

Borrego Springs Watermaster
Board of Directors Meeting
February 19, 2025
AGENDA ITEM V.D

To: Board of Directors
From: Lauren Salberg, Associate Geologist, West Yost
Date: February 14, 2025
Subject: Semi-Annual Report of Groundwater Level and Quality Results for the Borrego Springs Subbasin: Fall 2024

Recommended Action **Provide Direction to Staff** **Information and Discussion**
 Fiscal Impact **Cost Estimate**

Recommended Action

Board discussion

Fiscal Impact: None.

Background and Previously Related Actions by the Board

On April 6, 2023, the Watermaster adopted an updated [Groundwater Monitoring Plan for the Borrego Springs Subbasin](#) (GWMP) that defined (1) the wells included groundwater monitoring network and (2) the actions and schedule to fill data gaps and improve monitoring documentation and reporting protocols. Generally, the main objectives of the monitoring program are to collect the data that can be used to:

- Demonstrate progress toward meeting the Sustainability Goal of the Groundwater Management Plan (GMP), which is to ensure that by 2040 the Subbasin is operated within its Sustainable Yield without causing Undesirable Results. The main Undesirable Results to be avoided are the significant and unreasonable occurrences of the following Sustainability Indicators¹: chronic lowering of groundwater levels; reduction in groundwater storage; and degradation of groundwater quality.
- Inform adaptive management to achieve the Sustainability Goal.
- Improve the Borrego Valley Hydrologic Model (BVHM) in a cost-effective manner that offers the most benefit for the resources expended.

¹ "Sustainability Indicator" refers to any of the effects caused by groundwater conditions occurring throughout the Basin that, when significant and unreasonable, cause undesirable results (California Water Code Section 10721(x)).

To demonstrate progress towards sustainability, the monitoring program data is used to track and monitor specific parameters relative to Minimum Thresholds² for the relevant Sustainability Indicators for the Basin. The GMP identified a subset of the wells in the monitoring program as Representative Monitoring Wells to assess groundwater conditions within the three management areas of the Basin (North, Central, and South)³.

Monitoring is performed semi-annually in the spring and fall of each year by Watermaster staff and the Borrego Water District. Wells in the groundwater-quality monitoring program are sampled for the parameters listed in the following table. The five constituents of concern (COCs) identified in the GMP are total dissolved solids (TDS), nitrate, arsenic, sulfate, and fluoride. The remaining parameters are monitored to assist in source water characterization and general water quality characterization.

Groundwater Quality Monitoring Program: Water Quality Parameters	
Alkalinity (including bicarbonate and carbonate)	Nitrite
Arsenic	Magnesium
Calcium	Potassium
Chloride	Sodium
Fluoride	Sulfate
Nitrate	Total dissolved solids

This report summarizes the most recent semi-annual event that occurred in October 2024. This report includes:

- A description of the groundwater-level and groundwater-quality monitoring networks as of fall 2024.
- A summary of the activities that occurred during the fall 2024 event.
- Characterization of the data collected during the fall 2024 event, including:
 - Comparison of groundwater-level data at the Representative Monitoring Wells against Minimum Thresholds.
 - Time-series charts of groundwater-level data at all wells monitored in fall 2024 (showing entire period of historical data at each well).
 - Spatial distribution maps of groundwater-quality results for the five COCs at all wells sampled in fall 2024.
 - Time-series charts of groundwater-quality at all wells monitored in fall 2024 (showing entire period of historical data at each well).

² Minimum Thresholds are quantitative values that represent the groundwater conditions at a Representative Monitoring Well that, when exceeded individually or in combination with Minimum Thresholds at other monitoring sites, may cause an Undesirable Result(s) in the Basin.

³ The GMP identifies representative monitoring wells for groundwater-levels only. For groundwater-quality, this report shows results for all wells monitored.

Status of Groundwater Monitoring Network

Table 1 lists wells in the groundwater-level and groundwater-quality monitoring programs. It details the local or alias⁴ well name, State Well ID, well use (if known), type of monitoring performed, and, if applicable, the reason(s) why a sample or measurement was not collected during fall 2024. Wells in the groundwater-level monitoring network and the groundwater-quality monitoring network are shown on Figures 1 and 2, respectively.

Of the wells in the monitoring programs, some are strictly observation wells (no pumping), while others are used to pump groundwater for municipal, recreation (e.g., golf courses), and other purposes. As shown in Table 1, the monitoring network currently consists of 62 groundwater wells. Of the 62 wells in the network:

- 53 wells are monitored for groundwater-levels. Figure 1 shows the locations of the wells that are currently or have recently been in the groundwater-level monitoring network. Of these 53 wells:
 - 33 wells have groundwater-level measurements collected manually in the spring and fall of each year.
 - 20 wells have groundwater-level measurements collected at a high frequency interval (15 minutes to 1 hour) using a pressure transducer with an integrated data logger. Manual water level measurements are also collected semi-annually at these wells while the transducer data is downloaded.
- 39 wells are monitored for groundwater-quality. Figure 2 shows the locations of the wells that are currently in the groundwater-quality monitoring network. Of these 39 wells:
 - 10 wells are wells used for drinking water.
 - 21 wells are non-potable wells used for agricultural and recreation irrigation, and other purposes (not used for drinking water).
 - 8 wells are dedicated monitoring wells.

Summary of Fall 2024 Groundwater Monitoring Event

The fall 2024 semi-annual monitoring event took place from October 27 to 31, 2024, and included the following activities:

- Groundwater-level measurements at 52 of the 53 wells, including:
 - Manual measurement of depth to groundwater and download of data loggers at all 20 wells equipped with transducers.⁵ Notable outcomes included:

⁴ Due to data confidentiality agreements, some wells in the groundwater monitoring program are not identified by name or owner. Instead, they are assigned anonymous names based on their relative location in the Management Area.

⁵ Additionally, the barologger installed in the BSR 6 well was downloaded. The barologger data is used to compensate transducer measurements taken at surrounding wells for variations in barometric pressure.

- New transducers were installed at RH-1, RH-2, and RH-6 to replace units with faulty timing settings. Groundwater-level measurements were extracted and processed from these new units.⁶
- Manual measurement of depth to groundwater at 32 of the 33 wells. Notable outcomes included:
 - One well, Airport 2, could not be monitored due to a collapsed casing, preventing groundwater level measurements since fall 2023. If it is not feasible to conduct a well rehabilitation, the Airport 2 well should be removed from the groundwater-level monitoring program. Given that this well is a Representative Monitoring Well, a replacement will need to be selected. These options will be explored as part of the 5-year GMP Assessment.
- Water quality grab samples were collected at 37 of 39 wells. Notable outcomes include:
 - Two wells were sampled for the first time in fall 2024: ID5-15 and a private well (NMA-7) in the North Management Area. These wells have been added to the groundwater quality monitoring program.
 - A water quality sample was not collected at the Fortiner well due to pump maintenance activities during the sampling event.
 - A water quality sample was not collected at the Terry Well due to the inability to contact the well owner after multiple attempts to confirm permission to collect a sample. Watermaster staff will try to reach out to the well owner prior to the next monitoring event but may need help from the community to see if the owner is still in town.

Expansion of Groundwater Monitoring Network

The GWMP identified and recommended areas for additional monitoring to improve the monitoring programs. Filling these data gaps and expanding the groundwater monitoring networks will improve the understanding of the hydrogeology of the Basin by collecting additional information on seasonal and long-term trends in groundwater quality, the effects of recharge and GMP implementation on groundwater flow and quality, and the depth distribution of groundwater quality, groundwater elevation, groundwater-flow directions, and hydraulic gradients in the North Management Area and the Central Management Area. Figure 3 shows the data gaps that have been filled or remain unfilled as a result of the efforts to date to expand the water-level and water-quality monitoring network.

To implement the recommended improvements to the groundwater monitoring network, the GWMP identified three primary methods to add a well to the monitoring network, which include: (i) using an existing pumping well, (ii) converting an abandoned or inactive well into a monitoring, and (iii) constructing a new monitoring well. Expanding the groundwater monitoring network during the first two years of implementation of the GWMP is focused on (i) using existing wells in the Basin and (ii) converting inactive/abandoned wells into monitoring wells.

⁶ The malfunctioning transducers were factory reset and are now kept as backups for the monitoring program.

Since adoption of the GWMP, the Watermaster has made efforts to expand the groundwater monitoring networks with an emphasis on identifying existing active and inactive/abandoned wells in the Basin that could be incorporated into the monitoring network. Efforts included:

- Engaged with the public and Basin pumpers to solicit interest from well owners in participating in the monitoring program and/or to identify wells that may be a good candidate for filling a monitoring gap.
- Performed a desktop assessment of all candidate wells that could be added to the monitoring networks to evaluate which wells are most appropriate to add.
- Collected well construction information on candidate wells and added the information to the Watermaster's database.
- Performed site visits to candidate wells to evaluate the current condition of the wells.
- Executed entry and data confidentiality agreements with well owners.

During the fall 2024 monitoring event, Watermaster performed site visits to evaluate five abandoned wells for potential inclusion in the monitoring program. Table 2 lists details on these wells by management area, including their alias names, uses, statuses (inactive or actively pumping), any required securing or conversion activities before they can be added to the monitoring network, the specific monitoring network they are being considered for, and whether a sample or measurement was collected during fall 2024. Additionally, Figure 3 illustrates the locations of the wells evaluated in relation to the areas recommended for additional monitoring.

If the securing and/or conversion activities proceed as planned, then all five wells evaluated will be added to the groundwater-level monitoring program in 2025. Groundwater-level measurements were taken at two of these wells, NMA-5 and CMA-3. The measurements for these two wells are plotted in the groundwater-level time-series included in Appendix A.

Fall 2024 Groundwater Monitoring Results

The following tables and figures were prepared to summarize and analyze the results of the fall 2024 monitoring event, including from wells in the groundwater-level and groundwater-quality monitoring programs and wells evaluated in fall 2024 for potential future inclusion in the monitoring program. Well owners were provided the groundwater quality results and given the opportunity to meet with Watermaster Staff to discuss them.

Table 3 – Current Groundwater Elevations at Representative Monitoring Wells Compared to Minimum Threshold. For each well, this table lists the groundwater elevation in fall 2024, the Minimum Threshold⁷, and the difference between the fall 2024 groundwater elevation and Minimum

⁷ As defined in the GMP, the Minimum Threshold for water levels is expressed as the maximum allowable decline in groundwater levels from the beginning of the Physical Solution implementation through 2040. Watermaster staff converted the decline into an elevation for comparison to current elevations.

Threshold.⁸ If the difference is positive, current elevations are above the Minimum Threshold. **Table 3 shows that groundwater-levels are above the Minimum Thresholds at all Representative Monitoring Wells.**

Table 4 – Groundwater Level Trends at Representative Monitoring Wells – Fall 2019 to Fall 2024. For each well, the table lists the groundwater elevation in fall 2019 (i.e., the start of Physical Solution implementation period in WY 2020), the groundwater elevation in fall 2024, the change in groundwater-level, the rate of change in groundwater level from fall 2019 to fall 2024, and the historical groundwater-level trend (average decline in feet per year prior to fall 2019). Table 4 shows that since fall 2019:

- Groundwater levels decreased at all 16 Representative Monitoring Wells, ranging from -0.9 to -14.7 feet.
- **Generally, the rate of decline in groundwater-levels at the Representative Monitoring Wells is slowing compared to historical rates of change.** However, three wells (ID4-4, ID4-11, and Air Ranch) exhibited an increase in the rate of groundwater-level decline compared to the historical rate of change. This observation is consistent with observations from prior monitoring events.

Figures 4a – 4p – Groundwater Level and Sustainable Management Criteria at Representative Monitoring Wells. For each well, these time-series charts show historical groundwater elevations prior to the start of GMP implementation, groundwater elevations since the start of GMP implementation (i.e., fall 2019), and the Minimum Threshold. Figures 4a-4p show static groundwater elevations, which are groundwater levels in an aquifer under non-pumping conditions. In some cases, wells are equipped with high-frequency transducer data and capture groundwater elevations during groundwater pumping at the well, or a nearby well. Pumping groundwater elevations show fluctuations in groundwater levels due to pumping, including drawdown (groundwater level declines due to water being removed from the aquifer) and recovery (groundwater level increases once pumping ends). To display static groundwater elevations for active pumping wells ID4-18, ID4-11, ID5-5, ID1-12, ID1-16, and RH-1 (Figures 4-b, 4-f, 4-i, 4-j, 4-k, and 4-o), the high-frequency transducer data has been screened to remove groundwater elevations influenced by groundwater pumping at the well. Groundwater

⁸ In its work to prepare the five-year assessment of the GMP and perform modeling for the Redetermination of Sustainable Yield, Watermaster staff determined that there are problems with some of the Sustainable Management Criteria (SMCs) established in the GMP—specifically the Measurable Objectives (MOs) and Minimum Thresholds (MTs) for groundwater levels—for a number of wells in the Basin. Staff is still trying to understand and work out the details of the various methods used at each well to establish the MOs and MTs, but at this time it's clear there are at least a couple problems with the SMCs: (1) at some Representative Monitoring Wells, the MT elevations are higher than the MO elevations, which is not logical, and (2) the simulation of future pumping in the South Management Area did not accurately reflect planned pumping under the Rampdown—specifically, it appears no pumping was assumed in the future and thus any SMCs based on the model projections do not represent reasonable operational flexibility. Given that Watermaster is in the process of updating and recalibrating the groundwater model (the BVHM), including plans to simulate new future scenarios of pumping under the Rampdown and Redetermined Sustainable Yield, the plan is to use the improved model and projections to update all SMCs for groundwater elevations and estimate of groundwater in storage in the Basin. For the purpose of this report, groundwater levels are only compared to MTs, with the understanding that the SMCs will be evaluated and changed, as appropriate, when the modeling work is completed (by March 31, 2025).

elevations were also screened for monitoring well MW-3 (Figure 4-l), in which the lowest groundwater elevations occur when a nearby pumping well (ID1-8) is in operation. The groundwater elevations that occur while the wells are pumping, or influenced by pumping, are not representative of “true static” groundwater conditions and, therefore, are not intended to be compared to Minimum Thresholds. **Figures 4a-4p show that groundwater-levels are above the Minimum Thresholds at all Representative Monitoring Wells.**

Table 5 – Water Quality Standard Exceedance Report. This table lists all groundwater-quality sample results that exceeded a California or EPA drinking water standard (e.g., California Maximum Contaminant Level [MCL]) for the constituents tested during the fall 2024 monitoring event. For each well with a water quality standard exceedance, the table lists: the well owner, well name, well use (e.g. public supply, non-potable irrigation, or observation), the water quality parameter(s) exceeded, the date of the water quality sample, the fall 2024 parameter concentration, and the water quality standard. Notable results included:

- Amongst the wells sampled in the groundwater-quality monitoring program, the COC concentrations that exceeded water-quality standards were generally similar to past results, with the exception of six wells in the South Management Area that exceeded the MCL for arsenic, which is double the number of wells with an exceedance in past monitoring events.
- Recent results from MW-5A and MW-6S show variability that is not characteristic for the Basin. The variability is due to differences in sampling depth between monitoring events. Watermaster staff will review the sampling results and define the optimal sampling depth for each well at future monitoring events to better enable tracking of trends. It should be noted that all the results are valuable in that they show where there is stratification of constituent concentrations at depth.

Table 6 - Summary of Exceedances of Water Quality Standard by Standard Type and Well Type. This table summarizes the number of water-quality results that exceeded a California or EPA drinking water standard by well type (i.e. drinking water, non-potable, or observation well).

The groundwater-quality results from the Fall 2024 monitoring program indicate:

- 17 wells exceeded the lower limit of the secondary MCL for TDS (500 mg/L)
- 2 wells exceeded the upper limit of the secondary MCL for TDS (1,000 mg/L)
- 12 wells exceeded the secondary MCL for sulfate (250 mg/L)
- 5 wells exceeded the MCL for nitrate (10 mg/L)
- 1 well exceeded the secondary MCL for Fluoride (2 mg/L)
- 6 wells exceeded the MCL for Arsenic (0.01 mg/L)

Figures 6 through 10. These figures characterize groundwater-quality for the five COCs constituents of concern identified in the GMP: TDS, nitrate, arsenic, sulfate, and fluoride. Each figure includes:

- A map that illustrates the spatial distribution of water quality concentrations at all wells sampled in fall 2024.
- Time-series charts of historical concentration trends at selected wells in each of the Management Areas to demonstrate the range of concentrations observed at select wells with long records of groundwater-quality results.

Appendix A (A-1 through A-55). These figures show time-series charts of the historical groundwater elevation data for all 53 wells in the groundwater level monitoring network and the two wells evaluated for inclusion in the monitoring network in fall 2024. Appendix A is available as a handout only – to access click on this [LINK](#) or visit the Meetings page of the Watermaster’s website

Appendix B (B-1 through B-195). This appendix includes time-series charts of the five constituents of concern for all 39 wells in the groundwater-quality monitoring network (arsenic, TDS, sulfate, fluoride, and nitrate). The primary or secondary MCLs for drinking water quality standards for each constituent are also plotted on each chart. The figures also identify the general well location and the total depth, and screened interval of the well. Appendix B is available as a handout only – to access click on this [LINK](#) or visit the Meetings page of the Watermaster’s website.

