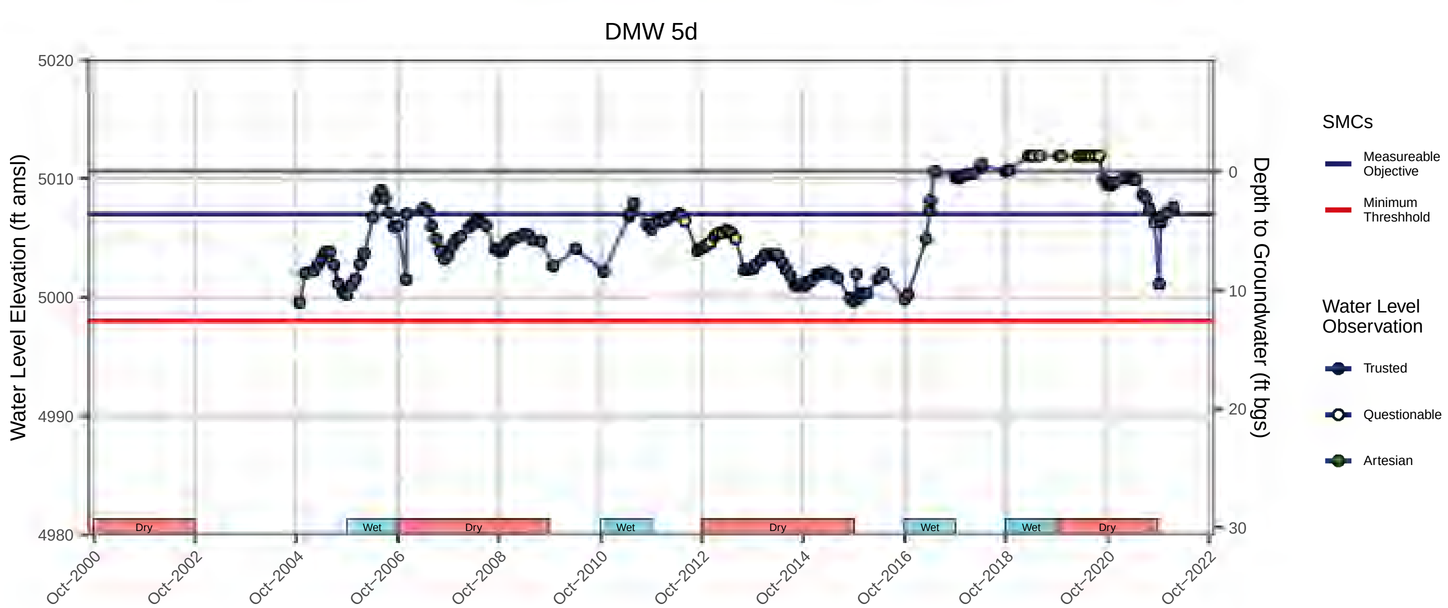
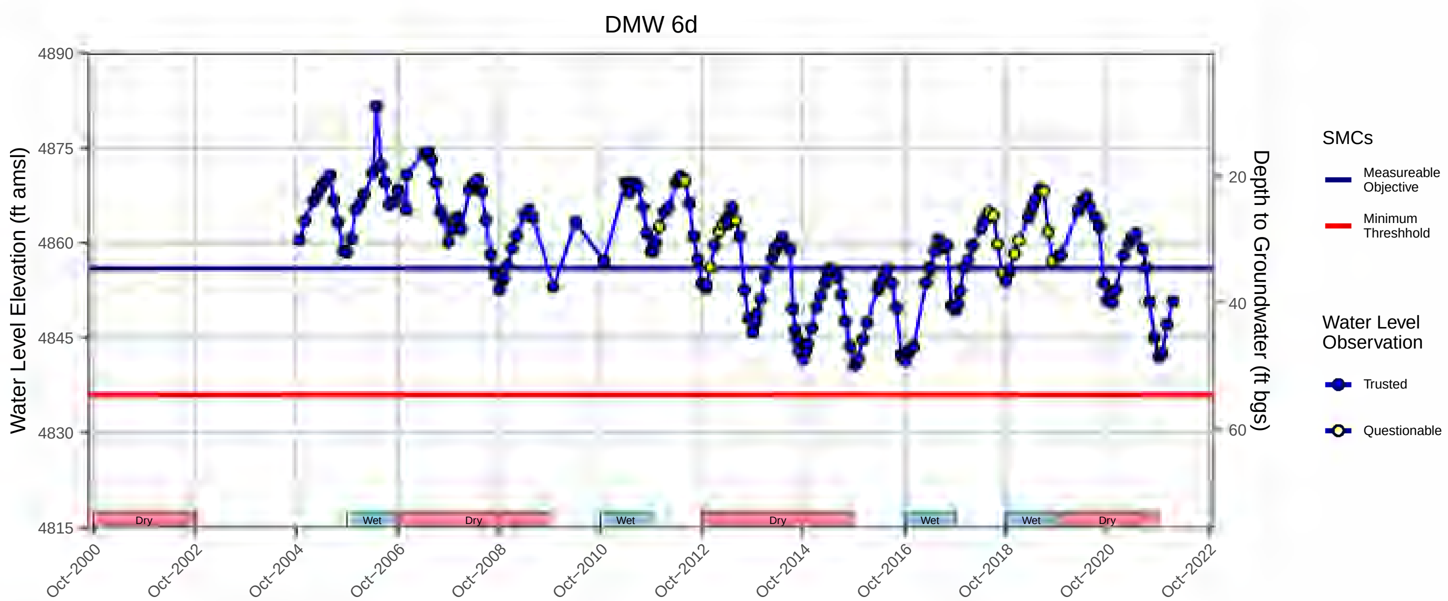
Water Level Elevation (ft amsl)
Depth to Groundwater (ft bgs)
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable
Dry
Wet
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022