Enclosures

Figure 1. Groundwater-Level Monitoring Network (Fall 2024)

Figure 2. Groundwater-Quality Monitoring Network (Fall 2024) Program

Figure 3. Groundwater Wells Evaluated in Fall 2024 for Expansion of the Monitoring Network

Figures 4a – 4p. Groundwater Level and Sustainable Management Criteria at Representative Monitoring Wells

Figure 5. TDS in Groundwater

Figure 6. Nitrate in Groundwater

Figure 7. Arsenic in Groundwater

Figure 8. Sulfate in Groundwater

Figure 9. Fluoride in Groundwater

Table 1. Groundwater Level and Quality Monitoring Network and Wells Monitored in Fall 2024

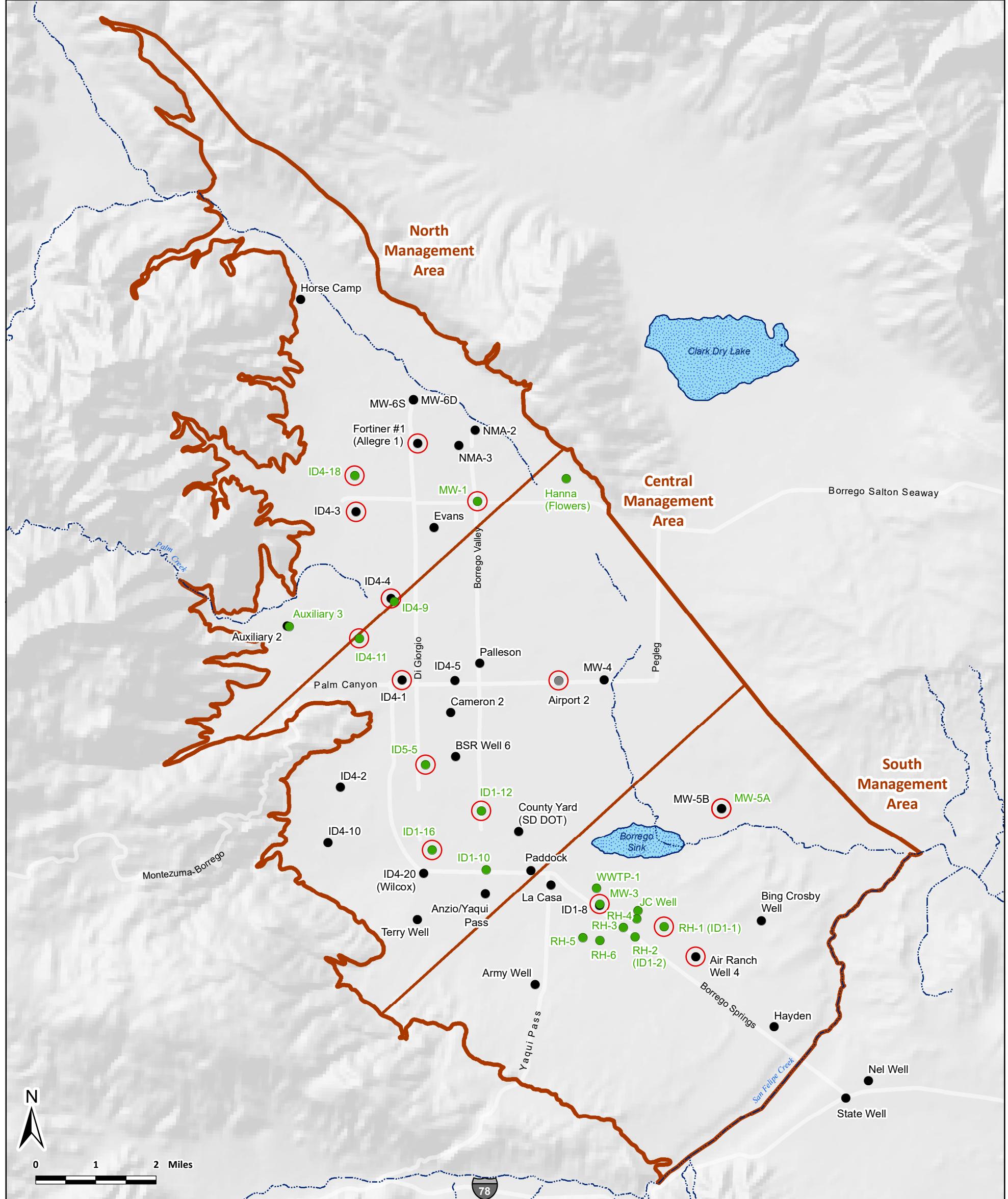
Table 2. Groundwater Wells Evaluated in Fall 2024 for Expansion of Monitoring Network

Table 3. Current Groundwater Elevations at Representative Monitoring Wells Compared to Minimum Thresholds

Table 4. Groundwater Level Trends at Representative Monitoring Wells - Fall 2019 to Fall 2024

Table 5. Water Quality Standard Exceedance Report – Fall 2024

Table 6. Summary of Exceedances of Water Quality by Standard and Well Type



Groundwater-Level Monitoring Network

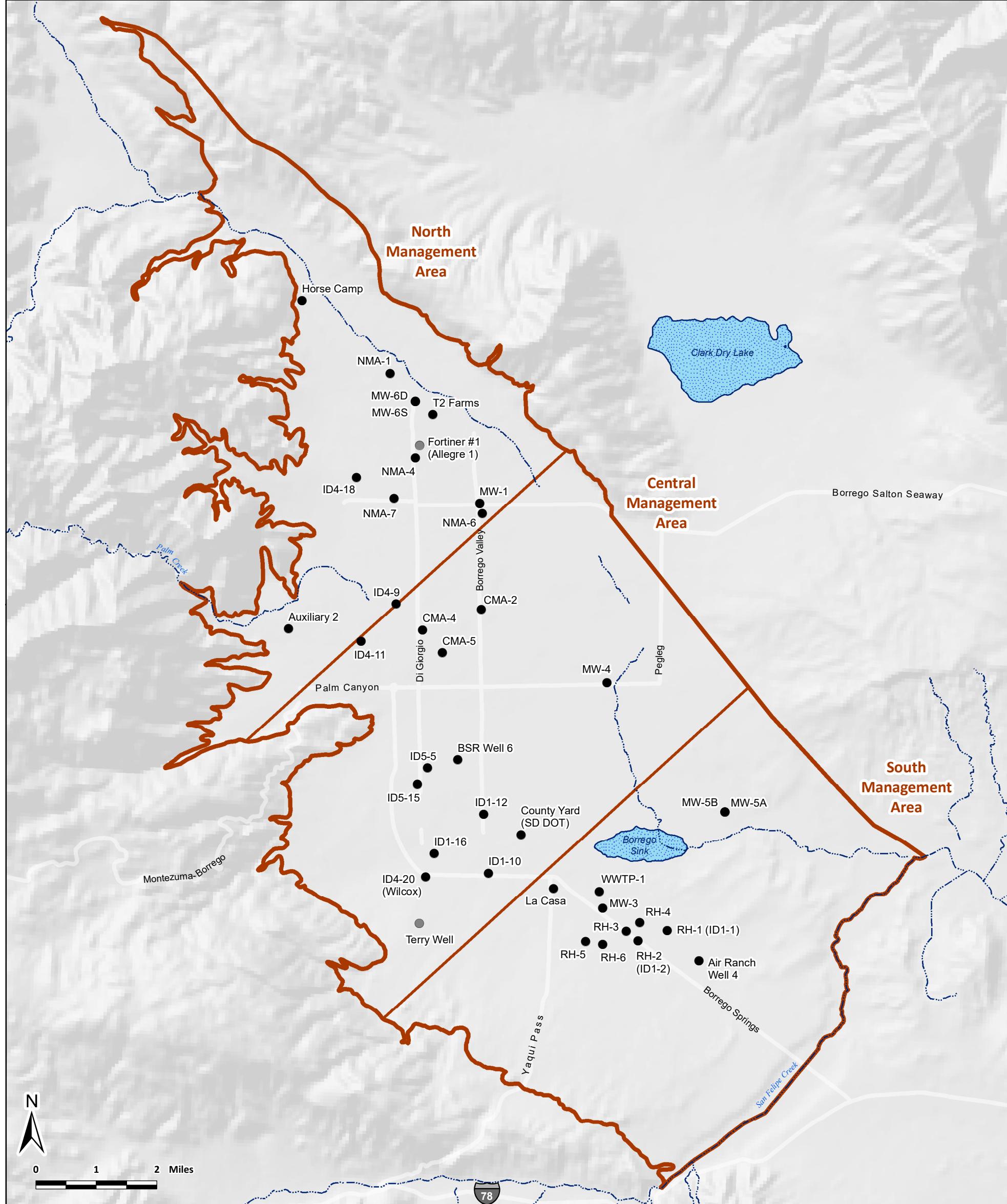
○ Representative Monitoring Site

■ Borrego Springs Subbasin with Management Area Divisions

Wells Monitored for Groundwater Level in Fall 2024

- Manual Water-Level Data
- Transducer Water-Level Data
- Unable to Measure Water-Level





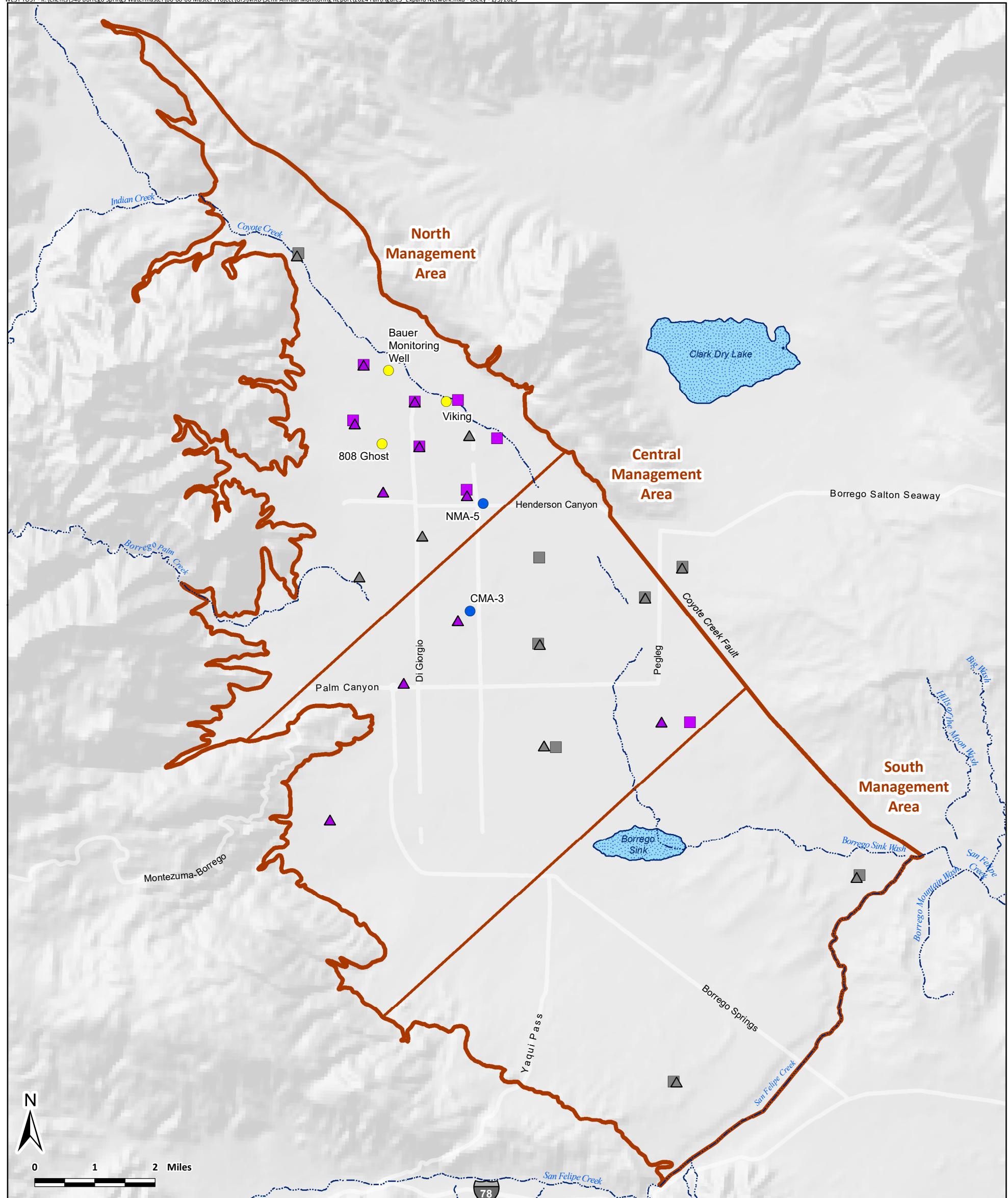
Groundwater-Quality Monitoring Network - Fall 2024

- Well Sampled for Water Quality
- Unable to Sample Well for Water Quality

- Borrego Springs Subbasin with Management Area Divisions



Borrego Springs Watermaster
Groundwater Monitoring Plan



Groundwater Wells Evaluated in Fall 2024 for the Ground-Level Monitoring Network

- Depth to Water Measured
- Depth to Water not Measured

Area of Recommended Additional Water-Quality Monitoring

- ▲ Filled
- △ Not Filled

Area of Recommended Additional Water-Level Monitoring

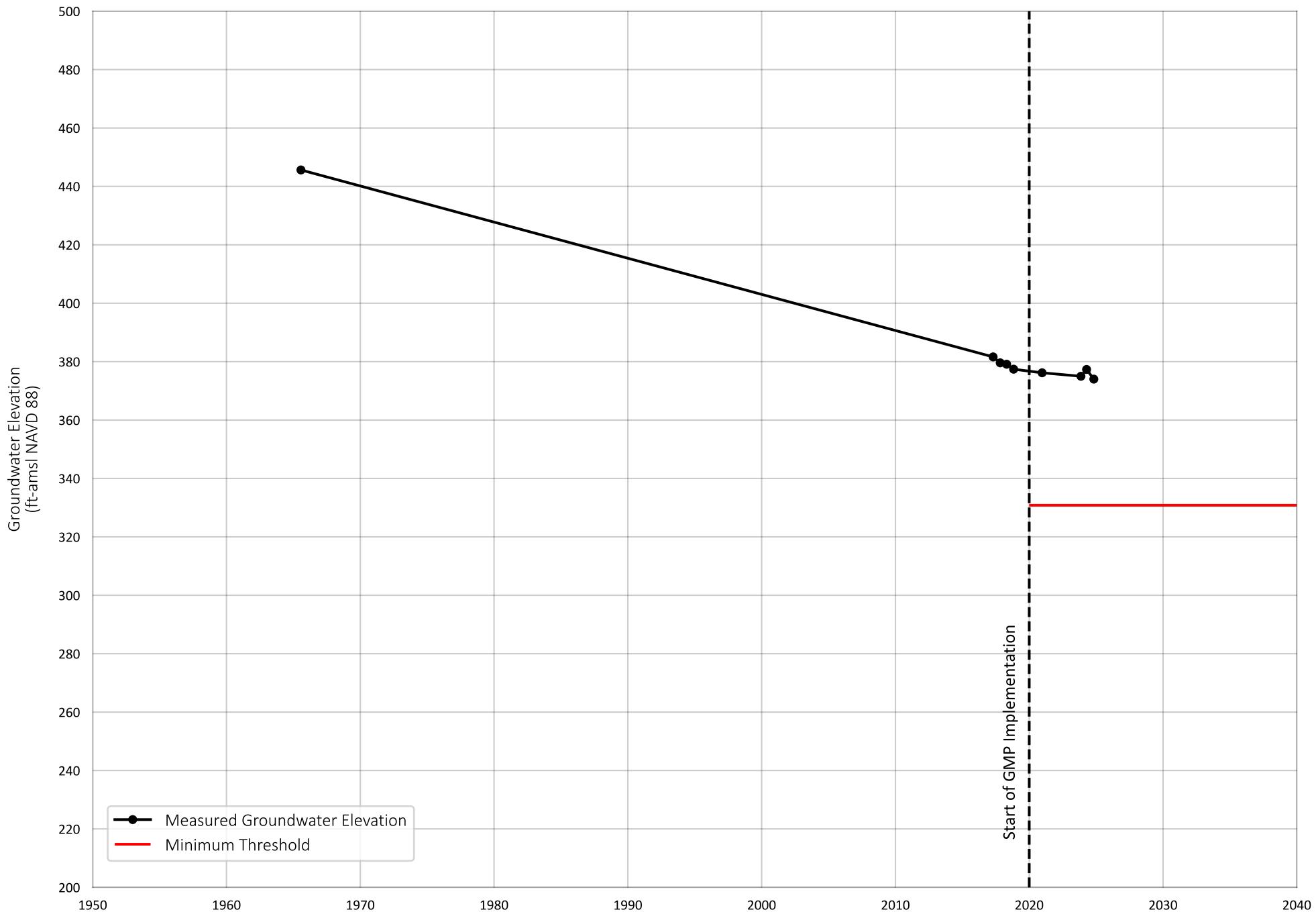
- Filled
- Not Filled

Other Features

- Borrego Springs Subbasin with Management Area Divisions



Borrego Springs Watermaster

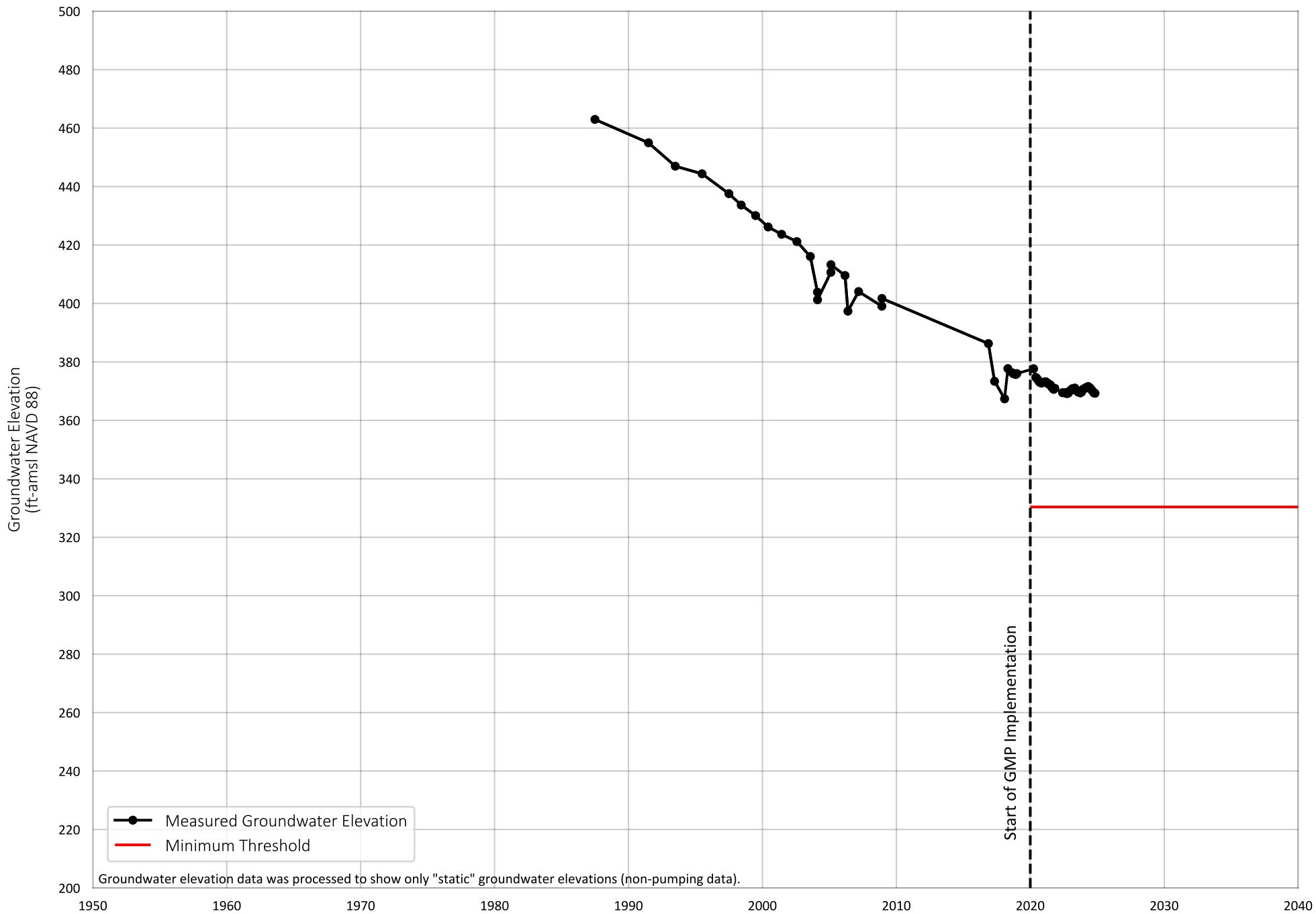


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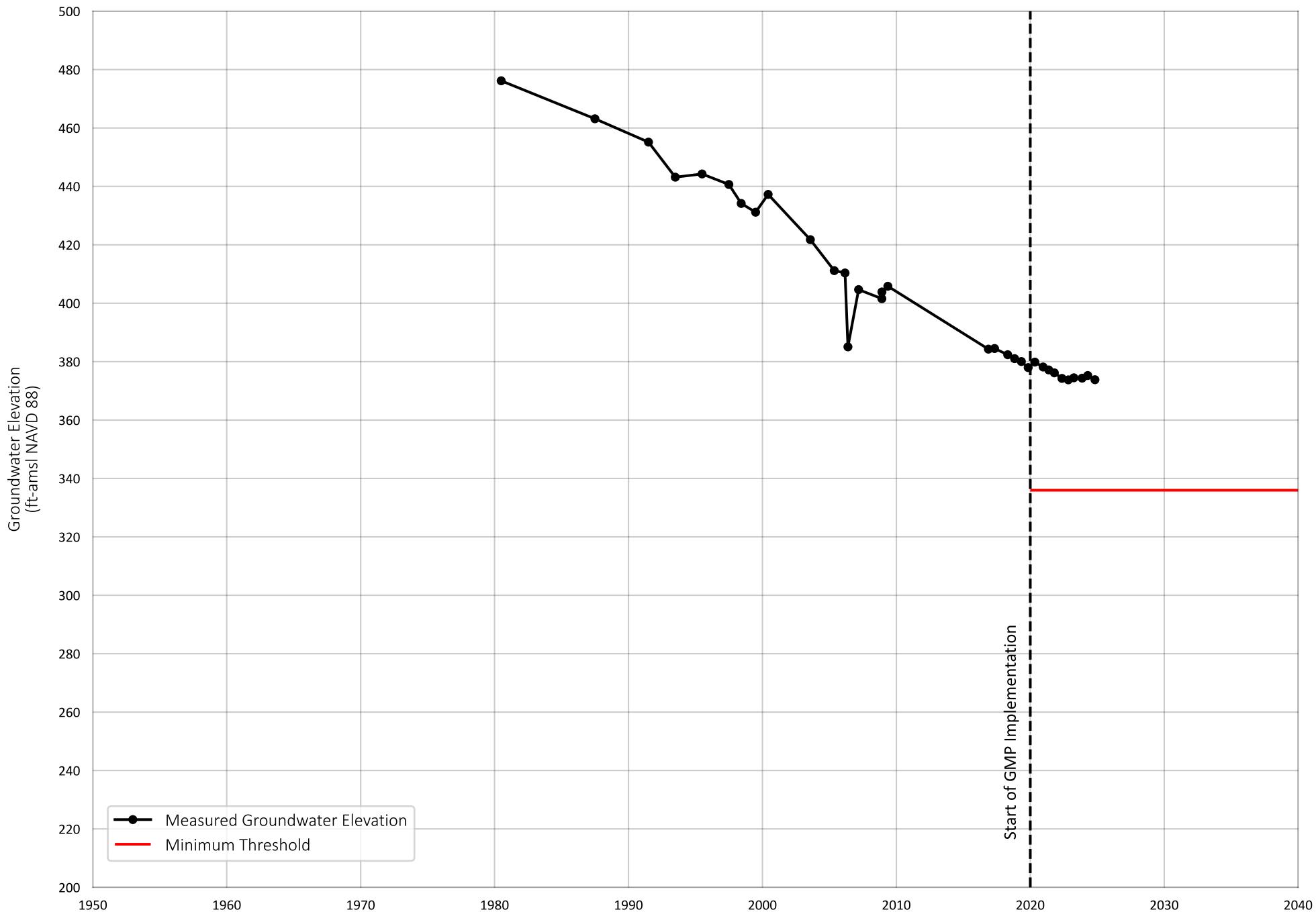


Figure 4-a

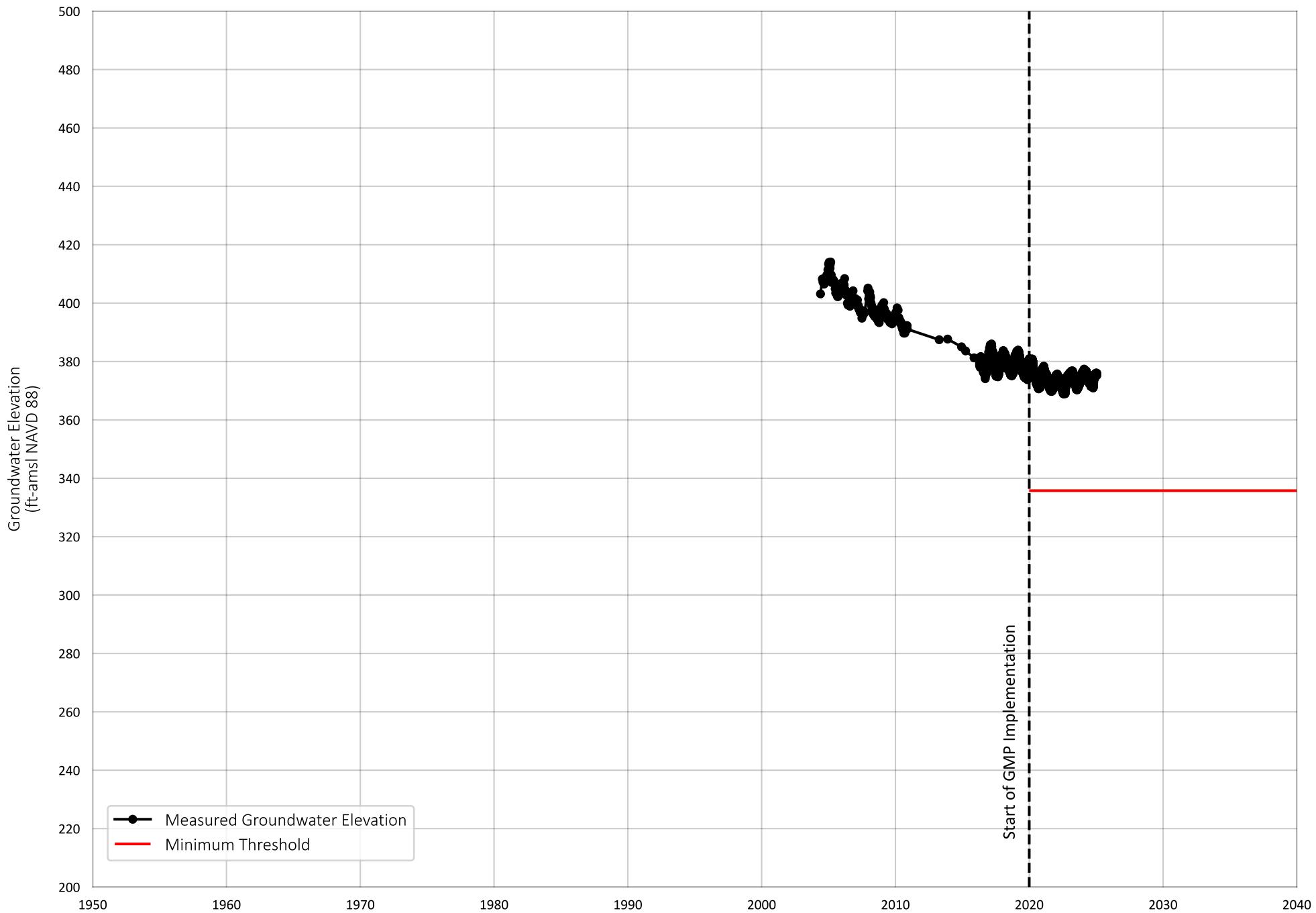
Groundwater Level and Sustainable Management Criteria
at Representative Monitoring Well Fortiner #1 (Allegre 1)



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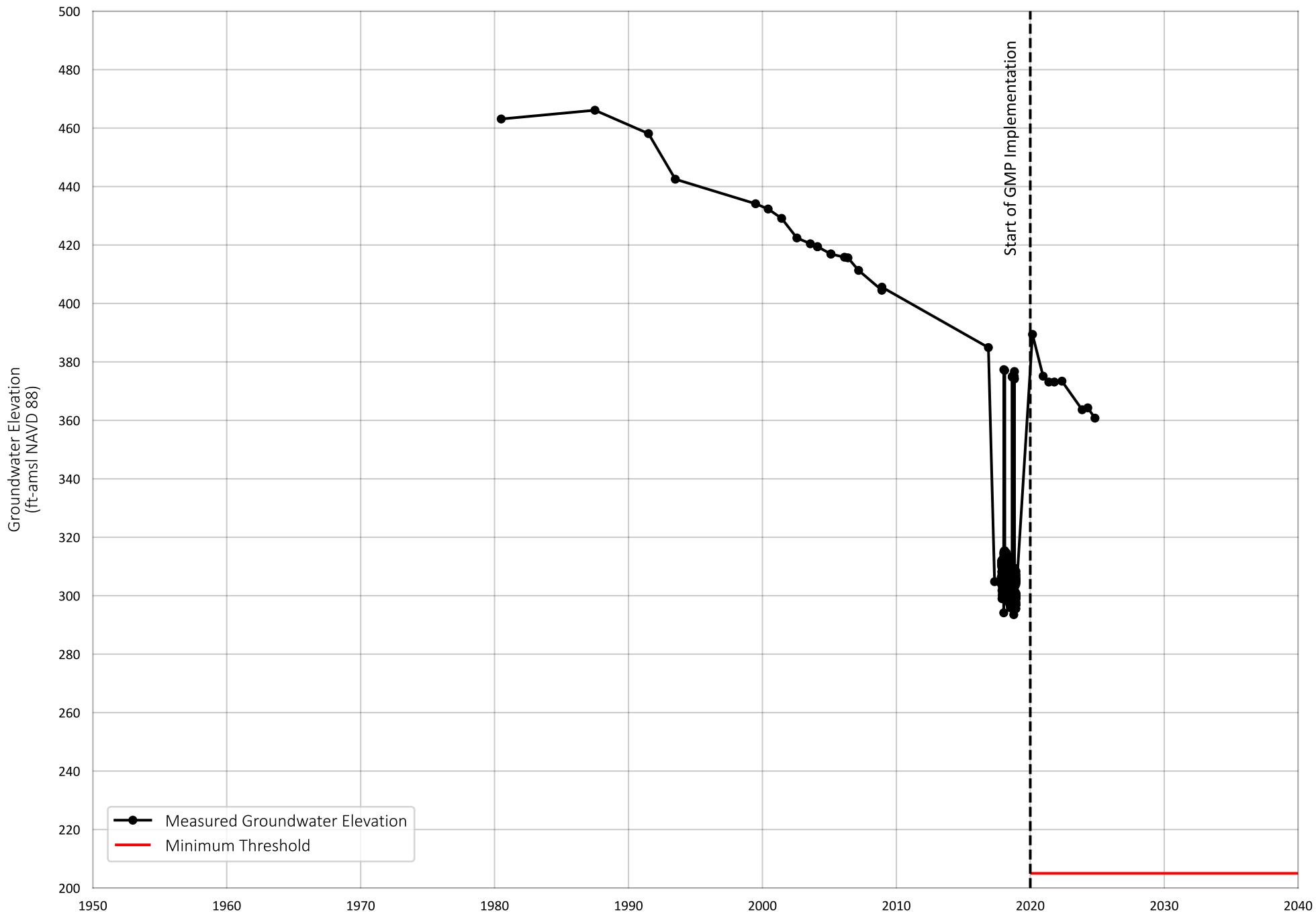


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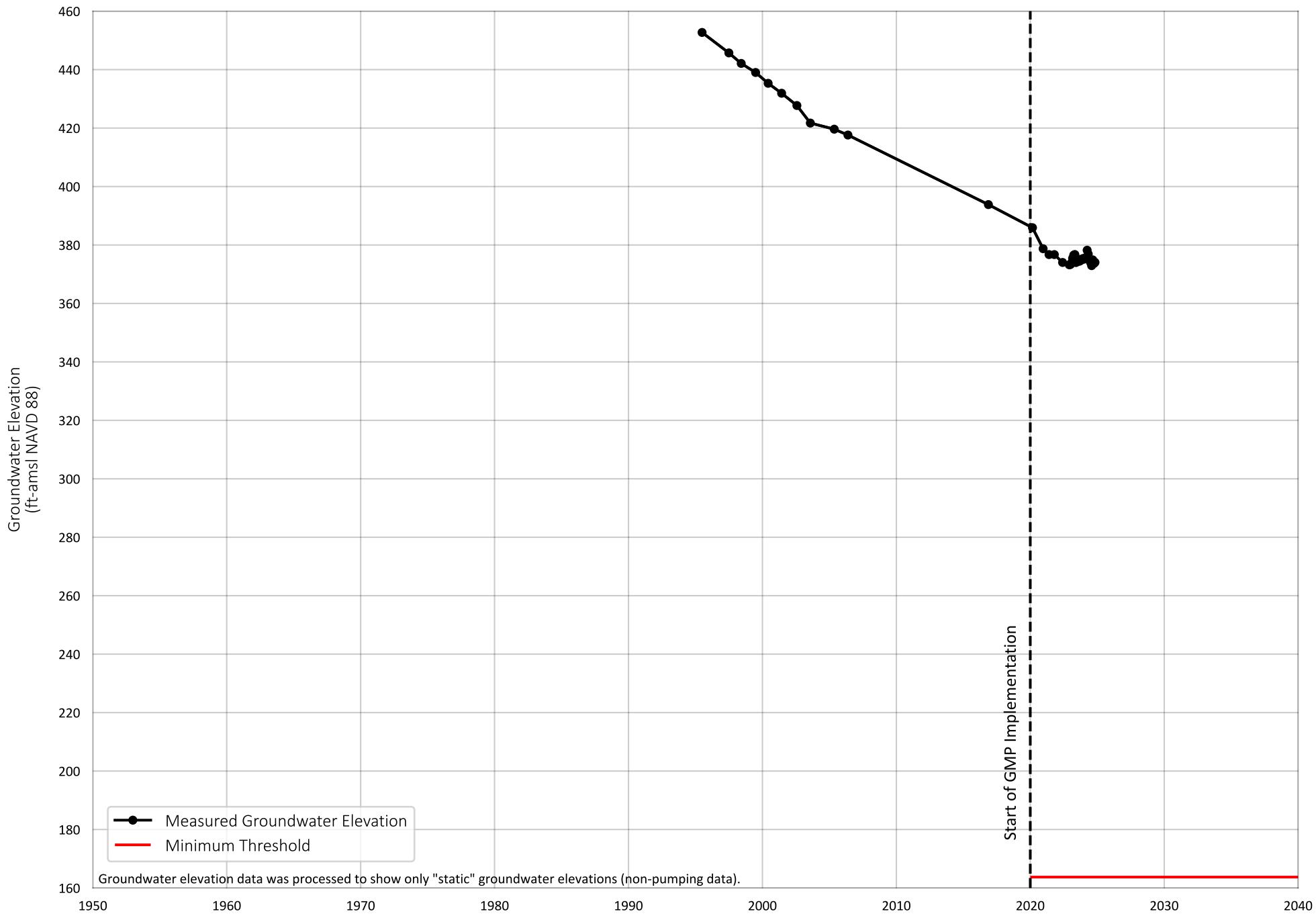