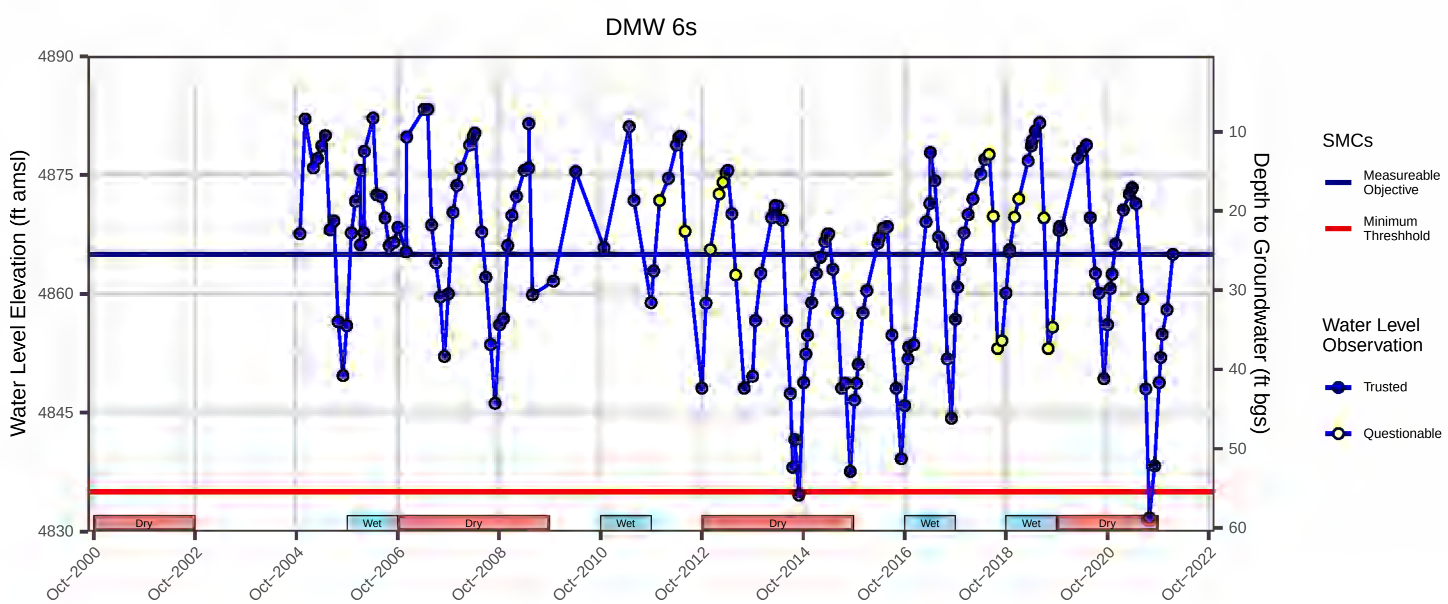

DMW 4i
Water Level Elevation (ft amsl)
Depth to Groundwater (ft bgs)
4900
4890
4880
4870
4860
30
40
50
60
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable


DMW 4s
Water Level Elevation (ft amsl)
Depth to Groundwater (ft bgs)
4910
4900
4890
4880
10
20
30
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable


DMW 5d
Water Level Elevation (ft amsl)
Depth to Groundwater (ft bgs)
5020
5010
5000
4990
4980
0
10
20
30
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable
Artesian


DMW 5s
Water Level Elevation (ft amsl)
Depth to Groundwater (ft bgs)
5010
5005
5000
4995
4990
5
10
15
20
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable


DMW 6d
Water Level Elevation (ft amsl)
Depth to Groundwater (ft bgs)
4890
4875
4860
4845
4830
4815
20
40
60
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable


DMW 6s
Water Level Elevation (ft amsl)
Depth to Groundwater (ft bgs)
4890
4875
4860
4845
4830
10
20
30
40
50
60
Dry
Wet
Dry
Wet
Dry
Wet
Wet
Dry
Oct-2000
Oct-2002
Oct-2004
Oct-2006
Oct-2008
Oct-2010
Oct-2012
Oct-2014
Oct-2016
Oct-2018
Oct-2020
Oct-2022
SMCs
Measureable Objective
Minimum Threshhold
Water Level Observation
Trusted
Questionable









Groundwater Sustainability Agencies Contact Information

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