Figure 4-d

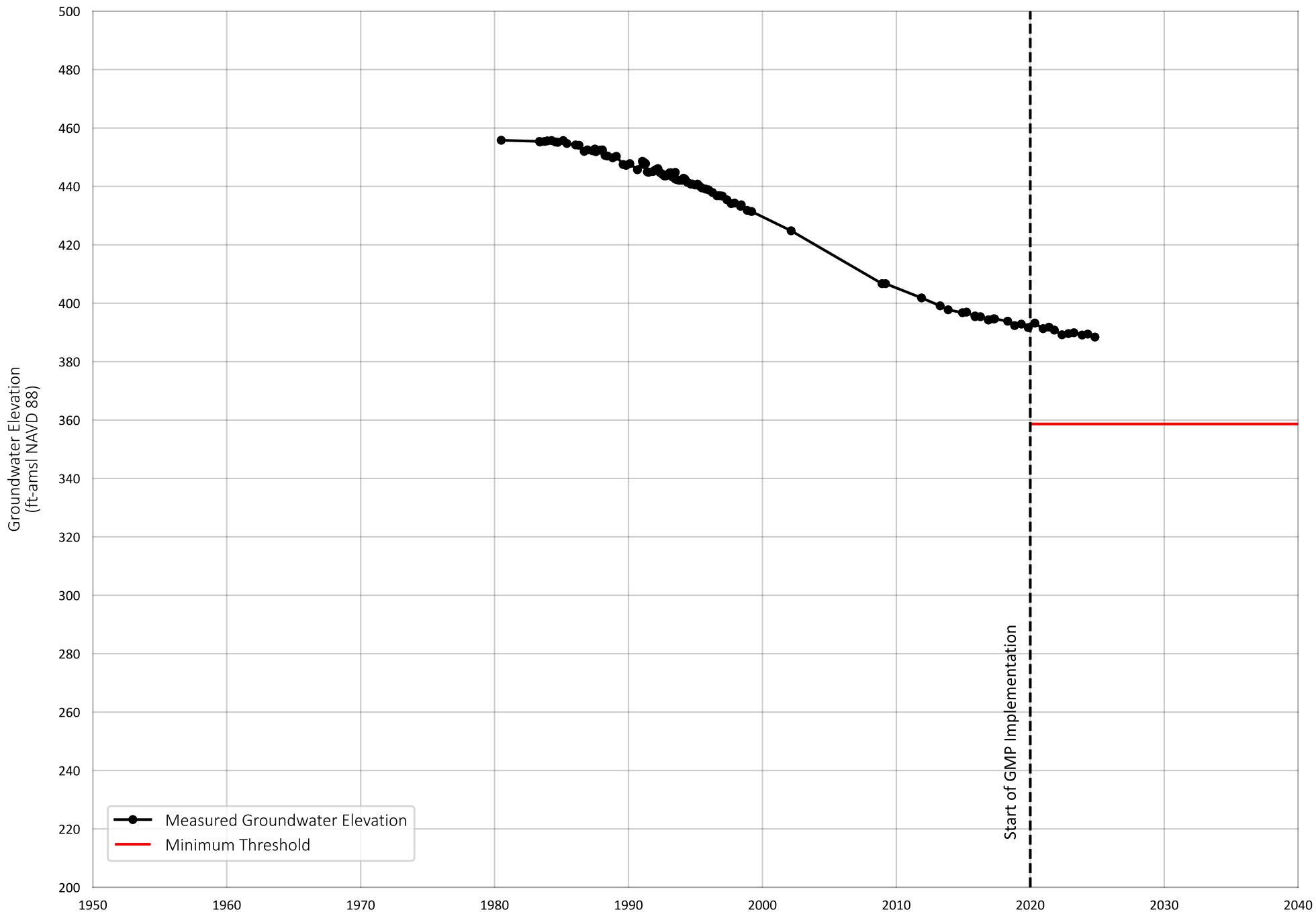
Groundwater Level and Sustainable Management Criteria
at Representative Monitoring Well MW-1



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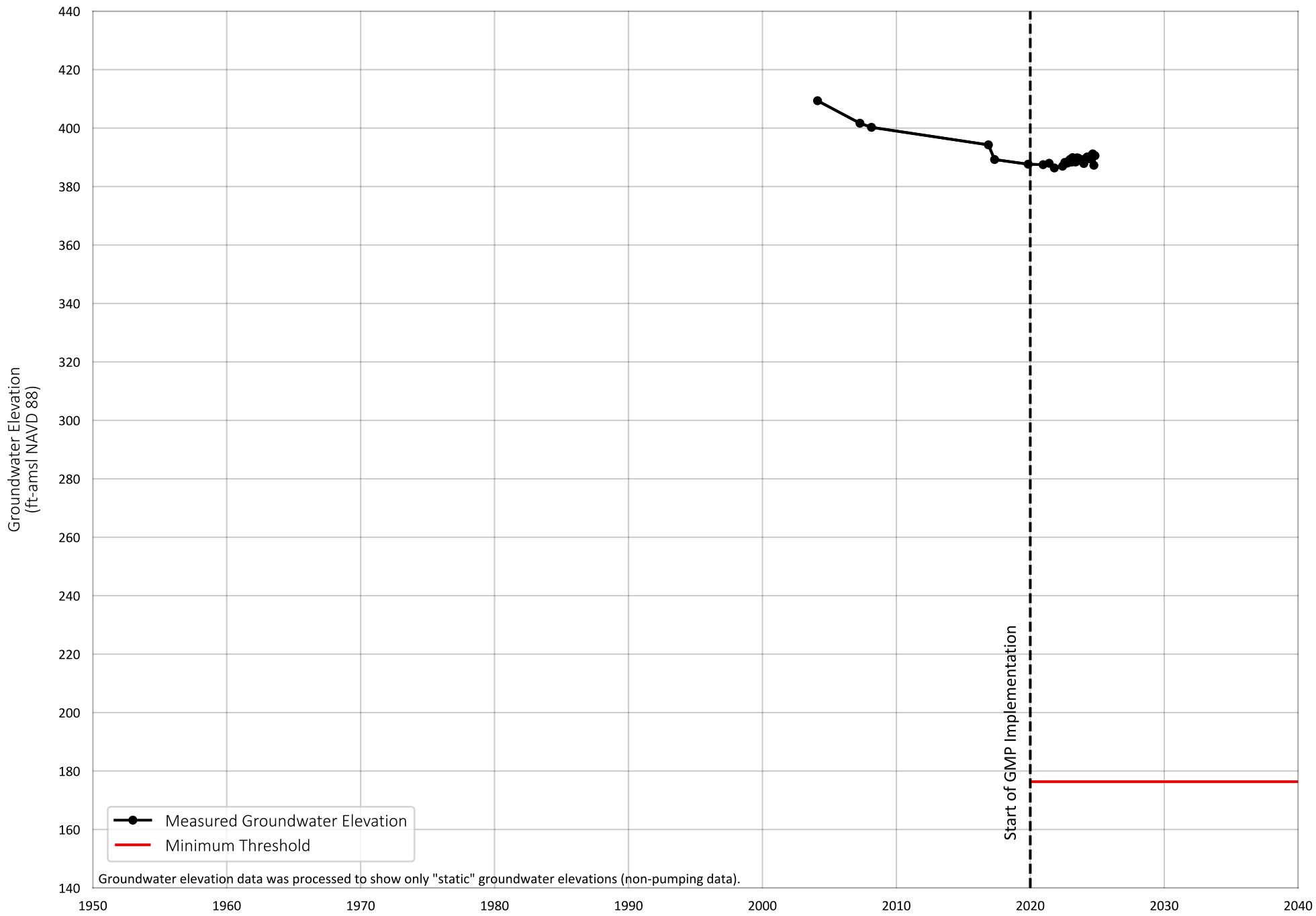
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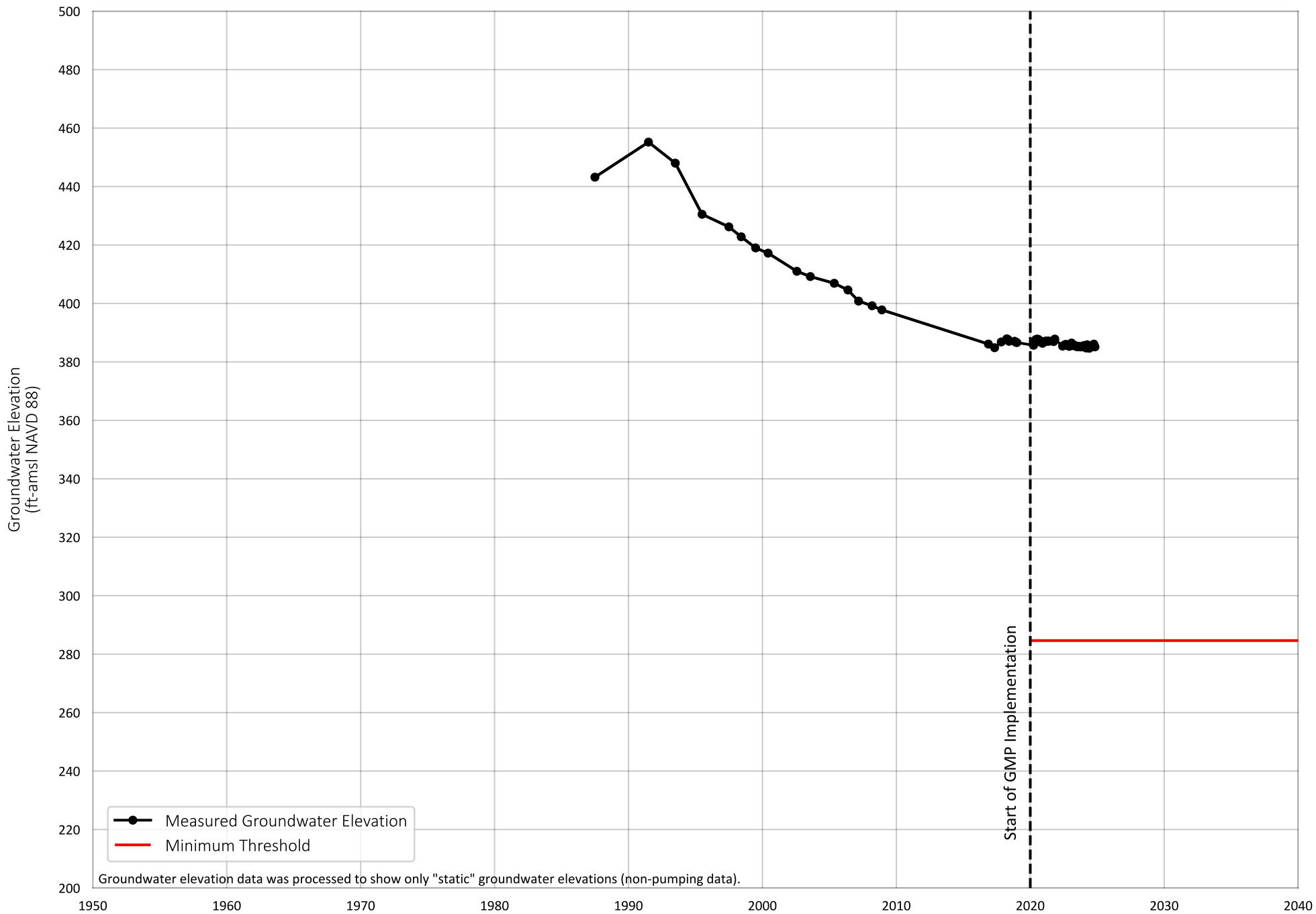
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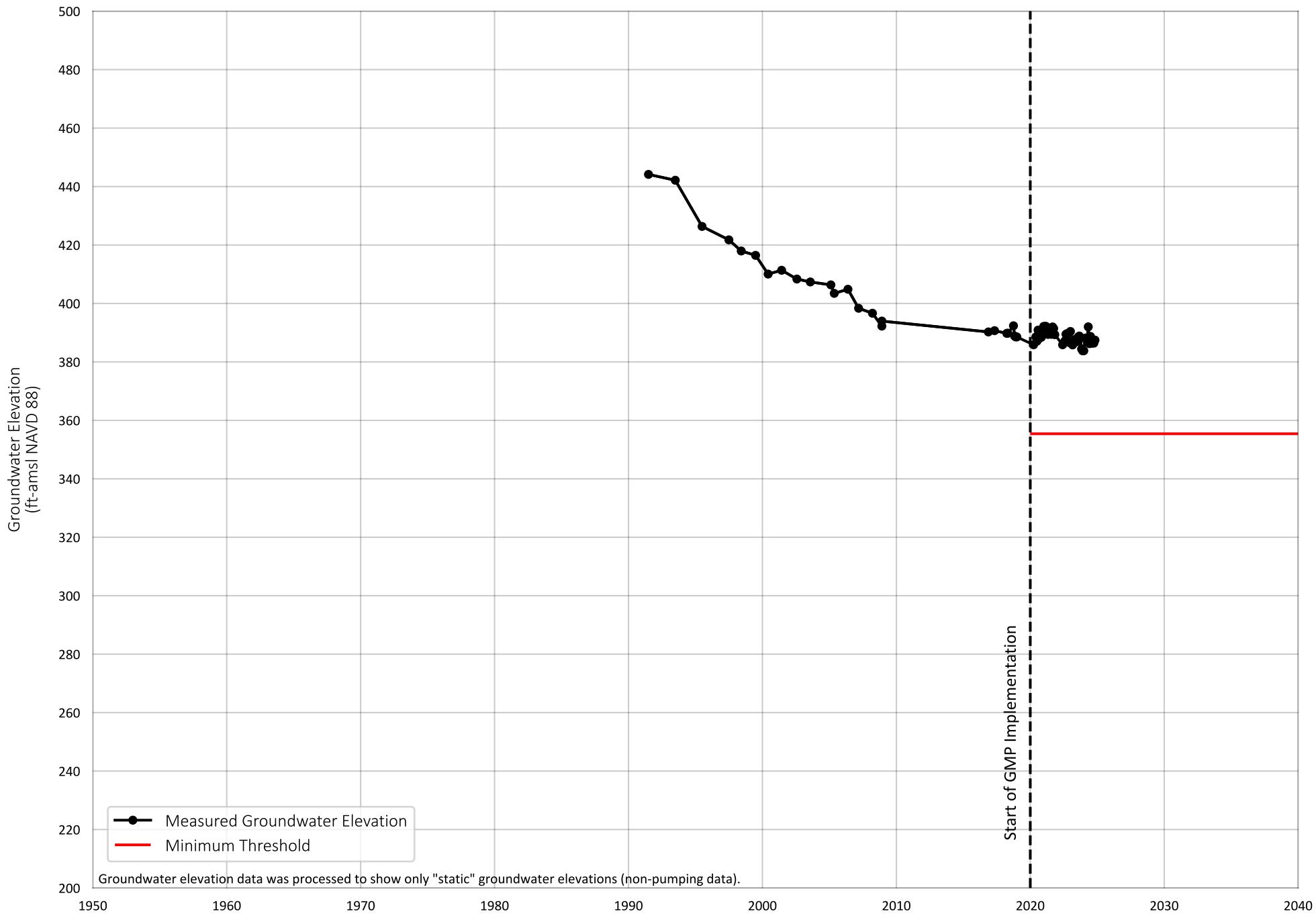
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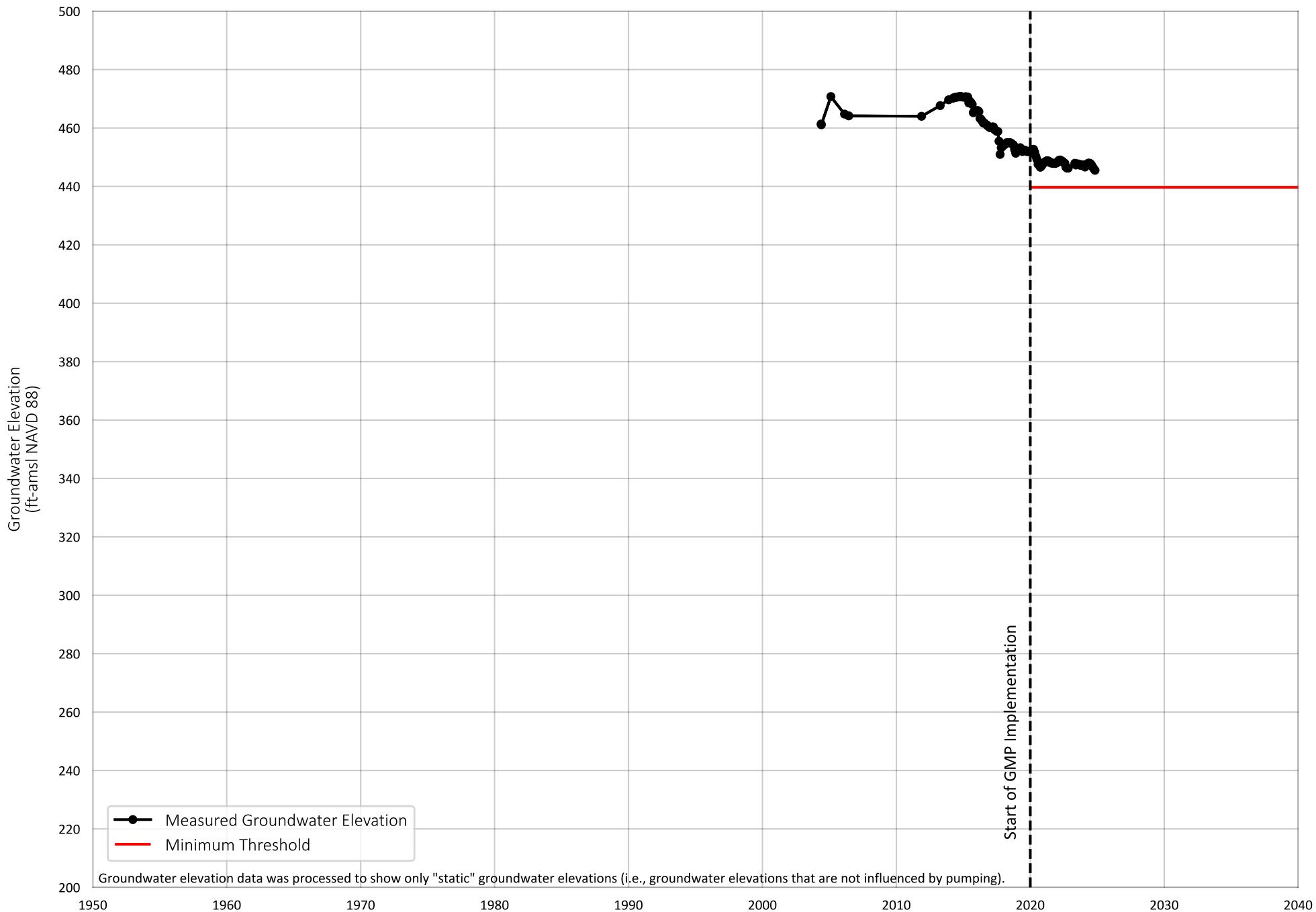
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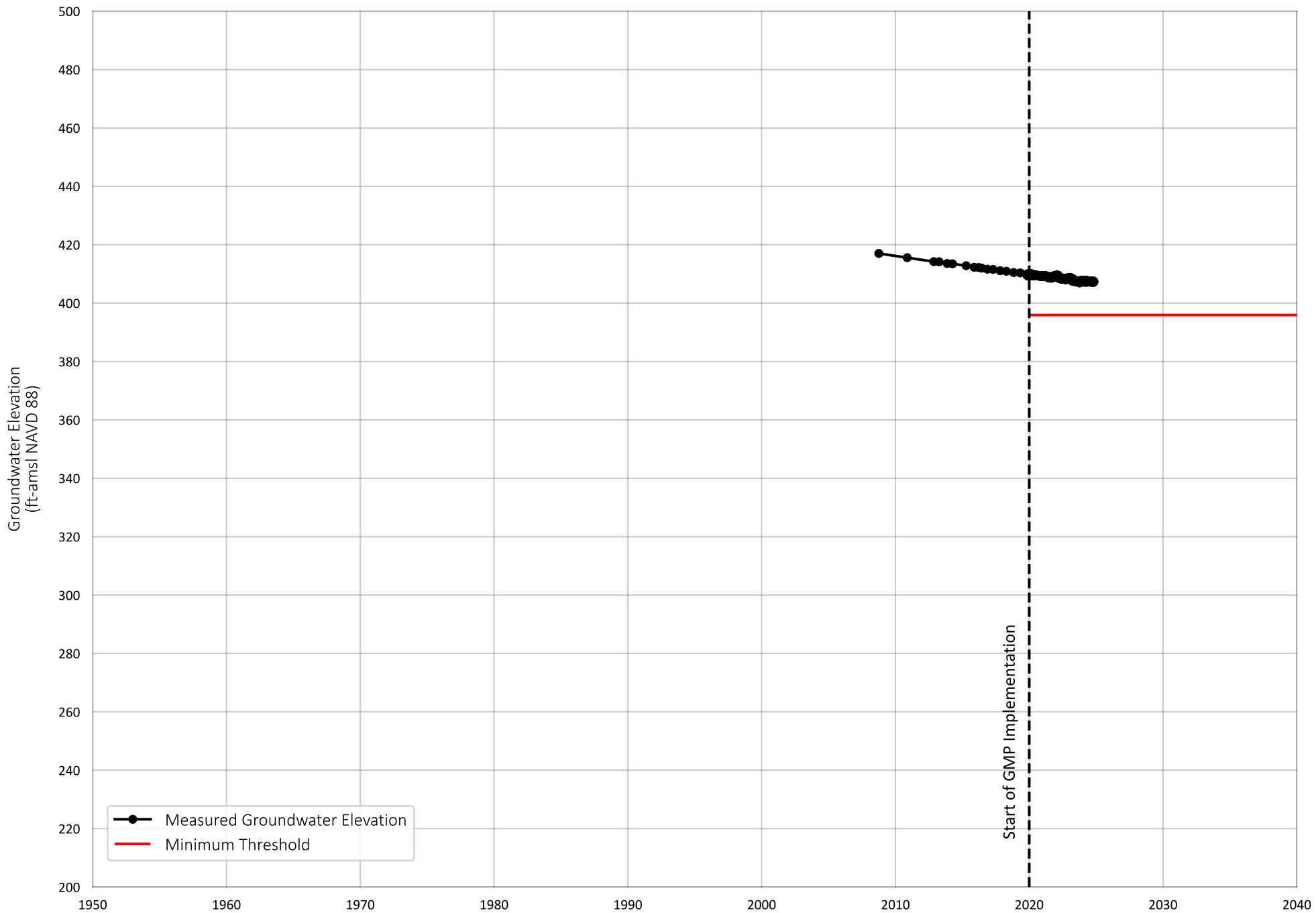


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Figure 4-I

Groundwater Level and Sustainable Management Criteria
at Representative Monitoring Well MW-3

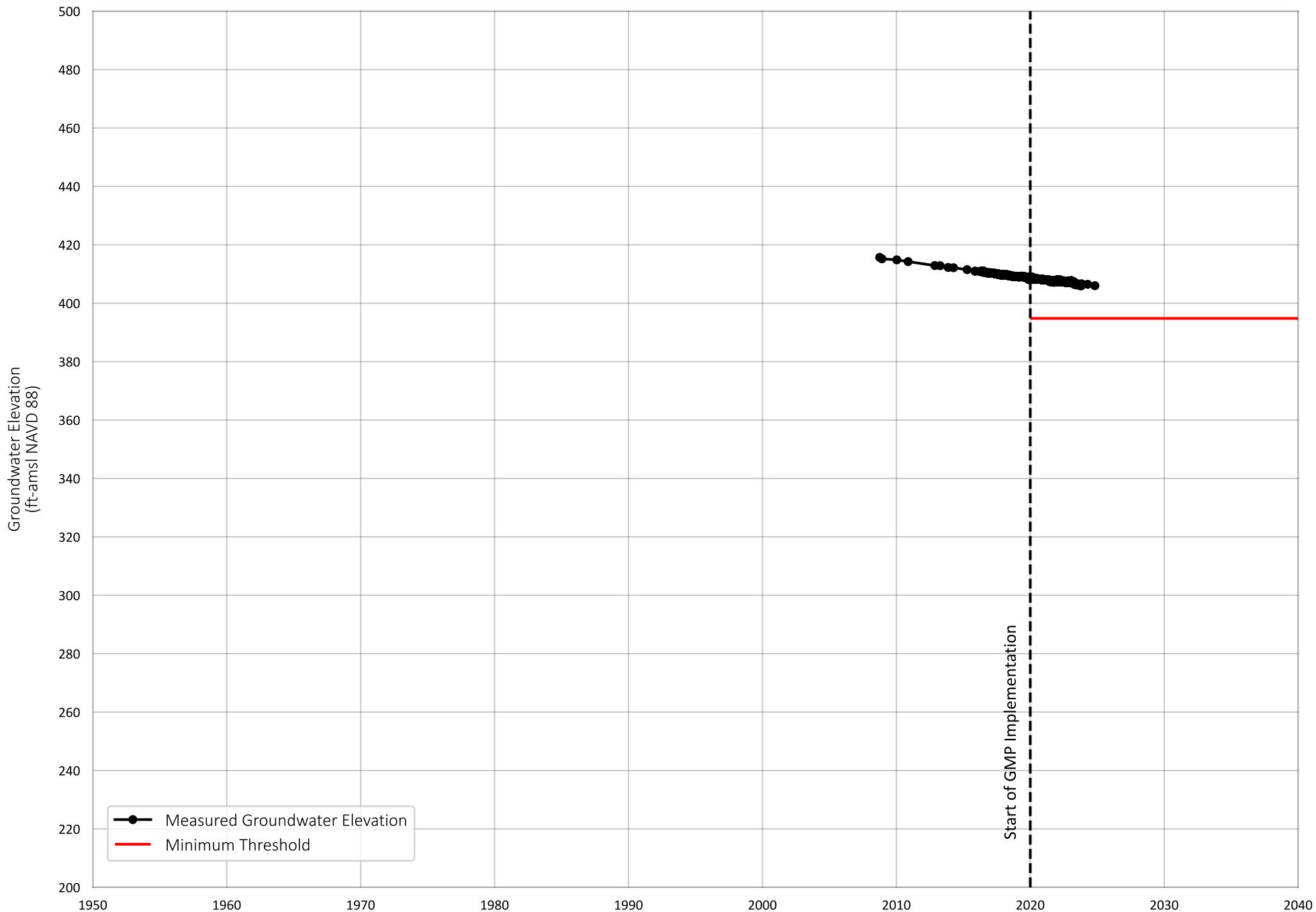


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Figure 4-m

Groundwater Level and Sustainable Management Criteria
at Representative Monitoring Well MW-5A (East-Lower)

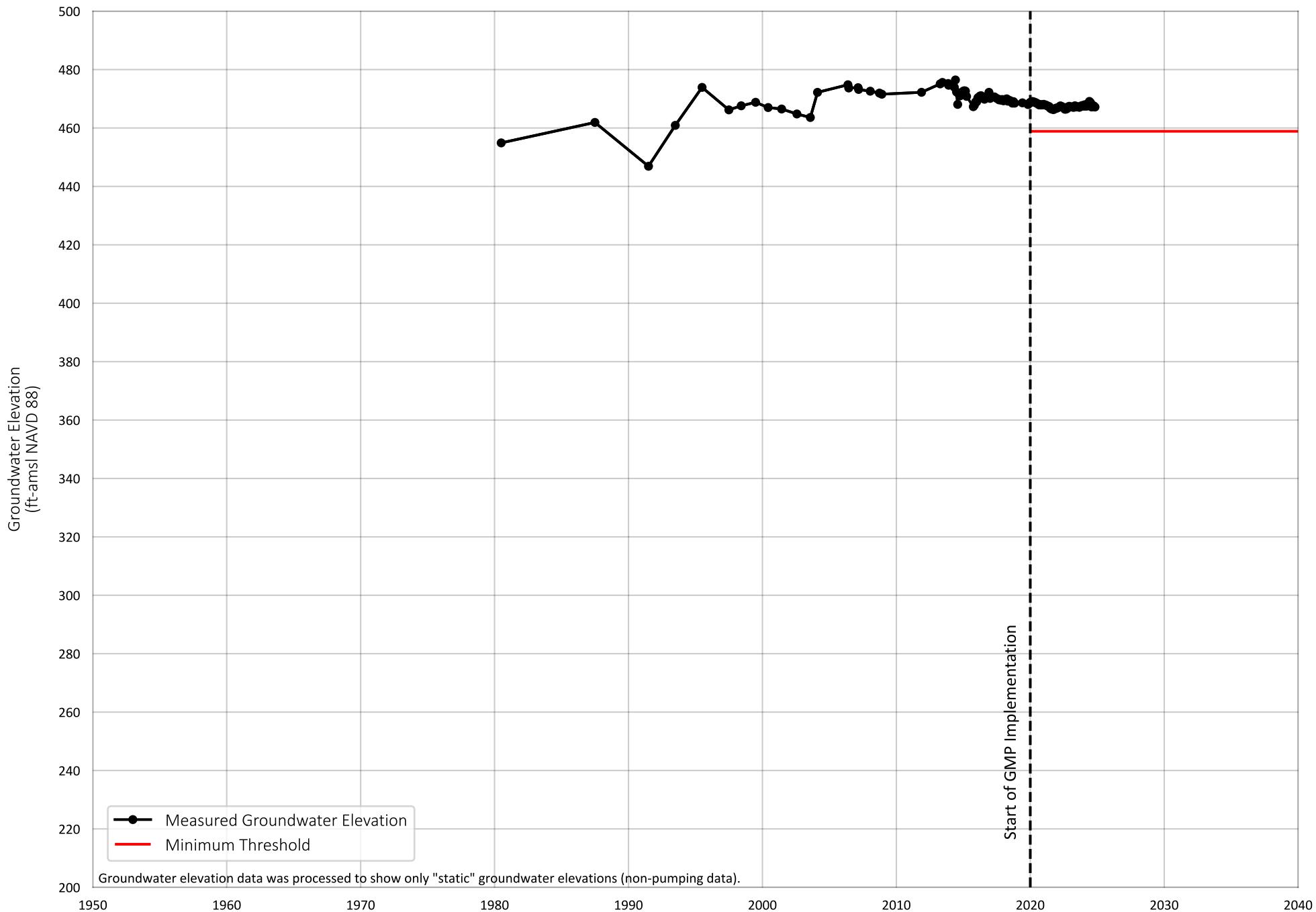


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Figure 4-n

Groundwater Level and Sustainable Management Criteria
at Representative Monitoring Well MW-5B (West-Upper)

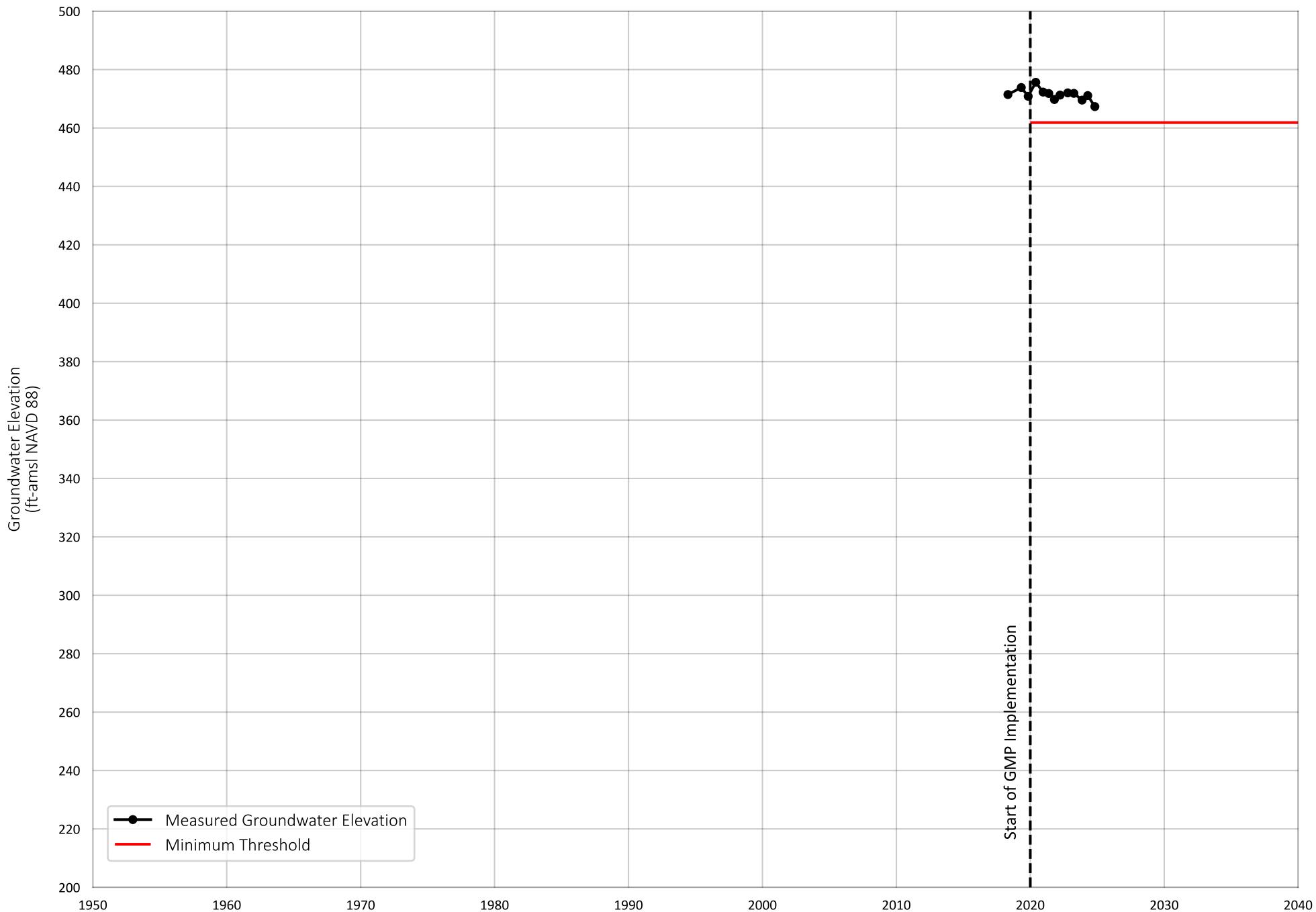


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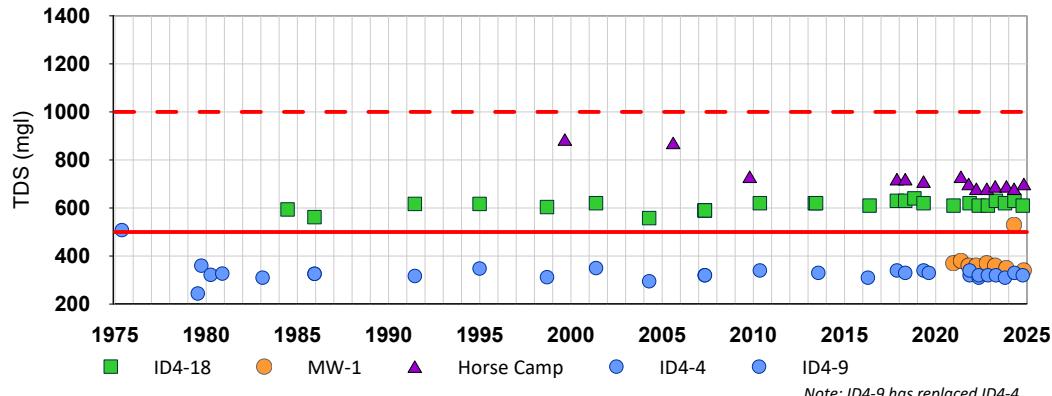
Figure 4-o

Groundwater Level and Sustainable Management Criteria
at Representative Monitoring Well RH-1 (ID1-1)

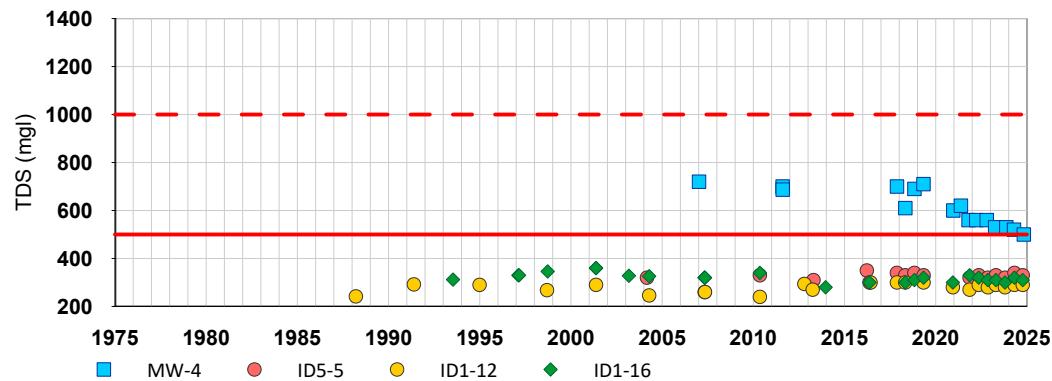


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North Management Area



Central Management Area



South Management Area

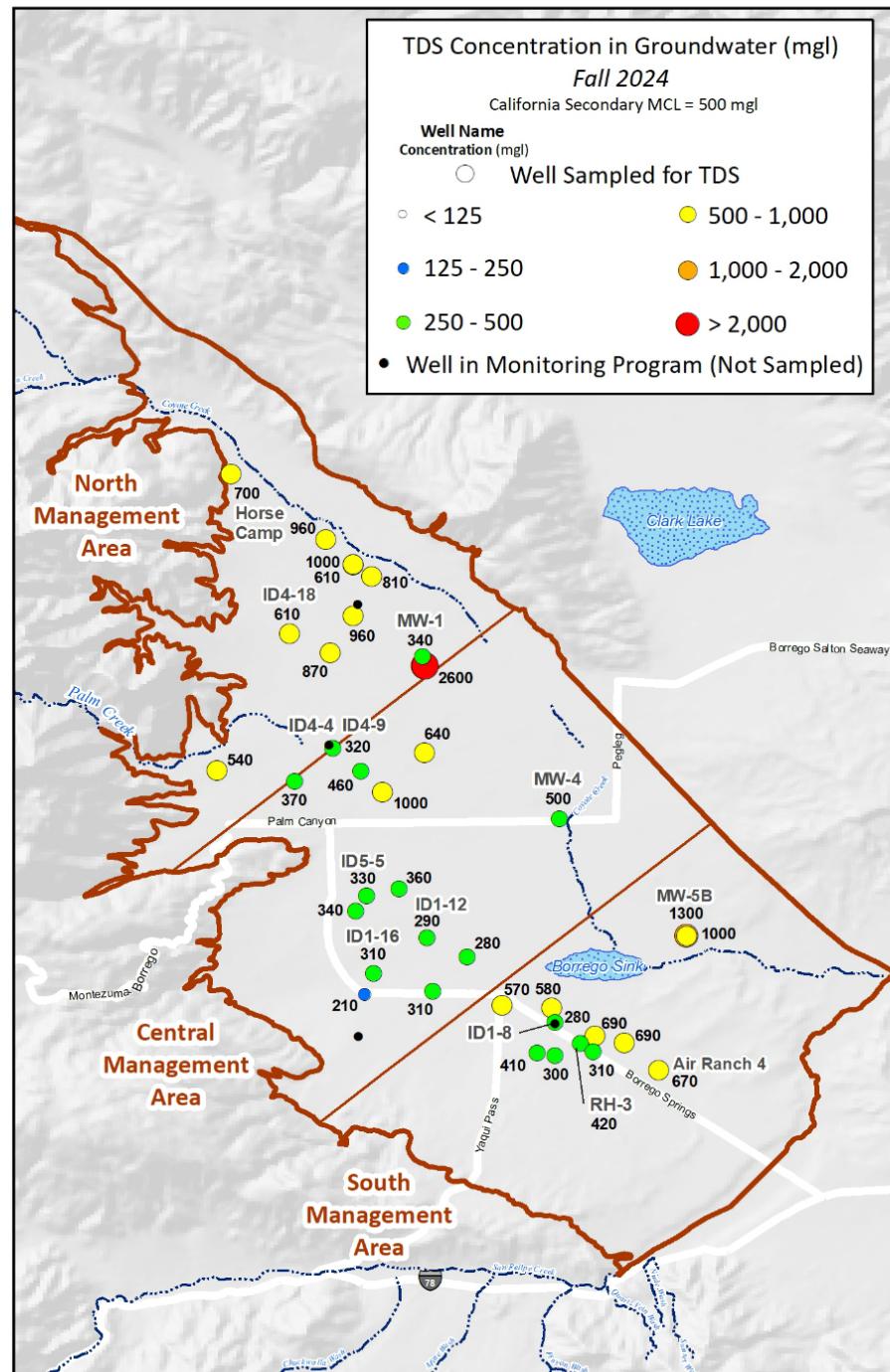
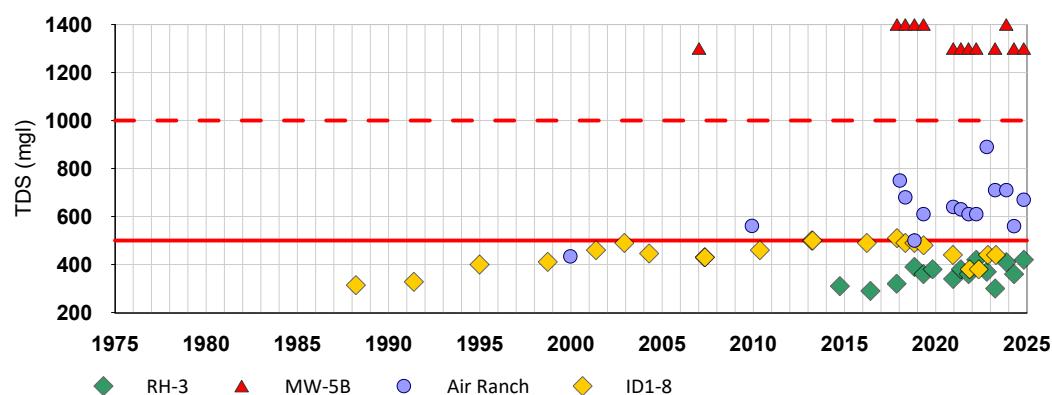
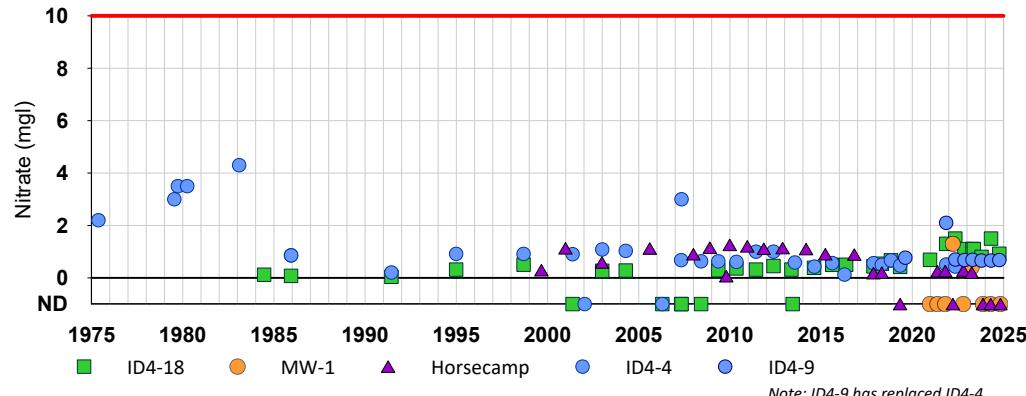


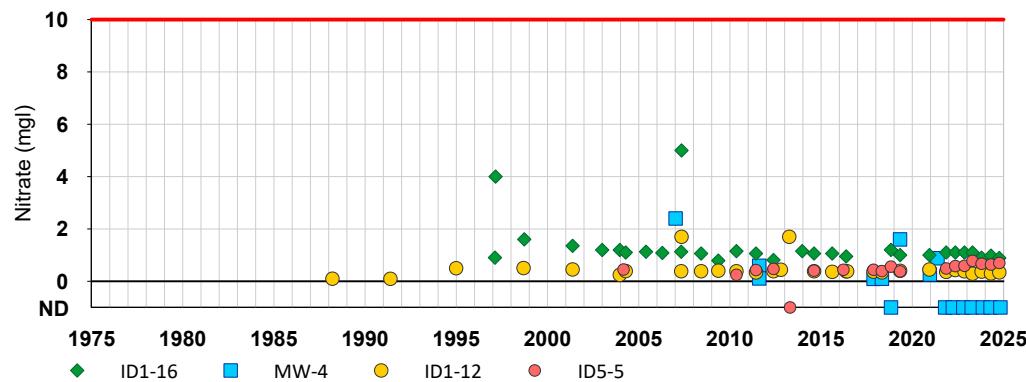
Figure 5

Total Dissolved Solids (TDS) in Groundwater

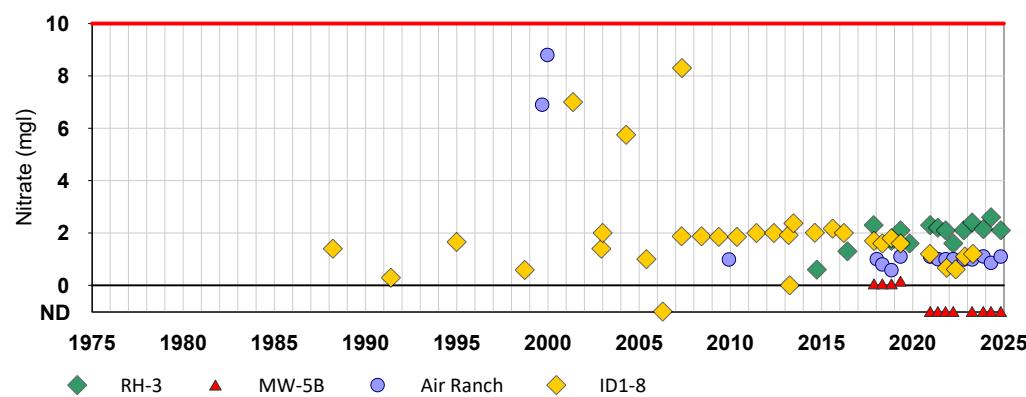
North Management Area



Central Management Area



South Management Area



Wells by Principal Aquifer

- △ Upper
- ◊ Lower
- Upper and Middle
- ◊ Upper, Middle, and Lower
- Middle and Lower

Maximum Contaminant Level

— Primary MCL

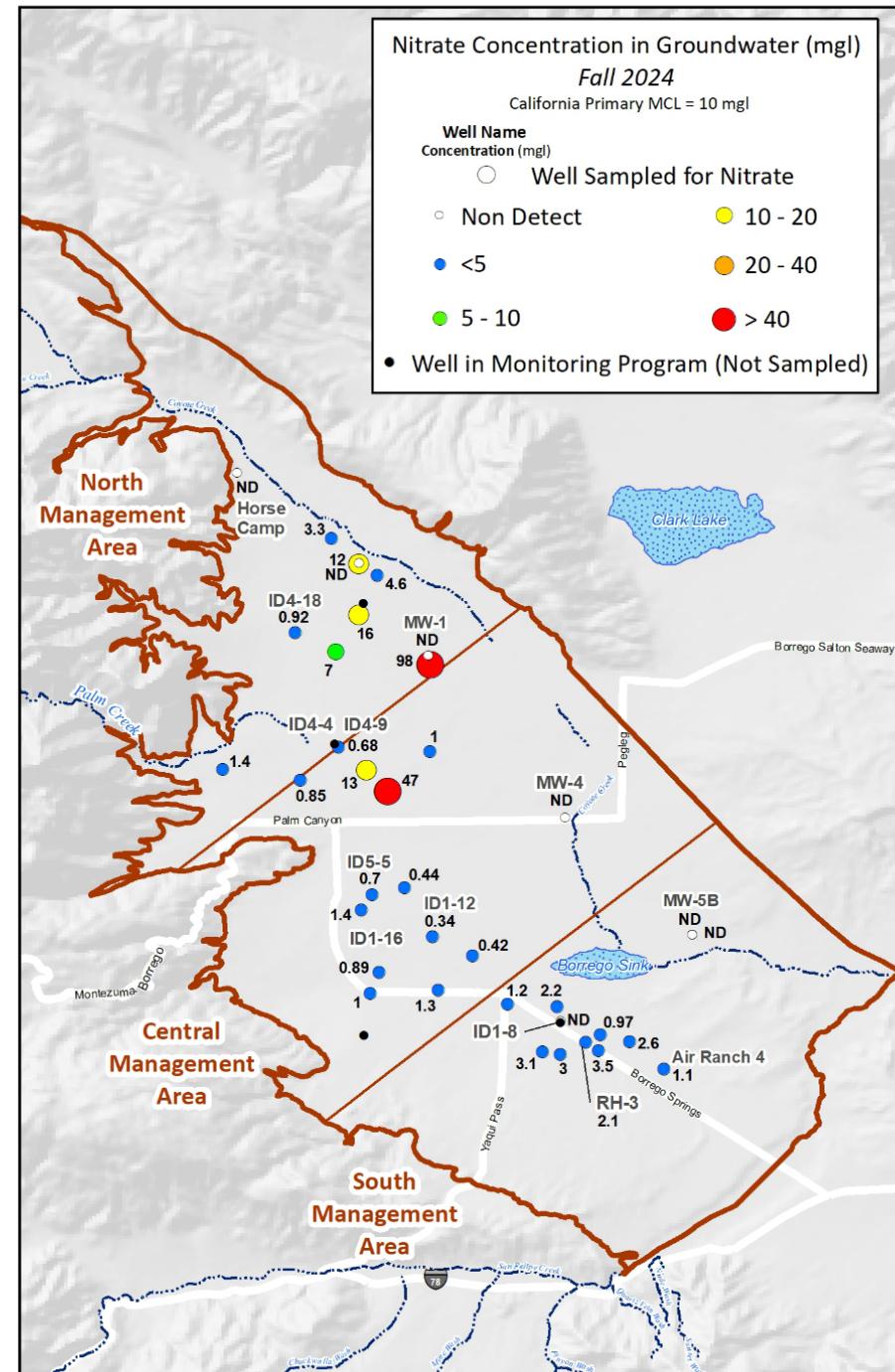
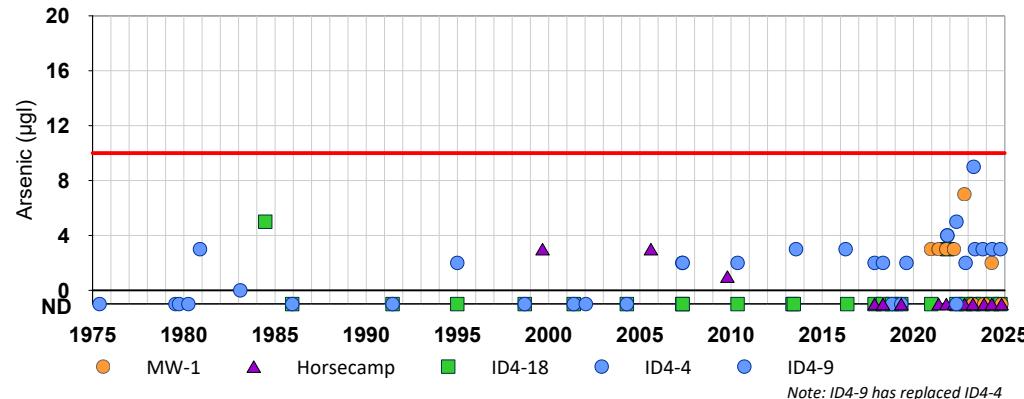


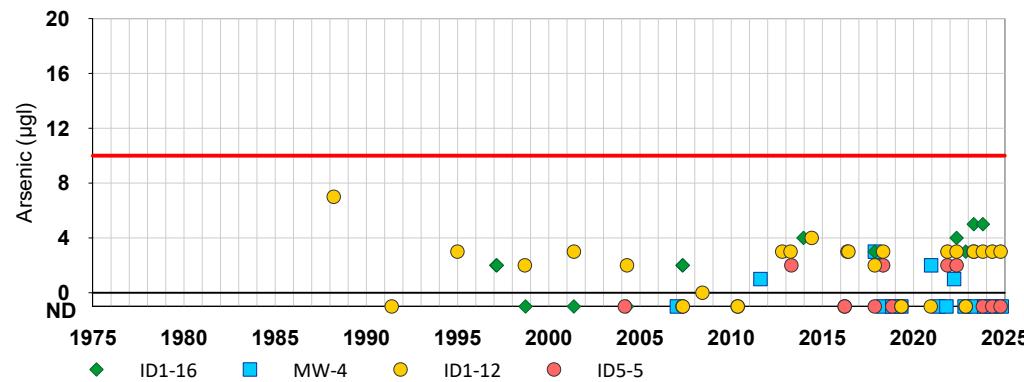
Figure 6

Nitrate (as Nitrogen) in Groundwater

North Management Area



Central Management Area



South Management Area

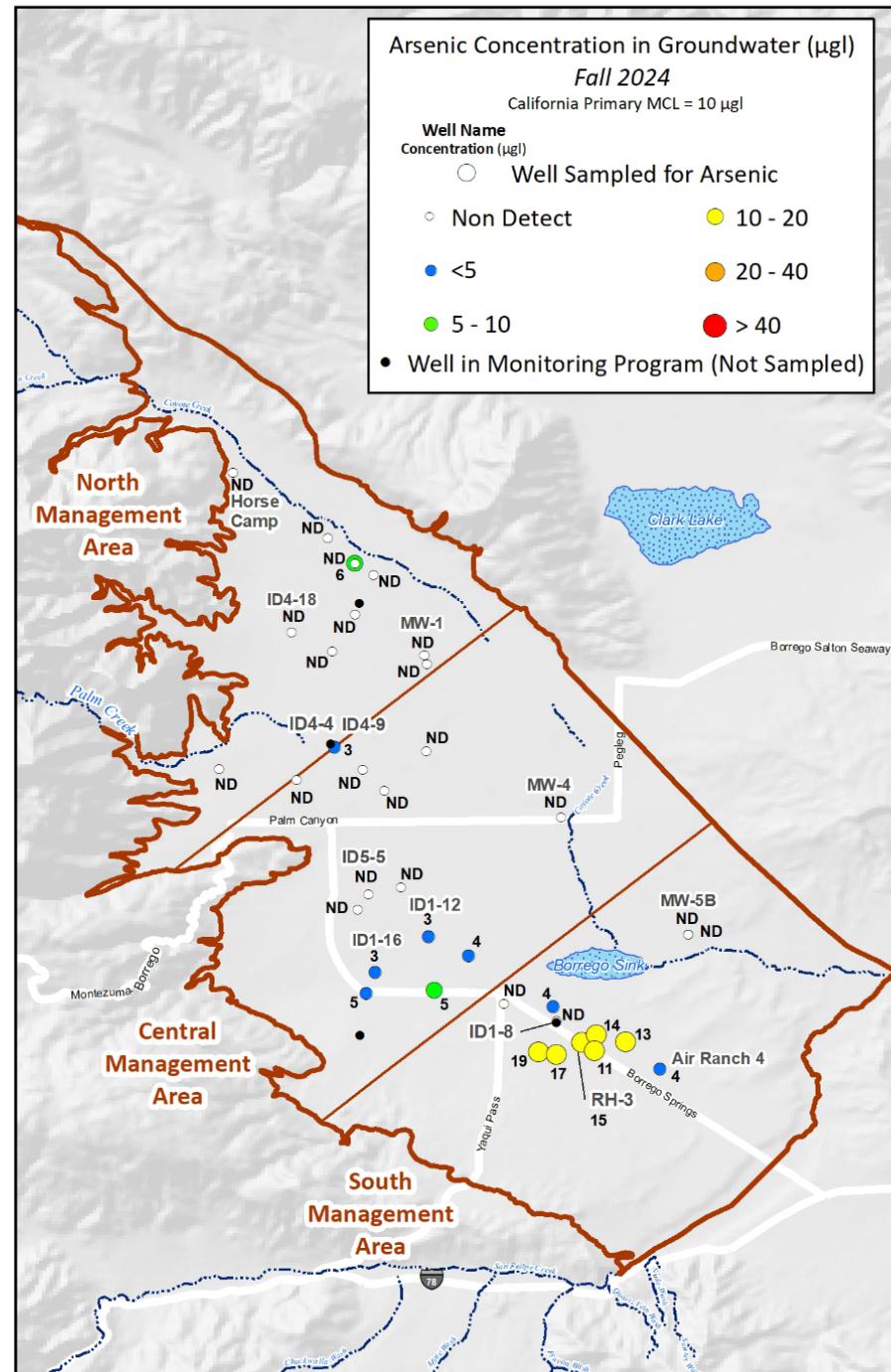
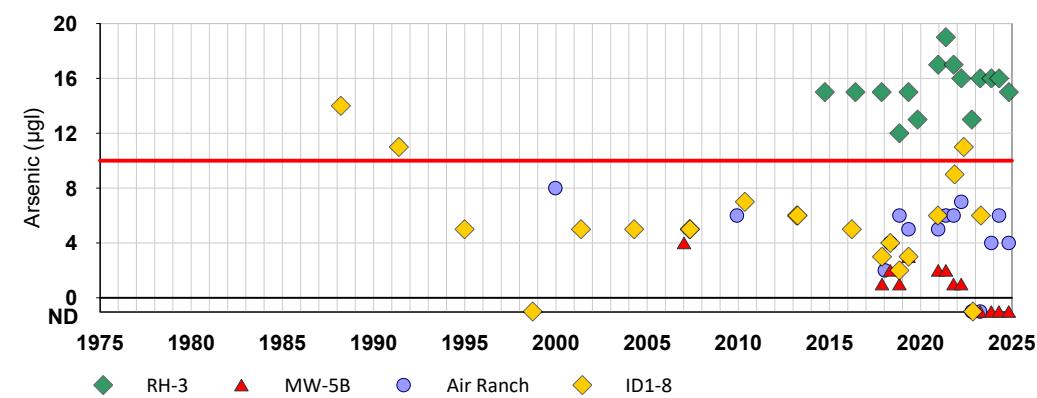
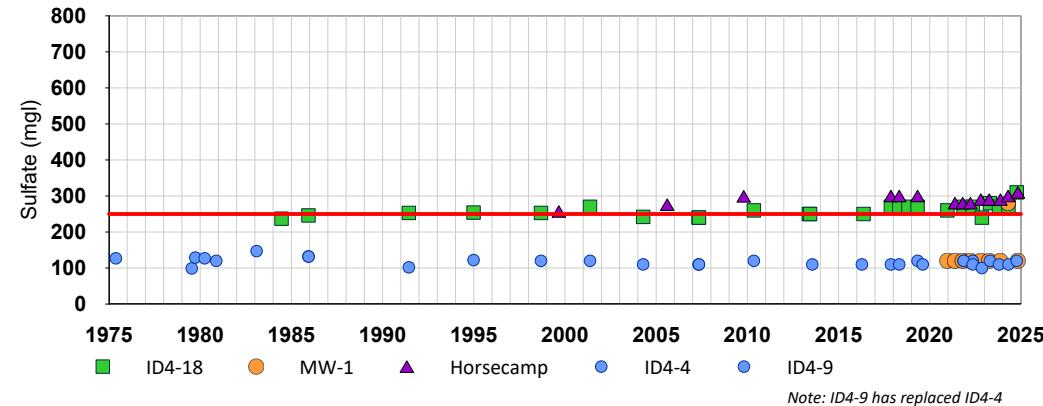


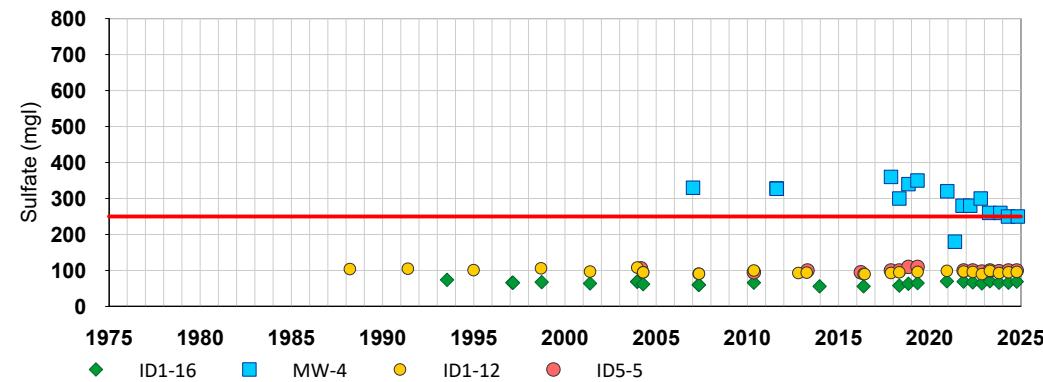
Figure 7

Arsenic in Groundwater

North Management Area



Central Management Area



South Management Area

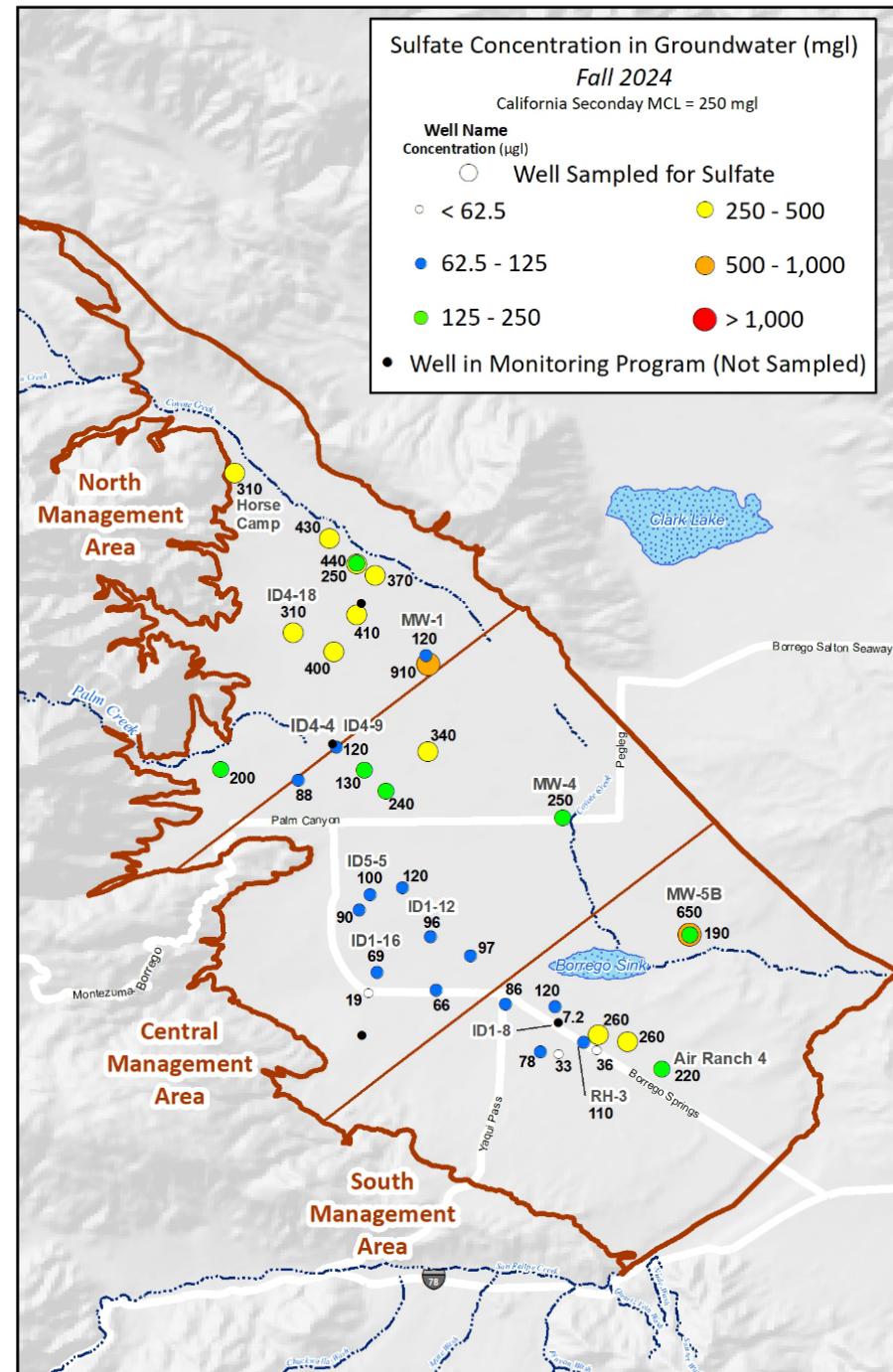
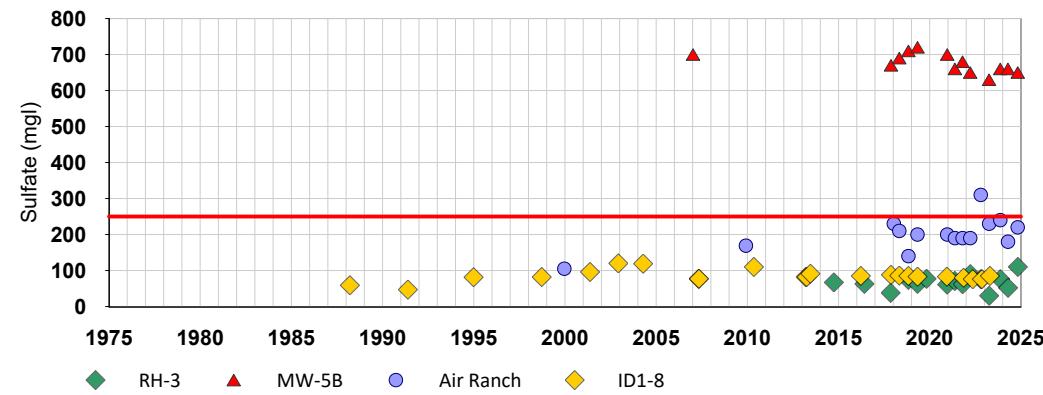
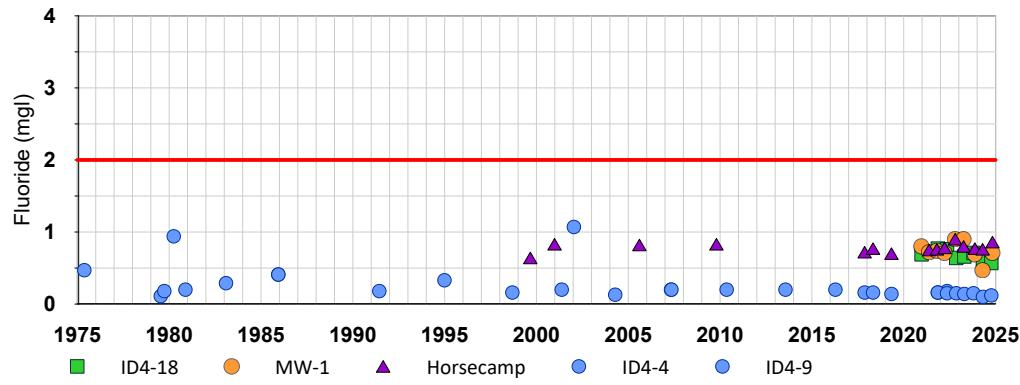
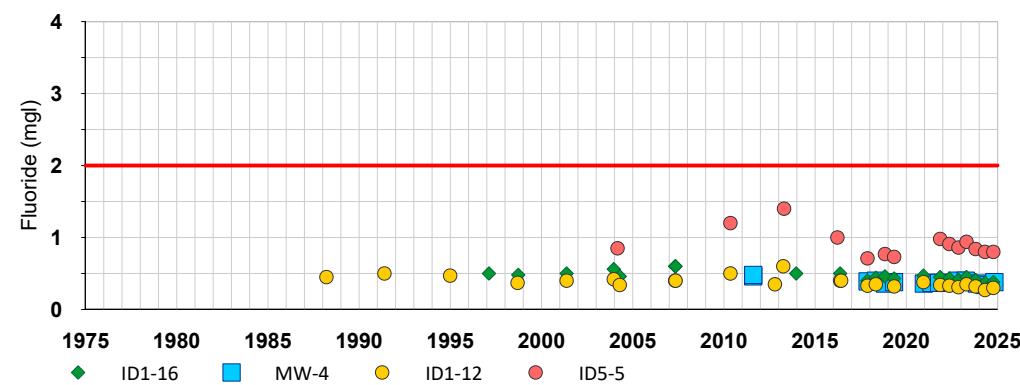


Figure 8

North Management Area



Central Management Area



South Management Area

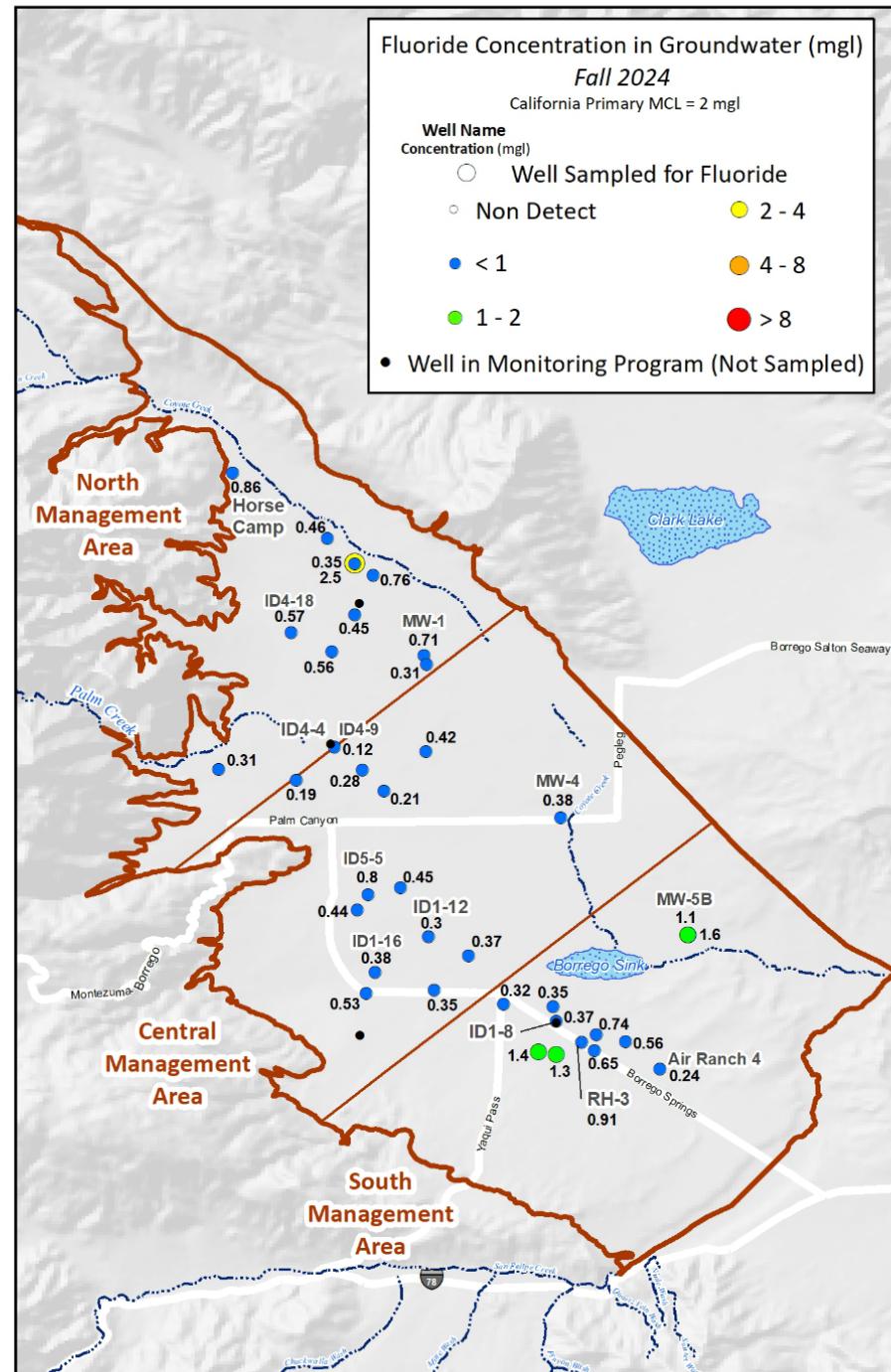
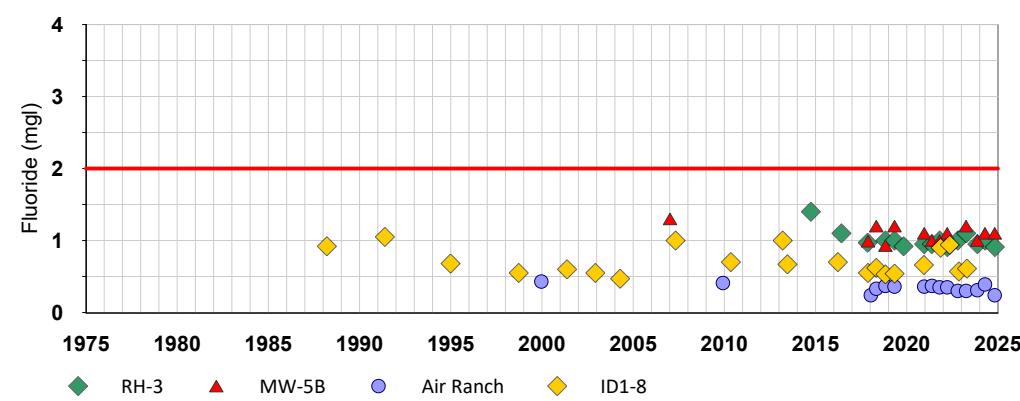


Figure 9

Fluoride in Groundwater

Table 1. Groundwater Level and Quality Monitoring Network and Wells Monitored in Fall 2024

Local Well Name	State Well ID	Well Use	Groundwater Monitoring Network				Comments	
			Water Level		Water Quality			
			Method if in program ^(a)	Fall 2024	Well in program?	Fall 2024		
North Management Area								
ID4-18*	010S006E18J001S	Public Supply	transducer	x	yes	x		
ID4-3*	010S006E18R001S	Observation	manual	x				
ID4-4*	010S006E29K002S	Observation	manual	x				
ID4-9	010S006E29K003S	Public Supply	transducer	x	yes	x		
MW-1*	010S006E21A002S	Observation	transducer	x	yes	x		
Evans	010S006E21E001S	Observation	manual	x				
Horse Camp	009S006E31E003S	Other	manual	x	yes	x		
Fortiner*	010S006E09N001S	Domestic	manual	x	yes		Unable to sample for GWQ in Fall 2024 due to the well pump being non-operational.	
Auxiliary Well 3	010S005E25R002S	Other	transducer	x				
Auxiliary Well 2	010S005E25R001S	Other	manual	x	yes	x		
T2 Farms	010S006E09C001S	Irrigation	no		yes	x	Unable to measure GWL due to sounding tube obstruction.	
MW-6S	010S006E08A003S	Observation	manual	x	yes	x		
MW-6D	010S006E08A002S	Observation	manual	x	yes	x		
NMA-1	Private ^(b)	Irrigation	no		yes	x		
NMA-2	Private ^(b)	Domestic	manual	x				
NMA-3	Private ^(b)	Abandoned	manual	x				
NMA-4	Private ^(b)	Irrigation	no		yes	x		
NMA-6	Private ^(b)	Irrigation	no		yes	x		
NMA-7	Private ^(b)	Irrigation	no		yes	x	First sample collected for GWQ. Well added to GWQ network.	
Central Management Area								
Anzio/Yaqui Pass	011S006E22E001S	Observation	manual	x				
BSR Well 6	011S006E09B002S	Irrigation	manual	x	yes	x		
Cameron 2	011S006E04F001S	Observation	manual	x				
County Yard	011S006E15G001S	Industrial	manual	x	yes	x		
ID1-10	011S006E22D001S	Public Supply	transducer	x	yes	x		
ID1-12*	011S006E16A002S	Public Supply	transducer	x	yes	x		
ID1-16*	011S006E16N001S	Public Supply	transducer	x	yes	x		
ID4-1*	010S006E32R001S	Observation	manual	x				
ID4-10	011S006E18L001S	Observation	manual	x				
ID4-11*	010S006E32D001S	Public Supply	transducer	x	yes	x		
ID4-2	011S006E07K003S	Observation	manual	x				
ID4-5	010S006E33Q001S	Observation	manual	x				
ID5-5*	011S006E09E001S	Public Supply	transducer	x	yes	x		
ID5-15		Public Supply	no		yes	x	First sample collected for GWQ. Well added to GWQ network.	
MW-4	010S006E35Q001S	Observation	manual	x	yes	x		
Paddock	011S006E22B001S	Observation	manual	x				
Palleson	010S006E33J001S	Observation	manual	x				
Wilcox	011S006E20A001S	Public Supply	manual	x	yes	x		
Hanna (Flowers)	010S006E14G001S	Observation	transducer	x				
Terry Well	011S006E20R001S	Irrigation	manual	x	yes		Unable to sample for GWQ in Fall 2024 because WM staff were unable to reach the well owner to activate the pump.	
Airport 2*	010S006E35N001S	Observation	destroyed				Unable to measure GWL since Fall 2023 due to collapsed well casing.	
CMA-2	Private ^(b)	Irrigation	no		yes	x		
CMA-4	Private ^(b)	Recreation	no		yes	x		
CMA-5	Private ^(b)	Recreation	no		yes	x		
South Management Area								
Air Ranch Well 4*	011S007E30L001S	Public Supply	manual	x	yes	x		
Army Well	011S006E34A001S	Observation	manual	x				
Hayden (32Q1)	011S007E32Q001S	Observation	manual	x				
ID1-8	011S006E23J001S	Public Supply	manual	x				
JC Well	011S006E24Q001S	Observation	transducer	x				
La Casa	011S006E23E001S	Irrigation	manual	x	yes	x		
MW-3*	011S006E23J002S	Observation	transducer	x	yes	x		
MW-5A*	011S007E07R001S	Observation	transducer	x	yes	x		
MW-5B*	011S007E07R002S	Observation	manual	x	yes	x		
RH-1 (ID1-1)*	011S006E25A001S	Recreation	transducer	x	yes	x	Transducer replaced in Fall 2024.	
RH-2 (ID1-2)	011S006E25C001S	Recreation	transducer	x	yes	x	Transducer replaced in Fall 2024.	
RH-3	011S006E25C002S	Recreation	transducer	x	yes	x		
RH-4	011S006E24Q002S	Recreation	transducer	x	yes	x		
RH-5	011S006E26B001S	Recreation	transducer	x	yes	x		
RH-6	011S006E26H001S	Recreation	transducer	x	yes	x	Transducer replaced in Fall 2024.	
WWTP	011S006E23H001S	Observation	transducer	x	yes	x		
Bing Crosby Well	011S007E20P001S	Observation	manual	x				
Outside Borrego Springs Subbasin								
State Well	012S007E03L001S	Observation	manual	x				
Nel Well	012S007E04R001S	Observation	manual	x				
Wells not included in the groundwater level or groundwater quality monitoring program are greyed out.								
*Representative Monitoring Well with defined Minimum Thresholds and Measurable Objectives, as identified in Table 3-4 and Table 3-5 of the GMP								
(a) Wells denoted with "transducer" have a pressure transducer installed that continuously records water level measurements on a high frequency interval (15-minutes to 1 hour).								
(b) Private wells with data confidentiality agreements are denoted by aliases "NMA-#" or "CMA-#" based on their relative location in the Management Area.								

Table 2. Groundwater Wells Evaluated in Fall 2024 for Expansion of Monitoring Network

Alias Well Name ^(a)	Well Use	Well Status	Are securing or conversion activities required? ^(b)	Groundwater Monitoring Network Considered and Date Evaluated			
				Water Level		Water Quality	
				Well added to Monitoring Program?	Fall 2024	Well added to Monitoring Program?	Fall 2024
North Management Area							
Viking Well	Abandoned	Inactive	Yes - secure only	yes - after well conversion	<i>not measured</i>		
Bauer Monitoring Well	Abandoned	Inactive	Yes - convert & secure	yes - after well conversion	<i>not measured</i>		
808 Ghost	Abandoned	Inactive	Yes - convert & secure	yes - after well conversion	<i>not measured</i>		
NMA-5	Abandoned	Inactive	Yes - convert & secure	yes - after well conversion	x		
Central Management Area							
CMA-3	Abandoned	Inactive	Yes - convert & secure	yes - after well conversion	x	<i>na</i>	

(a) Private wells with data confidentiality agreements are denoted by aliases "NMA-#" or "CMA-#" based on their relative location in the Management Area.

(b) Most inactive wells require activities be performed to either convert the well into a monitoring well or secure the well to prevent it from being a risk to the public prior to adding the well to the monitoring network. Well conversion activities may include: removing downhole equipment, video logging the wells to document the well screen intervals and conditions, well rehabilitation, installing new well head access points to allow for water-level monitoring and/or low-flow water-quality sampling, and/or installing transducers to measure groundwater-level. Well securing activities may include: installing locking well caps, improving the well head, installing a concrete pad around the well head, and/or installing bollards to physically protect the well.

**Table 3. Current Groundwater Elevations at Representative Monitoring Wells
Compared to Minimum Threshold**

Local Well Name	State Well ID	Fall 2024 Groundwater Elevation ^(a) (ft-msl)	Minimum Threshold ^(b) (ft-msl)	Fall 2024 Groundwater Elevation minus Minimum Threshold (ft)
		<i>a</i>	<i>b</i>	<i>c = a-b</i>
North Management Area				
MW-1	010S006E21A002S	373.85	336	38.1
ID4-3	010S006E18R001S	373.81	336	37.9
Fortiner	010S006E09N001S	374.01	331	43.2
ID4-18	010S006E18J001S	369.01	330	38.7
ID4-4	010S006E29K002S	360.75	128	233.2
Central Management Area				
ID4-1	010S006E32R001S	388.42	359	29.8
Airport 2	010S006E35N001S	400.76	381	20.2
ID1-16	011S006E16N001S	386.18	355	30.8
ID4-11	010S006E32D001S	371.79	<i>164</i>	208.1
ID1-12	011S006E16A002S	384.23	<i>285</i>	99.6
ID5-5	011S006E09E001S	386.17	<i>176</i>	209.8
South Management Area				
MW-5A	011S007E07R001S	407.43	396	11.5
MW-5B	011S007E07R002S	406.00	395	11.2
MW-3	011S006E23J002S	445.22	<i>438</i>	7.5
Air Ranch	011S007E30L001S	467.33	<i>462</i>	5.5
RH-1	011S006E25A001S	466.97	<i>459</i>	8.1

(a) If a water level was not measured in Fall 2024, an "estimated static" groundwater elevation was selected based on recent trends in groundwater elevation at the well and nearby wells, and knowledge of the influence of nearby pumping. Estimated values are shown in *blue italic font*. In Fall 2024, the only estimated value is for the Airport 2 well; its well casing collapsed prior to the Semi-Annual Monitoring Event in fall 2023.

(b) *Italic values* are Minimum Thresholds established based on the top of the well screen. All other Minimum Thresholds are based on model results from the Borrego Valley Hydrologic Model (BVHM). All Minimum Thresholds in the GMP have been converted to feet above mean sea level.

Table 4. Groundwater Level Trends at Representative Monitoring Wells

Fall 2019 to Fall 2024

Local Well Name	State Well ID	Fall 2019 Groundwater Elevation ^(a,b) (ft-msl)	Fall 2024 Groundwater Elevation ^(c) (ft-msl)	Change in Groundwater Elevation since Fall 2019 (ft)	Rate of Change Groundwater Elevation since Fall 2019 (ft/yr)	Historical Rate of Change in Groundwater Elevation ^(d) (ft/yr)
		<i>a</i>	<i>b</i>	<i>c = b-a</i>	<i>d = c/(2024 - 2019)</i>	
North Management Area						
MW-1	010S006E21A002S	374.76	373.85	-0.9	-0.2	-2.14
ID4-3	010S006E18R001S	377.96	373.81	-4.1	-0.8	-2.09
Fortiner	010S006E09N001S	<i>376.82</i>	374.01	-2.8	-0.6	-2.48
ID4-18	010S006E18J001S	<i>374.36</i>	369.01	-5.4	-1.1	-2.31
ID4-4	010S006E29K002S	<i>375.06</i>	360.75	-14.3	-2.9	-2.73
Central Management Area						
ID4-1	010S006E32R001S	391.66	388.42	-3.2	-0.6	-1.39
Airport 2	010S006E35N001S	405.60	<i>400.76</i>	-4.8	-1.0	-1.67
ID1-16	011S006E16N001S	<i>388.42</i>	386.18	-2.2	-0.4	-0.95
ID4-11	010S006E32D001S	<i>386.44</i>	371.79	-14.7	-2.9	-2.29
ID1-12	011S006E16A002S	<i>385.94</i>	384.23	-1.7	-0.3	-1.51
ID5-5	011S006E09E001S	387.64	386.17	-1.5	-0.3	-0.85
South Management Area						
MW-5A	011S007E07R001S	409.92	407.43	-2.5	-0.5	-0.74
MW-5B	011S007E07R002S	408.80	406.00	-2.8	-0.6	-0.74
MW-3	011S006E23J002S	451.68	445.22	-6.5	-1.3	-5.84
Air Ranch	011S007E30L001S	470.85	467.33	-3.5	-0.7	-0.5
RH-1	011S006E25A001S	467.87	466.97	-0.9	-0.2	-0.94

(a) Fall 2019 is the start of Physical Solution Implementation Period.

(b) If a Fall 2019 water level was not measured, an "estimated static" groundwater elevation was selected based on recent trends in groundwater elevation at the well and nearby wells, and knowledge of the influence of nearby pumping. Estimated values are shown in *blue italic font*.

(c) If a water level was not measured in Fall 2024, an "estimated static" groundwater elevation was selected based on recent trends in groundwater elevation at the well and nearby wells, and knowledge of the influence of nearby pumping. Estimated values are shown in *blue italic font*. In Fall 2024, the only estimated value is for the Airport 2 well; its well casing collapsed prior to the Semi-Annual Monitoring Event in fall 2023.

(d) Historical rate of change in groundwater level is based on pre-fall 2018 groundwater levels as reported in the GMP (Dudek, 2020).

Table 5. Water Quality Standard Exceedance Report

Fall 2024

Owner	Well Name	State Well ID	Well Use	Analyte (unit)	Date	Result	US EPA Primary MCL ⁽¹⁾	US EPA Secondary MCL ⁽²⁾	California Primary MCL ⁽³⁾	California Secondary MCL ⁽⁴⁾
Borrego Air Ranch	Air Ranch Well 4	011S007E30L001S	Public Supply	TDS (mg/L)	10/27/2024	670		500		500-1,000
Borrego Water District	ID4-18	010S006E18J001S	Public Supply	Sulfate (mg/L)	10/8/2024	310		250		250
				TDS (mg/L)	10/8/2024	610		500		500-1,000
	MW-5A	011S007E07R001S	Observation	Chloride (mg/L)	10/28/2024	340		250		250-500
				TDS (mg/L)	10/28/2024	1000		500		500-1,000
	MW-5B	011S007E07R002S	Observation	Sulfate (mg/L)	10/28/2024	650		250		250
				TDS (mg/L)	10/28/2024	1300		500		500-1,000
	WWTP	011S006E23H001S	Observation	TDS (mg/L)	10/28/2024	580		500		500-1,000
CWC Casa del Zorro LLC	La Casa	011S006E23E001S	Public Supply	TDS (mg/L)	10/31/2024	570		500		500-1,000
Private	NMA-1	Private	Irrigation	Sulfate (mg/L)	10/30/2024	430		250		250
				TDS (mg/L)	10/30/2024	960		500		500-1,000
				Nitrate-Nitrogen (mg/L)	10/30/2024	16	10		10	
	NMA-4	Private	Irrigation	Sulfate (mg/L)	10/30/2024	410		250		250
				TDS (mg/L)	10/30/2024	960		500		500-1,000
				Nitrate-Nitrogen (mg/L)	10/30/2024	98	10		10	
	NMA-6	Private	Irrigation	Sulfate (mg/L)	10/30/2024	910		250		250
				TDS (mg/L)	10/30/2024	2600		500		500-1,000
				Nitrate-Nitrogen (mg/L)	10/30/2024	400		250		250
	NMA-7	Private	Irrigation	Sulfate (mg/L)	10/30/2024	870		500		500-1,000
				TDS (mg/L)	10/30/2024	340		250		250
				Nitrate-Nitrogen (mg/L)	10/29/2024	13	10		10	
State of California, Department of Parks and Recreation	Horse Camp	009S006E31E003S	Other	Nitrate-Nitrogen (mg/L)	10/29/2024	47	10		10	
				Sulfate (mg/L)	10/31/2024	310		250		250
	Auxiliary 2	010S005E25R001S	Other	TDS (mg/L)	10/31/2024	700		500		500-1,000
T2 Borrego LLC (Rams Hill)	RH-1	011S006E25A001S	Irrigation	TDS (mg/L)	10/30/2024	690		500		500-1,000
				Arsenic (mg/L)	10/30/2024	0.013	0.01		0.01	
				Sulfate (mg/L)	10/30/2024	260		250		250
	RH-2	011S006E25C001S	Irrigation	TDS (mg/L)	10/30/2024	690				
	RH-3	011S006E25C002S	Irrigation	Arsenic (mg/L)	10/30/2024	0.011	0.01		0.01	
	RH-4	011S006E24Q002S	Irrigation	Arsenic (mg/L)	10/30/2024	0.015	0.01		0.01	
				Sulfate (mg/L)	10/30/2024	260		250		250
T2 Farms	RH-5	011S006E26B001S	Irrigation	TDS (mg/L)	10/30/2024	690		500		500-1,000
	RH-6	011S006E26H001S	Irrigation	Arsenic (mg/L)	10/29/2024	0.019	0.01		0.01	
T2 Farms	T2 Farms	010S006E09C001S	Irrigation	Arsenic (mg/L)	10/29/2024	0.017	0.01		0.01	
	Sulfate (mg/L)	10/30/2024	370		250		250			
	TDS (mg/L)	10/30/2024	810		500		500-1,000			

Note: Notification levels are health-based advisory levels established by CDPH for chemicals in drinking water that lack maximum contaminant levels (MCLs). When chemicals are found at concentrations greater than their notification levels, certain requirements and recommendations apply. State law requires timely notification of the local governing bodies by drinking water systems whenever a notification level is exceeded in a drinking water source.

1) US EPA Primary MCLs are federally enforceable limits for chemicals in drinking water and are set as close as feasible to the corresponding EPA MCLG.

2) US EPA Secondary MCLs or National Secondary Drinking Water Regulations are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. EPA recommends secondary standards to water systems but does not require systems to comply. However, states may choose to adopt them as enforceable standards.

3) California Primary MCLs are set by the Department of Public Health analogous to EPA Primary MCLs. Primary MCLs are enforceable at the state level.

4) California Secondary MCLs are defined in the California Code of Regulation Title 22 and are set to based on aesthetic considerations (taste, odor, color) for consumer acceptance. Some Secondary MCLs have recommended and upper limits.

5) Private wells with data confidentiality agreements are denoted by aliases "NMA-#" or "CMA-#" based on their relative location in the north and central management zones.

Table 6. Summary of Exceedances of Water Quality by Standard and Well Type

Parameter	Standard	Standard Limit (units)	Number of Drinking Water Wells with Exceedance	Number of Non-Potable Water Wells with Exceedance ¹	Number of Observation Wells with Exceedance
TDS ²	CA Secondary MCL – lower limit	500 mg/l	3	9	2
TDS ³	CA Secondary MCL – upper limit	1,000 mg/l	0	2	3
Sulfate	CA and EPA Secondary MCL	250 mg/l	1	9	2
Nitrate (as N)	CA and EPA Primary MCL	10 mg/l	0	4	1
Fluoride	EPA Secondary MCL	2 mg/l	0	0	1
Arsenic	CA Primary MCL	0.01 mg/l	0	6	0

Notes:

mg/l = milligrams per liter

- (1) Non-potable wells are wells used for irrigation and/or “other” purposes. These wells are not used for drinking water (potable) supplies. Note that the Fortiner well is considered “other” because water pumped from this well is not used for potable supply, per conversation with the well owner on October 12, 2023.
- (2) Wells shown exceeding the CA Secondary MCL – lower limit are wells with TDS results greater than 500 mg/l, but less than 1,000 mg/l (less than the CA Secondary MCL – upper limit).
- (3) Wells shown exceeding the CA Secondary MCL – upper limit are wells with TDS results greater than 1,000 mg/l. This row does not include wells that exceeded the CA Secondary MCL – lower limit.